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**NATIONAL NEUTRON CROSS SECTION CENTER
BROOKHAVEN NATIONAL LABORATORY
UPTON, NEW YORK 11973**

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NEUTRON CROSS SECTIONS VOLUME I, RESONANCE PARAMETERS

S.F. MUGHARGHAB AND D.I. GARBER

June 1973

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Each section is organized by element with the natural element information first, followed by isotope information. At the end of each section is a bibliography. Within each subsection the information is structured first by thermal cross section, then resonance properties, followed by resonance parameters.

FOREWORD

This edition of BNL 325, *Neutron Cross Sections*, takes on a new identity. Previous editions presented in compact form a summary of the complete store of the neutron data files. The increase in the volume and detail of neutron data since the second edition of BNL 325 published in 1960 and its supplements published during 1964-1966 makes a wide distribution of a compendium of all neutron data in ready reference form impractical. Furthermore, those wishing current knowledge of available data clearly must supplement published compendia by material available from data centers upon request. This new edition of BNL 325 aims at providing those portions of neutron data that are considered to be of prime importance and best suited for inclusion in ready reference form.

However, many of our users have need for an up to date complete and detailed compendium of all data on resonance parameters or cross sections such as was found in former editions. These are available on a per demand basis from NNCSC (or your regional data center - see map on last page) as requests. On the following pages are examples of such requests:

1. Interleaved and grouped resonance parameter data and recommended quantities. Quantities are in the form cited by the author.
2. Interleaved and grouped resonance parameter data and recommended quantities. Quantities are converted to a standard representation, such as $g\Gamma_n$, whenever possible to facilitate intercomparison.

The above are based upon a library of 150,000 resonance parameters.

3. Listings of CSISRS Library entries which include bibliographic abstracts in addition to the data.
4. Detailed graphical representation of cross section data with all data shown in reasonable detail.

In addition other types of requests are filled for both human and computer readable representations of neutron cross section data.

These are based upon a library of over 1,250,000 cross section points.

This edition, significantly aided by computer techniques, consists of two volumes: Volume 1, thermal cross sections, resonance properties, resonance parameters, and bibliography; and Volume 2, curves and bibliography. As in previous editions, recommended values for thermal cross sections and resonance parameters, eye-guide curves, and references to all data are included. Material was selected so as to avoid an undue increase in size or reduction in readability.

Editions of BNL 325 have been widely used and are frequently referenced. We hope that this new edition continues to be a prime source book and that together with new and varied material obtainable from data centers, it will satisfy the needs of both the casual and serious user of neutron cross sections.

ISOTOPE = 25-MANGANESE - 55 SPIN= 2.5 ABUNDANCE= 1.0000 PAGE (1)

E_0 (keV)	Γ (eV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)	Misc	AUTHOR	YR
-4.700			3		$\Gamma_n^0 =$	6.9		Stephenso	58
-3.300			2		$\Gamma_n^0 =$	.73		Stephenso	68
-2.830			2		calc	.21		RECHD-SH	72
-2.830			2		$\Gamma_n^0 =$	5.05		Cote	64
-0.078			3		calc	0.019		RECHD-SH	72
-0.078			3		$\Gamma_n^0 =$	0.016		Cote	64
0.335±0.001		$\Gamma_n =$	2		$\Gamma_n^0 =$	1.220 ±2.0-3		Garg	66
0.335±4.0-4		calc	2		$\Gamma_n^0 =$	1.22		Cote	64
0.337±0.001		calc	2	0	0.5±	1.017 ±0.002		RECHD-SH	72
0.337±0.001	22.5± 1.0	$\Gamma_n =$	2		calc	1.22 ±0.050		RECHD-SH	66
0.337			2		$\Gamma_n^0 =$			Alves	69
0.337		$\Gamma_n =$	2		$\Gamma_n^0 =$	1.22		Morgenste	65
0.337			2					Garg	64
0.337±0.003	21.5± 0.8	calc	2		$\Gamma_n^0 =$	1.14 ±0.050	$\sigma_0\Gamma^2 = 144. ±10.0$	Bollinger	55
0.345		$\Gamma_n =$	3		calc	1.16290		Harris	50
0.346±0.011		$\Gamma_n =$	3		0.6		$\sigma_0\Gamma^2 = 3.0+6±6.0+5$	Seidl	54
0.346±0.011		$\Gamma_n =$	2		0.5±	1.66657±0.161		Seidl	54
0.349					calc	1.39777±0.161	$\sigma_0\Gamma^2 = 1.2+6$	Gaerttner	54
1.040								Gaerttner	54
1.040								Seidl	54
1.080			3					Alves	69
1.080±0.020	14.5± 1.5	calc	3	0	$\Gamma_n^0 =$	0.42 ±0.050	$\sigma_0\Gamma^2 = 2.8 ±0.70$	Bollinger	55
1.098±0.002		calc	3		calc	0.513 ±0.025		RECHD-SH	72
1.098±0.002		$\Gamma_n =$	3		$\Gamma_n^0 =$	0.44 ±0.020		RECHD-SH	66
1.098		$\Gamma_n =$	3		$\Gamma_n^0 =$	0.44		Morgenste	65
1.098±0.002		$\Gamma_n =$	3		$\Gamma_n^0 =$	0.49 ±0.010		Garg	66
1.098±0.002			3					Garg	64
1.098±2.3-3		calc	3		$\Gamma_n^0 =$	0.44		Cote	64

Interleaved and grouped resonance parameter data and recommended quantities.

Quantities quoted are those exactly as cited by the author.

ISOTOPE = 25-MANGANESE - 55 SPIN= 2.5 ABUNDANCE= 1.0000 PAGE (1)									
E_0 (keV)	Γ (eV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)	Misc	AUTHOR YR	
-4.700			3			8.05000		Stephenso	68
-3.300			2			3.94167		Stephenso	68
-2.830			2		0.45	4.21		RECHD-SH	72
-2.830			2			4.20833		Cote	64
-0.078			3		0.45	0.019		RECHD-SH	72
-0.078			3			0.01867		Cote	64
0.335±0.001		18.6667±0.017	2			1.01667±1.7-3		Garg	66
0.335±4.0-4		18.6220	2			1.01667		Cote	64
0.337±0.001		18.67 ±0.017	2	0	0.5± 0.1calc	1.017±0.002		RECHD-SH	72
0.337±0.001	22.5± 1.0	18.3333±0.833	2			1.01667±0.042		RECHD-SH	66
0.337			2					Alves	69
0.337		18.6667	2			1.01667		Morgenste	65
0.337			2					Garg	64
0.337±0.003	21.5± 0.8	17.4397±0.771	2			0.95000±0.042	$\sigma_0\Gamma^2 = 144. \pm 10.0$	Bollinger	55
0.345		25.2000	3		0.6	1.35672		Harris	50
0.346±0.011		36.1667±3.500	3		0.5± 0.1calc	1.94433±0.188	$\sigma_0\Gamma^2 = 3.0+6±6.0+5$	Seidl	54
0.346±0.011		21.6667±2.500	2			1.16481±0.134		Seidl	54
0.349							$\sigma_0\Gamma^2 = 1.2+6$	Gaerttner	54
1.040								Gaerttner	54
1.040								Seidl	54
1.080			3					Alves	69
1.080±0.020	14.5± 1.5	16.1030±1.906	3			0.49000±0.058	$\sigma_0\Gamma^2 = 2.8 \pm 0.70$	Bollinger	55
1.098±0.002		17.01 ±0.82	3	0	calc	0.513±0.025		RECHD-SH	72
1.098±0.002		17.0333±0.817	3			0.51333±0.023		RECHD-SH	66
1.098		17.0333	3			0.51333		Morgenste	65
1.098±0.002		25.6667±0.525	3			0.57167±0.012		Garg	66
1.098±0.002			3					Garg	64
1.098±2.3-3		calc 17.0097	3			0.51333		Cote	64

Interleaved and grouped resonance parameter data and recommended quantities. Quantities are converted to a standard representation, such as $g\Gamma_n$ whenever possible to facilitate intercomparison.

ENTRY	20011	2003	20011	0	1
SUBENT	20011001	2003	20011	1	1
BIB	15	42	20011	1	2
REFERENCE	(R,KFK-1000,(SUPP.2),6902)=(R,EUR-3963,(SUPP.2),6902)=20011 1 3				
	(R,EWND(E)-111,(SUPP.2),6902)) GRAPHS ONLY. 20011 1 4				
	(R,KFK-1000,6906)=(R,EUR-3963E,6906)=20011 1 5				
	(R,EWND(E)-111,6906)) ABOVE 0.9 MEV SODIUM IS TAKEN20011 1 6				
	FROM THIS REFERENCE. 20011 1 7				
	(U,NEBE,7012) DATA ON TAPE. 20011 1 8				
TITLE	-HIGH RESOLUTION TOTAL NEUTRON CROSS SECTIONS FOR Na, 20011 1 9				
	CL, K, V, MN AND CO BETWEEN 0.5 AND 30 MEV.- 20011 1 10				
AUTHOR	(S,CIERJACKS, P.FORTI, D.KOPSCH, L.KROPP, J.NEBE, 20011 1 11				
	H.UNSELD) 20011 1 12				
INSTITUTE	(ZGERKFK) 20011 1 13				
FACILITY	(CYCLI) 45 MEV KARLSRUHE ISOCRONOUS CYCLOTRON (KIC)20011 1 14				
	DESCRIBED BY S.CIERJACKS ET AL., REV.SCI.INSTR. 20011 1 15				
	39(1968)1279. 20011 1 16				
	.DEUTERON BURST WIDTH 1 NS, REPETITION RATE 20 KC/S. 20011 1 17				
N-SOURCE	(D-U) UCD,NX)-REACTION. 20011 1 18				
INC-SPECT	BROAD NEUTRON SPECTRUM IN THE ENERGY REGION FROM 20011 1 19				
	0.3 TO 30 MEV. 20011 1 20				
METHOD	(TOF) FLIGHT PATH LENGTH = ABOUT 57.5 M, 20011 1 21				
	MORE PRECISE VALUES ARE GIVEN UNDER COMMENT FOR EACH 20011 1 22				
	ELEMENT. 20011 1 23				
	(TRANSM) TRANSMISSION MEASUREMENT. 20011 1 24				
STANDARD	(ABSOL) ABSOLUTE MEASUREMENT. 20011 1 25				
DETECTOR	(LSCIN,RECC) LIQUID SCINTILLATOR (NE-213), 20011 1 26				
	9 CM DIAM. 1 CM THICK VIEWED BY AN XP-1040 PHOTO TUBE.20011 1 27				
CORRECTION	.CORRECTED FOR BACKGROUND AND 20011 1 28				
	.FOR THE DEAD TIME OF THE TIME RECORDING SYSTEM. 20011 1 29				
	.MULTIPLE SCATTERING EFFECTS ARE ESTIMATED TO BE 20011 1 30				
	NEGLECTIBLE. 20011 1 31				
ERR-ANALYS	.TOTAL ERROR GIVEN IS AN UPPER LIMIT. 20011 1 32				
	.THE STATISTICAL ERROR RUNS FROM BETTER THAN 1 PER CENT20011 1 33				
	TO ABOUT 3 PER CENT IN MOST OF THE CHANNELS, EXCEPT 20011 1 34				
	FOR THE LOW ENERGY REGION OF SODIUM, SEE SUBCOMMENT. 20011 1 35				
COMMENT	OVERALL ENERGY RESOLUTION GIVEN IS AN UPPER LIMIT = 20011 1 36				
	(FWHM OF THE GAMMA PEAK)/(FLIGHT PATH) = DT/L. 20011 1 37				
	VALUES OF DT AND L ARE GIVEN UNDER COMMENT FOR EACH 20011 1 38				
	NUCLIDE. 20011 1 39				
STATUS	(PRIV) NEBE, 70121), ON TAPE. 20011 1 40				
	(APRVD) NEBE. TELEPHONE CALLS AND LETTERS, 02/71. 20011 1 41				
HISTORY	(701211R) DATA RECEIVED ON TAPE. 20011 1 42				
	(710115C) 20011 1 43				
	(710326E) 20011 1 44				
ENDBIB	42	0	20011	1	45
NOCOMMON	0	0	20011	1	46
ENDSUBENT	45	0	20011	1	9999
SUBENT	20011006	2003	20011	6	1
BIB	5	10	20011	6	2
ISO-QUANT	(25-MN-55,TOT) 20011 6 3				
PRNT-DET	(N) NEUTRONS. 20011 6 4				
SAMPLE	(CONC=) CHEMICAL PURITY 99.5 PER CENT. 20011 6 5				
	.THICKNESS, N = 0.2464 ATOMS/BOHRN. 20011 6 6				
COMMENT	.TOTAL TIME UNCERTAINTY OF THE SPECTROMETER = DT, 20011 6 7				
	DT = (FWHM OF THE GAMMA PEAK) = 3.3 NANOSEC, 20011 6 8				
	L = (FLIGHT PATH LENGTH) = 57.540 M. 20011 6 9				
HISTORY	(701211R) DATA RECEIVED ON TAPE. 20011 6 10				
	(710115C) 20011 6 11				
	(710326E) 20011 6 12				
ENDBIB	10	0	20011	6	13
NOCOMMON	0	0	20011	6	14
DATA	4	5129	20011	6	15
EN	EN-RSL	DATA	DATA-ERR	20011	6 16
MEV	NSEC/N	B	PER-CENT	20011	6 17
5.0000E-01	5.7000E-02	3.4600E+00	3.0000E+00	20011	6 18
5.0017E-01	5.7000E-02	3.5400E+00	3.0000E+00	20011	6 19
5.0034E-01	5.7000E-02	3.3400E+00	3.0000E+00	20011	6 20
5.0051E-01	5.7000E-02	3.6500E+00	3.0000E+00	20011	6 21
5.0068E-01	5.7000E-02	3.3900E+00	3.0000E+00	20011	6 22

1 14-NOV-79 13:31

Listings of CSISRS Library entries which include bibliographic abstracts in addition to the data.

Detailed graphical representation of cross section data with all data shown in reasonable detail.

ACKNOWLEDGMENTS

A project of this magnitude is not the work of two individuals. The list of people who must be acknowledged is necessarily quite long. Three people must be specially mentioned and thanked. They are R.R. Kinsey, F. Scheffel and P. Hlavac.

The scope of the project consists of three parts: (1) preparation of the body of data for subsequent consideration, (2) recommendation, and (3) production and checking.

1. Production of this volume demanded an accurate and complete body of the world's resonance parameter data. For this publication, it was judged best to create a computerized library of resonance data from the original articles in the image of the original article. This library now consists of 150,000 points. The mammoth task was overseen by Frances Scheffel, and the never-ending keypunching and verifying was ably done by M. Blennau, J. Buiniskis, and P. Price. Programs to operate on this data base to present the data in a highly usable form for recommendation were developed by H. Connell and O. Ozer. We wish to thank L.T. Whitehead at Oak Ridge for sending us the Cinda Library on magnetic tape, allowing us to perform additional completeness checks on our library. We are indebted to S. Santos for her diligent hours in our library, and to S. Amoretty for translating numerous articles. We wish to thank M.K. Drake for developing specifications for this library.

2. In the recommendation phase, B.A. Magurno helped in the evaluation of the thermal cross sections of the light elements ($Z=15-20$), S. Pearlstein in the evaluation of rhodium resonance parameters, and B. Leonard in the evaluation of the samarium and europium isotopes. Interesting and useful discussions with M.R. Bhat, T.J. Krieger, A. Prince, J. Stehn, H. Takahashi, and R.E. Chrien were greatly appreciated. Programs were written by O. Ozer to compute resonance integrals, contribution to thermal cross section, coherent scattering amplitude, etc. from the recommended parameters which aided greatly in the recommendations.

3. This volume was printed directly from computer generated microfilm. The program to automatically compose pages, including upper and lower case symbols and Greek letters, was due to R.R. Kinsey and afforded very substantial savings of money and errors. The task of keeping track of all the recommended values and their corrections and looking over the output of checking programs was ably performed by P. Hlavac and later by C. Brewster. Thanks go to G. Irving and J. Redzinak for typing and distribution. The authors wish to express special thanks to the Brookhaven Graphics Arts group, under K. Boehm, for their help in the publication, and to S. Pearlstein, R. Dannels and R.E. Chrien for their leadership throughout this project.

Many people outside of the NNCSC have aided in this publication. We are grateful to the many experimentalists who made special effort to provide us with their recent data prior to publication. In particular, special mention goes to Drs. H. Liou, U.N. Singh, F. Rahn, G. Hacken, J. Rainwater of Columbia University, Drs. W. Good, R.L. Macklin, J.A. Harvey, J.W.T. Dabbs, and G.G. Slaughter of Oak Ridge National Laboratory, Drs. G.A. Keyworth, M.G. Silbert, G.F. Auchampaugh, and J.H. McNally of Los Alamos Scientific Laboratory, Drs. R.C. Block and R.W. Hockenbury of Rensselaer Polytechnic Institute, Professors H.W. Newson, E. Bilpuch of Duke University, Dr. S. Friesenhahn of Gulf General Atomic, Dr. S.A. Cox of Argonne National Laboratory, Professor J.B. Garg of State University of New York at Albany, Dr. R.R. Winter of Dennison University, Ohio, Professor C.G. Shull of Massachusetts Institute of Technology, Drs. O.A. Wasson, R.E. Chrien, and W. Kane of Brookhaven National Laboratory, Drs. B.L. Berman and J.C. Browne of Lawrence Berkeley Laboratory, Drs. H. Weigman, G. Rohr, and F. Poortmans of Geel, Belgium, Dr. F. Fröhner of CCDN Saclay, Drs. D. Earl and G. Bartholomew of Chalk River Nuclear Laboratories. Useful and interesting discussions of thermal cross sections with Dr. N. Holden of Knolls Atomic Power Laboratory are acknowledged.

The criticism and suggestions of the reviewers have been essential. Our thanks go to Professor R.O. Lane of Ohio State University, Professors E.G. Bilpuch and H.W. Newson of Duke University, Dr. D.C. Dodder of Los Alamos Scientific Laboratory, Dr. P. Ribon of Saclay, while visiting BNL, Drs. G. de Saussure of Oak Ridge National Laboratory, Drs. J.R. Smith, F.B. Simpson of Idaho Falls, Dr. C.D. Bowman of National Bureau of Standards.

A tabulation of energy ordered listing of strong resonances as an aid to experimentalists to identify impurities in samples was motivated by a suggestion from the late E.R. Rae.

We would like to recognize the NNCSC Advisory Committee, R. Erlich, A.B. Smith, H. Goldstein, G. Hanna, P. Lazarus, and P. Greebler, for their suggestions with regard to the new format of BNL 325.

NOTATION AND NOMENCLATURE

The following is a table of definitions of quantities used in the present edition of BNL 325. A quantity with a superscript c indicates that it is calculated from resonance parameter information or related measurements.

I. Thermal Cross Sections

- $\sigma_\gamma = \sigma_{\text{B}\gamma}$ = neutron radiative capture cross section.
- $\sigma_s = \sigma_s$ = "free" neutron scattering cross section.
- $\sigma_\alpha = \sigma_{\text{B}\alpha}$ = neutron cross section for alpha particle emission.
- $\sigma_p = \sigma_{\text{B}p}$ = cross section for proton emission.
- $\sigma_f = \sigma_{\text{B}f}$ = fission cross section.
- σ_a = neutron absorption cross section.
- σ_{pm} = paramagnetic cross section.
- σ_t = total neutron cross section.
- a_{coh} = coherent scattering amplitude (bound), a complex quantity sometimes referred to in literature as b.
- $\nu = \nu_p + \nu_d$, total number of neutrons emitted per fission; ν_d is the number of delayed neutrons per fission.
- ν_p = number of prompt neutrons emitted per fission.
- ν_{sp} = number of prompt neutrons per spontaneous fission.
- $\eta = \nu(\sigma_f / \sigma_a)$ = number of neutrons emitted per neutron absorbed.
- $\alpha = \sigma_\gamma / \sigma_f$ = capture to fission cross section ratio. At a neutron resonance, this is equivalent to Γ_γ / Γ_f .

II. Resonance Properties

- I_γ = radiative capture resonance integral.
- I_f = fission resonance integral.
- I_a = absorption resonance integral. For fissionable nuclei, $I_a = I_\gamma + I_f$.
- I_p = proton emission resonance integral.
- (D) = mean observed level spacing.
- R' = potential scattering radius.
- $S_0 = (g\Gamma_n^0) / (D^0)$ = s-wave neutron strength function.
- $S_1 = (g\Gamma_n^1) / 3(D^1)$ = p-wave neutron strength function. For brevity, S_0 and S_1 are given in units of 10^{-1} .

III. Resonance Parameter Tables

A quantity enclosed by parentheses () or square brackets [] indicates that it is assumed or preferred respectively.

E_0 = resonance energy.

Γ = total width of resonance at E_0 .

Γ_n = neutron width at E_0 .

Γ_γ = radiative width.

$\Gamma_a = \Gamma_\gamma + \Gamma_n + \Gamma_f$.

Γ_α = alpha width at E_0 .

Γ_d = deuteron width at E_0 .

Γ_f = fission width. Positive and

negative signs associated with this quantity are interpreted as follows: pairs of resonances with fission widths having the same sign interfere destructively while pairs with opposite signs interfere constructively.

Γ_{f1} = fission width in channel number 1.

Γ_{f2} = fission width in channel number 2.

Γ_p = proton width at E_0 .

σ_0 = peak cross section at E_0 .

$\Gamma_n^0 = \Gamma_n \sqrt{1 \text{ eV}/E_0}$ = reduced neutron width at 1 eV for s-wave neutrons.

$\Gamma_n^1 = \Gamma_n \sqrt{1 \text{ eV}/E} [1 + (1/k^2 R^2)]$ = reduced neutron width for p-wave neutrons.

$\gamma_n^2 = \Gamma_n / 2P_n$ = reduced neutron width in R-matrix formalism.

P_l = neutron penetrability for a specified orbital angular momentum of the incoming neutron.

$k = 2\pi/\lambda$ = wave number.

R = nuclear radius.

S_n = neutron separation energy for the compound nucleus $A+1$. These were generally adopted from Wapstra¹; if more accurate values derived from (n, γ) measurements carried out with Ge-Li detectors were available, they were adopted.

I^π = spin of the target nucleus; superscript on I indicates the parity.

$J = I + I + \frac{1}{2}$.

l = orbital angular momentum of the incoming neutron.

$g = (2J+1)/[(2s+1)(2I+1)]$ = statistical weight factor. For neutrons, the spin $s = \frac{1}{2}$ so that $g = (2J+1)/[2(2I+1)]$.

%Abd = percentage abundance of isotope. These are generally taken from 1973 Chart of the Nuclides (N. Holden & F.W. Walker).

$a = (\text{as in } 2ag\Gamma_n)$ fractional abundance of isotope.

The recommended widths are R-matrix derived parameters for $Z \leq 28$ and are single-level Breit-Wigner parameters for $29 \leq Z$ unless otherwise indicated.

The widths are generally expressed in the laboratory coordinate system unless otherwise noted.

CONSIDERATIONS INVOLVED IN THE RECOMMENDATIONS

INTRODUCTION

The aim of the following survey is to present (1) the various considerations employed in the assessment of the experimental data and (2) the relationships, methods, and principles that have been useful in arriving at the recommended parameters. This survey is not intended to be an exhaustive review of the field of neutron physics. For comprehensive and detailed reviews the user may consult any of the excellent articles or books on the subject.²⁻⁶

I. THERMAL CROSS SECTIONS

A. Capture, Absorption, Fission, and Total Cross Sections.

The total neutron cross section can be written as the sum of partial cross sections:

$$\sigma_t = \sigma_\gamma + \sigma_a + \sigma_p + \sigma_f + \sigma_s. \quad (1)$$

Because of its simplicity and widespread use, we present here a description of these cross sections in terms of single-level Breit-Wigner parameters. For an isolated resonance, one can write

$$\sigma_\gamma = \sigma_0 \frac{\Gamma_\gamma}{\Gamma} \left(\frac{E_0}{E} \right)^{1/2} \frac{1}{1+y^2}, \quad (2)$$

$$\sigma_s = 4\pi(R')^2 + \left[\frac{\sigma_0 \Gamma_n}{\Gamma} + \frac{\sigma_0 2R'y}{\lambda_0} \right] \frac{1}{1+y^2}, \quad (3)$$

where $y = \frac{2}{\Gamma} (E - E_0)$,

$$\sigma_0 = 4\pi\lambda_0^2 \frac{g\Gamma_n}{\Gamma} = \frac{2.608 \times 10^6}{E(\text{eV})} \left(\frac{A+1}{A} \right)^2 \frac{g\Gamma_n}{\Gamma}. \quad (4)$$

Expressions similar to that for σ_γ can be written for σ_f , σ_a , and σ_p .

Some of the factors considered in the recommendation for the thermal cross sections are the following:

1. The resonance contribution to the capture and fission cross sections at a neutron energy of 0.0253 eV is calculated from the resonance parameters. If neutron-bound levels are not required to account for the discrepancy between measured and calculated values, reasonable adjustments are made in either the resonance parameters or the thermal cross sections (depending on the accuracy of the measurements) in order to achieve consistency. In some cases sufficient information is available to warrant a calculation for the parameters of a bound level. When a bound level contribution is required to account for the thermal cross section, this is indicated in the resonance parameter tables. The parameters of a bound level are not unique and should be considered as a means for providing a description of the cross section at low neutron energies.

2. In a few cases, we have employed the isomeric ratio (ratio of the activation cross sections leading to the isomeric and the ground state) as an aid, either to calculate one of the partial activation cross sections, or to test the consistency of measurements. The target isotopes ^{82}Kr and ^{84}Kr provide a good example. The isomeric ratio for ^{84}Kr is experimentally determined to be 2.14 (see page B/96). Assuming that the γ -ray multiplicities of ^{83}Kr and ^{85}Kr are approximately the same and that the respective spins of the ground and isomeric states are identical for ^{83}Kr and ^{85}Kr , then one can calculate the activation cross section leading to the ground state of ^{83}Kr : $\sigma_{\gamma g} = \sigma_{\gamma m}/2.14 = 9.3$ b. As a result the total capture cross section of ^{82}Kr is 20.0 ± 9.3 b, which compares favorably (within the error limits) with the one available single measurement: $\sigma_{\gamma} = 45 \pm 15$ b.

3. In addition to the general requirement that the sum of the partial cross sections should be equal to the total cross section, the values of α , η , and ν of the fissile nuclides are constrained to fit the following relationships:

$$\alpha = \frac{\sigma_{\gamma}}{\sigma_t}, \quad (5)$$

$$\eta = \nu \frac{\sigma_f}{\sigma_a} = \frac{\nu}{1 + \alpha}. \quad (6)$$

A consistent set of values was sought in the analysis.

In the rare-earth region and for elements in the ionic state, such as oxide samples, one must take into consideration the interaction between the magnetic moment of the neutron and that of the ion. Such an interaction gives rise to a paramagnetic cross section which has the form⁷

$$\sigma_{pm} = \frac{2}{3} \pi \left(\frac{e^2}{mc^2} \right) \gamma^2 \mu^2 \overline{F^2}, \quad (7)$$

where e^2/mc^2 is the classical electron radius, γ is the magnetic moment of the neutron, μ is the effective magnetic moment of the atom in Bohr magnetons, and F is the neutron scattering form factor. The paramagnetic cross sections can be determined from an analysis of the total cross sections. Recommended

values for σ_{pm} are given in the present edition of BNL 325 and they range, for example, from 26 b for Er to 5 b for Yb.

B. Coherent Scattering Amplitude.

The coherent scattering amplitude can be measured by the techniques of diffraction, refraction, and reflection of neutrons. Very recently, specialized methods such as the Christiansen filters⁶ and Pendellosung effect⁷ have been developed which give highly accurate values of the coherent scattering amplitude. It can also be calculated from the resonance parameters.

The coherent scattering amplitude for slow neutrons ($kR \ll 1$) is given by

$$a_{coh} = R' + \sum_j \frac{\lambda_j \Gamma_{nj}}{2(E - E_j) + i\Gamma_j} \quad (8)$$

The summation is carried out over resonances j of the same spin. The term R' is sometimes referred to as the potential scattering amplitude. In most cases, $|E_j| \gg |\Gamma_j|$ and $|E_j| \gg |E|$; then a_{coh} reduces at thermal energies to the simple form

$$a_{coh} = R' - \sum_j \frac{\lambda_j \Gamma_{nj}}{2E_j} \quad (9)$$

where

$$\lambda_j = \frac{0.286 \times 10^{-6}}{\sqrt{E_j(\text{eV})}} \left(\frac{A+1}{A} \right) \text{ in cm} \quad (10)$$

However, in the case in which a resonance is located close to thermal energy, the complex part of the coherent amplitude is not negligible (e.g., in ^{113}Cd). For nuclei with nuclear spin $I \neq 0$, s-wave neutron capture leads to two compound states, with spins $I + \frac{1}{2}$ and $I - \frac{1}{2}$. Then a coherent scattering amplitude is associated with each of these spin states. In addition, one could generally allow for a spin dependence of R' . Under these conditions, the resultant total coherent scattering amplitude becomes

$$a_{coh} = g_+ a_+ + g_- a_- \quad (11)$$

where g_+ and g_- are the statistical weight factors for spin states $I + \frac{1}{2}$ and $I - \frac{1}{2}$, respectively, and are given by

$$g_+ = \frac{I+1}{2I+1}, \quad g_- = \frac{I}{2I+1} \quad (12)$$

The coherent scattering cross section is given by

$$\sigma_{coh} = 4\pi a_{coh}^2 = 4\pi(g_+ a_+ + g_- a_-)^2 \quad (13)$$

The total scattering cross section is the sum of the coherent and incoherent cross sections and is related to a_+ and a_- by the following relation:

$$\sigma_s = \sigma_{coh} + \sigma_{inc} = 4\pi g_+ a_+^2 + 4\pi g_- a_-^2 \quad (14)$$

With the aid of Eqs. (13) and (14), one can calculate the spin incoherent cross section:

$$\sigma_{\text{inc}}(\text{spin}) = 4\pi g_+ g_- (a_+ - a_-)^2. \quad (15)$$

Note that the incoherent cross section is identically zero if $a_+ = a_-$ and in this case, as well as for nuclei with $I = 0$, the total scattering cross section is equivalent to the coherent scattering cross section; i.e.,

$$\sigma_s = \sigma_{\text{coh}}. \quad (16)$$

In general the most direct way of determining the amplitudes for each spin state is to use polarized neutrons and polarized targets. For example, such measurements have been carried out on cobalt by Ito and Shull.¹⁰ For this isotope the total scattering cross section is attributable largely to spin incoherence.

In the previous discussion, we did not take into consideration the effect of isotopic incoherence on scattering. This can be treated in a similar manner as spin incoherence. If the fractional abundances of two isotopes in a sample are f_1 and f_2 and their coherent amplitudes are a_1 and a_2 , then it follows that

$$\begin{aligned} a_{\text{coh}} &= f_1 a_1 + f_2 a_2, \\ \sigma_{\text{inc}}(\text{isotopic}) &= 4\pi f_1 f_2 (a_1 - a_2)^2. \end{aligned} \quad (17)$$

The best example of isotopic incoherence is afforded by nickel.

Finally, we would like to point out that the recommended values of a_{coh} presented in BNL 325 pertain to bound nuclei in a crystal lattice. The scattering amplitude for a free nucleus is related to the amplitude for a rigidly bound nucleus by

$$a_{\text{coh}}(\text{free}) = \frac{A}{A+1} a_{\text{coh}}(\text{bound}). \quad (18)$$

We would like to point out that Eq. (8) in addition to providing us with a useful means for checking the consistency of the variables (when measured independently) was also applied to deduce one of the parameters when the others are known. For example, when information on the resonance parameters of negative and positive energy resonances is available, then R' was obtained from a_{coh} .

Extensive use has been made of this relation in the evaluation of the parameters in the thermal energy region.

II. RESONANCE PROPERTIES

A. Resonance Integrals.

The epicadmium dilute resonance integral for a particular reaction $\sigma_R(E)$ ($\sigma_\gamma, \sigma_f, \sigma_a, \sigma_n, \sigma_p, \sigma_s$) is expressed by the relationship

$$I = \int_{E_c}^{\infty} \sigma_R(E) \frac{dE}{E}, \quad (19)$$

where E_c is determined by the cadmium cutoff energy, which depends on the cadmium thickness. We have assumed that the cutoff energy, E_c , equals 0.5 eV. It is assumed that the dE/E neutron spectrum is not perturbed by the absorbing material. Explicit expressions have been derived by Story¹¹ for the integral for the case in which the cross section is represented by a Breit-Wigner shape. However, if the resonances are not located close to E_c and the cross section is described by a sum of single-level Breit-Wigner contributions, the resonance capture integral (in barns) can be approximated by the very simple expression

$$I_\gamma = \frac{\pi}{2} 2.608 \times 10^6 \left(\frac{A+1}{A} \right)^2 \sum_j \frac{\Gamma_{\gamma j}}{E_j^2} \frac{g\Gamma_{nj}}{\Gamma_j}, \quad (20)$$

where the summation is extended over resolved resonances and all units are expressed in eV. Similar expressions for the resonance fission integral could be written. The contribution to the resonance integral from the unresolved energy region has been treated by Dresner.¹² The $1/v$ contribution to the resonance integral for a cadmium cutoff energy of 0.5 eV is given by

$$I_\gamma(1/v) = 0.45\sigma_\gamma(0.0253). \quad (21)$$

The capture and fission resonance integrals have been computed for each isotope from the resonance parameters and have been compared with measurements. If large discrepancies exist between measured and calculated values, these cases have been brought to the attention of the user. Finally we would like to point out that the bibliography relating to resonance integrals is complete only for isotopes with $Z \geq 90$.

B. Determination of the Potential Scattering Radius.

For s-wave neutrons ($\ell=0$), the scattering cross section in the single-level Breit-Wigner approximation can be written in the form

$$\sigma_s(E) = 4\pi(1-g)(R')^2 + 4\pi g \lambda_0^2 \left| \frac{\Gamma_n/2}{E-E_0+i\Gamma/2} + \frac{R'}{\lambda_0} \right|^2. \quad (22)$$

In an energy region away from resonances, the above expression reduces to

$$\sigma_s(E) = \sigma_p = 4\pi(R')^2. \quad (23)$$

σ_p is the potential scattering cross section, and R' is the potential scattering radius, which is related to the "nuclear" radius by the relation

$$R' = R[1 - R^\infty], \quad (24)$$

where R^∞ describes the effect of distant levels located outside the investigated energy regions. R' is determined by carrying out a shape analysis of the total or scattering cross section over an extended energy range.

In addition, we derived R' from accurate values of the coherent scattering amplitude, provided that the contribution of positive and negative energy resonances is known. The recommended potential scattering lengths are plotted in Figure 1 and are compared with the "nuclear" radius $R = 1.35A^{1/3}$ and with the optical model calculation based on the Buck and Perey code.¹³ The optical model potential parameters used in the present computation are the same as those employed for the derivation of S_0 and S_1 . Note that the present calculation describes well the behavior of the experimental data and in particular the oscillation of R' with A . The scatter of the experimental points around mass number $A=150$ is indicative of the problems associated with the determination of R' in the rare-earth region, where the samples used are in the oxide form. This results in large corrections due to water absorption. Experiments with metal foils are required to improve the experimental data in this region.

There are indications that R' depends on the spin of the compound state. In the study of the total cross section of ^{51}V , Firk et al.¹⁴ reported potential scattering lengths of 7.5 and ≤ 5 fm for $J=3$ and 4 resonances, respectively. By applying the method of shape analysis to the transmission data of ^{59}Co , Morgenstern et al.¹⁵ derived $R' = 4.9 \pm 0.5$ fm for $J=3$ resonances and $R' = 5.8 \pm 0.5$ fm for $J=4$ resonances. It is interesting that these results, when combined with the polarization data and the resonance parameters of positive resonances, indicate that the contribution to the thermal cross section of ^{59}Co is largely due to one or more bound levels with spin 3.

C. Average Level Spacing and Level Density Formula.

The spacings between neighboring resonances drawn from the same population (same spin and parity) obey the Wigner distribution:

$$P(D) = \frac{\pi}{2} \left(\frac{D}{\langle D \rangle} \right)^2 e^{-\pi(D/2\langle D \rangle)^2}, \quad (25)$$

where D is the spacing between adjacent resonances and $\langle D \rangle$ is the mean level spacing for the same spin and parity. Note that this distribution describes the "level repulsion effect"; i.e., small level spacings are unlikely to occur. The available experimental data agree well with the Wigner distribution. Intermediate structure (e.g., subthreshold fission effects) would lead to significant departure from these statistical distributions. An estimate of the error on $\langle D \rangle$ was derived from the distribution of spacings and is given by the relationship

$$\Delta D = \left(\frac{4-\pi}{\pi N} \right)^{1/2} \langle D \rangle, \quad (26)$$

where N is the number of spacings.

Following Reichel and Wilkins¹⁶ and Muradyan and Adamchuk,¹⁷ the most probable value of spacing, D^* , can be calculated by using the method of maximum likelihood. The result is

$$D^* = \left(\frac{\pi}{4M} \sum_{j=1}^M D_j^2 \right)^{1/2}, \quad (27)$$

where $M = N - 1$, and D_j is the nearest level spacing.

The level density formula derived on the basis of the Fermi gas model is

$$\rho(U, J) = \frac{C(2J+1)}{U^2} e^{-J(J+1)/2\sigma^2} e^{2(aU)^{1/2}}, \quad (28)$$

where U is the effective excitation energy, σ is the spin cutoff factor and a is the level density parameter. Note that for the case $J(J+1) < 2\sigma^2$ (for example, when $\sigma = 3$, $I \leq 7/2$) the level density would be proportional to $2J+1$ and the spacing is $\langle D \rangle \propto 1/(2J+1)$.

D. s- and p-Wave Neutron Strength Functions.

The s- and p-wave neutron strength functions are defined by the following relations:

$$S_0 = \frac{\langle g\Gamma_n^0 \rangle}{\langle D^0 \rangle} = \frac{\sum_j g\Gamma_{nj}^0}{\Delta E}, \quad (29)$$

$$S_1 = \frac{\langle g\Gamma_n^1 \rangle}{3\langle D^1 \rangle} = \frac{\sum_j g\Gamma_{nj}^1}{3\Delta E}, \quad (30)$$

where the summation is carried out over N resonances in an energy interval ΔE , and $\langle D^0 \rangle$ and $\langle D^1 \rangle$ are the mean level spacings for s- and p-wave neutrons, respectively.

The error on the strength function is estimated from the relation $(2/N)^{1/2} S_0$ (which is an asymptotic approximation for large N) based on the Porter-Thomas distribution of reduced neutron widths. For a limited number of resonances, Muradyan and Adamchuk¹⁷ and later Slavinskis and Kennett¹⁸ took into consideration the distribution of reduced neutron widths to calculate the most probable value of the strength function and the associated asymmetrical errors. Recently, Liou and Rainwater¹⁹ have applied the Monte Carlo method to solve for S_0 (and S_1) and their errors.

These quantities are important because of their use in the calculation of average cross sections in the unresolved energy region and because of the significant role they played in the development of the optical model. The recommended s- and p-wave neutron strength functions derived from the individual resonance parameters and from average cross sections are plotted in Figures 2 and 3 and are compared with an optical model calculation based on the Buck-Perey code. The optical model parameters employed in these calculations are $V_0 = 41.5$ MeV, $V_{s0} = 8$ MeV, surface absorptions $W_D = 5.4$ MeV, and $r_{SP} = 1.35$ fm. Note that the minima at $A = 100$ in the s-wave strength function and at $A = 50, 190$, in the p-wave strength functions are not well reproduced by the calculations. Refinements such as the influence of intermediate

structure had not been taken into consideration in the calculation. There is mounting evidence that doorway states, such as 2-particle 1-hole states, play an important role in determining the magnitude of the strength functions.

The first success of the optical model was achieved by Feshbach, Porter, and Weisskopf,²⁰ whose calculations showed that the "cloudy crystal ball" model qualitatively described the general trend of the experimental data. Subsequent, more accurate, measurements, particularly around $A=155$, demonstrated that the peak around $A=155$ is in fact split in two. Chase et al.,²¹ by including deformation of the nucleus in the optical model parameters, adequately described the splitting of the peak at $A=155$. Moldauer²² accounted for the deep minimum at $A=100$ in the s-wave neutron strength function by concentrating the imaginary part of the optical potential outside the nuclear surface. Considerable effort was devoted by the Saclay group²³ to a search for a spin dependence of the strength function. However, to date, there is no convincing evidence for a spin dependence of the strength function.

Much experimental and theoretical effort was concentrated recently on the study of the variation of S_0 with isotope number. The first observation of a general decrease of S_0 with A was reported by Fuketa and Harvey²⁴ for the tin isotopes. This behavior was accounted for by Shakin²⁵ in terms of the 2p-1h or doorway state model. Studies in the 4-s giant resonance by Fuketa and Harvey²⁶ for the Hf isotopes and by Mughabghab and Chrien²⁷ for the Dy, Er, and Yb isotopes revealed the same systematic trend for the even-even target isotopes. A possible explanation for this behavior can be based on Lane's²⁸ isospin potential:

$$\begin{aligned} V(\text{isospin}) &= \vec{\tau} \cdot \vec{T} \frac{V_1}{A}, \\ &= (N-Z) \frac{V_1}{A} \text{ (for neutrons),} \end{aligned} \quad (31)$$

where $\vec{\tau}$ and $\vec{T}$ respectively describe the isobaric spin vectors of the incident particle and the target nucleus with mass number A .

In extensive investigations of the Te isotopes, Tellier et al.²⁹ showed that these isotopes manifested the same trend as the Sn isotopes. By including the Lane potential in the absorptive part of the optical potential ($V_1 \rightarrow W_1$) and by using coupled channel calculations (Tamura's Jupiter Code³⁰), Newstead et al.³¹ were able to fit the experimental data for the Sn and Te isotopes with reasonable values of W_1 .

Finally, a new approach to this problem was taken by Nikolenko.³² By introducing neutron pair correlations in a superconducting model, Nikolenko was successful in describing well the behavior of the strength functions of the Te and Sn isotopes.

Figure 1. Variation of R' with A . The solid curve is based on the vibrational rotational optical model with parameters $V_0 = 43.5$ MeV, $r_{sp} = 1.35$ fm, $V_{s0} = 8$ MeV and surface absorption $W_D = 5.4$ MeV.

III. INDIVIDUAL RESONANCE PARAMETERS

The level widths are generally determined from a shape or area analysis of the reaction cross section, with use of certain formalisms, described in Refs. 2-5. For fissile nuclei, the various resonance reaction formalisms were recently described by de Saussure.³³

The general considerations that were taken into account in the recommendation of the width of the resonances are the following: (1) resolution, (2) sample thickness, (3) type of measurement, (4) isotopic enrichment, and (5) type of analysis. In addition, charged particle reaction data such as (d,p) and inverse reactions such as (γ ,n) and (α ,n) reactions were also considered. In some cases radiation widths have been calculated in the framework of the statistical and valence neutron models and comparisons made with measurements. In the recommendations of spins and parities, clear-cut decisions have been made, depending on the merit of the methods. The different techniques of spin and parity determinations have been reviewed and assessments have been made.

Figure 2. s-Wave neutron strength function. The parameters of the optical potential are the same as in Figure 1.

A. Determination of Spins of Neutron Resonances

A knowledge of resonance spins is required for studies of (a) the distribution of level spacings or of level densities; (b) spin dependence of the strength function, average radiation widths, fission widths, and average reduced neutron widths; (c) Porter-Thomas distribution of partial radiative widths; (d) valence neutron predictions, and (e) channel theory of fission. Because of these and other considerations we outline, briefly, the various methods for determining the spins of neutron resonances:

1. Total Cross Section Measurements.

The peak cross section of a resonance is expressed by

$$\sigma_0 = 4\pi\lambda^2 \frac{g\Gamma_n}{\Gamma} \quad (32)$$

for resonances with $\Gamma_n \gg \Gamma_\gamma$, $\sigma_0 = 4\pi\lambda^2 g$. Hence, an experimental determination of the peak cross section σ_0 and the resonance energy E_0 establishes the spin of the resonance. This method is used extensively in the mass region $A < 60$. Additional spin assignments have been made in BNL 325 from total cross section data on the basis of this relation.

Figure 3. Experimental values of p-wave strength functions compared with predictions of the optical model.

In the heavy mass region and for nonfissile nuclei where the condition $\Gamma_n \gg \Gamma$ is no longer applicable, one could carry out a shape analysis of good resolution transmission data to extract $g\Gamma_n$ and Γ values. With the aid of the relationship

$$\Gamma_\gamma = \Gamma - \frac{g\Gamma_n}{g} > 0, \quad (33)$$

one could determine the spin.

2. Scattering Measurements.

In a scattering measurement, the scattering area, A_s , is expressed by

$$A_s = 2\pi^2 \lambda^2 \frac{g\Gamma_n^2}{\Gamma}. \quad (34)$$

When this information is combined with $g\Gamma_n$ and Γ values, it yields the spin of the resonance.

3. Capture Measurements.

Similarly, in a total capture measurement, the capture area, A_γ , is

$$A_\gamma = 2\pi^2 \lambda^2 \frac{g\Gamma_n \Gamma_\gamma}{\Gamma}. \quad (35)$$

Figure 4. s-Wave radiation widths.

With the aid of available $g\Gamma_n$ and Γ_γ values, the spin of a resonance can be deduced. An example illustrating the application of this method for p-wave resonances of ^{52}Cr is by plotting the $g\Gamma_n\Gamma_\gamma/\Gamma$ values of resonances versus neutron energy. Assuming that $\Gamma_n \gg \Gamma_\gamma$ and that Γ_γ is approximately constant one expects the experimental points to be clustered roughly around two lines, $g\Gamma_\gamma = 0.5$ or 1.0 eV, corresponding to $J = 1/2$ or $3/2$, respectively. Large deviations from these lines may indicate a breakdown of the above assumptions or possibly the existence of doublets. An independent confirmation of the spin assignments of ^{52}Cr is provided by the threshold photonuclear results of Jackson and Strait.³⁴ On the basis of similar considerations one could make tentative spin assignments of $J = 3/2$ for the p-wave resonances of ^{58}Ni located at neutron energies: 26.67, 34.24, 39.59, 61.8, 81.1, 94.5, 101.1, 105.3, 110.7, and 117.5 keV.

4. Primary and Low-Energy γ -Rays Detected by Ge-Li Detectors.

For s-wave neutron capture, the observation of reasonably strong primary γ -rays populating low-lying states with spins $I + 3/2$ or $I - 3/2$ establishes the spin of the capturing state as $I + 1/2$ or $I - 1/2$, respectively. Underlying this conclusion is the assumption of primary dipole transitions. Because of the Porter-Thomas distribution of partial radiative widths or the unavailability of low-lying states with these spins, these selected high-energy γ -rays may be either

Figure 5. p-Wave radiation widths.

weak or absent in the spectrum of a resonance. One could then alternatively rely on measurements of low-energy γ -rays. As shown by Huizenga and Vandebosch,³⁵ using a simple statistical model, the γ -ray population of a low-lying state is sensitive to the spin of the capturing state. By considering two suitable low-energy γ -rays and forming intensity ratios for the various resonances, one finds that these ratios separate into two distinct groups. In 1953, Sailor³⁶ observed a large difference in the isomeric ratios, which are related to the population ratios, of the first two levels of ^{115}In . Subsequently Draper et al.³⁷ studied the low-energy γ -rays of $^{115}\text{In}(n,\gamma)^{116}\text{In}$ and showed that the intensity ratios form two groups. Later, Wetzcl and Thomas,³⁸ using Ge-Li detectors, established that the intensity ratio is related to the spin of the capturing state. The BNL fast chopper group³⁹ has extended this technique to a variety of nuclei in the rare-earth region. The combination of primary and low-energy γ -rays proved to be a powerful tool for the determination of spins of neutron resonances. Very recently Corvi⁴⁰ successfully made use of this technique to determine the spins of ^{235}U resonances below 41 eV.

5. The 2-Step Cascade Method.

Bollinger et al.⁴¹ introduced a novel approach for the determination of neutron resonance spins, known as the 2-step cascade method. The intensity for such a cascade to the ground state is measured by recording the spectrum of

the pulse heights for coincident counts in two NaI crystals. Under certain simplifying assumptions [such as a constant Γ_γ and a $(2J+1)$ dependence of level density] it can be easily shown that the intensity for such a cascade is proportional to $(2J+1)^{-1}$. As a result, it would be expected that the 2-step cascade intensities for the resonances would separate cleanly into two groups. This method was applied by Bollinger et al.⁴¹ to even-odd target nuclei $^{111,113}\text{Cd}$, ^{135}Ba , ^{105}Pd , and ^{177}Hf , for which the intensities behaved according to expectation. Since then, spin assignments of resonances of these target nuclei have been made with the aid of other techniques. To assess the experimental validity of the 2-step cascade method, spin assignments derived by this and other methods have been compared by us and the excellent agreement warrants the extensive use of the 2-step cascade method in spin determinations.

6. The γ -Ray Multiplicity Method.

Another method, developed by Coceva et al.,⁴² relies on the idea that the multiplicity, or average number of steps per cascade, depends on the spin difference between the initial and final states. By using two NaI crystals viewing a sample, they measured the intensity ratio $R = I_s/I_c$, where I_s is the intensity of counts measured with a single pulse-height detector and I_c is the intensity of coincidence counts measured with two NaI detectors. For s-wave capture, expectations are that R will separate into two distinct classes. The applicability of these ideas has been verified experimentally by determining the resonance spins of ^{105}Pd , $^{99,101}\text{Ru}$, $^{95,97}\text{Mo}$, and $^{177,179}\text{Hf}$. On the other hand, nuclei such as $^{121,123}\text{Sb}$ and ^{171}Yb did not exhibit the expected spin effect in R .⁴³

7. Polarization Measurements.

One of the direct measurements of resonance spins is the use of polarized neutrons and targets. Under these conditions, the interaction cross section can be written in the simple form

$$\sigma = \sigma_0 + f_n f_N \sigma_p, \quad (36)$$

where f_n and f_N are the neutron and nuclear polarization and σ_0 , σ_p are the polarization-independent and polarization-dependent cross sections and are expressed by

$$\begin{aligned} \sigma_0 &= g_+ \sigma_+ + g_- \sigma_- , \\ \sigma_p &= g_- (\sigma_+ - \sigma_-) . \end{aligned} \quad (37)$$

These quantities are related through the transmission effect τ by the relationship

$$\tau = \frac{\tau_P - \tau_A}{\tau_P + \tau_A} \approx -\frac{1}{2} (1 + \varphi) f_n (f_N N \sigma_0 t) \frac{\sigma_p}{\sigma_0}, \quad (38)$$

where τ_P and τ_A are the transmissions through the target when the neutron beam is polarized parallel or antiparallel to the applied magnetic field, respectively, φ is the efficiency for reversing the beam polarization, t is the sample

thickness, and N is the number of target nuclei per unit volume. Since one can measure the quantities $\frac{1}{2}(1 + \varphi)f_n$ and $f_N N \sigma_0 t$, a polarization measurement determines σ_P/σ_0 . Note that for a well-isolated resonance,

$$\frac{\sigma_P}{\sigma_0} = -1 \quad \text{for } J = I - 1/2$$

$$\frac{I}{I+1} \quad \text{for } J = I + 1/2 . \quad (39)$$

Recently Reddingius et al.⁴⁴ and Keyworth et al.⁴⁵ achieved a spin determination of resonances of ^{235}U and ^{237}Np .

8. Level-Level Interference in Scattering or Fission Channel.

It can be shown that the resonance-resonance interference term due to scattering for two resonances can be written in the form

$$\Delta\sigma_{nn} = \left(\frac{4\sigma_{01}\sigma_{02}\Gamma_{n1}\Gamma_{n2}}{\Gamma_1\Gamma_2} \right)^{1/2} \frac{1 + X_1 X_2}{(1 + X_1^2)(1 + X_2^2)} , \quad (40)$$

where

$$X_1 = \frac{2(E - E_1)}{\Gamma_1} ,$$

A shape analysis between resonances can give an indication of the spins of the resonances. Côté et al.⁴⁶ applied this method to deduce the spin of resonances of ^{55}Mn . This method is used also in partial capture cross section measurements for spin determinations.

Similarly, shape analysis of the fission cross section using multilevel formalisms can separate the resonance into two classes. For example, Moore et al.⁴⁷ were successful in deducing the two classes of ^{241}Pu resonances.

9. Degree of Symmetry of Fission: Ratio of Symmetric to Asymmetric Fission.

One of the indirect methods for the determination of spins of fissionable nuclides is by a measurement of the degree of symmetry in the fission process. Cowan and collaborators⁴⁸ developed a method in which a sample is placed on a rotating wheel and the ratio of the fission products ^{115}Cd and ^{99}Mo is determined radiochemically. This ratio is related to the ratio of symmetric and asymmetric fission. A comparison between the ^{235}U spin assignments of Cowan et al.⁴⁸ and Keyworth et al.⁴⁵ below 33.5 eV shows reasonably good agreement, suggesting that there is a correlation between spin and symmetry of fission.

B. Determination of the Parity of Neutron Resonances.

The parity of neutron resonances is determined by the orbital angular momentum (ℓ) of the incoming neutron and the parity of the target nucleus. Some of the methods described previously for spin determination may shed light, in some cases, on the ℓ value of the incident neutron. For example, the

observation of a strong primary γ -ray transition to the ground state of ^{94}Nb ($I=9/2^+$) with spin and parity 6^+ indicates that the capturing state is 5^- under the reasonable assumption that the radiation is dipole in character. Hence, the capturing state is formed by p-wave interaction of neutrons. Higher orbital angular momenta may be excluded on the basis of the strength and Wigner limit of a resonance. Similarly, in the γ -ray multiplicity method, the determination of intensity ratios different from those expected for s-wave capture may indicate interaction of p-wave neutrons with the target nucleus. However, these techniques are indirect in nature. Some of the direct methods are outlined below.

1. Interference Effects.

Presence of an interference minimum on the low-energy side of a resonance gives evidence that the resonance is formed by s-wave neutrons. The resonance strength must be reasonable to allow experimental observation of the dip. As an illustration, the 45-eV resonance of ^{95}Mo exhibits the interference minimum to allow a definite $\ell=0$ assignment for it.

2. Angular Distributions of Elastically Scattered Neutrons.

The differential cross section can be written in the form

$$d\sigma(\alpha's';\alpha s) = \frac{\lambda_\alpha^2}{2s+1} \sum_{L=0}^{\infty} B_L(\alpha's';\alpha s) P_L(\cos \Theta) d\Omega, \quad (41)$$

where the channel index α describes the type of incoming particle and state of the target nucleus, and s defines the channel spin, i.e., the total spin angular momentum. $P_L(\cos \Theta)$ are the usual Legendre polynomials, and $B_L(\alpha's';\alpha s)$ coefficients are related to the Z coefficients and collision matrix. For details, the reader is referred to the work of Blatt et al.⁴⁹ For elastic scattering of neutrons, $\alpha = \alpha'$. In general, for an unpolarized neutron beam on an unpolarized target, summation of s, s' must be carried out for the entrance and exit channels. However, for spinless nuclides the channel spin is unique, and for the case of an incoming neutron, $s = s' = 1/2$. From the shape and interference patterns of the differential cross sections, the ℓ value of the incoming neutron can be inferred. Asami et al.⁵⁰ applied these methods to determine the parity of the 1.15-keV resonance of ^{56}Fe . Recently, Kirouac and Nebe⁵¹ exploited the same techniques for the determination of the spins and parities of ^{40}Ca resonances.

3. Angular Distribution of Capture γ -Rays.

It is possible to utilize high-energy capture γ -rays by measuring their angular distribution for the purpose of investigating the parity of the initial, as well as final, states. For even-even target nuclei and for dipole radiation (p-wave neutron capture) the expected angular distributions for transitions $3/2 \rightarrow 5/2$, $3/2 \rightarrow 3/2$, and $3/2 \rightarrow 1/2$ are displayed in Table 1. Also listed in the table are the γ -ray intensity ratios at two selected angles, 90° and 135° , determined by the neutron beam and γ -ray directions.

By observing an anisotropy in the γ -ray capture spectra recorded at two angles, one can readily deduce the spins and parities of the initial and final states. It should be noted, however, that the observation of a symmetrical angular distribution does not permit a distinction between $s_{1/2}$ and $p_{1/2}$ resonances. Using NaI crystals, McNeil et al.⁵² applied these methods to investigate the γ -rays of the 62-eV resonance of ^{124}Sn . Recently, Slaughter et al.⁵³ reported similar measurements for the 45.8-eV resonance of ^{118}Sn and the 62.0-eV resonance of ^{124}Sn . With the advent of high-resolution GeLi detectors, Bhat et al.,⁵⁴ Mughabghab et al.,^{55,56} and Chrien et al.⁵⁷ exploited these methods for the determination of low energy p-wave resonances in $^{116,118,120,122}\text{Sn}$, ^{98}Mo , ^{108}Pd , and ^{56}Fe as well as spin assignments of low-lying compound states. Angular distributions can also determine channel spin admixtures for $\ell \neq 0$ resonances in target nuclei where $I > 0$ as demonstrated by Chrien et al.⁵⁸ for ^{93}Nb .

Table 1
Angular Distribution of Dipole γ -Rays Due to p-Wave Capture
in Target Nuclides With $I=0$

Transition	$W(\Theta)$	$\frac{W(90^\circ)}{W(135^\circ)}$
$3/2 \rightarrow 5/2$	$\frac{3}{80\pi} (6 + \sin^2\Theta)$	$\frac{14}{13}$
$3/2 \rightarrow 3/2$	$\frac{1}{20\pi} (7 - 3\sin^2\Theta)$	$\frac{8}{11}$
$3/2 \rightarrow 1/2$	$\frac{1}{16\pi} (2 + 3\sin^2\Theta)$	$\frac{10}{7}$
$1/2 \rightarrow 1/2$	symmetrical	1

4. Angular Distribution of Photoneutrons.

In recent years, Jackson and Strait³⁴ and Berman et al.⁵⁹ made use of the threshold photonuclear reaction (introduced by Bertozzi et al.⁶⁰) to study the properties of the neutron resonance states. By measuring the angular distribution of the ejected photoneutrons and by assuming dipole transitions, information on the spin and parity of the compound resonance states can be deduced. Spins and parities for the compound nuclides ^{51}Cr , ^{81}Na , and ^{57}Fe have been reported by Jackson and Strait.³⁴

5. The Wigner Limit.

In the atomic mass region of light nuclei, one could apply the Wigner limit Γ_w to place an upper limit on the ℓ value of the incoming neutron.

$$\Gamma_w = \frac{3\hbar^2}{2mR} kV_\ell,$$

where V_ℓ is the probability of passing through a centrifugal barrier. Values of V_ℓ for $\ell \leq 3$ are derived for a square potential well. These are included in Table 2. The experimentally determined width of a resonance must not exceed the Wigner limit corresponding to a particular ℓ value.

6. Statistical Considerations.

The application of statistical arguments such as the Porter-Thomas distribution of reduced neutron widths, Dyson and Mehta's Δ and F statistics, and Baye's theorem may give some indication of the p-wave assignment of resonances. These techniques have been extensively used by the Columbia⁶¹ and Livermore⁶² groups. They do not give definite ℓ assignments since there is an overlap between the weak s-wave and strong p-wave resonances. The principal use of these methods is the ability to estimate average quantities such as p-wave strength functions and p-wave mean level spacings.

Table 2

ℓ	V_ℓ
0	1
1	$k^2 R^2 / (1 + k^2 R^2)$
2	$k^4 R^4 / (9 + 3k^2 R^2 + k^4 R^4)$
3	$k^6 R^6 / (225 + 45k^2 R^2 + 6k^4 R^4 + k^6 R^6)$

C. s- and p-Wave Radiative Widths.

The first attempt to study average radiative widths and interpret them in terms of Blatt and Weisskopf's⁶³ estimates of partial radiative widths was made by Levin and Hughes.⁶⁴ Subsequently, by carrying out a similar study of the experimental $\langle \Gamma_\gamma \rangle$, Stolovey and Harvey⁶⁵ arrived at the following empirical expression for $\langle \Gamma_\gamma \rangle$:

$$\langle \Gamma_\gamma \rangle = (5.3 \times 10^{-4}) A^{2/3} [D(U)]^{0.25} U^{4.3} \quad (\text{in meV}). \quad (42)$$

The total radiative width for electric dipole radiation can be written in the approximate form

$$\Gamma_\gamma = \frac{3}{4} \frac{(\bar{e})^2}{\hbar c} \left(\frac{R}{\hbar c} \right)^2 \frac{D(U)}{D_0} \int_0^U \frac{E^3 dE}{D(U-E)}, \quad (43)$$

where $\bar{e}$ is the effective charge, U is the effective excitation energy (defined below), and $D(U)$ is the level spacing at U .

With the aid of this expression and Newton's level spacing formula,⁶⁶ Cameron derived the following expression for the total radiative width:

$$\Gamma_{\gamma} = 5.2 A^{2/3} b^4 \left[1 + \frac{2b}{U^{1/2}} \right] \left[U^2 - \frac{10b}{3} U^{3/2} + 5b^2 U - \frac{35}{9} b^3 U^{1/2} + \frac{35}{27} b^4 \right] \quad (\text{in meV}). \quad (44)$$

Here $b = 5.97 / (\bar{J}_N + \bar{J}_Z + 1)^{1/2} A^{1/3}$ and, for slow neutrons, $U = S_n - \Delta$. $\bar{J}_N$ and $\bar{J}_Z$ are the effective total angular momenta of single-particle states near the Fermi surface, S_n is the neutron separation energy, and Δ is the pairing energy which is expressed (for compound nucleus $A + 1$) as

$$\begin{aligned} \Delta &= \delta_n + \delta_p && \text{even-even} \\ &= \delta_p && \text{even-odd} \\ &= \delta_n && \text{odd-even} \\ &= 0 && \text{odd-odd.} \end{aligned}$$

δ_n and δ_p are the neutron and proton pairing energies. These relationships were used to calculate Γ_{γ} in the absence of experimental data.

Our present knowledge of the variation of the average s-wave radiative widths with mass number A is illustrated in Figure 4. Two interesting features emerge from this plot: (a) the monotonic decrease of Γ_{γ} with A in the mass region 60-190 and (b) the maxima at about the mass numbers $A = 50$ and 208, which are related to the magic numbers $Z = 28$ and 82. A comparison of measured s-wave radiative widths with calculations based on Cameron's formula shows qualitative agreement. It should be noted that large fluctuations from resonance to resonance are observed for the s-wave radiative widths around $A = 50$.

The variation of p-wave radiative widths with mass number is shown in Figure 5, which demonstrates the same qualitative features as for s-wave radiative widths. A detailed comparison of s- and p-wave radiative widths shows generally the following results:

$$\begin{aligned} \langle \Gamma_{\gamma} \rangle_s &> \langle \Gamma_{\gamma} \rangle_p \quad \text{at } A \simeq 50, \\ \langle \Gamma_{\gamma} \rangle_p &> \langle \Gamma_{\gamma} \rangle_s \quad \text{at } A \simeq 100. \end{aligned}$$

These differences can be understood in terms of channel or valence neutron capture of Lane and Lynn.^{68, 69} In this model an incident neutron is pictured as undergoing a transition to a low-lying final single-particle state. By considering the motion of a valence neutron in a potential well, Lynn³ derived the following expression for the partial radiative width between an initial state i and final state f :

$$\Gamma_{\gamma if} = \frac{16\pi k^3}{9} \Theta_i^2 \Theta_f^2 \frac{|\langle j' I_j || Y^{(1)} || j'' I_j \rangle|^2}{2J_i + 1} \times |\tilde{e} \int_0^{\infty} dr r_i r_f|^2, \quad (45)$$

where $\bar{e}$ is the effective charge, k is the photon wave vector, Θ_i^2 , Θ_f^2 are dimensionless reduced widths of the initial and final states, respectively, and are expressed by $\Theta_i^2 = \gamma_i^2 / \gamma_{sp}^2$ and $\Theta_f^2 = S_{dp}$. γ_{sp}^2 is the single-particle reduced width of the initial state, and S_{dp} is the (d,p) stripping spectroscopic factor. The radial overlap integral is calculated by Lynn³ with use of a Saxon-Woods potential with a spin orbit coupling term.

The first success of the valence neutron model was quantitatively demonstrated by Mughabghab et al.^{70,71} for the case of p-wave resonances of ⁹⁸Mo and ⁹⁶Zr. In a few cases particularly in the 2p and 3p giant resonances, Γ_γ was calculated using the above relationships.

D. Neutron-Induced Fission.

The body of available data for fissile material is described in terms of the single-level Breit-Wigner formalism because of its simplicity. However, in a few cases, authors reported fission widths derived on the basis of the multilevel Reich-Moore formalism⁷² with two fission channels (Γ_{f1} and Γ_{f2}). An attempt was made to present single-level Breit-Wigner parameters, except for those cases where only multilevel Reich-Moore parameters are available. (See footnote at the end of resonance parameter tables.)

For an understanding of the energy and spin dependence of the fission widths, it is necessary to discuss briefly the channel theory of fission. To estimate the fission width, Bohr and Wheeler⁷³ applied statistical considerations to arrive at an expression which was subsequently reinterpreted by Aage Bohr:

$$(\Gamma_F(J^\pi)) = \frac{\langle D(J^\pi) \rangle N(J^\pi)}{2\pi}, \quad (46)$$

where $\langle \Gamma_F(J^\pi) \rangle$ and $\langle D(J^\pi) \rangle$ are respectively the average total fission width and average level spacing of resonances of specified spin and parity, and $N(J^\pi)$ is the available number of levels in the transition state. In modern terminology, $N(J^\pi)$ is known as the number of exit fission channels. This simple relation played a major role in accounting for some principal features of nuclear fission, such as (1) the steplike increase of the fission cross section with increasing excitation energy, (2) spin dependence of the fission widths, and (3) mass distribution of fission fragments, etc. Of particular importance in the development of the theory of fission is the introduction by Aage Bohr⁷⁴ of the concept that the spectrum of transition states at the saddle point is finite. The nucleus at the saddle point is considered thermodynamically "cold" because a large fraction of the available energy is in the form of potential energy of deformation. Then the number of fission channels for a particular J^π is small and can be related to the vibrational and rotational modes of the nucleus at the saddle point; i.e., the spectrum of transition states at the saddle point resembles the rotational and vibrational spectra of deformed nuclei near the ground state. In other words the exit fission channels can be characterized by the parity and the J and K quantum number (the projection of the angular momentum

quantum number on the symmetry axis of the nucleus). A description of the exit fission channels or transition states for even-even compound nuclei in terms of simple collective motions has recently been summarized by Lynn.⁶⁶ A brief summary of the number of transition states is presented in Table 3 for the target isotopes ^{233, 235}U and ^{239, 241}Pu for neutron energies just above the neutron separation energies.

Table 3
Comparison of Experimental and Predicted Ratios of Fission Widths
in the Framework of the Channel Theory of Fission

Target nucleus	I ^π	N _F (I-1/2)	N _F (I+1/2)	$\frac{\Gamma_F(I-1/2)}{\Gamma_F(I+1/2)}$ Predictions	$\frac{\Gamma_F(I-1/2)}{\Gamma_F(I+1/2)}$ Experimental
²³³ U	5/2+	2.5	1.5	2.3	-
²³⁵ U	7/2-	2.5	1.0	1.9	1.7
²³⁹ Pu	1/2+	1.5	0.23-0.042	20-110	44
²⁴¹ Pu	5/2+	2	1	2.8	2.9

For excitation energies below the fission barrier (subthreshold fission for a single-humped potential), the above relation for the average fission width has to be modified to take into account barrier penetration, or transmission factors:

$$P_f = \frac{1}{1 + \exp(2\pi(E_f - E)/\hbar\omega)}, \quad (47)$$

where E_f and E are the fission barrier height of a particular fission channel f and the excitation energy, respectively, and ω is the circular frequency of the oscillator. $\hbar\omega$ gives a measure of the curvature of the barrier. Estimates of $\hbar\omega$ range from about 0.3 to 0.9 MeV. P_f is also referred to as the "channel width" or "degree of opening." Note that it is unity for $E \gg E_f$ and is 0.5 at E_f . The relation for the barrier penetration factor was first derived by Hill and Wheeler⁷⁵ for a potential barrier of an inverted simple harmonic oscillation. Therefore the general expression for $\langle \Gamma_F \rangle$ becomes

$$\langle \Gamma_F(J^\pi) \rangle = \frac{\langle D(J^\pi) \rangle}{2\pi} \sum_f \frac{1}{1 + \exp(2\pi(E_f - E)/\hbar\omega)}, \quad (48)$$

where the summation is extended over f fission channels.

1. Consequences of the Channel Theory of Fission.

(a) Fluctuation of fission widths. Early in the history of fission, it was held that the fission width would behave much like the radiation width (numerous exit channels, and therefore constant value), but experimental findings soon showed that the fission widths do not behave according to these expectations

but fluctuate strongly from resonance to resonance of a particular nucleus. Analysis of the ^{235}U fission widths carried out by Porter and Thomas⁷⁶ indicated that the number of degrees of freedom is 2.3 ± 0.8 .

At this point it is important to note that the effective number of degrees of freedom, $\nu_{\text{eff}}(J^\pi)$, obtained from analysis of the fission widths on the basis of a chi-squared distribution is generally different from $N(J^\pi)$. This arises because the degrees of opening of the various contributing fission channels may be different which results in unequal average partial fission widths, Γ_f . Under this condition, the distribution of the total fission widths, Γ_F , no longer exactly obeys a chi-squared distribution. Thus, one could define an effective number of degrees of freedom by the relationship

$$\nu_{\text{eff}}(J^\pi) = \frac{2[\langle \Gamma_F(J^\pi) \rangle]^2}{\text{Variance } \Gamma_F(J^\pi)} \quad (49)$$

In terms of the penetration factors or "degrees of opening" of the various fission channels, it can be shown that

$$\nu_{\text{eff}}(J^\pi) = \frac{(\sum_f P_f)^2}{\sum_f (P_f)^2} \quad (50)$$

Note then that ν_{eff} is generally larger than $N_F(J^\pi)$.

(b) Spin dependence of $\langle \Gamma_F \rangle$. One of the interesting consequences of the channel theory of fission is the spin dependence of the average fission width, which arises from the specific properties of the transition states associated with each J^π . Because of the importance of average fission widths to the channel theory of fission and to reactor calculations, let us examine briefly the available data.

(i) $^{235}\text{U}(I^\pi = 7/2)$. s-Wave neutron capture by ^{235}U leads to two spin states $J^\pi = 3^-$ and 4^- . The fission barriers of the various transition states are such that $N_F(3^-) = 2.5$ ($N_{f1} = N_{f2} = 1$, and $N_{f3} = 0.5$) and $N_F(4^-) = 1.0$ ($N_{f1} = N_{f2} = 0.5$). With the assumption of a $(2J+1)$ dependence of the level density, the channel theory of fission gives a ratio for $\Gamma_F(3^-)/\Gamma_F(4^-)$ of 1.9. This is to be compared with an experimental value of 1.7 obtained with the multilevel fission widths determined by de Saussure et al.⁷⁷ [Note: the presently available spin-assigned resonances of ^{235}U do not follow a $(2J+1)$ law, possibly because (1) all spins in the energy interval below 56 eV are not determined and (2) high target spin value of ^{235}U .] It is interesting to note that the distributions of the fission widths for $J^\pi = 3^-$ and 4^- in terms of Eq. (50) show that $\nu_{\text{eff}}(3^-) = 1.9$ and $\nu_{\text{eff}}(4^-) = 2.5$. The latter value is consistent with the picture of at least two partially open channels contributing to the fission widths of 4^- resonances.

(ii) $^{239}\text{Pu}(I^\pi = 1/2^+)$. s-Wave neutron capture by ^{239}Pu results in two spin states, $J^\pi = 1^+$ and 0^+ . For the 0^+ resonances, there are about 1 to 2 transition states while for the 1^+ resonances, one transition state is partially open. Therefore, the calculated ratio $\Gamma_F(0^+)/\Gamma_F(1^+)$ is very sensitive to the location

of the transition state associated with the 1^+ resonances. With the aid of the Bohr-Wheeler relationship [Eq. (47)], this ratio can be estimated to lie in the range 20 to 110. The experimental resonance data of ^{239}Pu show that this ratio is equal to 44, in reasonable agreement with the prediction of the channel theory of fission.

(iii) $^{241}\text{Pu}(I^\pi = 5/2^+)$. For this nucleus there are probably 2 and 1 open transition states for $J^\pi = 2^+$ and 3^+ resonances, respectively. Therefore, the predicted ratio $\Gamma_F(2^+)/\Gamma_F(3^+) = 2.8$. Analysis of the ^{241}Pu fission widths is limited by the small number of resonances with assigned spins. From the known 13 resonances with $J^\pi = 3^+$ and 8 resonances with $I^\pi = 2^+$, we obtain an estimated ratio of $\Gamma_F(2^+)/\Gamma_F(3^+) = 2.9$.

In conclusion, the analysis of the available resonance data demonstrates the validity of the channel theory of fission and consequently the spin dependence of the average fission widths. Should an evaluator require the spin of a resonance when it is not determined, he could call upon these concepts to assign provisional spins. For example, tentative spin assignments $J=0$ could be attributed to the ^{239}Pu resonances with large fission widths at neutron energies of 346.6, 357.9, 371.7, etc.

Because of scope and space limitations some of the recent interesting features, such as (1) subthreshold fission of ^{238}U , ^{237}Np , ^{238}Pu , ^{240}Pu , and ^{242}Pu and its description in terms of the double-humped fission barrier, and (2) variation of ν with resonance energies and its possible interpretations in terms of spin quantum number K and/or $(n,\gamma f)$, could not be discussed. The user is referred to Refs. 3 and 4 and to the recent excellent review article by Michaudon.⁷⁸

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1 H

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.332 \pm 0.002 \text{ b} \\ \bar{\sigma}_a &= 20.436 \pm 0.023 \text{ b} \\ a_{coh} &= -3.739 \pm 0.003 \text{ fm} \\ a_{coh} &= -23.719 \pm 0.013 \text{ fm [J0]} \\ a_{coh} &= 5.414 \pm 0.005 \text{ fm [J1]}\end{aligned}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
H	σ_c para H	PRL,26,1581(71)	Houk
H	σ_c	PR/C,3,1886(71)	Houk
H	reflection	PRL,27,956(71)	Koester
H	pulsed n	PRIVATE COMM.(69)	Cokinos
H	pulsed n	NSE,35,70(69)	Nassar
H	pulsed n	NUK,11,159(68)	Elkert
H	σ_t	RMP,39,546(67)	Houk
H	refractometry	ZP,198,187(67)	Koester
H	pulsed n	DA/B,27,257(66)	Silver
H	pulsed n	NP,74,497(65)	Cox
H	decay	ANS,8,274(65)+	Gon
H	pulsed n	PPS,85,79(65)	Harris
H	pulsed n	65KARSR,1,35(65)	Silver
H	neutron lifetime	PRIVATE COMM.(64)	Kay
H	neutron lifetime	63MANCHST,34(63)	Lynchank
H	mirror reflection	PR,126,632(62)	Dickinson
H	diffusion length	NSE,14,224(62)	Starr
H	mirror reflection	UCRL-6320(61)	Dickinson
H	neutron lifetime	NSE,9,132(61)	Meadows
H	pulsed n	NUK,2,131(60)	Kuechle
H	pulsed n	NSE,8,88(60)	Kuechle
H	pulsed n	AF,15,471(59)	Sjostrand
H	neutron lifetime	PR,114,1561(59)	Stooksberry
H	neutron density	PRS/A,248,539(58)	Baker
H	pulsed n	ZN/A,13,822(58)	Beckurts
H	pulsed n	NUK,1,13(58)	Dio
H	pile osci.	PRS/A,248,539(58)-	Lockett
H	pile osci.	AERE-R/R-2333(57)	Cummins
H	diffusion length	ORNL-2076,32(56)	Campbell
H	neutron lifetime	PPS/A,69,469(56)	Meads
H	σ_t	55GENEVA,2,81(55)	Nikitin
H	$\bar{\sigma}_s$ para-ortho	PRS,230,19(55)	Squires
H	$\bar{\sigma}_s$ ortho-para	PR,90,1125(53)	Stewart
H	σ_t	PR,90,1125(53)	Stewart
H	mirror reflection	PR,84,1160(51)	Burgy
H	polarization	PR,82,5(51)	Meyerhof
H	diffraction	PR,81,527(51)	Shull
H	σ_c (120,345 ev)	PR,79,747(50)	Hibdon
H	reflection	PR,77,291(50)	Hughes
H	σ_t	PR,76,1744(49)	Melkonian
H	σ_t	PR,76,1750(49)	Melkonian
H	σ_t	PR,72,1147(47)	Sutton
H	$\bar{\sigma}_s$ ortho-para	PR,72,1147(47)	Sutton
H	σ_c	HPA,19,285(46)	Gibert
H	capture	PR,67,202(45)	LeRoy
H	σ_c	PR,59,489(41)	Hanstein
H	σ_c	PR,48,265(35)	Dunning

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 0.53 \pm 0.02 \text{ mb} \\ \bar{\sigma}_s &= 3.390 \pm 0.012 \text{ b} \\ a_{coh} &= 6.672 \pm 0.007 \text{ fm} \\ a_{coh} &= 6.35 \pm 0.02 \text{ fm [J3/2]} \\ a_{coh} &= 0.65 \pm 0.04 \text{ fm [J1/2]}\end{aligned}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
D	σ_t (1-1000 kev)	PRL,29,1745(72)	Stoler
D	σ_t reflection	PL/B,36,208(71)	Dilg
D	diffraction	ACR/B,25,2442(69)	Coppens
D	Christiansen filter	ZP,219,300(69)	Koester
D	reflection	PR,174,313(68)	Bartolini
D	activation	NSE,34,195(68)	Merritt
D	a+/a-	PL/B,24,151(67)	Alfimenkov
D	polarization	PL/B,24,151(67)	Alfimenkov
D	activation	NSE,28,286(67)	Merritt
D	analysis	PL/B,24,562(67)	Van Oers
D	σ_t (1.4 ev)	NP,61,381(65)	Rayburn
D	mirror reflection	BAP,8,477(63)	Bartolini
D	σ_t	ZK,118,149(63)	Gissler
D	σ_t (spectra)	63ANL-6797,236(63)	Jurney
D	σ_t (spectra)	ANL-6719,17(63)	Raboy
D	σ_t (5,10 ev)	PRIVATE COMM.(59)	Fluharty
D	analysis	JNE,11,34(59)	Hone
D	σ_t	55GENEVA,2,81(55)	Nikitin
D	activation	PR,87,785(52)	Kaplan
D	σ_t (1.4 ev)	PR,87,174(52)	Rayburn
D	$\bar{\sigma}_s$	CJP,29,36(51)	Hurst
D	diffraction	PR,81,527(51)	Shull
D	σ_t (120,345 ev)	PR,79,747(50)	Hibdon
D	$\bar{\sigma}_s$	PR,80,117(50)	Hurst
D	ortho + para	PR,75,578(49)	Fermi
D	σ_t (5 ev)	PR,73,733(48)	Rainwater
D	diffusion	CJR/A,25,134(47)	Sargent
D	σ_t	PR,60,702(41)	Carrol
D	σ_t	PR,59,489(41)	Hanstein
D	$\bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber
D	σ_t	PR,48,265(35)	Dunning

¹T
[12.33 yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &< 0.006 \text{ mb} \\ \bar{\sigma}_s &= 1.3 \pm 0.3 \text{ b} \\ a_{coh} &= 5.0 \pm 0.3 \text{ fm}\end{aligned}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
T	refraction	PR/C,5,1952(72)	Donaldson
T	$\bar{\sigma}_s$	IZV,31,349(67)	Vertebnyi
T	activation	NP,59,81(64)	Imhof
T	activation	AFSNC-TDR-62-26(62)	Imhof
T	activation	BAP,7,268(62)	Grench

^2He

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_s &< 0.05 \text{ b} \\ \bar{\sigma}_s &= 0.76 \pm 0.01 \text{ b} \\ a_{coh} &= 3.0 \pm 0.1 \text{ fm}\end{aligned}$$

^3He

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_f &= 0.060 \pm 0.030 \text{ mb} \\ \sigma_s &= 5327 \pm 10 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma^c} = 2390 \pm 10 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 1/2^+ \quad \quad \quad \chi_{Abn} = 0.00013 \quad \quad \quad S_n = 20578.48 \pm .36 \text{ keV}$$

E_0 (keV)	J	ℓ	Γ_p (keV)
^a -500	0	0	1200

^a Proton width at an excitation energy of the binding energy of a neutron in He-4.

^4He

THERMAL CROSS SECTIONS

$$\begin{aligned}\bar{\sigma}_s &= 0.76 \pm 0.01 \text{ b} \\ a_{coh} &= 3.0 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+ \quad \quad \quad \chi_{Abn} = 100 \quad \quad \quad S_n = -890 \pm 50 \text{ keV}$$

E_0 (keV)	Γ (keV)	Γ_n (keV)	J	ℓ	Γ_d (keV)
^a 6.43			1/2	1	
1150 ± 20	1400 ± 200	1400 ± 200	3/2	1	
22155 ± 10	110 ± 20	55 ± 30	3/2	2	55 ± 30

^a Broad level.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
He ³	σ_{γ} (spectra)	BAP,18,591(73)	Bollinger
He	σ_t	NP/A,133,410(69)	Rorer
He ³	σ_t	PR/B,133,925(64)	Als-Nielsen
He	diffraction	ARN,11,303(64)	Wilkinson
He	σ_t	JPR,24,21(63)	Genin
He ³	σ_{γ} (spectra)	BAP,5,19(60)	Gallmann
He	$\bar{\sigma}_s$	ANL-4680,6(51)	Harris
He	reflector	PR,84,969(51)	McReynolds
He	$\bar{\sigma}_s$	PR,80,20(50)	Harris
He ³	σ_p	PR,75,1358(49)	Coon
He ³	σ_t	PR,75,1366(49)	King
He	analysis	PR,58,1004(40)	Schwinger
He	σ_t	PR,54,541(38)	Carroll

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
He ⁴	analysis	6430	NP/A,180,225(72)	Stammach
He ⁴	$\bar{\sigma}_s$	200-7000	PR,168,1114(68)	Morgan
He	$\bar{\sigma}_s$	200-7000	DA/B,28,4249(68)	Morgan
He,He ⁴	$\bar{\sigma}_s$ polar.	22160	NP,83,65(66)	Hoop
He ³	polarization	thermal	PR,150,146(66)	Passell
He,He ⁴	$\sigma_t \bar{\sigma}_s$	22150	PR/B,135,99(64)	Shamu
He,He ⁴	analysis	1297	NC,28,600(63)	Pisent
He ⁴	analysis	1297	NCS,1,386(63)	Pisent
He,He ⁴	σ_t	22150	PL,4,286(63)	Shamu
He ³	σ_p	thermal	ZET,40,1270(61)	Bergman
He,He ⁴	σ_t	1150	PR,118,683(60)	Vaughn
He,He ⁴	$\bar{\sigma}_s$	22150	PR,115,398(59)	Bonner
He ³	σ_p	500	ZET,33,9(57)	Bergman
He,He ⁴	$\bar{\sigma}_s$	400-2730	PR,86,155(52)	Adair
D	(t,n)	21900	PR,87,612(52)	Argo
He,He ⁴	σ_t	1150	PR,82,378(51)	Bashkin
He,He ⁴	$\bar{\sigma}_s$	1000	PR,57,936(40)	Staub

³Li

THERMAL CROSS SECTIONS

$$\sigma_T = 70.7 \pm 0.7 \text{ b}$$
$$a_{coh} = -2.14 \pm 0.05 \text{ fm}$$

⁶Li

THERMAL CROSS SECTIONS

$$\sigma_T = 0.028 \pm 0.007 \text{ b}$$
$$\bar{\sigma}_s = 0.72 \pm 0.02 \text{ b}$$
$$\sigma_a = 940 \pm 4 \text{ b}$$
$$\sigma_t = 941 \pm 4 \text{ b}$$
$$a_{coh} = 1.80 \pm 0.25 \text{ fm}$$

RESONANCE PARAMETERS

$$I^\pi = 1^+$$
$$\%Abn = 7.5$$
$$S_n = 7250.6 \pm 0.5 \text{ keV}$$

E_0 (keV)	Γ (keV)	Γ_n (keV)	J	ℓ	Γ_a (keV)
-808		*265	1/2	0	3152
252 ± 5	137 ± 15	90 ± 10	5/2	1	47 ± 10
3500	1400 ± 100	>800	3/2	1	
*4600	272 ± 50	2	3/2	1	

Note-All widths are in center of mass system. Location of the positive parity bound level (possibly its existence also) is uncertain. It is postulated to account for the larger s-wave scattering in channel spin $s=1/2$.

* γ_n^2

* Isotopic spin of resonances is 3/2. Its proton and inelastic neutron widths are 110 and 160 keV respectively.

⁷Li

THERMAL CROSS SECTIONS

$$\sigma_T = 0.037 \pm 0.004 \text{ b}$$
$$a_{coh} = -2.1 \pm 0.1 \text{ fm}$$

RESONANCE PARAMETERS

$$I^\pi = 3/2^-$$
$$\%Abn = 92.5$$
$$S_n = 2032.7 \pm 0.7 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	ℓ	Γ_γ (eV)
257 ± 3	32 ± 3	3	1	.07 ± .03
*1350	~1140	(1,2)	1	
3400	~8500	2	0	
3800	650	(2,3)	(1)	
5000	1000	(3+,3-)	(1,2)	

Note-All widths are in the center of mass system. Polarization data favors an s-wave background, predominantly in the parallel channel spin state ($S=2$).

* Other possible spin assignments for the 1350 keV resonance are J=1 and $\ell=0,2$.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Li	Christiansen filters	ACR/A,28,357(72)-	Koester
Li	σ_t	70ANL,125(70)	Becker
Li ⁶	pulsed n	NSE,40,12(70)	Meadows
Li ⁷		ACR/A,25,391(69)-	Smith
Li	pile osci.	NUK,8,443(63)	Bouzyk
Li	diffraction	PCS,23,621(62)	Calder
Li ⁶	diffraction	JPJ,17,335(62)	Peterson
Li ^{6,7}	σ_γ (spectra)	HPA,34,483(61)	Jarczyk
Li	pulsed n	NSE,9,132(61)	Meadows
Li ⁷	diffraction	ARN,11,303(61)	Wilkinson
Li ⁷	activation	PR,114,1037(59)	Imhof
Li ⁶	σ_γ (spectra)	CJP,35,1347(57)	Bartholomew
Li ⁷	activation	DDK,111,331(56)	Koltypin
Li	pile osci.	JPR,13,171(52)	Ailloud
Li	reactivity	PR,87,785(52)	Kaplan
Li	pile osci.	CR,232,2089(51)	Grimeland
Li	pile osci.	PR,83,641(51)	Pomerance
Li ⁷	diffraction	PR,81,527(51)	Shull
Li ⁸	diffraction	PR,81,527(51)	Shull
Li	pile osci.	PPS/A,63,1175(50)	Colmer
Li	$\bar{\sigma}_s$	PR,71,666(47)	Fermi
Li	ratio	CJR/A,25,73(47)	Fenning
Li ⁷	activation	PR,72,646(47)	Hughes
Li	σ_t	PR,70,154(46)	Havens
Li	absorption	PR,50,738(36)	Fink

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Li ⁶	σ_a	252	PRIVATE COMM.(72)	Fort
Li ⁶	σ_t	255-808	NSE,48,221(72)	Meadows
Li ⁷	$\bar{\sigma}_s$	3800-5000	NP/A,182,321(72)	Presser
Li ⁷	σ_y	254	PR/C,3,1737(71)	Allen
Li ⁶	$\sigma_a, \bar{\sigma}_s$	260	71KNOX,611(71)	McPherson
Li ⁶	$\bar{\sigma}_s$	1-110	70HEL SINK1,1,153(70)	Asami
Li ⁷	σ_t	261	NSE,41,351(70)	Meadows
Li ⁶	analysis	247	70ANL,80(70)	Uttley
Li ⁶	σ_t	250	AERE-PR/NP-16,3(69)	Diment
Li ⁶	σ_p	3500-4600	NP/A,131,679(69)	Presser
Li ⁶	σ_t	249	AERE-PR/NP-14,20(68)	Diment
Li ⁶	σ_t	250.6	68WASH,1,153(68)	Farrell
Li ⁶	σ_t	250	68WASH,1,159(68)	Hibdon
Li ⁶ , Li ⁷	σ_t	260	68WASH,1,159(68)	Hibdon
Li ⁷	polarization	thermal	YF,6,657(67)	Gul'ko
Li ⁶	σ_a	267	NP,63,593(65)	Schwarz
Li ⁶	analysis	256	NP,74,161(65)	Mahaux
Li ⁶	$\bar{\sigma}_s$ polar.	200-2000	PR/B,136,1710(64)	Lane
Li ⁷	$\bar{\sigma}_s$ polar.	200-2000	PR/B,136,1710(64)	Lane
Li ⁷	polarization	256	NP,31,78(62)	Elwyn
Li ⁶	polarization	0.146	BAP,7,305(62)	Marshak
Li ⁶	σ_a	.00046-thermal	ZET,40,1270(61)	Bergman
Li ⁶	analysis	255	NP,22,439(61)	Darden
Li ⁷	analysis	256	NP,22,439(61)	Darden
Li ⁶	σ_a	255	PR,114,201(59)	Gabbard
Li ⁷	σ_y	250	PR,114,1037(59)	Imhof
Li ⁶	analysis	255	PR,104,1402(56)	Marion
Li ⁷	$\bar{\sigma}_s$	256	PR,101,759(56)	Thomas
Li ⁶	$\bar{\sigma}_s$	255	PR,101,765(56)	Willard
Li ⁷	$\bar{\sigma}_s$	256	PR,101,765(56)	Willard
Li ⁷	inelastic	400-1700	PH,46,17(55)	Freeman
Li ⁶	σ_t	247	ANL-5273,64(54)	Hibdon
Li ⁷	σ_t	257	ANL-5273,64(54)	Hibdon
Li ⁶	σ_t	255	PR,96,985(54)	Johnson
Li	σ_t	260-1150	PR,84,69(51)	Bockelman
Li ⁷	σ_t	258	PR,84,162(51)	Stelson
Li ⁷	σ_t	270	PR,79,1018(50)	Adair

⁷₄Be

[53.29 day]

THERMAL CROSS SECTIONS

$$\sigma_p = 48000 \pm 9000 \text{ b}$$
$$\sigma_a < 1 \text{ b}$$

RESONANCE PARAMETERS

$$I^n = 3/2^-$$

$$S_n = 18900.2 \pm 0.9 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	ℓ
^a 10 ± 10	>500	2	0
^a 365	220	3	1

Note-The broad s-wave resonance at threshold accounts for the large thermal cross section.

^a Data from charged particle reactions.

⁹₄Be

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 9.2 \pm 1.0 \text{ mb}$$
$$\bar{\sigma}_a = 6.14 \pm 0.008 \text{ b}$$
$$\sigma_t = 6.149 \pm 0.008 \text{ b}$$
$$a_{coh} = 7.74 \pm 0.10 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 4 \pm 1 \text{ mb}$$

RESONANCE PARAMETERS

$$I^n = 3/2^-$$

$$\% \text{Abn} = 100$$

$$S_n = 6812.0 \pm 0.4 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	ℓ
622.0 ± .8	17.5 ± .5	3	2
811.8 ± .7	7.0 ± .9	2	1
2730	~100	4	[2]
2850	~400	[2]	[1]
^a 4300			

Note-Peak at neutron energy of 2850 keV is complex.

^a Weak resonance.

¹⁰₄Be

[1.6 × 10⁸ yr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma < 1 \text{ mb}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Be	σ_t (1.25, 5.2 ev)	PRIVATE COMM.(73)	Koester
Be ¹⁰	σ_f	100-17147, 17(66)	Tromp
Be	$\bar{\sigma}_s$	ZN/A, 19, 354(64)	Sherm
Be ⁹	pile osci.	PRIVATE COMM.(63)	Carre
Be ⁹	σ_f (spectra)	63ANL-6797, 236(63)	Jurney
Be ⁹	σ_f (spectra)	HPA, 34, 483(61)	Jarczyk
Be ⁹	diffraction	ARN, 11, 303(61)	Wilkinson
Be ⁹	pile osci.	AERE-R/R-2516(58)	Jowitt
Be ⁹	pile osci.	58GENEVA, 16, 34(58)	Rose
Be ⁹	$\bar{\sigma}_s$	AERE-N/R-1165(57)	Egelstaff
Be ⁹	reactivity	55GENEVA, 5, 13(55)	Geraseva
Be ⁷	$\sigma_p \sigma_n$	PM, 46, 381(55)	Hanna
Be	reflection	PR, 86, 604(52)	Harvey
Be ⁹	σ_t	PRIVATE COMM.(52)	Palevsky
Be ⁹	diffraction	PR, 81, 527(51)	Shull
Be ⁹	$\bar{\sigma}_s$	PR, 71, 666(47)	Fermi
Be ⁹	activation	PR, 71, 269(47)	Hughes
Be ⁹	diffusion	ANL-4076, 10(47)	Nobles
Be ⁹	$\bar{\sigma}_s$	PRS/A, 162, 127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Be ⁹	$\sigma(\alpha, n)$	9330-10800	PR/C, 7, 1827(73)	DeMartini
Be ⁹	(α, a)	9030-10300	PR/C, 7, 1837(73)	Goss
Be ⁹	σ_t	622.0-811.8	BAP, 16, 495(71)+	Schwartz
Be ⁹	σ_t	2710	68WASH, 2, 851(68)	Johnson
Be ⁹	$\bar{\sigma}_s$	625-815	NSE, 26, 500(66)	Chien
Be ⁷	compilation		NP, 78, 1(66)	Lauritsen
Be ⁹	$\bar{\sigma}_s$ polar.	2730-2850	NP, 84, 201(66)	Schirmer
Be ⁹	$\sigma(\alpha, n)$	8120-14840	NAT, 206, 494(65)	Groce
Be ⁹	$\bar{\sigma}_s$ polar.	625-815	PR/B, 133, 409(64)	Lane
Be ⁷	analysis		ZE1, 40, 1270(61)	Bergman
Be ⁹	$\bar{\sigma}_s$	620-800	AP, 12, 135(61)	Lane
Be ⁹	compilation		NP, 11, 1(58)	Ajzenberg-Selove
Be ⁹	$\bar{\sigma}_s$	2800	BAP, 3, 305(58)	Fowler
Li ⁷	(p, n)		PR, 109, 105(58)	Macklin
Be ⁹	σ_t	620-810	PR, 98, 669(55)	Willard
Be ⁹	σ_t	620-2730	PR, 84, 69(51)	Bockelman
Be ⁹	σ_t	2720	PP5/A, 64, 388(51)	Stafford
Be ⁹	σ_t	620-810	PR, 80, 1011(50)	Bockelman
Be ⁹	σ_t	625	PR, 75, 1124(49)	Adair
Be ⁹	$\sigma_t \sigma_n$	550-2600	PRS/A, 192, 114(47)	Allen

⁵B

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_a &= 759 \pm 2 \text{ b} \\ \sigma_s &= 3.6 \pm 0.2 \text{ b} \\ a_{coh} &= 5.40 \pm 0.04 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_a = 341 \pm 2 \text{ b}$$

¹⁰
⁵B

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_a &= 3837 \pm 9 \text{ b} \\ \sigma_s &= 0.5 \pm 0.2 \text{ b} \\ \sigma_{sc} &= 2.23 \pm 0.06 \text{ b} \\ \sigma_p &< 0.2 \text{ b} \\ \sigma_a &= 3837 \pm 9 \text{ b} \\ a_{coh} &= 1.4 \pm 0.5 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_a = 1722 \pm 5 \text{ b}$$

RESONANCE PARAMETERS

$$I^a = 3^+ \quad \%Abr. = 19.8 \quad S_n = 11456.0 \pm 0.4 \text{ keV}$$

E_0 (keV)	Γ (keV)	Γ_n (keV)	J	ϵ	Γ_e (keV)
-947 ±6		^a 120	7/2	0	100
170.3	300	4	5/2	0	296
370	884	770	7/2	0	114
530	201	31	5/2	1	170
1830	425	100	9/2	1	325
1880	430	80(5/2, 7/2)	2		350
2820	855	800	11/2	2	55
3400	<275				
4040	700	500		2	200
4730					180
5750					
6300					

Note: All widths are expressed in the center of mass system.

^a Value is the reduced neutron width, γ_n^2 .

¹¹₅B

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 5.5 \pm 3.3 \text{ mb} \\ \sigma_s &= 3.9 \pm 0.2 \text{ b} \\ a_{coh} &= 6.1 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 3/2^-$$

$$\%Abn = 80.2$$

$$S_n = 3369.3 \pm 1.3 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	ℓ	Γ_γ (eV)
20.8 ± 0.5	.0031 ± .0006	3	2	.023 ± .008
430 ± 5	35 ± 5	2	1	.30
1025 ± 5	11 ± 2	1	0	
1090 ± 50	360 ± 50	2	0	
1275 ± 5	115 ± 10	4	2	0.20
1775 ± 10	70 ± 20	1	1	0.9
2450 ± 10	134 ± 20	3	1	
2570 ± 10	40 ± 10	3	2	
2700 ± 50	1060 ± 200	1	2	
3500 ± 30	153 ± 30	1	1	
3800 ± 50	540 ± 100	1	1	
4550	<15			
4680	49			
4800	98			
5010	30			
5310	71			
5590	82			
6180	131			
7180	109			
7820	71			
9720	131			

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
B ¹⁰	$\bar{\sigma}_s$	JNE,24,85(70)	Asami
B ¹⁰	pulsed n	NSE,40,12(70)	Meadows
B ¹¹	$\bar{\sigma}_s$	70HEL51NK1,1,651(70)	Vertebnyi
B	pile osci.	AE-351(69)	Sokolowski
B	pulsed n	NSE,33,218(68)	Larsson
B,B ¹⁰	absorption	JNE,21,373(67)	Debus
B	σ_c	AERE-R-5224(67)	Diment
B ¹¹	diffraction	ACR,20,214(66)	Craven
B ^{10,11}	refraction	PR,146,660(66)	Donaldson
B	reflection	PR/B,138,1116(65)	Donaldson
B	σ_c	PR/B,133,925(64)	Als-Nielsen
B	reflection	BAP,6,477(63)+	Bartolini
B,B ¹⁰	σ_c	JNE,17,83(63)	Prosdocimi
B ¹¹	activation	PR,125,1334(62)	Imhof
B,B ¹⁰	n lifetime	NSE,9,132(61)	Meadows
B	σ_c	NII/A,27,216(61)	Singh
B	σ_c	NSE,8,453(60)	Gould
B,B ¹⁰	σ_c	PR,119,1291(60)	Safford
B,B ¹⁰	σ_c	NP,17,109(60)	Schmitt
B	n lifetime	PNE,2,183(58)	Von Dardel
B ¹⁰	σ_γ	CJP,35,1347(57)	Bartholomew
B	σ_c	JNE,5,41(57)	Egelstaff
B	n lifetime	PR,96,1566(54)	Von Dardel
B	σ_c	PR,92,716(53)	Carter
B		PR,90,603(53)	Hamermesh
B ¹⁰	$\bar{\sigma}_s$	ANL-4982,15(52)	Hibdon
B	$\bar{\sigma}_s$	PRIVATE COMM.(51)	Shull
B,B ^{10,11}	$\bar{\sigma}_s$	ANL-4552,6(50)	Hibdon
B ¹¹	compilation	AECD-2274(48)	Way
B ¹¹	activation	AECD-2274(48)	Way

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
B ¹¹	$\bar{\sigma}_s$ polar.	2630	NP/A,203,89(73)	Cox
B ¹¹	$\bar{\sigma}_s$	2200-4500	BAP,18,538(73)	Nelson
B ¹⁰	σ_a	1500-4500	C00-1717,5(73)	Hausladen
B ¹⁰	σ_a	1500-4500	BAP,18,538(73)	Hausladen
B ¹¹	$\bar{\sigma}_s$	2200-4500	C00-1717,4(73)	Nelson
B ¹⁰	σ_a	170-1860	PR/C,4,380(71)	Lane
B ¹¹	$\bar{\sigma}_s$ polar.	20-1770	PR/C,2,2097(70)	Lane
B ¹⁰	$\bar{\sigma}_s$ polar.	940-1860	70ANL,107(70)	Lane
B ¹⁰	σ_a	170	70ANL,151(70)	Soverby
B ¹⁰	σ_a	170	70HELSINKI,1,161(70)	Soverby
B ¹¹	(d,p)	20	PR,185,1401(69)	Fortune
B ¹¹	$\sigma_t \bar{\sigma}_s$	20.8	PR,178,1612(69)	Mooring
B ^{10,11}	compilation		NP/A,114,1(68)	Ajzenberg-Selove
B ¹¹	polarization	75-2250	BAP,12,87(67)	Lane
Li ⁷	(α, α)	37-4767	NP,86,481(66)	Cusson
B ¹⁰	$\sigma_t \sigma_a$	10-500	NP,82,16(66)	Mooring
B ¹¹	σ_t	10-500	NP,82,16(66)	Mooring
B ¹¹	σ_γ	23	ANL-6877,5(64)	Mooring
B ¹¹	σ_γ	20	BAP,9,434(64)	Mooring
B ¹¹	σ_γ	430-1780	PR,125,1334(62)	Imhof
B ¹⁰	σ_a	530-6400	NP,27,448(61)	Davis
B ¹⁰	σ_t	4300-6200	PR,123,209(61)	Fossan
B ¹¹	σ_t	3500-9720	PR,123,209(61)	Fossan
B ¹⁰	$\bar{\sigma}_s$ inelastic	1930-4730	PR,117,1330(60)	Day
B ¹¹	σ_γ	430-1780	BAP,5,245(60)	Imhof
B ¹¹	σ_t	1027	BAP,5,245(60)	Imhof
Li ⁷	$\sigma(\alpha, n)$	570	PR,114,571(59)	Gibbons
B ¹⁰	σ_a	250	ZET,33,9(57)	Bergman
B ¹⁰	σ_a	530-4100	PR,108,1025(57)	Bichsel
B ¹¹	σ_t	430-1280	PR,98,669(55)	Willard
B ¹¹	σ_t	430-2580	PR,84,69(51)	Bockelman
B ¹⁰	σ_a	1900	PR,83,1148(51)	Petree

${}^6\text{C}$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_a &= 3.4 \pm 0.2 \text{ mb} \\ \sigma_s &= 4.75 \pm 0.02 \text{ b} \\ \sigma_t &= 4.75 \pm 0.02 \text{ b} \\ a_{coh} &= 6.657 \pm 0.003 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 1.5 \pm 0.2 \text{ mb}$$

${}^{12}_6\text{C}$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 3.4 \pm 0.3 \text{ mb} \\ a_{coh} &= 6.65 \pm 0.01 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 1.5 \pm 0.2 \text{ mb}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\%Abn = 98.89$		$S_n = 4946.03 \pm 15 \text{ keV}$	
$E_0 \text{ (keV)}$	$\Gamma \text{ (keV)}$	J	ℓ	$\gamma_n^2 \text{ (keV)}$	
-2020		1/2	0	540	
2077 $\pm$ 2	8 $\pm$ 2	5/2	2		
2818 $\pm$ 4	(1)				
2950 $\pm$ 2	100 $\pm$ 10	3/2	2		
3600 $\pm$ 50	1100 $\pm$ 100	3/2	2		
4260 $\pm$ 20	220 $\pm$ 20	1/2	1		
4936 $\pm$ 6	11 $\pm$ 4				
5366 $\pm$ 6	33 $\pm$ 4	3/2	1		
^a 6293 $\pm$ 5	60 $\pm$ 4				
^a 6361 $\pm$ 5	24 $\pm$ 3				
6554 $\pm$ 5	82 $\pm$ 15				
^b 6645 $\pm$ 5	8 $\pm$ 4				
6660 $\pm$ 5	62				
7368 $\pm$ 10	107 $\pm$ 14				
^b 7480 $\pm$ 5	68 $\pm$ 4				
^a 7609 $\pm$ 40	~260				
7758 $\pm$ 5	81 $\pm$ 8				
8100	160				
9300	400				
11100 $\pm$ 100	490				
12100 $\pm$ 100	250				

Note-Charged particle reactions (Goss 73- DeMartini 73) indicate that the resonance structure at excitation energies of 13.28-14.46 meV (neutron energies 9-11) is complex.

^a Possible doublet.

^b Resolved in (d,p) data.

^b Observed in (d,p) data.

¹³
₆C

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.9 \pm 0.2 \text{ mb}$$
$$a_{\text{coh}} = 6.0 \pm 0.2 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 1.3 \pm 0.2 \text{ mb}$$

RESONANCE PARAMETERS

$$I^{\pi} = 1/2^{-}$$

$$\% \text{Abn} \approx 1.11$$

$$S_n = 8177.01 \pm .35 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	ℓ	Γ_{γ} (eV)
152.9 ± .5	3.7 ± 0.7	2	1	4.0 ± 1.6
1751 ± 8	20	1	>0	
2432 ± 10	17	2		
2454 ± 10	10	>1		

¹⁴
₆C

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} < 0.001 \text{ mb}$$

[5730 yr]

E_0 (eV)	Γ (meV)	g^p_n (meV)	J	ℓ	Γ_T (meV)	g^p_n (meV)	g^p_l (meV)
3252.7 ± 1.0		83 ± 8	1/2	0		1.46 ± .14	
3270.0 ± 1.0		26 ± 4	1/2	0		.45 ± .07	
3295.7 ± 1.0		408 ± 45	1/2	0		7.11 ± .78	
3307.2 ± 1.0		4.0 ± 4.0	1/2	0		.07 ± .07	
3317.6 ± 1.0		5.2 ± 2.9	1/2	0		.09 ± .05	
3331.8 ± 1.0		41 ± 6	1/2	0		.71 ± .10	
3342.9 ± 1.0		170 ± 20	1/2	0		2.94 ± .35	
3351.4 ± 1.0		18 ± 4	1/2	0		.31 ± .07	
3363.5 ± 1.0		75 ± 10	1/2	0		1.29 ± .17	
3408.5 ± 1.0		5.0 ± 1.8	1/2	0		.09 ± .03	
3442.9 ± 1.1		20 ± 3	1/2	0		.34 ± .05	
3471.9 ± 1.1		18 ± 3	1/2	0		.31 ± .05	
3510.0 ± 1.1		4.7 ± 3.0	1/2	0		.08 ± .05	
3521.8 ± 1.1		106 ± 18	1/2	0		1.79 ± .30	
3544.2 ± 1.1		7.1 ± 3.0	1/2	0		.12 ± .05	
3574.4 ± 1.1		16.7 ± 3.0	1/2	0		.28 ± .05	
3594.4 ± 1.1		20 ± 4	1/2	0		.35 ± .07	
3611.6 ± 1.1		120 ± 15	1/2	0		2.00 ± .25	
3623.5 ± 1.1		15 ± 3	1/2	0		.25 ± .05	
3636.7 ± 1.2		9 ± 3	1/2	0		.15 ± .05	
3651.7 ± 1.2		67.1 ± 7.9	1/2	0		1.11 ± .13	
3674.2 ± 1.2		15 ± 3	1/2	0		.25 ± .05	
3692.7 ± 1.2		10 ± 4	1/2	0		.16 ± .07	
3707.6 ± 1.2		6 ± 3	1/2	0		.10 ± .05	
3716.0 ± 1.2		26 ± 4	1/2	0		.43 ± .07	
3722.9 ± 1.2		100 ± 20	1/2	0		1.64 ± .33	
3732.8 ± 1.2		50 ± 7	1/2	0		.82 ± .11	
3745.2 ± 1.2		4.9 ± 3.1	1/2	0		.08 ± .05	
3759.2 ± 1.2		8.0 ± 3.1	1/2	0		.13 ± .05	
3786.4 ± 1.2		25 ± 9	1/2	0		.40 ± .15	
3799.4 ± 1.2		4.9 ± 3.1	1/2	0		.08 ± .05	
3820.5 ± 1.2		40 ± 6	1/2	0		.65 ± .10	
3827.0 ± 1.3		110 ± 17	1/2	0		1.78 ± .27	
3848.5 ± 1.3		12 ± 4	1/2	0		.19 ± .06	
3868.8 ± 1.3		65.3 ± 8.1	1/2	0		1.05 ± .13	
3883.4 ± 1.3		11 ± 3	1/2	0		.18 ± .05	
3906.0 ± 1.3		220 ± 30	1/2	0		3.52 ± .48	
3923.4 ± 1.3		8.8 ± 3.1	1/2	0		.14 ± .05	
3931.5 ± 1.3		37 ± 6	1/2	0		.59 ± .10	
3951.1 ± 1.3		10 ± 4	1/2	0		.16 ± .06	
3961.4 ± 1.3		41 ± 6	1/2	0		.65 ± .10	
3970.3 ± 1.3		72 ± 9	1/2	0		1.14 ± .14	
3976.5 ± 1.3		120 ± 17	1/2	0		1.90 ± .27	
3994.4 ± 1.3		36.0 ± 5.7	1/2	0		.57 ± .09	

Note - Single-level Breit-Wigner parameters. P-wave assignment of resonances are generally made on the basis of their strength and statistical distribution.

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 1500 \pm 100 \text{ b} \\ \sigma_f &= 15 \pm 2 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 400 \pm 100 \text{ b}$$

²³³₉₀Th
[22.2 min]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 1.8 \pm 0.5 \text{ b} \\ \sigma_f &< 0.01 \text{ b}\end{aligned}$$

²³⁴₉₀Th
[24.10 day]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Th ²²⁷	σ_f	JIN, 32, 3441 (70)	VonGuten
Th ²²⁷	σ_f	TID-5223, 2, 631 (52)	Peterson
Th ²²⁸	activation	PR-CE-20(55)+	Baerg
Th ²²⁸	σ_f	TID-5223, 2, 587 (52)	Studier
Th ²²⁹	ν_p	70HEL5INKI, 2, 182 (70)	Zamyatnin
Th ²²⁹	ν	AE, 29, 95 (70)	Kroshkin
Th ²²⁹	σ_f	JIN, 15, 1 (60)	Gindler
Th ²²⁹	ν	ANL-6600, 124 (61)+	Jaffey
Th ²²⁹	ν	ZET, 35, 535 (58)	Lebedev
Th ²²⁹	σ_f	CF-3809 (47)	Studier
Th ²³⁰	σ_c	AE, 26, 507 (69)	Kalebin
Th ²³⁰	σ_c	AE, 24, 243 (68)	Kalebin
Th ²³⁰	activation	CJP, 40, 194 (62)	Attree
Th ²³⁰	activation	CJP, 36, 989 (58)	Cabell
Th ²³⁰	oscillator	ORNL-1620, 42 (53)+	Pomerance
Th ²³⁰	σ_f	TID-5223, 2, 593 (52)	Ghiorso
Th ²³⁰	activation	ANL-4249 (49)	Jaffey
Th ²³⁰	activation	ANL-4183 (48)	Hyde
Th ²³⁰	σ_f	PRIVATE COMM. (46)	Ghiorso
Th ²³⁰	σ_f	CS-3471, 4 (46)+	Seaborg
Th ²³²	I_γ activation	JIN, 34, 2699 (72)	Steinnes
Th ²³²	I_γ absorption activation	AKE, 15, 83 (70)	Breitenhuber
Th ²³²	σ_f	68WASH. 1, 611 (68)	Neve-Oelvergnies
Th ²³²	RI reactivity	NSE, 21, 406 (65)	Foell
Th ²³²	RI activation	NSE, 22, 121 (65)	Hardy
Th ²³²	σ_c (1.44ev)	NP, 61, 381 (65)	Rayburn
Th ²³²	RI activation	NSE, 19, 244 (64)	Brose
Th ²³²	RI pile osci.	CEA-2486 (64)	Vidal
Th ²³²	diffraction	PR5/A, 274, 122 (63)	Willis
Th ²³²	diffraction	ACR, 15, 351 (62)	Roof
Th ²³²	RI activation	GA-3069 (62)	Sampson
Th ²³²	RI activation	AEEN-R-163, 17 (62)	Tiren
Th ²³²	RI activation	JNE, 11, 95 (60)	Johnston
Th ²³²	σ_γ RI pile osci.	JNE, 12, 32 (60)	Tattersall
Th ²³²	σ_f	ZET, 37, 41 (59)	Kurneev
Th ²³²	σ_c	TID-7547, 39 (57)	Hubert
Th ²³²	σ_c	57COLUMBIA, 39 (57)	Hubert
Th ²³²	RI reactivity coefficient	AE, 3, 507 (57)	Klimontov
Th ²³²	σ_γ RI activation	AE, 2, 22 (57)	Myasishcheva
Th ²³²	σ_γ reactivity coefficient	DP-207 (57)	Wade
Th ²³²	RI activation	JNE, 2, 243 (56)	Macklin
Th ²³²	σ_γ activation	JNE, 1, 234 (55)	Crocker
Th ²³²	σ_c	NRDC-84, 10 (55)	Egelstaff

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Th ²³²	σ_a pile osci.	JNE,1,319(55)	Small
Th ²³²	ν_{sp}	PPS/A,65,73(52)	Barclay
Th ²³²	σ_f	TID-5223,2,593(52)	Ghiorso
Th ²³²	σ_a pile osci.	PR,88,412(52)	Pomerance
Th ²³²	$\bar{\sigma}_s$	ANL-4680,5(51)	Hibdon
Th ²³²	σ_t	ORNL-1164,34(51)	Rayburn
Th ²³²	$\bar{\sigma}_s$	PR,81,527(51)	Shull
Th ²³²	diffraction	PR,81,527(51)	Shull
Th ²³²	σ_γ	MC-70(44)	Grummitt
Th ²³²	σ_γ activation	CP-2376(44)	Seren
Th ²³²	σ_t	PR,48,265(35)	Dunning
Th ²³³	σ_γ chemical separation	JNE,11,95(60)	Johnston
Th ²³³	σ_f	NSE,2,33(57)	Fields
Th ²³³	σ_f	PRIVATE COMM.(56)	Crane
Th ²³³	σ_γ activation	ANL-4165(48)	Hyde
Th ²³⁴	σ_f	ACT.EL,14/A,839(54)-	Osborne
Th ²³⁴	σ_γ activation	PR,80,1098(50)	Harvey
Th ²³⁴	σ_f	CL-RWS-20(46)	Barney
Th ²³⁴	σ_f	MON-P-178,10(46)	Osborn

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Th ²²⁸	σ_c	1.896-7.55	NSE,29,423(67)	Simpson
Th ²²⁹	σ_f	.61-51.0	BAP,16,16(71)+	Felvinci
Th ²²⁹	σ_f	.61-16.8	BAP,8,370(63)	Bollinger
Th ²²⁹	σ_c	.609-29.9	BAP,6,417(61)+	Cote
Th ²²⁹	σ_f	.24-.727	AE,8,47(60)	Konakhovich
Th ²³⁰	σ_f	721	NP/A,289,225(72)	James
Th ²³⁰	σ_c	-.07-563.	AE,26,507(69)	Kalebin
Th ²³⁰	σ_c	1.425-294.	PR,176,1421(68)	Cote
Th ²³⁰	σ_c	1.107-47.5	66PARIS,1,71(66)	Kalabin
Th ²³²	$\sigma_c \sigma_f \sigma_\gamma (SI)$	21.78-4592.7	PR/C,6,1854(72)	Rahn
Th ²³²	σ_γ	8.35-1940	PRL,27,117(71)+	Forman
Th ²³²	σ_γ	8.35-1940	71KNOX,2,735(71)	Forman
Th ²³²	σ_c	8.35-3006.9	CEA-N-1149(69)	Ribon
Th ²³²	σ_c	-7.	NUK,11,61(68)	Lundgren
Th ²³²	σ_c	21.80-69.25	BAP,13,722(68)+	Shve
Th ²³²	σ_c	21.78-69.13	PR,155,1362(67)	Bhat
Th ²³²	$\sigma_c \sigma_f \bar{\sigma}_s$	8.24-866.2	NP,76,196(66)	Asghar
Th ²³²	σ_γ	21.80-221.9	PR/B,140,50(65)	Haddad
Th ²³²	σ_c	21.78-305.50	65ANTWERP,166(65)	Ribon
Th ²³²	σ_c	8.34-103.6	PL,8,45(64)	Bollinger
Th ²³²	σ_c	21.8-171	PRIVATE COMM.(64)	Cote
Th ²³²	σ_c	112.90-3592.66	PR/B,134,985(64)	Garg
Th ²³²	σ_γ	21.80-69.2	BAP,9,31(64)	Haddad
Th ²³²	$\sigma_c \sigma_f \bar{\sigma}_s$	21.69-489	AERE-PR/NP-7,5(64)	Moxon
Th ²³²	$\sigma_\gamma (SI)$	21.8-171	BAP,9,20(64)+	Palevsky
Th ²³²	σ_c	21.69-341.16	AERE-PR/NP-7,6(64)	Pattenden
Th ²³²	$\sigma_c \bar{\sigma}_s$	21.69-489	PRIVATE COMM.(64)	Rae
Th ²³²	σ_c	8.346-3005.78	PRIVATE COMM.(64)	Ribon
Th ²³²	σ_c	8.346-3005.78	64PARIS,2,744(64)	Ribon
Th ²³²	σ_c	21.73-69.02	AERE-PR/NP-5,6(63)	Pattenden
Th ²³²	σ_c	68.95-341.16	AERE-M-1223(63)	Uttley
Th ²³²	analysis	-4.3	AEEW-R-163,15(62)-	Schroder
Th ²³²	σ_c	-3.5	ANS,4,271(61)	Cooper
Th ²³²	$\sigma_\gamma (SI)$	113.15-1390	CU(PNPL)-206,6(60)	Rosen
Th ²³²	σ_c	195-263	PRIVATE COMM.(59)	Bollinger
Th ²³²	σ_c	-7	PR,110,692(58)	Seth
Th ²³²	σ_c	22.1-23.8	PR,101,1328(56)	Levin
Th ²³²	σ_c	22.00-350	AE,1,(5),55(56)	Radkevich
Th ²³²	σ_c	22.0-310	PRIVATE COMM.(55)	Pilcher
Th ²³²	σ_c	4.94-194	PR,95,476(54)	Seidl

THERMAL CROSS SECTIONS

$$\sigma_f = 1500 \pm 250 \text{ b}$$

²³⁰₉₁Pa
[17.4 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 210 \pm 20 \text{ b} \\ \sigma_f &= 0.010 \pm 0.005 \text{ b} \\ \sigma_t &= 211 \pm 4 \text{ b}\end{aligned}$$

²³¹₉₁Pa
[3.25 × 10⁴ yr]

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 1500 \pm 100 \text{ b} \\ \langle D \rangle &= 0.45 \pm 0.07 \text{ eV} \\ S_0 &= 0.85 \pm 0.10\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 3/2^-$$

$$S_n = 5562 \pm 22 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
-.318		56	.111	
.396 ± .003	.080 ± .004	43	.127 ± .006	.0018 ± .0007
.494 ± .003	.009 ± .003	40	.013 ± .004	.013 ± .007
.743 ± .003	.0077 ± .0011	40 ± 4	.0089 ± .0013	.007 ± .004
1.238 ± .003	.028 ± .001	46 ± 3	.025 ± .001	<.006
1.405 ± .005	.0012 ± .0008	45	.0010 ± .0007	
1.960 ± .005	.0071 ± .0004	46 ± 4	.0051 ± .0003	
2.790 ± .006	.0099 ± .0003	39 ± 5	.0059 ± .0002	
3.483 ± .007	.0470 ± .0015	48 ± 5	.0252 ± .0008	
4.12 ± .01	.085 ± .004	50	.042 ± .002	
4.35 ± .01	.060 ± .004	60	.029 ± .002	
4.53 ± .01	.017 ± .002	55	.0080 ± .0009	
5.06 ± .01	.49 ± .02	63 ± 10	.218 ± .009	
5.28 ± .02	.085 ± .007	45	.037 ± .003	
5.63 ± .02	.047 ± .005	45	.0198 ± .002	
5.82 ± .02	.058 ± .005	45	.024 ± .002	
6.55 ± .03	.049 ± .005	50	.019 ± .002	
6.87 ± .03	.25 ± .02	46 ± 11	.095 ± .008	
7.57 ± .03	.093 ± .006	60	.034 ± .002	
7.82 ± .03	.182 ± .014	55	.065 ± .005	
8.73 ± .03	.74 ± .03	57 ± 10	.25 ± .01	
9.26 ± .04	.046 ± .006	55	.015 ± .002	
9.70 ± .04	.230 ± .010	50	.074 ± .003	
10.33 ± .04	.700 ± .035	49 ± 10	.218 ± .011	
10.76 ± .04	.341 ± .013	30 ± 20	.104 ± .004	
11.26	.362 ± .013		.108 ± .004	
11.67	.683 ± .061		.200 ± .018	
12.08	.0216 ± .003		.0062 ± .0008	

²³¹Pa

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
13.26	.801 ± .146		.220 ± .040	
13.38	1.097 ± .146		.300 ± .040	
14.10	.578 ± .030		.154 ± .008	
15.06	.109 ± .006		.0282 ± .0016	
15.57	.201 ± .008		.051 ± .002	
16.02	.328 ± .016		.082 ± .004	
16.66	.229 ± .016		.056 ± .004	
16.99	.306 ± .016		.074 ± .004	
18.29	1.514 ± .086		.354 ± .020	
18.74	.693 ± .035		.160 ± .008	
19.25	.176 ± .026		.040 ± .006	
19.55	.080 ± .027		.018 ± .006	
20.3	.041 ± .009		.009 ± .002	
20.6	.999 ± .054		.220 ± .012	
21.3	.554 ± .185		.120 ± .040	
21.45	.648 ± .185		.140 ± .040	
22.12	.470 ± .028		.100 ± .006	
24.75	.279 ± .020		.056 ± .004	
25.45	.091 ± .020		.018 ± .004	
25.97	1.070 ± .051		.210 ± .010	
26.85	.155 ± .021		.030 ± .004	
27.32	.554 ± .042		.106 ± .008	
28.23	.202 ± .021		.038 ± .004	
28.69	.268 ± .021		.050 ± .004	
29.62	1.687 ± .109		.310 ± .020	
30.22	.0550 ± .016		.010 ± .003	
31.73	3.38 ± .23		.60 ± .04	
32.2	.057 ± .023		.010 ± .004	
32.80	.18 ± .02		.032 ± .004	
33.39	.14 ± .023		.024 ± .004	
35.15	.20 ± .02		.034 ± .004	
36.14	.39 ± .04		.054 ± .006	
36.65	1.45 ± .24		.240 ± .040	
36.80	.36 ± .12		.060 ± .020	
37.53	.98 ± .06		.16 ± .01	
38.26	.20 ± .04		.032 ± .006	
39.73	1.05 ± .06		.17 ± .01	
41.27	.45 ± .10		.070 ± .016	
42.08	.65 ± .10		.100 ± .016	
43.34	1.51 ± .16		.230 ± .024	
44.54	.19 ± .04		.028 ± .006	
44.91	.11 ± .04		.016 ± .006	
45.64	1.22 ± .16		.180 ± .024	
46.39	.33 ± .07		.048 ± .010	
47.22	1.03 ± .17		.150 ± .024	
48.60	.292 ± .056		.042 ± .008	
50.12	.13 ± .06		.018 ± .008	
50.85	.856 ± .065		.120 ± .012	
51.25	.49 ± .07		.068 ± .010	
51.92	.98 ± .10		.136 ± .014	
52.54	2.18 ± .15		.300 ± .020	
53.91	.808 ± .088		.110 ± .012	

²³¹₉₁Pa

E ₀ (eV)	2gΓ _n (meV)	Γ _γ (meV)	2gΓ _n ⁰ (meV)	Γ _f (meV)
54.45	1.36 ± .10		.184 ± .014	
55.20	9.36 ± .74		1.26 ± .10	
56.05	2.17 ± .15		.290 ± .020	
56.52	.83 ± .09		.110 ± .012	
57.16	1.42 ± .14		.188 ± .018	
60.16	.25 ± .06		.032 ± .008	
61.35	2.82 ± .31		.36 ± .04	
61.77	.79 ± .31		.10 ± .04	
62.35	.22 ± .10		.028 ± .012	
63.38	1.39 ± .14		.174 ± .018	
64.40	.29 ± .08		.036 ± .010	
65.30	1.08 ± .15		.134 ± .018	
66.43	.11 ± .08		.014 ± .010	
67.35	.95 ± .15		.116 ± .018	
68.21	.22 ± .10		.026 ± .012	
69.09	1.83 ± .33		.22 ± .04	
70.07	.27 ± .10		.032 ± .012	
70.64	.84 ± .13		.100 ± .016	
71.33	1.52 ± .34		.180 ± .040	
72.03	.54 ± .12		.064 ± .014	
73.8	.69 ± .16		.080 ± .018	
74.9	1.23 ± .19		.142 ± .022	
75.7	.37 ± .12		.042 ± .014	
76.6	.53 ± .16		.060 ± .018	
77.8	.86 ± .18		.098 ± .020	
78.5	.34 ± .14		.038 ± .016	
79.2	.45 ± .14		.050 ± .016	
80.1	1.00 ± .18		.112 ± .020	
81.0	.77 ± .20		.086 ± .022	
83.5	3.29 ± 1.10		.36 ± .12	
84.7	2.03 ± .55		.22 ± .06	
85.7	2.04 ± .56		.22 ± .06	
87.7	2.06 ± .56		.22 ± .06	
90.0	1.14 ± .38		.12 ± .04	
91.5	1.15 ± .38		.12 ± .04	
92.8	.48 ± .27		.050 ± .028	
93.9	.60 ± .27		.062 ± .028	
95.8	3.92 ± .78		.40 ± .08	
99.0	2.19 ± .40		.22 ± .04	

Note - Resonances are missed above neutron energy of 15 eV.
Single-level Breit-Wigner parameters.

²³²₉₁Pa
[1.32 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 760 \pm 100 \text{ b}$$

$$\sigma_f = 700 \pm 100 \text{ b}$$

²³³₉₁Pa

[27.0 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 21 \pm 3 \text{ b [1.17 min } ^{234}\text{Pa}^*] \\ \sigma_{\gamma} &= 20 \pm 3 \text{ b [6.67 hr } ^{234}\text{Pa}^*] \\ \sigma_f &< 0.1 \text{ b} \\ \sigma_t &= 55 \pm 3 \text{ b}\end{aligned}$$

²³⁴₉₁Pa

[1.17 min]

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 895 \pm 30 \text{ b} \\ \langle D \rangle &= 0.69 \pm 0.09 \text{ eV} \\ S_0 &= 0.75 \pm 0.06\end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 3/2^-$$

$$S_n = 5197 \pm 6 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	ℓ	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
Bound level		0		
.795 ± .005	.0014 ± .0004		50 ± 10	.0016 ± .0004
1.341 ± .003	.139 ± .014		40 ± 5	.120 ± .012
1.644 ± .004	.38 ± .04		42 ± 5	.296 ± .029
2.356 ± .004	.0117		50	.0076
2.830 ± .004	.207 ± .020		46 ± 5	.123 ± .012
3.386 ± .006	.39 ± .09		50 ± 5	.21 ± .05
4.288 ± .009	.113 ± .010		48 ± 5	.055 ± .005
5.152	.524 ± .037		55 ± 5	.231 ± .016
7.181	.21		60	.080
8.26	.0673		65	.0234
8.97	.22		70	.074
9.37	1.50		70	.490
10.35	.14		50	.044
10.89	.21		65	.0625
11.52	.106		50	.031
12.15	.460		75	.132
12.90	.14		60	.039
14.42	.53		70	.14
14.80	.077		50	.020
15.96	1.19		70	.297
17.00	.367		50	.0891

Note - Single-level Breit-Wigner parameters.

²³⁴₉₁Pa

[6.67 hr]

THERMAL CROSS SECTIONS

$$\sigma_f < 500 \text{ b}$$

THERMAL CROSS SECTIONS

$$\sigma_f < 5000 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pa^{230}	σ_f	PRIVATE COMM.(46)	Ghiorso
Pa^{231}	σ_f	AE,32,178(72)	Alexsandrov
Pa^{231}	σ_t	NSE,12,243(62)	Simpson
Pa^{231}	σ_f activation	PR,101,1053(56)+	Smith
Pa^{231}	σ_f activation	PR,90,102(53)	Elson
Pa^{231}	σ_f	TID-5223,2,593(52)+	Ghiorso
Pa^{231}	σ_f activation	TID-5223,2,604(52)	Jaffey
Pa^{231}	σ_f	LAMS-354(46)	Farwell
Pa^{231}	σ_f activation	CS-3471,2(46)	Seaborg
Pa^{232}	σ_f activation	PR,101,1053(56)	Smith
Pa^{232}	σ_f activation	PR,90,102(53)	Elson
Pa^{232}	σ_f	PRIVATE COMM.(46)	Ghiorso
Pa^{232}	σ_f	PRIVATE COMM.(46)	Perlman
Pa^{233}	σ_f , chemical separation	WAPD-TM-837(70)	Connor
Pa^{233}	RI chemical separation	NSE,29,408(67)	Connor
Pa^{233}	σ_t	NSE,28,133(67)	Simpson
Pa^{233}	σ_t	NSE,20,235(64)	Simpson
Pa^{233}	RI	PRIVATE COMM.(64)	Stoughton
Pa^{233}	σ_a RI mass spectrometry	ORNL-3320,1(62)	Halperin
Pa^{233}	σ_f chemical separation	CJP,38,751(60)	Eastwood
Pa^{233}	σ_f mass spectrometry	NSE,1,1(56)	Halperin
Pa^{233}	σ_f chemical separation	IDO-16226(55)	Smith
Pa^{233}	σ_f mass spectrometry	NSE,1,1(56)-	Katzin
Pa^{233}	σ_f chemical separation	TIO-5223,543(52)	Katzin
Pa^{234}	σ_f	PRIVATE COMM.(46)	Borst

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pa^{231}	σ_t	0.4-99	ORNL-3268,47(62)	Patterson
Pa^{231}	σ_f	0.39-0.743	BAP,6,8(61)	Leonard
Pa^{231}	σ_f	0.39-1.238	HW-67219(60)	Leonard
Pa^{231}	σ_t	0.38-1076	NSE,12,243(60)	Simpson
Pa^{233}	σ_t	1.31-15.96	PRIVATE COMM.(68)	Burgus
Pa^{233}	σ_t	0-1700	NSE,28,133(67)	Simpson
Pa^{233}	σ_t	0-0.43	PRIVATE COMM.(66)	Simpson
Pa^{233}	σ_t	0.01-1.0	NSE,20,235(64)	Simpson
Pa^{233}	σ_t	0-1700	BAP,9,433(64)	Simpson

²³⁰₉₂U
[20.8 day]

THERMAL CROSS SECTIONS

$$\sigma_f = 25 \pm 10 \text{ b}$$

²³¹₉₂U
[4.2 day]

THERMAL CROSS SECTIONS

$$\sigma_f = 400 \pm 300 \text{ b}$$

²³²U
92
[72 yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 73.1 \pm 1.5 \text{ b} \\ \sigma_f &= 75.2 \pm 4.7 \text{ b} \\ \sigma_a &= 148.3 \pm 4.4 \text{ b} \\ \sigma_s &= 14.7 \text{ b} \\ \sigma_t &= 163 \pm 10 \text{ b} \\ \alpha &= 0.972 \pm 0.061 \\ \nu_p &= 3.13 \pm 0.06\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 280 \pm 15 \text{ b} \\ I_f^c &= 320 \pm 40 \text{ b} \\ \langle D \rangle &= 7.6 \pm 1.5 \text{ eV} \\ S_0 &= 1.0 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^{\circ}$$

$$S_n = 5743 \pm 10 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_{γ} (meV)	$g\Gamma_n^0$ (meV)	Γ_f (meV)
-60		(45 ± 5)	.14	-40 ± 4
5.98 ± .01	1.2 ± 0.2	(45 ± 5)	.49 ± .08	25 ± 5
12.70 ± .03	6.5 ± .5	(45 ± 5)	1.83 ± .14	263 ± 5
21.00 ± .05	1.9 ± 0.2	(45 ± 5)	.41 ± .04	-580 ± 70
23.80 ± .05	5.2 ± .5	(45 ± 5)	1.07 ± .11	90 ± 10
24.75 ± .05	.50 ± .03	(45 ± 5)	.10 ± .05	-1150
27.70 ± .05	2.4 ± .1	(45 ± 5)	.46 ± .02	-200 ± 50
29.65 ± .06	.85	(45 ± 5)	.016	900
34.24 ± .06	.59	(45 ± 5)	.10	-360
40.0 ± .07	.25	(45 ± 5)	.04	-2600
43.16 ± .07	7.9	(45 ± 5)	1.2	178
47.61 ± .07	1.06	(45 ± 5)	.15	-340
52.48 ± .08	2.0	(45 ± 5)	.27	284
74.24	31	(45 ± 5)	3.6	-720
102.3				
106.4				
107.3				
112.5				
124.6				
128.1				
131.5				
141.5				
149.6				

Note - Multi-level Reich and Moore parameters. Two fission channels are required to adequately fit the cross section data.

THERMAL CROSS SECTIONS

$$\begin{aligned}
 \sigma_{\gamma} &= 47.7 \pm 2.0 \text{ b} \\
 \sigma_f &= 531.1 \pm 1.3 \text{ b} \\
 \sigma_h &= 578.8 \pm 2.0 \text{ b} \\
 \sigma_a &= 8.2 \pm 2.0 \text{ b} \\
 \sigma_c &= 587.0 \pm 1.3 \text{ b} \\
 \alpha &= 0.0899 \pm 0.004 \\
 \eta &= 2.287 \pm 0.007 \\
 \nu &= 2.492 \pm 0.008
 \end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}
 I_{\gamma} &= 140 \pm 6 \text{ b} \\
 I_f &= 764 \pm 13 \text{ b} \\
 \langle D \rangle &= 0.68 \pm 0.06 \text{ eV} \\
 S_0 &= 1.1 \pm 0.2
 \end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 5/2^{+}$$

$$S_n = 6840.8 \pm 3.6 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
Bound level						
.17 $\pm$.02	100 $\pm$ 20	.00020 $\pm$.00004		40 $\pm$ 10	.00049 $\pm$.00010	60 $\pm$ 15
1.55 $\pm$.02	600 $\pm$ 50	.165 $\pm$.010		45 $\pm$ 20	.133 $\pm$.008	555 $\pm$ 80
1.79 $\pm$.01	260 $\pm$ 30	.34 $\pm$.04		40 $\pm$ 10	.25 $\pm$.03	220 $\pm$ 30
2.17 $\pm$.01	170 $\pm$ 20	.072			.048	115 $\pm$ 20
2.29 $\pm$.01	75 $\pm$ 10	.17 $\pm$.03		40 $\pm$ 10	.11 $\pm$.02	35 $\pm$ 5
3.49 $\pm$.07	500 $\pm$ 200	.07		(45)	.037	455 $\pm$ 200
3.66 $\pm$.01	185 $\pm$ 20	.12 $\pm$.02		50 $\pm$ 15	.063 $\pm$.011	135 $\pm$ 20
4.76 $\pm$.01	900 $\pm$ 100	.24 $\pm$.07	[2]	(45)	.11 $\pm$.03	855 $\pm$ 100
5.89 $\pm$.02	350 $\pm$ 70	.17 $\pm$.03		(45)	.070 $\pm$.012	320 $\pm$ 50
6.42 $\pm$.02	600 $\pm$ 75	.22 $\pm$.11		(45)	.087 $\pm$.04	570 $\pm$ 75
6.81 $\pm$.02	150 $\pm$ 30	.78 $\pm$.12			.30 $\pm$.05	108 $\pm$ 20
7.48 $\pm$.02	170 $\pm$ 30	.038 $\pm$.007		48 $\pm$ 15	.015 $\pm$.003	120 $\pm$ 30
8.67 $\pm$.02	380 $\pm$ 50	.038 $\pm$.019		40 $\pm$ 20	.013 $\pm$.007	340 $\pm$ 60
9.26 $\pm$.02	300 $\pm$ 50	.13 $\pm$.03		50 $\pm$ 20	.043 $\pm$.010	250 $\pm$ 50
9.68 $\pm$.02	600 $\pm$ 50	.13		(45)	.042	555 $\pm$ 50
10.37 $\pm$.02	320 $\pm$ 30	1.66 $\pm$.08			.515 $\pm$.025	260 $\pm$ 30
10.86 $\pm$.04	350	.073			.022	
11.31 $\pm$.02	325 $\pm$ 60	.20 $\pm$.07	[2]		.059 $\pm$.021	280 $\pm$ 60

$^{233}_{92}\text{U}$
 $[1.553 \times 10^5 \text{ yr}]$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
12.05±.04	900	.30 ±0.05			.086 ±.014	265 ± 20
12.81±.03	310 ± 15	1.4 ±0.1			.39 ±.03	120
13.45±.06	165	.055			.015	270 ± 40
13.74±.03	320 ± 40	.39 ±.05		(45)	.11 ±.01	190 ± 20
15.35±.03	235 ± 30	.47 ±.06		(45)	.12 ±.02	180 ± 25
15.54±.03	225 ± 25	.425 ±.060		(45)	.11 ±.02	485 ± 70
16.29±.06	530 ± 70	1.35 ±.10	[2]	(45)	.334 ±.025	127 ± 20
16.59±.03	172 ± 20	.48 ±.03		(45)	.118 ±.007	160 ± 30
18.01±.03	205 ± 30	.42 ±.03		(45)	.099 ±.007	253 ± 20
18.50±.06	225 ± 30	.23 ±.03		(45)	.054 ±.007	404 ± 40
18.98±.03	300 ± 20	1.74 ±.08		(45)	.399 ±.018	204 ± 25
20.54±.03	450 ± 40	1.17 ±.08		(45)	.258 ±.018	407 ± 50
21.90±.04	250 ± 25	1.2 ±.3		(45)	.26 ±.06	684
22.35±.04	450 ± 50	3.4 ±.2		(45)	.72 ±.04	365 ± 40
22.93±.04	730 ± 50	.85 ±.08		(45)	.18 ±.02	654
23.77±.04	450 ± 50	.60 ±.15		(45)	.12 ±.03	290 ± 30
24.26±.04	700	.48 ±.04		(45)	.098 ±.008	554 ±200
25.28±.04	315 ± 30	.88 ±.09		(45)	.175 ±.018	105
25.85±.04	600 ±200	.8 ±.2		(45)	.16 ±.04	254
26.30±.04	150	.036		(45)	.007 ±.04	540 ± 50
26.65±.04	300	.70 ±.18			.033	
27.04±.04	600 ± 50	.17			.0051 ±.0019	
28.03±.04		.027 ±.010			.094 ±.028	
28.38±.04		.50 ±.15		(45)	.33 ±.04	484 ± 40
29.07±.04	530 ± 40	1.8 ±.2		(45)	.055 ±.018	155 ± 50
29.61±.04	200 ± 50	.3 ±.1		(45)	.024 ±.005	355 ± 50
30.38±.04	400 ± 50	.13 ±.03		(45)	.14 ±.04	214 ± 30
30.75±.04	260 ± 30	.8 ±.2		(45)	.127 ±.013	404 ± 70
31.39±.04	450 ± 70	.71 ±.07		(45)	.290 ±.014	284 ± 50
32.06±.04	330 ± 50	1.64 ±.08		(45)	.218 ±.017	853 ±150
33.14±.04	900 ±150	1.26 ±.10		(45)	.23 ±.02	583 ± 50
34.02±.04	1000	1.35 ±.14		(45)	.37 ±.07	455
34.55±.04	630 ± 50	2.2 ±.4		(45)	.034	1100 ±400
35.20±.04	500	.20		(45)	.23 ±.03	110 ± 20
35.83±.04	1100 ±400	1.4 ±.2		(45)	.177 ±.021	360 ± 20
36.60±.04	170 ± 20	1.07 ±.13		(45)	.127 ±.018	729 ±100
37.50±.04	420 ± 20	.78 ±.11		(45)	.175 ±.032	535 ± 70
39.40±.05	775 ±100	1.1 ±.2		(45)	.078 ±.016	604 ± 70
39.94±.05	590 ± 70	.49 ±.10		(45)	.14 ±.03	179 ± 75
40.50±.05	650 ± 70	.9 ±0.2		(45)	.092 ±.005	
41.06±.05	225 ± 75	.59 ±.03		(45)		

E_{α} (eV)	Γ (eV)	$2g_{\alpha}$ (eV)	J	Γ_{γ} (eV)	$2g_{\gamma}^2$ (eV)	Γ_{γ} (eV)
42.08 ± .05	700 ± 100	.24 ± .02		(45)	.037 ± .003	655 ± 100
42.68 ± .02	230 ± 30	1.0 ± .2		(45)	.15 ± .03	274 ± 30
43.57 ± .05	290 ± 40	.52 ± .07		(45)	.079 ± .011	244 ± 30
44.70 ± .10	1000 ± 200	.70 ± .07		(45)	.11 ± .01	954 ± 200
46.18 ± .05	210 ± 40	.66 ± .05		(45)	.097 ± .007	164 ± 20
46.70 ± .05	230 ± 30	.075 ± .008		(45)	.011 ± .001	185 ± 30
47.37 ± .05	470 ± 40	.90 ± .06		(45)	.14 ± .09	424 ± 40
49.79 ± .05	208 ± 20	2.8 ± .3		(45)	.40 ± .04	160 ± 20
49.32 ± .05	270 ± 25	.34 ± .02		(45)	.048 ± .003	225 ± 25
50.53 ± .05	996 ± 50	1.27 ± .05		(45)	.179 ± .007	950 ± 50
51.49 ± .10	355 ± 50	.14 ± .02		(45)	.0195 ± .003	310 ± 50
52.11 ± .05	290 ± 30	.14 ± .02			.0194 ± .003	245 ± 30
53.17 ± .05		1.39			.19	290
53.54 ± .05		.40			.055	300
54.15 ± .05		2.2			.30	400
54.86 ± .05		2.4			.33	320
55.61 ± .05		1.7			.23	500
56.18 ± .05		1.5			.20	300
56.58 ± .05		2.6 ± .2			.34 ± .03	450
57.53 ± .05		5.6 ± .3			.74 ± .05	900
58.54 ± .05		1.76			.23	350
58.75 ± .05		.048			.009	300
60.28 ± .05		.35			.045	500
61.07 ± .05		.63			.08	280
61.50 ± .05		2.8			.36	400
62.72 ± .05		2.3			.29	185

Note - Single-level Breit-Wigner parameters. For Miller-Miller parameters, see de Sainture 70, Refs 70 and Cio 70. For Brinkman parameters see Brin 68.

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_p &= 100.2 \pm 1.5 \text{ b} \\ \sigma_f &= 0.65 \text{ b} \\ \sigma_a &= 12 \pm 1 \text{ b} \\ \sigma_t &= 112 \pm 1 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}E_0 &= 630 \pm 70 \text{ eV} \\ \langle \Gamma \rangle &= 12.3 \pm 1.5 \text{ eV} \\ S_0 &= 1.1 \pm 0.4\end{aligned}$$

RESONANCE PARAMETERS

$I^0 = 0^+$ $\Gamma_{\text{RBR}} = 0.0055$ $S_0 = 5257.6 \pm 0.5 \text{ keV}$

$E_0 \text{ (eV)}$	$g_{\text{R}}^2 \text{ (keV)}$	J	L	$\Gamma_2 \text{ (keV)}$	$g_{\text{R}}^2 \text{ (keV)}$	$\Gamma_2 \text{ (keV)}$
Bound level						
5.19 ± .01	3.92 ± .02	1/2	0	25 ± 6	1.72 ± .01	.019 ± .001
22.74 ± .09	.018 ± .002			(25)	.0034 ± .0004	
23.42 ± .09	.16 ± .02			(25)	.033 ± .004	
31.21 ± .16	6.50 ± .25			(25)	1.16 ± .045	.20 ± .025
36.06 ± .20	.050 ± .005			(25)	.0036 ± .0008	
45.83 ± .28	.287 ± .014			(25)	.0439 ± .0021	.108 ± .039
48.75 ± .34	8.0 ± .7			(25)	1.15 ± .10	.004 ± .002
77.64 ± .62	7.9 ± .3			(25)	.896 ± .034	.011 ± .005
91.4 ± .7						.038 ± .053
94.75 ± .83	39 ± 2			(25)	4.00 ± .21	.040 ± .005
106.65 ± .99	3.2 ± .3			(25)	.31 ± .03	.110 ± .028
111.49 ± 1.07	17.8 ± .6			(25)	1.69 ± .06	.287 ± .024
133.6 ± 1.5						
146.75 ± 1.60	9.4 ± 1.4			(25)	.77 ± .12	.007 ± .016
152.81 ± 1.70	19.7 ± .5			(25)	1.59 ± .05	.023 ± .008
177.25 ± 2.11	28 ± 4			(25)	2.1 ± .3	.120 ± .017
183.5 ± 2.3	37 ± 6			(25)	2.7 ± .4	.133 ± .017
188.3 ± 2.3	52 ± 1			(25)	3.79 ± .07	.032 ± .010
209.5 ± 2.7	6.4 ± 1.5			(25)	.44 ± .10	.052 ± .030
238.7 ± 3.3	5.9 ± .8			(25)	.25 ± .05	.091 ± .063
259.1 ± 3.8	7.0 ± 1.4			(25)	.435 ± .087	.422 ± .08
277.8 ± 4.2	3.2 ± .3			(25)	.19 ± .02	.216 ± .101
281.4 ± 4.5	29 ± 2			(25)	1.70 ± .12	.209 ± .032

E_0 (eV)	g_{μ}^2 (GeV)	J	I	F_1 (GeV)	g_{μ}^2 (GeV)	F_1 (GeV)
309.8 ± 4.0	11.3 ± 1.2			(25)	.64 ± .07	-.127 ± .054
315.4 ± 5.0	16.2 ± .4			(25)	-.90 ± .02	-.33 ± .14
324.5 ± 5.0	2.7 ± .2			(25)	-.15 ± .01	-.017 ± .039
332.9 ± 5.5	27 ± 6			(25)	1.44 ± .32	-.166 ± .143
350.8 ± 5.9	37 ± 5			(25)	1.95 ± .26	-.173 ± .053
360.3 ± 6.1						
367.5 ± 6.4						
383.1 ± 7.1	10.0 ± 1.5			(25)	-.509 ± .076	-.06 ± .16
414.1 ± 7.6	4.1 ± .1			(25)	-.202 ± .005	-.211 ± .138
439.1 ± 8.3	2.2 ± .8			(25)	-.105 ± .038	-.667 ± .232
457.0 ± 8.8	10.0 ± 1.7			(25)	0.466 ± .080	1.229 ± .443
466.4 ± 9.0	12.5 ± 1.6			(25)	-.579 ± .074	9.326 ± .924
491.1 ± 9.8	36 ± 11			(25)	1.62 ± .50	313 ± 167
515.0 ± 10.5	70 ± 30			(25)	3.09 ± 1.32	1.663 ± .154
543.8 ± 11.6	47 ± 13			(25)	2.00 ± .55	5.053 ± .426
559.1 ± 11.9	72 ± 26			(25)	3.1 ± 1.1	5.640 ± .454
578.3 ± 13.9	44 ± 10			(25)	1.8 ± .4	5.367 ± .452
638.4 ± 16.1	2 ± 8			(25)	-.079	51.1
686.7 ± 16.2					.46	9.06
732.0 ± 17.5						
770.0 ± 19.0	710 ± 85			(25)	29.6 ± 13.1	
817.6 ± 21.1	260 ± 100			(25)	9.09 ± 3.50	3.65 ± .51

σ_{μ}^2 (GeV)

THERMAL CROSS SECTIONS

$\sigma_v = 98.6 \pm 1.5 \text{ b}$
 $\sigma_{v'} = 582.2 \pm 1.3 \text{ b}$
 $\sigma_{v''} = 680.8 \pm 1.3 \text{ b}$
 $\sigma_{v'''} = 13.8 \pm 0.5 \text{ b}$
 $\sigma_{v''''} = 694.6 \pm 1.1 \text{ b}$
 $\sigma = 0.169 \pm 0.002$
 $\sigma_{v'} = 2.068 \pm 0.009$
 $\sigma_{v''} = 2.416 \pm 0.008$
 $\sigma_{v'''} = 9.8 \pm 0.6 \text{ fm}$

RESONANCE PROPERTIES

$I_y = 144 \pm 6 \text{ b}$
 $I_{y'} = 275 \pm 5 \text{ b}$
 $\langle D \rangle = 0.63 \pm 0.06 \text{ eV}$
 $S_0 = 0.92 \pm 0.10$
 $S_1 = 1.8 \pm 0.3$

RESONANCE PARAMETERS

 $I^0 = 7/2^+$ $S_n = 6545.1 \pm 1.1 \text{ keV}$

$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_y \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$	$\Gamma_y \text{ (meV)}$
Bound level						
.285 ± .005	136 ± 8	.0032 ± .0005	3	36 ± 3	.0055 ± .0005	100 ± 8
1.135 ± .005	157 ± 11	.0154 ± .0011	4	42 ± 5	.0145 ± .0010	115 ± 10
2.028 ± .004	48 ± 3	.0077 ± .0003	3	38 ± 4	.0054 ± .0002	10 ± 1
2.84 ± .05	150 ± 50	.002 ± .001			.0018 ± .0006	100 ± 50
3.145 ± .005	160 ± 15	.028 ± 0.002	3	44 ± 6	.0158 ± 0.0011	116 ± 15
3.613 ± .005	87 ± 6	.046 ± .002	4	37 ± 5	.0242 ± .0011	50 ± 5
4.845 ± .005	40 ± 3	.059 ± .004	4	35 ± 4	.0268 ± .0018	5 ± 1
5.445 ± .006	70 ± 15	.022 ± .003		46 ± 8	.0094 ± .0013	24 ± 7
5.83 ± .01	110 ± 30	.016 ± .003			.0067 ± .0013	75 ± 20
6.21 ± .02	230 ± 50	.030 ± .003	3	45 ± 7	.0120 ± .0012	165 ± 50
6.39 ± .01	45 ± 3	.260 ± .015	4	35 ± 2	.103 ± .006	10 ± 2
7.08 ± .01	63 ± 4	.125 ± .005	4	36 ± 3	.0470 ± .0018	27 ± 3
8.78 ± .01	131 ± 10	1.18 ± .04	4	45 ± 5	.398 ± .013	85 ± 6
9.26 ± .01	156 ± 40	.18 ± .03	4	47 ± 10	.059 ± .010	109 ± 20
9.74 ± .01	150 ± 50	.026 ± .005			.0083 ± .0015	85 ± 20
10.18 ± .01	95 ± 10	.067 ± .006	4	45 ± 6	.021 ± .0019	46 ± 7

E_0 (eV)	Γ (meV)	$2g_n^+$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)	Γ_γ (meV)
10.80 ± .01	700 ± 200	.016 ± .008			.0049 ± .0024	700 ± 200
11.66 ± .01	45 ± 5	.59 ± .04	4	40 ± 5	.173 ± .011	4.6 ± 1.0
12.39 ± .01	70 ± 6	1.29 ± .03	3	42 ± 4	.366 ± .009	27 ± 3
12.65 ± .01	83 ± 15	.098 ± .006	4	28 ± 2	.011 ± .002	55 ± 15
13.28 ± .01	80 ± 20	.055 ± .006		40 ± 10	.0151 ± .0016	40 ± 20
13.69 ± .01	113 ± 30	.050 ± .010		43 ± 27	.014 ± .003	70 ± 20
14.02 ± .01	500 ± 100	.41 ± .07	3	(40)	.109 ± .019	460 ± 100
14.51 ± .01	52 ± 8	.11 ± .02	3	39 ± 5	.029 ± .005	13 ± 3
15.40 ± .01	91 ± 10	.25 ± .02	4	44 ± 6	.084 ± .005	47 ± 7
16.08 ± .01	55 ± 5	.35 ± .01	4	38 ± 4	.087 ± .003	17 ± 2
16.68 ± .01	119 ± 14	.28 ± .02	4	41 ± 8	.089 ± .005	78 ± 12
18.05 ± .01	155 ± 20	.37 ± .01	3	45 ± 10	.087 ± .002	110 ± 20
18.96 ± .01	90 ± 15	.084 ± .010	4	50 ± 10	.019 ± .002	40 ± 15
19.30 ± .01	103 ± 7	3.15 ± .13	4	43 ± 4	.717 ± .003	60 ± 5
20.13 ± .01	197 ± 20	.12 ± .02	4	43 ± 28	.027 ± .005	74 ± 22
20.62 ± .01	90 ± 10	.18 ± .02	4	45 ± 7	.040 ± .004	45 ± 7
21.07 ± .01	68 ± 6	1.50 ± .05	4	44 ± 4	.327 ± .001	24 ± 4
22.14 ± .05		.007 ± .004			.0015 ± .0009	
22.94 ± .01	92 ± 9	.45 ± .03	4	41 ± 4	.084 ± .006	46 ± 8
23.42 ± .01	43 ± 5	.69 ± .06	4	35 ± 5	.14 ± .01	7 ± 1
23.63 ± .01	144 ± 30	.90 ± .10	3	43 ± 10	.185 ± .021	100 ± 30
24.25 ± .01	74 ± 12	.32 ± .04	3	46 ± 10	.065 ± .008	28 ± 6
24.50 ± .04	88 ± 15	.14 ± .04		(45)	.028 ± .008	43 ± 15
25.19 ± .03		.18 ± .04			.036 ± .008	
25.59 ± .01	250 ± 50	.60 ± .10	3		.12 ± .02	200 ± 50
26.49 ± .02	167 ± 40	.60 ± .03	[4]	41 ± 15	.116 ± .006	125 ± 40
27.16 ± .01	95 ± 20	.10 ± .03		(45)	.019 ± .006	50 ± 20
27.82 ± .01	104 ± 15	.70 ± .05	4	35 ± 10	.133 ± .010	68 ± 9
28.09 ± .02		.030 ± .015			.0052 ± .0028	
28.36 ± .01	153 ± 17	.17 ± .02	[3]	37 ± 7	.032 ± .004	116 ± 15
28.72 ± .03	115 ± 20	.05 ± .02		(45)	.0093 ± .0037	70 ± 20
29.65 ± .01	73 ± 6	.18 ± .02	4	43 ± 4	.033 ± .004	30 ± 4
30.59 ± .01	44 ± 15	.22 ± .02	3	44 ± 11	.040 ± .004	100 ± 15
30.86 ± .01	63 ± 6	.50 ± .05		42 ± 5	.090 ± .009	20 ± 3
32.07 ± .01	97 ± 10	1.90 ± .08	4	45 ± 6	.336 ± .014	50 ± 6
33.53 ± .01	62 ± 7	1.90 ± .05	4	37 ± 7	.328 ± .009	23 ± 3
34.39 ± .01	83 ± 10	2.15 ± .10	4	43 ± 4	.367 ± .017	38 ± 4
34.85 ± .01	120 ± 20	.9 ± .2	3	29 ± 20	.15 ± .03	90 ± 20
35.20 ± .01	175 ± 18	4.5 ± .2	4	50 ± 10	.084 ± .004	120 ± 15
35.78 ± .03		0.5			.064 ± .0057	
37.45 ± .05		0.035				

E _γ (eV)	Γ (meV)	2g _γ ² (meV)	J	Γ _γ (meV)	2g _γ ² (meV)	Γ _γ (meV)
36.36 ± .05	111 ± 20	.55 ± .06	4	(45)	.089 ± .010	65 ± 20
39.41 ± .01	95 ± 7	2.5 ± .2	4	40 ± 4	.40 ± .03	52 ± 5
39.90 ± .01		.40 ± .08			.063 ± .013	60 ± 20
40.52 ± .01	205 ± 40	.45 ± .10	4		.071 ± .016	160 ± 40
41.30 ± .01	100 ± 20	0.35 ± .10		(45)	.055 ± .015	55 ± 15
41.55 ± .01	70 ± 20	0.22 ± .07			.034 ± .011	36 ± 10
41.88 ± .01	75 ± 10	1.35 ± .10	3	54 ± 10	.209 ± .015	20 ± 4
42.23 ± .01	100 ± 15	.35 ± .05		40	.055 ± .008	60 ± 10
42.70 ± .01	64 ± 6	.27 ± .03		44 ± 4	.041 ± .005	20 ± 3
43.40 ± .01	70 ± 7	.64 ± .05		44 ± 5	.097 ± .008	25 ± 4
43.94 ± .01	105 ± 20	.60 ± .05	4	(45)	.091 ± .008	60 ± 20
44.60 ± .01	225 ± 50	.8 ± .2	4	(45)	.12 ± .03	180 ± 50
45.00 ± .02	445 ± 200	.5 ± .2	4	(45)	.075 ± .030	100 ± 200
45.79 ± .01	60 ± 6	.23 ± .08	4		.034 ± .012	23 ± 7
46.79 ± .01	104 ± 10	.57 ± .06		37 ± 28	.034 ± .012	66 ± 13
47.00 ± .02	136 ± 20	1.0 ± 0.2		38 ± 19	.146 ± .029	90 ± 20
47.98 ± .01	78 ± 8	.84 ± .06	4	(45)	.121 ± .009	24 ± 3
48.30 ± .01	100 ± 20	1.10 ± .08	3	(45)	.158 ± .012	54 ± 15
48.90 ± .01	68 ± 8	.95 ± .15	3		.136 ± .021	26 ± 4
49.43 ± .01	58 ± 5	.75 ± .08	4	37 ± 4	.107 ± .011	20 ± 3
50.13 ± .01	54 ± 6	.25 ± .02		33 ± 4	.035 ± .003	21 ± 4
50.49 ± .01	123 ± 10	1.13 ± .03	4	54 ± 7	.159 ± .004	68 ± 7
51.27 ± .01	191 ± 16	3.50 ± .15		47 ± 5	.503 ± .002	140 ± 15
51.68 ± .02	70 ± 10	.30 ± .03		39 ± 7	.042 ± .004	31 ± 7
52.23 ± .02	361 ± 25	2.48 ± .10		38 ± 7	.343 ± .014	320 ± 20
53.45 ± .01	128 ± 25	.61 ± .05		47 ± 6	.063 ± .007	80 ± 20
54.10 ± .02		.26 ± .03	4		.035 ± .004	58 ± 6
55.08 ± .02	118 ± 10	3.20 ± .08		57 ± 6	.431 ± .011	205 ± 50
55.65 ± .02	247 ± 50	2.3 ± .4	4	40 ± 5	.31 ± .05	92 ± 8
56.50 ± .02	142 ± 10	4.89 ± .35		45 ± 5	.65 ± .05	60 ± 20
57.81 ± .02	101 ± 20	1.14 ± .05		40 ± 5	.150 ± .007	37 ± 5
58.08 ± .02	71 ± 10	1.36 ± .08		33 ± 6	.178 ± .011	109 ± 12
58.69 ± .02	156 ± 15	1.37 ± .10		46 ± 10	.166 ± .013	180 ± 10
59.75 ± .02	220	.25 ± .03		40 ± 5	.023 ± .004	92
60.20 ± .02	138	1.28 ± .07		(45)	.165 ± .008	124 ± 15
60.95 ± .02	169 ± 20	.51 ± .03		45 ± 10	.055 ± .004	
61.17 ± .02		.45 ± .05			.058 ± .006	
62.40 ± .02		.16 ± .03			.020 ± .004	
63.03 ± .02		-1.26			.158	
64.28 ± .02	58 ± 7	1.25 ± .06		50 ± 6	.156 ± .008	7 ± 1
65.80 ± .02	60 ± 30	.31 ± .06		30 ± 10	.038 ± .004	30 ± 9

E_{β} (eV)	Γ (meV)	$2g_{\beta}^n$ (meV)	J	Γ_{γ} (meV)	$2g_{\beta}^n$ (meV)	Γ_{γ} (meV)
66.36 ± .02	68 ± 10	.37 ± .04		32 ± 6	.045 ± .005	36 ± 9
67.28 ± .02	45	.088 ± .02		34	.011 ± .002	10.5
68.50 ± .02	90	.13 ± .02		50	.016 ± .003	40
69.30 ± .02	200 ± 30	.74 ± .04		53 ± 27	.089 ± .005	146 ± 28
70.42 ± .02	192	2.9 ± 0.3		49 ± 5	.35 ± .04	140
70.75 ± .02	225	2.3 ± 0.2		40 ± 5	.27 ± .03	183
71.55 ± .02		.47 ± .05			.055 ± .006	
72.40 ± .02	125 ± 20	3.20 ± .40		50 ± 9	.376 ± .050	72 ± 13
72.91 ± .02		.26 ± .03			.020 ± .003	
74.57 ± .02	119 ± 12	2.96 ± .20		56 ± 8	.343 ± .024	60 ± 7
75.16 ± .02		~1.30			~.15	
75.54 ± .02	230 ± 60	1.23 ± .20		32	.142 ± .023	197 ± 64
76.73 ± .02	75 ± 10	.068 ± .011		36 ± 25	.0078 ± .0013	39 ± 15
77.49 ± .02		1.02 ± .08			.116 ± .009	
77.52 ± .02	120 ± 10	1.02 ± .08		54 ± 7	.116 ± .009	65 ± 6
78.11 ± .02	146 ± 15	1.02 ± .08		39 ± 9	.115 ± .009	106 ± 15
78.70 ± .02		.13 ± .03			.015 ± .004	
79.68 ± .02	125 ± 12	.69 ± .03		37 ± 6	.077 ± .003	87 ± 10
80.36 ± .02	196 ± 30	.74 ± .03		25 ± 9	.082 ± .003	170 ± 25
81.45 ± .02	113 ± 10	.89 ± .03		29 ± 5	.099 ± .003	83 ± 8
82.06 ± .02		~.05			~.0055	
82.67 ± .02		2.20 ± .12			.242 ± .014	
83.59 ± .02	118 ± 20	1.17 ± .12		48 ± 17	.128 ± .010	69 ± 14
84.04 ± .02		~1.50			~.184	
84.35 ± .02		~1.9			~.21	
85.04 ± .02		~1.0			~.11	
85.59 ± .02		~.6			~.06	
86.14 ± .02		~.05			~.005	
86.85 ± .02	80	.72 ± .06		52	.077 ± .006	27
87.54 ± .02		.74 ± .06			.079 ± .006	
88.77 ± .02		3.3 ± .3			.35 ± .03	
89.11 ± .02		.18			.019	
89.83 ± .02	136 ± 15	.66 ± .05		46 ± 10	.070 ± .005	89 ± 10
90.42 ± .02	60 ± 6	4.83 ± .20		46 ± 4	.500 ± .021	9 ± 1
91.28 ± .02	280 ± 60	2.96 ± .40		39	.310 ± .004	238 ± 66
92.07 ± .02	120 ± 20	.72 ± .05		44 ± 16	.075 ± .005	75 ± 15
92.59 ± .02	95 ± 12	2.53 ± .20		48 ± 7	.263 ± .021	44 ± 6
93.23 ± .02	85	.33 ± .06		39	.034 ± .006	46
94.12 ± .02	75 ± 12	4.0 ± .3		61 ± 13	.41 ± .03	9.5 ± 1.5
94.76 ± .02	105	.5 ± .2		41	.051 ± .025	66
95.56 ± .02		1.58 ± .15			.162 ± .015	

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)
96.48 ± .02	230 ± 40	1.03 ± .15		51 ± 17	.105 ± .015	176 ± 32
98.11 ± .02		2.78 ± .10			.281 ± .010	
99.58 ± .02		.62 ± .06			.062 ± .006	
100.37 ± .01	133 ± 15	.66 ± .04		60 ± 10	.066 ± .004	72 ± 10
101.00 ± .01	89 ± 8	1.00 ± .05		60 ± 7	.0895 ± .0050	28 ± 3
101.87 ± .02	88 ± 20	.36 ± .03		38 ± 10	.036 ± .003	50 ± 15
102.97 ± .02	125 ± 12	2.52 ± .30		40 ± 10	.248 ± .030	82 ± 10
103.59 ± .02	146 ± 20	2.07 ± .10		65 ± 10	.203 ± .010	81 ± 10
104.18 ± .02		.27 ± .03			.026 ± .003	
105.16 ± .02	139 ± 40	2.40 ± .12		41 ± 16	.234 ± .012	96 ± 28
105.44 ± .02		.31 ± .03			.030 ± .003	
106.11 ± .02	200 ± 50	1.16 ± .05		43 ± 19	.112 ± .005	156 ± 40
106.72 ± .02		.13 ± .01			.013	
107.62 ± .02	76 ± 7	4.12 ± .10		52 ± 4	.397 ± .010	20 ± 2
108.08 ± .02	112 ± 18	.44 ± .04		52 ± 12	.042 ± .004	60 ± 10
108.91 ± .02	95 ± 10	1.26 ± .04		58 ± 6	.121 ± .004	36 ± 4
109.72 ± .02		2.12 ± .08			.202 ± .008	
110.18 ± .02		.58 ± .08			.055 ± .008	
111.20 ± .04	103 ± 15	.48 ± .02		79 ± 12	.046 ± .002	23 ± 4
111.69 ± .02	96 ± 10	1.13 ± .04		49 ± 5	.107 ± .004	46 ± 5
113.57 ± .02	202 ± 20	1.44 ± .06		56 ± 16	.135 ± .006	145 ± 17
115.15 ± .02	62 ± 15	.44 ± .06		39 ± 10	.041 ± .006	23 ± 7
115.95 ± .02		3.86 ± .30			.266 ± .030	
116.20 ± .02		2.7			.25	
116.73 ± .02		3.1			.28	
121.95 ± .02	151 ± 25	5.82 ± .6		42	.527 ± .054	103 ± 22
123.57 ± .02	90	.4		41	.036 ± .009	49
123.86 ± .02		.11 ± .04			.010 ± .004	
124.81 ± .02	182 ± 27	2.2 ± .3		59 ± 19	.197 ± .027	123 ± 24
125.67 ± .02		4.2 ± 1.0			.37 ± .09	
126.00 ± .02	150	1.9 ± .5		34	.17 ± .05	114
126.47 ± .02		4			.35 ± .09	
127.74 ± .02		.65 ± .20			.057 ± .018	
128.19 ± .02	230 ± 60	1.5 ± .2		47	.13 ± .02	182 ± 58
129.58 ± .02	120	.68 ± .20		35	.060 ± .018	84
130.00 ± .05	77 ± 12	1.89 ± .15		63 ± 10	.15 ± .02	12 ± 2
131.24 ± .02	155	2.2 ± .6		51	.19 ± .05	102
131.64 ± .02	199	1		21	.087	177
132.17 ± .02		2.2 ± .6			.19 ± .05	44
132.75 ± .04		1.2 ± .4		35 ± 16	.10 ± .04	
133.04		1.1			.095	

E_0 (eV)	Γ (meV)	$2\sigma_{E_n}^2$ (meV)	J	Γ_γ (meV)	$2\sigma_{\Gamma_n}^2$ (meV)	Γ_γ (meV)
132.61 ± .02	82 ± 14	4.47 ± .50		43 ± 9	.387 ± .043	34 ± 10
135.06 ± .02	200	4		53	.34	143
135.47 ± .02	250	4		32	.34	214
136.38 ± .02	112 ± 12	3.15 ± .20		70 ± 8	.270 ± .017	39 ± 12
137.56 ± .02	57 ± 7	3.1 ± .3		33 ± 5	.26 ± .03	21 ± 4
139.23 ± .02	44 ± 7	.47 ± .06		23 ± 5	.040 ± .005	20 ± 5
140.27 ± .02		1.3 ± .2			.11 ± .02	
141.80 ± .02	100	.6		41	.05	58
142.15 ± .02	95	5.6 ± .30		45	.470 ± .025	44
143.05 ± .02		.15			.013	
145.60 ± .02		7.3 ± .6			.60 ± .05	
147.38 ± .02	74	2.70 ± .15		37 ± 5	.222 ± .012	34 ± 4
148.95 ± .13						
149.90 ± .13						
151.65 ± .06						
153.60 ± .06						
154.90 ± .06						
155.65 ± .06						
156.15 ± .06						
156.90 ± .06						
158.65 ± .06						
159.35 ± .06						
159.90 ± .06						
160.95 ± .06						
162.20 ± .06						
162.60 ± .06						
163.56 ± .06						
166.28 ± .06						
167.94 ± .06						
169.30 ± .06						
170.29 ± .07						
171.70 ± .07						
172.37 ± .07						
173.31 ± .07						
174.12 ± .07						
174.50 ± .07						
176.47 ± .07						
177.50 ± .07						
178.50 ± .07						
179.33 ± .07						
180.32 ± .08						

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E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_0$ (meV)	Γ_f (meV)
182.32 $\pm$ 0.08						
183.50 $\pm$ 0.08						
183.88 $\pm$ 0.08						
184.10 $\pm$ 0.08						
185.95 $\pm$ 0.08						
186.43 $\pm$ 0.08						
186.85 $\pm$ 0.08						
187.48 $\pm$ 0.08						
190.83 $\pm$ 0.09						
192.28 $\pm$ 0.09						
193.50 $\pm$ 0.09						
194.19 $\pm$ 0.09						
196.30 $\pm$ 0.09						
197.30 $\pm$ 0.09						
198.40 $\pm$ 0.09						
200.3 $\pm$ 0.10						
201.10 $\pm$ 0.10						
201.90 $\pm$ 0.10						
203.20 $\pm$ 0.10						
203.80 $\pm$ 0.10						
205.60 $\pm$ 0.10						
207.00 $\pm$ 0.10						
209.60 $\pm$ 0.10						
211.40 $\pm$ 0.10						
212.70 $\pm$ 0.10						
213.70 $\pm$ 0.10						
214.90 $\pm$ 0.10						
215.60 $\pm$ 0.10						
216.30 $\pm$ 0.10						
217.10 $\pm$ 0.10						
219.20 $\pm$ 0.10						
220.60 $\pm$ 0.10						
221.50 $\pm$ 0.12						
223.20 $\pm$ 0.12						
224.70 $\pm$ 0.12						
226.50 $\pm$ 0.12						
229.10 $\pm$ 0.12						
231.00 $\pm$ 0.10						
231.30 $\pm$ 0.12						
232.90 $\pm$ 0.12						
233.90 $\pm$ 0.12						

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E_0 (eV)	Γ (meV)	$2g_n^+$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)	Γ_f (meV)
235.30 $\pm$ 0.12						
238.60 $\pm$ 0.12						
239.80 $\pm$ 0.12						
241.30 $\pm$ 0.14						
242.50 $\pm$ 0.14						
244.80 $\pm$ 0.14						
245.40 $\pm$ 0.14						
246.20 $\pm$ 0.14						
247.90 $\pm$ 0.14						
249.00 $\pm$ 0.14						
250.50 $\pm$ 0.14						
251.60 $\pm$ 0.14						
253.20 $\pm$ 0.14						
253.80 $\pm$ 0.14						
256.00 $\pm$ 0.14						
257.50 $\pm$ 0.14						
258.70 $\pm$ 0.14						
260.10 $\pm$ 0.16						
261.50 $\pm$ 0.16						
262.90 $\pm$ 0.16						
263.80 $\pm$ 0.16						
264.90 $\pm$ 0.16						
266.30 $\pm$ 0.16						
266.80 $\pm$ 0.16						
267.90 $\pm$ 0.16						
270.00 $\pm$ 0.16						
270.50 $\pm$ 0.16						
272.70 $\pm$ 0.16						
275.00 $\pm$ 0.16						
276.80 $\pm$ 0.16						
279.70 $\pm$ 0.16						
280.90 $\pm$ 0.18						
282.00 $\pm$ 0.18						
282.70 $\pm$ 0.18						
284.00 $\pm$ 0.18						
285.50 $\pm$ 0.18						
286.10 $\pm$ 0.18						
287.50 $\pm$ 0.18						
289.30 $\pm$ 0.18						
290.60 $\pm$ 0.20						
292.20 $\pm$ 0.20						

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
293.60 ± 0.20						
295.10 ± 0.20						
296.20 ± 0.20						
296.90 ± 0.20						
297.50 ± 0.20						
298.50 ± 0.20						
300.50 ± 0.20						

Note - Single-level Breit-Wigner parameters. For recent R-matrix resonance parameters see de Saussure 73 and Cramer 69.
For Adler-Adler parameters, see de Saussure 73 and Adler 67.

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(2.342 x 10¹⁷ yr)

THERMAL CROSS SECTIONS

$\sigma_s = 5.2 \pm 0.3$ b
 $\sigma_{sp} = 1.89 \pm 0.05$

RESONANCE PROPERTIES

$\Gamma_0 = 365 \pm 20$ b
 $\langle \Gamma \rangle = 15.4 \pm 1.0$ eV
 $S_0 = 1.3 \pm 0.2$
 $S_1 = 2.3 \pm 0.6$

RESONANCE PARAMETERS

$\Gamma^* = 0^+$

$E_x = 5124.5 \pm 3.2$ keV

E_0 (eV)	$\sigma_{s,0}^{*2}$ (meV)	Γ_0 (meV)	$\sigma_{s,0}^{*2}$ (meV)	Γ_0 (meV)
-9.7 ± 1.0			.51%	
5.45 ± .03	2.16 ± .08	24.9 ± 1.0	.925 ± .034	.29 ± .07
29.8 ± .1	.585 ± .030	(23.9 ± 1.0)	.107 ± .006	.16 ± .04
34.0 ± .1	2.35 ± .13	20.9 ± 3.5	.403 ± .022	.18 ± .05
43.7 ± 0.1	11.8 ± .6	22.0 ± 1.5	1.79 ± .09	.43 ± .11
63.1 ± 0.2	.034 ± .005	(23.9 ± 1.0)	.0043 ± .0006	
71.1 ± 0.2	19.0 ± 1.0	23.3 ± .9	2.25 ± .12	.29 ± .07
86.2 ± 0.2	27.0 ± 1.5	24.3 ± 1.3	2.91 ± .15	.30 ± .08
120.5 ± 0.3	51.8 ± 4.0	24.0 ± 1.5	4.73 ± .37	.34 ± .09
124.4 ± .3	15.9 ± 1.9	21.0 ± 3.5	1.43 ± .17	.21 ± .05
133.7 ± .7	1.08 ± .09	(23.9 ± 1.0)	.093 ± .009	
137.0 ± .7	.48 ± .10	(23.9 ± 1.0)	.041 ± .009	
*153.6 ± .08				
*161.09 ± .08				
164.91 ± .08	2.09 ± .15		.16 ± .03	
189.90 ± .10	3.5 ± .5		.18 ± .04	
193.00 ± .10	8.8 ± 1.7		.63 ± .12	
193.35 ± .20	36 ± 7		2.59 ± .51	
194.49 ± .15	36 ± 7		2.59 ± .51	
212.99 ± .15	98.2 ± 10.0	24.8 ± 1.3	6.73 ± .67	.32 ± .08
229.89 ± .10	2.34 ± .14		.154 ± .009	
243.0	.30 ± .15		.019 ± .10	
261.9 ± .1	1.0 ± .2		.06 ± .01	
273.23 ± .10	30 ± 10	25 ± 3	1.8 ± .6	.52 ± .13
289.03 ± .11	11.5 ± 2.0		.68 ± .17	.53 ± .13
303.68 ± .12	70 ± 10	26 ± 2	4.01 ± .58	.48 ± .13
320.91 ± .12	5.2 ± .6		0.30 ± .03	
335.44 ± .20	6.7 ± 0.4		.39 ± .022	
356.0	.64 ± .10		.033 ± .005	
367.8	.40 ± .30		.021 ± .016	
371.62 ± .20	13.8 ± 1.0		.716 ± .052	.42 ± .11
380.42 ± .20	125 ± 20	24.8 ± 3.0	6.40 ± 1.03	.30 ± .08
415.03 ± .20	15.8 ± 2.0	(27 ± 3)	.78 ± .10	
431.56 ± .22	41 ± 8	(27 ± 3)	1.97 ± .39	
441.09 ± .20	42 ± 8	(27 ± 3)	2.0 ± .4	

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E_0 (eV)	g_{α}^2 (meV)	Γ_T (meV)	g_{α}^2 (meV)	Γ_T (meV)
466.09 ± .22	10 ± 2	(27 ± 3)	.46 ± .09	
478.92 ± .20	34 ± 7	(27 ± 3)	1.55 ± .32	
501.04 ± .20	4.8 ± .9	(27 ± 3)	.22 ± .04	
507.61 ± .22	26 ± 5	(27 ± 3)	1.15 ± .22	
537.03 ± .27	60 ± 12	(27 ± 3)	2.59 ± .52	
543.46 ± .12	25 ± 5	(27 ± 3)	1.07 ± .22	
564.42 ± .28	71 ± 14	(27 ± 3)	3.0 ± .59	
576.91 ± .30	153 ± 30	(27 ± 3)	6.37 ± 1.25	
607.79 ± .30	14.3 ± .3	(27 ± 3)	.58 ± .01	
618.67 ± .30	60 ± 12	(27 ± 3)	2.41 ± .48	
638.64 ± .31	85.3 ± 17.0	(27 ± 3)	3.38 ± .67	
648.34 ± .33	8.1 ± 1.6	(27 ± 3)	.32 ± .06	
656.5 ± .40	107.7 ± 20.0	(27 ± 3)	4.20 ± .78	
* 661.86 ± .36		(27 ± 3)		
674.35 ± .64	64.5 ± 10.0	(27 ± 3)	2.48 ± .39	
692.18 ± .32	42.4 ± 8.0	(27 ± 3)	1.61 ± .30	
706.81 ± .37	33.4 ± 6.0	(27 ± 3)	1.26 ± .23	
721.39 ± .43	102 ± 20	(27 ± 3)	3.80 ± .75	
747.06 ± .42	23.8 ± .4	(27 ± 3)	.87 ± .02	
771				
790				
807				
822				
828				
848				
866				
889				
902				
931				
949				
956				
969				
996				

* Uncertain resonance.

Note - Scattering widths for resonances above 431.65 eV, maybe systematically low by about 30 percent.

Note - Single-level Breit-Wigner parameters.

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(6.75 day)

THERMAL CROSS SECTIONS

$\sigma_T = 411 \pm 138$ b
 $\sigma_f = 0.35$ b
 $\sigma_a = 411 \pm 138$ b

RESONANCE PROPERTIES

$I_\gamma = 290$ b

RESONANCE PARAMETERS

$I^\pi = 1/2^+$

$S_n = 6143.6 \pm 3.5$ keV

E_0 (eV)	$\sigma_0 \Gamma_r$ (b-eV)	E_0 (eV)	$\sigma_0 \Gamma_r$ (b-eV)	E_0 (eV)	$\sigma_0 \Gamma_r$ (b-eV)
46.2	132	93.7	12.4	160.2	6.9
52.4	4.7	98.0	6.6	169.1	9.1
57.3	6.6	103.9	1.9	175.3	18.7
60.3	3.9	112.4	8.3	184.9	12.6
67.5	10.1	119.9	11.3	192.4	42.9
70.0	5.8	129.5	2.4	200.9	5.3
73.8	131.0	131.0	45.1	207.7	64.1
81.1	41.0	138.8	9.1	212.4	6.8
82.7	5.8	143.0	8.2	216.7	25.0
87.3	7.9	145.4	9.3	235.0	100
88.4	46.7	149.9	6.3		
92.7	4.9	153.7	10.7		

THERMAL CROSS SECTIONS

$\sigma_f = 2.70 \pm 0.02$ b
 $\sigma_a = 9.90 \pm 0.16$ b
 $\sigma_{sc} = 11.60 \pm 0.16$ b
 $\sigma_{ep} = 1.90 \pm 0.03$ b
 $\sigma_{en} = 8.50 \pm 0.06$ b

RESONANCE PROPERTIES

$\Gamma_f = 275 \pm 5$ b
 $\Gamma_a = 9.9 \pm 0.3$ eV
 $\langle \sigma \rangle = 17.7 \pm 0.7$ eV
 $S_0 = 1.1 \pm 0.1$
 $S_1 = 1.7 \pm 0.3$

RESONANCE PARAMETERS

$I^0 = 0^\circ$		$S_2 = 9806.7 \pm 2.0$ meV				
E_R (eV)	Γ (meV)	g^2 (meV)	J	Γ_f (meV)	g^2 (meV)	g^2 (meV)
9.41 ± 0.01	27.5 ± 2.0	0.00011 ± 0.000002	1/2	26 ± 2	0.589 ± 0.008	3.5
6.67 ± 0.02		1.52 ± 0.02	1/2			
10.25 ± 0.02		0.00156 ± 0.00001	3/2			1.4
11.32 ± 0.02		0.00035 ± 0.00006				2.8
16.3 ± 0.04		0.00053 ± 0.00002				0.3
19.50 ± 0.02		0.0014 ± 0.00007				4.6
20.00 ± 0.10	34 ± 3	8.7 ± 0.5		25 ± 3	1.30 ± 0.13	
36.80 ± 0.07	57.0 ± 2.0	32.0 ± 1.0		25 ± 2	5.28 ± 0.17	
45.19 ± 0.07		0.00090 ± 0.00002				0.86
49.6 ± 0.2		0.00066 ± 0.00023				0.58
57.9 ± 0.3		0.00049 ± 0.00008				0.33
63.54 ± 0.06		0.0057 ± 0.0015				3.4
66.15 ± 0.15	48 ± 3	26.0 ± 1.5		22 ± 2	3.20 ± 0.18	
60.74 ± 0.07		2.0 ± 0.2			0.25 ± 0.02	2.3
83.57 ± 0.06		0.006 ± 0.001	(1/2)			31.4
89.19 ± 0.06		0.050 ± 0.010				1.0
93.2 ± 0.5		0.0030 ± 0.0006				
99.19 ± 0.07		0.001 ± 0.001			0.0001 ± 0.0001	
102.47 ± 0.06	95 ± 3	70 ± 3		26 ± 2	6.91 ± 0.30	
111.27 ± 0.06		0.001 ± 0.001			0.000065 ± 0.0001	
116.65 ± 0.11	52 ± 4	30 ± 4		22 ± 2	2.78 ± 0.37	

238
 92 U
 $(4.51 \times 10^9 \text{ yr})$

E_0 (eV)	Γ (meV)	g_n^0 (meV)	J	ℓ	Γ_γ (meV)	g_n^0 (meV)	g_n^1 (meV)
121.61±0.11		0.006 ± 0.003		1			1.4
124.30±0.12		0.014 ± 0.002		1		0.00035 ± .00018	3.0
127.32±0.13		0.004 ± 0.002				0.070 ± 0.050	
145.58±0.15		0.04 ± 0.05		0			5.8
152.42±0.17		0.037 ± 0.002		1			1.6
158.89±0.17		0.011 ± 0.002					
160.65±0.18		0.005 ± 0.003		1		0.00039 ± .00023	
165.27±0.09	21 ± 5	3.2 ± 0.2		0	18 ± 5	0.25 ± 0.02	
173.11 ± .21		0.033 ± 0.004		1			4.3
182.03±0.22		0.003 ± 0.002				0.0002 ± 0.0001	
189.70±0.20		0.003 ± 0.002		0		12.3 ± 0.7	
196.14±0.24		0.001 ± 0.001				0.00007 ± .00007	
198.57±0.24		0.003 ± 0.002				0.00002 ± .00001	
200.54±0.24		0.008 ± 0.003		1		0.0006 ± 0.0002	
202.30±0.24		0.040 ± 0.02					
208.46±0.25	75 ± 6	53 ± 6		1	22 ± 2	3.7 ± 0.4	3.8
214.97±0.27		0.04 ± 0.02		0			
237.27±0.16		29.0 ± 2.0		1		1.88 ± 0.13	11.6
242.65±0.17		0.15 ± 0.02		1			7.3
253.88±0.18		0.10 ± 0.03		1			4.4
255.37±0.19		0.05 ± 0.03		1			1.4
257.10±0.19		0.02 ± 0.01		1			15.9
263.95±0.19		0.23 ± 0.03	3/2	1			
273.59±0.20	49 ± 2	26.0 ± 1.0		0	23 ± 1	1.57 ± 0.06	5.1
275.76±0.20		0.08 ± 0.06		1			3.8
282.29±0.21		0.06 ± 0.03		1		0.94 ± 0.06	
291.00±0.20	38 ± 4	16.0 ± 1.0		0	22 ± 3		1.8
294.36±0.22		0.03 ± 0.02		1		0.057 ± 0.006	2.4
311.18±0.25		1.0 ± 0.1		0			
337.19±0.27		0.05 ± 0.02		1			
347.75±0.28	104 ± 3	81 ± 2		0	23 ± 2	4.34 ± 0.11	3.6
351.75±0.30		0.08 ± 0.03		1			1.4
354.66±0.30		0.03 ± 0.03		1		0.052 ± 0.01	2.9
376.90±0.32		1.0 ± 0.2		0	24 ± 4	0.30 ± 0.02	
397.63±0.20	30 ± 4	6.0 ± 0.4		0	21 ± 2	0.94 ± 0.05	
407.64±0.36	40 ± 2	19.0 ± 1.0		0	22 ± 2	0.021 ± 0.002	6.4
410.20±0.25	31 ± 3	9.2 ± 1.0		1			
434.00±0.40		0.45 ± 0.05		0			
439.60±0.40		5.0 ± 0.5		0	18 ± 6		
454.0 ± 0.4							
463.0 ± 0.3	23 ± 6						

E_0 (eV)	Γ (meV)	$g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$g\Gamma_n^0$ (meV)	$g\Gamma_n^1$ (meV)
477.0 $\pm$ 0.4		3.4 $\pm$ 0.4		0		0.16 $\pm$ 0.02	
485.4 $\pm$ 0.4		0.03 $\pm$ 0.03				0.001 $\pm$ 0.001	
486.2 $\pm$ 0.4		0.50 $\pm$ 0.05		1			13.8
498.93 $\pm$ 0.25		0.08 $\pm$ 0.04					2.1
518.28 $\pm$ 0.25	74 $\pm$ 6	50 $\pm$ 5		0	24 $\pm$ 2	2.20 $\pm$ 0.22	6.6
523.21 $\pm$ 0.26		0.27 $\pm$ 0.07		1			
532.3 $\pm$ 0.3		0.08 $\pm$ 0.04					
535.21 $\pm$ 0.25	67 $\pm$ 3	44 $\pm$ 2		0	24 $\pm$ 2	1.90 $\pm$ 0.09	2.2
542.34 $\pm$ 0.28		0.10 $\pm$ 0.03		1			
551.0 $\pm$ 0.3		0.087 $\pm$ 0.005					
556.00 $\pm$ 0.28		0.7 $\pm$ 0.2		0			
580.0 $\pm$ 0.3	62 $\pm$ 3	40 $\pm$ 2		0	24 $\pm$ 2	0.03 $\pm$ 0.01	
584.7 $\pm$ 0.3		0.15 $\pm$ 0.05				1.65 $\pm$ 0.08	
592.1 $\pm$ 0.3		0.05 $\pm$ 0.04					
594.9 $\pm$ 0.3	107 $\pm$ 6	85 $\pm$ 5		0	23 $\pm$ 2	0.0021 $\pm$ 0.0016	
606.1 $\pm$ 0.3		0.25 $\pm$ 0.08		1		3.49 $\pm$ 0.20	
619.8 $\pm$ 0.2	53 $\pm$ 3	30 $\pm$ 2		0	23 $\pm$ 2	1.21 $\pm$ 0.08	5.0
624.1 $\pm$ 0.3		0.8 $\pm$ 0.1		1			15.1
628.4 $\pm$ 0.4		5.4 $\pm$ 0.5		0	25 $\pm$ 3	0.22 $\pm$ 0.02	
661.0 $\pm$ 0.3	150 $\pm$ 8	125 $\pm$ 7		1		4.86 $\pm$ 0.27	4.3
668.4 $\pm$ 0.3		0.25 $\pm$ 0.08		1			11.6
677.0 $\pm$ 0.3		0.70 $\pm$ 0.20					
693.0 $\pm$ 0.3	65 $\pm$ 3	42 $\pm$ 2		0	23 $\pm$ 2	1.60 $\pm$ 0.07	
708.0 $\pm$ 0.3	45 $\pm$ 3	22.0 $\pm$ 2.0		0	23 $\pm$ 2	0.827 $\pm$ 0.075	
712.4 $\pm$ 0.3		0.25 $\pm$ 0.15		1			4.1
721.0 $\pm$ 0.3		1.3 $\pm$ 0.3		0		0.048 $\pm$ 0.011	
729.4 $\pm$ 0.4		0.70 $\pm$ 0.20		1			10.4
730.0 $\pm$ 0.3		0.70 $\pm$ 0.20		1			10.4
732.3 $\pm$ 0.3		1.3 $\pm$ 0.3					
743.1 $\pm$ 0.4		0.4 $\pm$ 0.1		0			5.8
756.0 $\pm$ 0.4		0.6 $\pm$ 0.2		1			8.5
765.0 $\pm$ 0.3	24 $\pm$ 2	7 $\pm$ 1		1	17 $\pm$ 2	0.25 $\pm$ 0.04	
779.1 $\pm$ 0.3		1.8 $\pm$ 0.2		0		0.065 $\pm$ 0.007	
790.9 $\pm$ 0.3		6.2 $\pm$ 0.4		0	15 $\pm$ 13	0.22 $\pm$ 0.01	
808.2 $\pm$ 0.4		0.40 $\pm$ 0.20					5.1
815.3 $\pm$ 0.4		0.20 $\pm$ 0.10		1			2.5
821.6 $\pm$ 0.4	84 $\pm$ 4	60 $\pm$ 3		0	24 $\pm$ 3	2.09 $\pm$ 0.11	
832.4 $\pm$ 0.4		0.25 $\pm$ 0.10		1			3.0
846.7 $\pm$ 0.4		0.7 $\pm$ 0.2		1	25 $\pm$ 3	1.89 $\pm$ 0.17	6.3
851.0 $\pm$ 0.4	80 $\pm$ 6	55 $\pm$ 5		0	23 $\pm$ 2		
856.2 $\pm$ 0.4	105 $\pm$ 7	82 $\pm$ 7		0		2.80 $\pm$ 0.24	

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E_0 (eV)	Γ (meV)	g^0_n (meV)	J	ℓ	Γ_γ (meV)	g^0_γ (meV)	g^1_γ (meV)
866.0 $\pm$ 0.4		5.5 $\pm$ 0.6		0		0.19 $\pm$ 0.02	
691.3 $\pm$ 0.4		0.8 $\pm$ 0.2		1			8.9
905.0 $\pm$ 0.4	73 $\pm$ 4	50 $\pm$ 3		0	23 $\pm$ 2	1.66 $\pm$ 0.10	
909.5 $\pm$ 0.4		1.3 $\pm$ 0.3		1			13.9
924.8 $\pm$ 0.4		10 $\pm$ 1		0		0.33 $\pm$ 0.03	3.0
932.4 $\pm$ 0.4		0.30 $\pm$ 0.20		1		4.57 $\pm$ 0.33	3.1
936.9 $\pm$ 0.4	164 $\pm$ 10	140 $\pm$ 10		0	24 $\pm$ 2		
940.1 $\pm$ 0.4		0.3 $\pm$ 0.2		1		6.46 $\pm$ 0.32	2.0
958.2 $\pm$ 0.4	222 $\pm$ 10	200 $\pm$ 10		0	22 $\pm$ 2		5.8
964.9 $\pm$ 0.4		0.20 $\pm$ 0.10		1			2.9
976.8 $\pm$ 0.4		0.6 $\pm$ 0.3		1			
985.6 $\pm$ 0.4		0.30 $\pm$ 0.20		1			
991.8 $\pm$ 0.4		370 $\pm$ 15		0		11.8 $\pm$ 0.5	
1011.0 $\pm$ 0.4		1.5 $\pm$ 0.6		0		0.047 $\pm$ 0.019	11.6
1014.4 $\pm$ 0.4		1.6 $\pm$ 0.5		1		0.28 $\pm$ 0.03	
1023.0 $\pm$ 0.4		9.0 $\pm$ 1.0		0		0.087 $\pm$ 0.022	8.8
1029.0 $\pm$ 0.5		2.8 $\pm$ 0.7		0			6.0
1033.0 $\pm$ 0.5		1.0 $\pm$ 0.6		1			
1054.0 $\pm$ 0.5	115 $\pm$ 10	90 $\pm$ 10		0	25 $\pm$ 2	2.77 $\pm$ 0.31	
1062.3 $\pm$ 0.5		0.7 $\pm$ 0.3		1			
1067.6 $\pm$ 0.4		0.3 $\pm$ 0.3		1			
1071.0 $\pm$ 0.5		0.3 $\pm$ 0.3		1			
1081.1 $\pm$ 0.5		1.0 $\pm$ 0.3		1			2.5
1094.6 $\pm$ 0.5		1.8 $\pm$ 0.5		1			14.6
1098.2 $\pm$ 0.5	39 $\pm$ 4	17 $\pm$ 3		0	22 $\pm$ 2	0.51 $\pm$ 0.09	12.0
1102.5 $\pm$ 0.5		1.5 $\pm$ 0.3		1			
1108.7 $\pm$ 0.5	54 $\pm$ 4	30 $\pm$ 3		0	24 $\pm$ 2	0.90 $\pm$ 0.09	
1131.4 $\pm$ 0.5		1.6 $\pm$ 0.4		0		0.048 $\pm$ 0.012	
1140.0 $\pm$ 0.5	244 $\pm$ 20	220 $\pm$ 20		0	24 $\pm$ 2	6.52 $\pm$ 0.59	2.3
1147.0 $\pm$ 0.5		0.30 $\pm$ 0.20		1			3.0
1154.8 $\pm$ 0.5		0.40 $\pm$ 0.20		1			
1167.0 $\pm$ 0.5	108 $\pm$ 6	85 $\pm$ 5		0	23 $\pm$ 2	2.49 $\pm$ 0.15	
1177.0 $\pm$ 0.5		65 $\pm$ 5		0	22 $\pm$ 2	1.90 $\pm$ 0.15	
1195.0 $\pm$ 0.5	111 $\pm$ 6	90 $\pm$ 5		0	21 $\pm$ 2	2.60 $\pm$ 0.15	
1210.7 $\pm$ 0.5		7.3 $\pm$ 0.7		1		0.21 $\pm$ 0.02	2.8
1217.9 $\pm$ 0.5		0.40 $\pm$ 0.20		1			2.8
1237.9 $\pm$ 0.5		0.40 $\pm$ 0.20		0	24 $\pm$ 2	7.37 $\pm$ 0.57	
1245.0 $\pm$ 0.5		260 $\pm$ 20		0			1.4
1256.5 $\pm$ 0.5		0.20 $\pm$ 0.20		1			
1267.0 $\pm$ 0.6	45 $\pm$ 3	24 $\pm$ 2		0	21 $\pm$ 2	0.67 $\pm$ 0.06	
1273.0 $\pm$ 0.6	52 $\pm$ 3	28 $\pm$ 2		0	24 $\pm$ 2	0.78 $\pm$ 0.06	

E_0 (eV)	Γ (meV)	g_{π}^0 (meV)	J	ℓ	Γ_{γ} (meV)	g_{π}^0 (meV)	g_{π}^1 (meV)
1298.3 $\pm$ 0.6		3.7 $\pm$ 0.8		0		0.10 $\pm$ 0.02	
1317.0 $\pm$ 0.6		4.0 $\pm$ 0.7		0		0.11 $\pm$ 0.02	
1332.0 $\pm$ 0.6		1.3 $\pm$ 0.2		0		0.036 $\pm$ 0.006	
1363.4 $\pm$ 0.6		1.1 $\pm$ 0.4		0		0.030 $\pm$ 0.011	
1371.6 $\pm$ 0.6		0.6 $\pm$ 0.4		1			3.5
1381.6 $\pm$ 0.6		0.6 $\pm$ 0.4		1			3.5
1393.0 $\pm$ 0.6				0			
1405.0 $\pm$ 0.3	217 $\pm$ 10	190 $\pm$ 10		0	27 $\pm$ 3	5.09 $\pm$ 0.27	
1410.5 $\pm$ 0.3	95 $\pm$ 6	70 $\pm$ 6		0	25 $\pm$ 2	1.87 $\pm$ 0.16	
1416.6 $\pm$ 0.3		0.4 $\pm$ 0.3		1			2.3
1419.5 $\pm$ 0.3		1.8 $\pm$ 0.5					
1427.4 $\pm$ 0.4	54 $\pm$ 4	9 $\pm$ 1		0		0.046 $\pm$ 0.013	
1443.7 $\pm$ 0.4	38 $\pm$ 4	29 $\pm$ 3		0	25 $\pm$ 3	0.24 $\pm$ 0.03	
1473.5 $\pm$ 0.4	151 $\pm$ 10	16 $\pm$ 2		0	22 $\pm$ 3	0.77 $\pm$ 0.08	
1522.5 $\pm$ 0.4	267 $\pm$ 16	125 $\pm$ 10		0	26 $\pm$ 3	0.42 $\pm$ 0.05	
1532.3 $\pm$ 0.4		240 $\pm$ 15		0	27 $\pm$ 7	3.93 $\pm$ 0.26	
1546.0 $\pm$ 0.4		0.40 $\pm$ 0.40				6.15 $\pm$ 0.38	
1550.0 $\pm$ 0.4		2.4 $\pm$ 1.2				0.010 $\pm$ 0.010	
1565.4 $\pm$ 0.4		1.2 $\pm$ 0.4				0.61 $\pm$ 0.03	
1588.0 $\pm$ 0.5	375 $\pm$ 25	355 $\pm$ 25		0	20 $\pm$ 4	0.031 $\pm$ 0.010	
1622.6 $\pm$ 0.5	104 $\pm$ 15	85 $\pm$ 15		0	19 $\pm$ 3	0.14 $\pm$ 0.03	
1638.0 $\pm$ 0.5	74 $\pm$ 6	55 $\pm$ 5		0	19 $\pm$ 3	6.88 $\pm$ 0.62	
1646.1 $\pm$ 0.5		1.0 $\pm$ 0.5		1	1.36 $\pm$ 0.12	2.11 $\pm$ 0.37	
1662.0 $\pm$ 0.5	194 $\pm$ 20	170 $\pm$ 20		0	24 $\pm$ 4	4.17 $\pm$ 0.49	4.4
1688.0 $\pm$ 0.5	114 $\pm$ 9	95 $\pm$ 9		0	19 $\pm$ 3	2.31 $\pm$ 0.22	
1709.0 $\pm$ 0.5	111 $\pm$ 10	85 $\pm$ 8		0	26 $\pm$ 5	2.06 $\pm$ 0.19	
1722.5 $\pm$ 0.5	36 $\pm$ 6	15 $\pm$ 2		0	21 $\pm$ 6	0.36 $\pm$ 0.05	
1744.5 $\pm$ 0.5		1.8 $\pm$ 0.4				0.043 $\pm$ 0.010	
1755.5 $\pm$ 0.5	140 $\pm$ 15	115 $\pm$ 15		0	25 $\pm$ 4	2.75 $\pm$ 0.36	
1782.6 $\pm$ 0.5		670 $\pm$ 70		0		15.87 $\pm$ 1.66	
1797.5 $\pm$ 0.5		2.5 $\pm$ 0.7		0		0.059 $\pm$ 0.017	
1808.4 $\pm$ 0.5	32 $\pm$ 6	15 $\pm$ 2		0	17 $\pm$ 5	0.35 $\pm$ 0.05	
1845.5 $\pm$ 0.5	26 $\pm$ 5	11.0 $\pm$ 1.5		0	15 $\pm$ 5	0.26 $\pm$ 0.03	
1868.0 $\pm$ 0.5		3.9 $\pm$ 2.2				0.090 $\pm$ 0.031	
1902.4 $\pm$ 0.5	56 $\pm$ 6	37 $\pm$ 4		0	19 $\pm$ 4	0.85 $\pm$ 0.09	
1912.6 $\pm$ 0.4		0.5 $\pm$ 0.3		1			1.8
1916.5 $\pm$ 0.5	44 $\pm$ 6	25 $\pm$ 3		0	19 $\pm$ 5	0.57 $\pm$ 0.07	
1953.4 $\pm$ 0.5		3.5 $\pm$ 0.5		0		0.079 $\pm$ 0.011	
1968.6 $\pm$ 0.5	695 $\pm$ 100	670 $\pm$ 100		0	25 $\pm$ 5	15.1 $\pm$ 2.3	
1974.3 $\pm$ 0.5		500 $\pm$ 40		0		11.25 $\pm$ 0.90	
2022.8 $\pm$ 0.5	220 $\pm$ 20	200 $\pm$ 20		0	20 $\pm$ 4	4.47 $\pm$ 0.45	

E_α (eV)	Γ (meV)	g_{α}^{th} (meV)	J	ℓ	Γ_γ (meV)	g_{α}^{th} (meV)	g_{α}^{th} (meV)
2029.8 ± 0.6	73 ± 7	55		0	18 ± 5	1.22 ± 0.11	
2070.9 ± 0.6		0.32				0.007 ± 0.004	
2088.1 ± 0.6	45 ± 6	23		0	22 ± 4	0.50 ± 0.09	
2095.9 ± 0.6		18		0		0.39 ± 0.1	
2123.8 ± 0.6		3.2		0		0.069 ± 0.030	
2144.6 ± 0.6	81 ± 8	66		0	15 ± 5	1.93 ± 0.13	
2152.2 ± 0.6	282 ± 22	250		0	32 ± 8	5.39 ± 0.43	
2175.2 ± 0.6		1.5		1			4.4
2186.0 ± 0.6	629 ± 40	600		0	29 ± 7	12.83 ± 0.86	
2200.6 ± 0.6	139 ± 11	113		0	26 ± 5	2.41 ± 0.21	
2235.1 ± 0.6		4.7		0		0.099 ± 0.021	
2258.8 ± 0.6		100		0		2.10 ± 0.21	
2265.9 ± 0.7	240 ± 20	225		0	20 ± 5	4.73 ± 0.42	
2281.7 ± 0.7	173 ± 20	155		0	18 ± 5	3.25 ± 0.42	
2288.9 ± 0.7		0.9		1			2.4
2314.5 ± 0.7		20		0		0.42 ± 0.56	
2336.9 ± 0.7		9		0		0.19 ± 0.02	
2352.8 ± 0.7	75 ± 11	47		0	28 ± 5	0.97 ± 0.21	
2355.3 ± 0.7	85 ± 11	61		0	24 ± 5	1.26 ± 0.21	
2381.4 ± 0.7		28		0		0.57 ± 0.04	
2410.8 ± 0.7		4.3		0		0.088 ± 0.012	
2425.7 ± 0.7		145		0		2.94 ± 0.31	
2445.5 ± 0.7		200		0		4.04 ± 0.30	
2454.8 ± 0.7		17		0		0.34 ± 0.04	
2488.4 ± 0.7		95		0		1.90 ± 0.18	
2520.7 ± 0.8		11		0		0.22 ± 0.06	
2547.2 ± 0.8		600		0		11.89 ± 1.98	
2558.5 ± 0.8		230		0		4.55 ± 0.59	
2579.9 ± 0.8		370		0		7.28 ± 0.59	
2596.5 ± 0.8		760		0			
2619.1 ± 0.8		48		0		0.94 ± 0.10	
2631.7 ± 0.8		2.1		0		0.041 ± 0.020	
2671.3 ± 0.9		270		0		5.22 ± 0.39	
2695.6 ± 0.9		23		0		0.44 ± 0.08	
2716.5 ± 0.9		150		0		2.86 ± 0.38	
2728.4 ± 0.9		2.1		0		0.040 ± 0.040	
2749.7 ± 0.9		42		0		0.80 ± 0.80	
2761.6 ± 0.9		20		0		0.38 ± 0.06	
2786.0 ± 0.9		12		0		0.23 ± 0.06	
2788.1 ± 0.8		2.0		0		0.038 ± 0.019	
2805.4 ± 0.9		4.2		0		0.079 ± 0.040	

E_0 (eV)	Γ (meV)	g_n^0 (meV)	J	ℓ	Γ_γ (meV)	g_n^0 (meV)	g_n^1 (meV)
2828.4 $\pm$ 0.9	18	$\pm$ 4		0		0.34	$\pm$ 0.08
2864.1 $\pm$ 0.9	200	$\pm$ 30		0		3.74	$\pm$ 0.56
2881.8 $\pm$ 0.9	550	$\pm$ 40		0		10.25	$\pm$ 0.75
2896.3 $\pm$ 0.9	13	$\pm$ 6		0		0.24	$\pm$ 0.11
2907.1 $\pm$ 0.8	1.5	$\pm$ 1.5		1			2.9
2922.1 $\pm$ 0.8	6.0	$\pm$ 1.0		1			7.5
2933.9 $\pm$ 1.0	32	$\pm$ 4		0		0.59	$\pm$ 0.07
2855.7 $\pm$ 1.0	20	$\pm$ 4		0		0.37	$\pm$ 0.07
2865.8 $\pm$ 1.0	3.4	$\pm$ 1.6		0		0.062	$\pm$ 0.029
2886.3 $\pm$ 1.0	5.5	$\pm$ 2.1		0		0.10	$\pm$ 0.04
3002.4 $\pm$ 1.0	125	$\pm$ 15		0		2.28	$\pm$ 0.27
3015.1 $\pm$ 1.0	1.7	$\pm$ 1.1		0		0.031	$\pm$ 0.020
3027.8 $\pm$ 1.0	140	$\pm$ 15		0		2.54	$\pm$ 0.27
3042.5 $\pm$ 1.0	2.2	$\pm$ 1.1		0		0.040	$\pm$ 0.020
3058.1 $\pm$ 1.0	30	$\pm$ 2		0		0.54	$\pm$ 0.04
3108.8 $\pm$ 1.0	210	$\pm$ 15		0		3.77	$\pm$ 0.27
3132.6 $\pm$ 1.0	7.0	$\pm$ 1.0		0		0.13	$\pm$ 0.02
3148.1 $\pm$ 1.1	90	$\pm$ 20		0		1.60	$\pm$ 0.36
3168.5 $\pm$ 1.1	8	$\pm$ 3		0		0.14	$\pm$ 0.05
3177.8 $\pm$ 1.1	80	$\pm$ 10		0		1.42	$\pm$ 0.18
3188.1 $\pm$ 1.1	90	$\pm$ 10		0		1.59	$\pm$ 0.18
3204.9 $\pm$ 1.1	80	$\pm$ 10		0		1.41	$\pm$ 0.18
3217.0 $\pm$ 1.1	8	$\pm$ 4		0		0.14	$\pm$ 0.07
3224.9 $\pm$ 1.1	28	$\pm$ 8		0		0.49	$\pm$ 0.14
3248.1 $\pm$ 1.1	25	$\pm$ 4		0		0.44	$\pm$ 0.07
3272.0 $\pm$ 1.1	4.0	$\pm$ 2.0		0		0.070	$\pm$ 0.035
3278.2 $\pm$ 1.1	250	$\pm$ 30		0		4.37	$\pm$ 0.52
3295.2 $\pm$ 1.1	4.6	$\pm$ 1.7		0		0.08	$\pm$ 0.03
3310.3 $\pm$ 1.1	135	$\pm$ 15		0		2.35	$\pm$ 0.26
3320.2 $\pm$ 1.2	120	$\pm$ 15		0		2.08	$\pm$ 0.26
3332.9 $\pm$ 1.2	80	$\pm$ 15		0		1.39	$\pm$ 0.26
3355.1 $\pm$ 1.2	120	$\pm$ 15		0		2.07	$\pm$ 0.26
3388.3 $\pm$ 1.2	14.5	$\pm$ 4.1		0		0.249	$\pm$ 0.070
3407.9 $\pm$ 1.2	200	$\pm$ 20		0		3.43	$\pm$ 0.34
3417.7 $\pm$ 1.2	4.1	$\pm$ 2.9		0		0.070	$\pm$ 0.050
3435.3 $\pm$ 1.2	360	$\pm$ 20		0		6.14	$\pm$ 0.34
3456.3 $\pm$ 1.3	610	$\pm$ 50		0		10.38	$\pm$ 0.85
3484.3 $\pm$ 1.3	102	$\pm$ 10		0		1.73	$\pm$ 0.17
3493.3 $\pm$ 1.3	9.6	$\pm$ 2.0		0		0.16	$\pm$ 0.03
3526.4 $\pm$ 1.3	4.0	$\pm$ 3.0		0		0.067	$\pm$ 0.051
3560.5 $\pm$ 1.3	235	$\pm$ 20		0		3.94	$\pm$ 0.34

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E_0 (eV)	Γ (meV)	$g_{\Gamma_n}^0$ (meV)	J	ℓ	Γ_γ (meV)	$g_{\Gamma_n}^0$ (meV)	$g_{\Gamma_n}^1$ (meV)
3572.7 $\pm$ 1.3		370		0		6.19 $\pm$ 0.67	
3593.3 $\pm$ 1.3		48	$\pm$ 40	0		0.80 $\pm$ 0.08	
3621.8 $\pm$ 1.3		9.0	$\pm$ 5	0		0.15 $\pm$ 0.07	
3628.3 $\pm$ 1.4		480	$\pm$ 50	0		7.97 $\pm$ 0.83	
3671.8 $\pm$ 1.4		7.9	$\pm$ 4.9	0		0.13 $\pm$ 0.08	
3692.0 $\pm$ 1.4		360	$\pm$ 40	0		5.92 $\pm$ 0.66	
3715.5 $\pm$ 1.4		86	$\pm$ 25	0		1.41 $\pm$ 0.41	
3733.0 $\pm$ 1.4		200	$\pm$ 20	0		3.27 $\pm$ 0.33	
3763.6 $\pm$ 1.5		85	$\pm$ 10	0		1.39 $\pm$ 0.16	
3780.8 $\pm$ 1.5		400	$\pm$ 50	0		6.51 $\pm$ 0.81	
3830.3 $\pm$ 1.5		9	$\pm$ 3	0		0.15 $\pm$ 0.05	
3856.4 $\pm$ 1.5		520	$\pm$ 30	0		8.37 $\pm$ 0.48	
3872.1 $\pm$ 1.5		185	$\pm$ 15	0		2.87 $\pm$ 0.24	
3901.3 $\pm$ 1.5		300	$\pm$ 30	0		4.80 $\pm$ 0.48	
3913.4 $\pm$ 1.5		100	$\pm$ 10	0		1.60 $\pm$ 0.16	
3939.0 $\pm$ 1.5		170	$\pm$ 50	0			
3953.9 $\pm$ 1.5		120	$\pm$ 15	0		1.91 $\pm$ 0.24	
4040.4 $\pm$ 1.5		63	$\pm$ 10	0		0.99 $\pm$ 0.16	
4063.0 $\pm$ 1.5		20	$\pm$ 8	0		0.31 $\pm$ 0.13	
4089.4 $\pm$ 1.6		87	$\pm$ 10	0		1.36 $\pm$ 0.16	
4124.0 $\pm$ 1.6		33	$\pm$ 8	0		0.51 $\pm$ 0.13	
4167.8 $\pm$ 1.6		160	$\pm$ 20	0		2.48 $\pm$ 0.31	
4178.2 $\pm$ 1.7		35	$\pm$ 9	0		0.54 $\pm$ 0.14	
4209.4 $\pm$ 1.7		47	$\pm$ 9	0		0.72 $\pm$ 0.14	
4257.7 $\pm$ 1.7		23	$\pm$ 7	0		0.35 $\pm$ 0.11	
4289.0 $\pm$ 1.7		136	$\pm$ 15	0		2.07 $\pm$ 0.23	
4323.9 $\pm$ 1.7		82	$\pm$ 20	0		1.25 $\pm$ 0.30	
4333.2 $\pm$ 1.8		3.3	$\pm$ 2.0	0		0.050 $\pm$ 0.030	
4375.6 $\pm$ 1.6		145	$\pm$ 15	0		2.19 $\pm$ 0.23	
4435.0 $\pm$ 1.8		105	$\pm$ 10	0		1.58 $\pm$ 0.15	
4487.2 $\pm$ 1.8		4	$\pm$ 2	0		0.06 $\pm$ 0.03	
4510.3 $\pm$ 1.8		550	$\pm$ 50	0		8.19 $\pm$ 0.75	
4542.0 $\pm$ 1.8		87	$\pm$ 12	0		1.29 $\pm$ 0.18	
4567.2 $\pm$ 1.8		38	$\pm$ 8	0		1.78 $\pm$ 0.37	
4592.7 $\pm$ 1.9		24	$\pm$ 7	0		0.35 $\pm$ 0.10	
4615.9 $\pm$ 1.9		10	$\pm$ 6	0		0.15 $\pm$ 0.09	
4630.4 $\pm$ 1.9		20	$\pm$ 7	0		0.29 $\pm$ 0.10	
4661.7 $\pm$ 1.9		155	$\pm$ 40			2.27 $\pm$ 0.59	
4695.0 $\pm$ 1.9		13	$\pm$ 6			0.19 $\pm$ 0.09	
4705.5 $\pm$ 1.9		400	$\pm$ 60			5.83 $\pm$ 0.87	
4725.9 $\pm$ 1.9		17	$\pm$ 6			0.25 $\pm$ 0.08	

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E ₀ (eV)	Γ (meV)	g _n ^a (meV)	J	ℓ	Γ _γ (meV)	g _γ ² (meV)	g _γ ¹ (meV)
4764.0 ±2.0		17	± 6			0.25	±0.03
4784.0 ±2.0		8	± 4			0.12	±0.06
4798.0 ±2.0		165	± 35			2.30	±0.50
4835.0 ±2.0		10	± 5			0.14	±0.07
4859.0 ±2.0		200	± 30			2.87	±0.43
4888.0 ±2.0		90	± 15			1.29	±0.21
4908.0 ±2.0		105	± 15			1.50	±0.15
4921.0 ±2.0		160	± 20			2.28	±0.29
4955.0 ±2.0		145	± 20			2.06	±0.28
4972.0 ±2.0		50	± 15			0.71	±0.21
5005.0 ±2.0		30	± 10			0.42	±0.14
5035 ±3		299	± 40			4.21	±0.56
5066 ±3		51	± 15			0.71	±0.21
5118 ±3		156	± 16			2.18	±0.22
5259 ±3		165	± 55			2.55	±0.76
5310 ±3		9.3	± 8.0			0.13	±0.11
5346 ±3		160	± 30			2.19	±0.41
5352 ±4		160	± 30			2.19	±0.41
5419 ±4		56	± 10			0.75	±0.14
5465 ±4		550	± 90			7.42	±1.21
5530 ±4		30	± 6			0.40	±0.08
5551 ±4		133	± 30			1.78	±0.40
5580 ±4		38	± 16			0.51	±0.21
5637 ±4		465	± 55			6.19	±0.73
5650 ±4		485	± 50			6.44	±0.66
5675 ±5		222	± 60			2.94	±0.80
5682 ±5		222	± 60			2.94	±0.80
5756 ±5		123	± 15			1.70	±0.20

^a Subthreshold fission widths of the 721.0 and 1210.7 eV resonances are 1.2 ± 0.3 and 1.2 ± 0.3 meV respectively for an assumed radiation width of 23 meV

Note - Single-level Breit-Wigner parameters.

$^{239}_{92}\text{U}$
(23.5 min)

THERMAL CROSS SECTIONS

$\sigma_f = 22 \pm 5 \text{ b}$
 $\sigma_a = 19 \pm 3 \text{ b}$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
U^{230}	σ_f	CC-3699,6(46)	Bentley
U^{231}	σ_f	CC-3699,6(46)	Bentley
U^{232}	σ, σ_f	71CANT,161(71)	Cabell
U^{232}	ν_p	NP/A,145,1(70)	Jaffey
U^{232}	σ_c	NSE,29,415(67)	Simpson
U^{232}	mass spectrometry,RI	NSE,21,257(65)	Halperin
U^{232}	pile osci.	CEA-R-2486(64)	Vidal
U^{232}	σ_c	ANS,6,44(63)+	Berneth
U^{232}	σ_f	PRIVATE COMM.(61)	Hulet
U^{232}	ν_p	ANL-6600,124(61)+	Jaffey
U^{232}	σ_f chemical separation	PR,89,329(53)	Elson
U^{232}	σ_f	TID-5223,2,590(52)	VanWinkle
U^{232}	σ_f	CS-3471,2(46)	Seaborg
U^{233}	σ_f	JIN,33,3972(71)	Cabell
U^{233}	delayed neutrons	NSE,44,173(71)	Conant
U^{233}	l_f, l_f	NSE,44,180(71)	Eiland
U^{233}	η reactivity	NSE,44,266(71)	Magnuson
U^{233}	ν_p	JNE,25,321(71)	Walsh
U^{233}	l_f	AE,28,359(70)	Bak
U^{233}	ν_p	THE515(70)	Boldeman
U^{233}	σ_f, σ_c	70HELSINKI,1,287(70)	Lounsbury
U^{233}	σ_f, η pile osci.	70HELSINKI,1,295(70)	Vidal
U^{233}	σ_f	JNE,22,477(68)	Keith
U^{233}	η analysis	NSE,34,263(68)	Staub
U^{233}	l_f, l_f	NSE,29,1(67)	Conway
U^{233}	ν_{sp}	AAEC/E-172(67)	Boldeman
U^{233}	α	66PARIS,2,3(66)	Cabell
U^{233}	ν	PR,152,1046(66)	Fultz
U^{233}	η	100-17083(66)	Smith
U^{233}	η	66WASH,2,919(66)	Smith
U^{233}	ν	65SALZBURG,2,25(65)	Colvin
U^{233}	l_f	NSE,22,121(65)	Hardy
U^{233}	ν_p	NF,66,149(65)	Mather
U^{233}	l_f	NST,2,52(65)	Yasuno
U^{233}	σ_f	CRRP-1183(64)	Bigham
U^{233}	α mass spectrometry	AECL-2148(64)	Okazaki
U^{233}	l_f, l_f	ANS,7,272(64)	Esch
U^{233}	ν_p	NP,48,433(63)	Hopkins
U^{233}	α mass spectrometry	JNE,16,195(62)	Cabell
U^{233}	η reactivity	NSE,12,359(62)	Gwin
U^{233}	η critical concentration	NSE,12,364(62)	Gwin
U^{233}	mass spectrometry,RI	ORNL-3176,1(61)	Halperin
U^{233}	σ_c	NSE,8,112(60)	Block
U^{233}	η Mn bath	NSE,8,210(60)	Macklin
U^{233}	σ_c	60VIENNA,203(60)	Safford
U^{233}	σ_c	PR,118,799(60)	Safford

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
U ²³³	σ_t	NSE, 7, 187(60)	Siampson
U ²³³	ν_p	NSE, 5, 49(59)	DeSaussure
U ²³³	η pile osci.	NSE, 5, 225(59)	Muehlhause
U ²³³	σ_f	AERE-R-2998, 17(59)	Raffle
U ²³³	ratio	PR, 113, 1589(59)	Ragier
U ²³³	σ_f	S8GENEVA, 16, 125(58)	Bigham
U ²³³	l_1	S8GENEVA, 16, 233(58)	Campbell
U ²³³	α cross section ratio	JNE, 6, 285(58)	Cocking
U ²³³	ν_p	S8GENEVA, 16, 121(58)	Colvin
U ²³³	η reactivity	NSE, 3, 758(58)	Gaerttner
U ²³³	η	AERE-R/R-2457(58)	Rose
U ²³³	pile osci.	JNE, 4, 403(57)	Green
U ²³³	η pile osci.	AERE-MP/R-2140(57)-	Littler
U ²³³	η analysis	NSE, 2, 253(57)	Francis
U ²³³	delayed neutron	PR, 107, 1044(57)	Keepin
U ²³³	ν	PR, 101, 1012(56)	Diven
U ²³³	delayed neutrons	JNE, 6, 1(57)	Keepin
U ²³³	σ_t	JNE, 3, 28(56)	Pattenden
U ²³³	ν_p	JNE, 2, 247(56)	Sanders
U ²³³	η critical concentration	NSE, 1, 20(56)	Thomas
U ²³³	η reactivity	SSGENEVA, 4, 301(55)	Alichanov
U ²³³	σ_f	SSGENEVA, 4, 235(55)	Auclair
U ²³³	σ_f	CR, 240, 2306(55)	Auclair
U ²³³	σ_f	JNE, 1, 286(55)	Popovic
U ²³³	ν	SSGENEVA, 4, 301(55)	Alichanov
U ²³³	η	SSGENEVA, 4, 34(55)	Rose
U ²³³	ν	SSGENEVA, 4, 295(55)	Spivak
U ²³³	ν_p	SSMOSCOV, 131(55)	Kalashnikova
U ²³³	ν_p	SSMOSCOV, 123(55)	Kalashnikova
U ²³³	destruction	SSGENEVA, 4, 230(55)	Kukavadse
U ²³³	mass spectrometry	SSGENEVA, 4, 230(55)	Kukavadse
U ²³³	α mass spectrometry	SSGENEVA, 4, 230(55)	Kukavadse
U ²³³	σ_t	SSGENEVA, 4, 210(55)	Lynn
U ²³³	η reactivity	KAPL-1464(55)	McMillan
U ²³³	ν_p	KAPL-1464(55)	McMillan
U ²³³	σ_t	SSGENEVA, 4, 224(55)	Nikitin
U ²³³	ν	SSGENEVA, 4, 295(55)	Spivak
U ²³³	η neutron density	SSGENEVA, 4, 295(55)	Spivak
U ²³³	absorption, U ²³³ /B	SSGENEVA, 4, 295(55)	Spivak
U ²³³	σ_f	CRGP-458(51)	Tunncliffe
U ²³³	α mass spectrometry	ANL-4515, 15(50)	Inghram
U ²³³	σ_f	ANL-4515, 15(50)	Inghram
U ²³³	η pile osci.	CRP-378(48)	Cruikshank
U ²³³	η pile osci.	CF-3651(46)	Zinn
U ²³³	σ_f	CF-3651(46)	Zinn
U ²³⁴	mass spectrometry	AERE-R-6761(71)	Cabell
U ²³⁴	σ_γ	70HELSINKI, 1, 287(70)	Lounsbury
U ²³⁴	σ_t	NSE, 8, 112(60)	Block

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
U^{235}	pile osci.	58GENEVA,16,64(58)	Halperin
U^{235}	σ_c	JNE,6,181(58)	McCallum
U^{235}	depletion	AECL-447,33(57)	Hurst
U^{235}	mass spectrometry	55GENEVA,4,105(55)	Inghraa
U^{235}	pile osci.	ORNL-CF-52-4-15(52)	Pomerance
U^{235}	pile osci.	ORNL-CF51-12-151(51)	Pomerance
U^{235}	mass spectrometry	ANL-4515,15(50)	Inghraa
U^{235}	σ_f	ORNL-S1(48)	Shapiro
U^{235}	σ_f	PRIVATE COMM.(72)	Borcea
U^{235}	isomer production	YF,14,685(71)	Belov
U^{235}	delayed neutrons	NSE,44,173(71)	Conant
U^{235}	$I_\beta I_\gamma$	NSE,44,180(71)	Eiland
U^{235}	η reactivity	NSE,44,286(71)	Hagnusen
U^{235}	I_f	AE,28,359(70)	Bak
U^{235}	ν_p	THESIS(70)	Boldeman
U^{235}	$\bar{\sigma}_s$	70HELSINKI,1,461(70)	Ceulemans
U^{235}	σ_f	70HELSINKI,1,117(70)	Deruytter
U^{235}	σ_{σ_f}	70HELSINKI,1,287(70)	Lounsbury
U^{235}	$\sigma_s \sigma_f I_\beta$ production rate	68WASH,2,1271(68)	Henneley
U^{235}	σ_f	JNE,22,477(68)	Keith
U^{235}	η analysis	NSE,34,263(68)	Staub
U^{235}	ν_p	AREC/E-172(67)	Boldeman
U^{235}	$I_\gamma I_f$	NSE,29,1(67)	Conway
U^{235}	$\bar{\sigma}_s$	PRIVATE COMM.(67)	Poortmans
U^{235}	α	66PARIS,2,3(66)	Cabell
U^{235}	ν	66PARIS,1,307(66)	Colvin
U^{235}	ν	ANL-7210,21(66)	DeVolpi
U^{235}	αI_γ	66PARIS,2,17(66)	Durham
U^{235}	ν_{sp}	JNE,20,549(66)	Fieldhouse
U^{235}	ν	PR,152,1046(66)	Fultz
U^{235}	I_f	NUK,8,1(66)	Hellstrand
U^{235}	$\eta \alpha$	66WASH,2,919(66)	Smith
U^{235}	η	100-17083(66)	Smith
U^{235}	σ_f	65SALZBURG,1,255(65)	Frayssé
U^{235}	I_f	AE-181(65)	Hellstrand
U^{235}	σ_f	CRRP-1183(64)	Bigham
U^{235}	ν_p	PRIVATE COMM.(64)	Colvin
U^{235}	σ_f	64GENEVA,2,366(64)-	Maslin
U^{235}	ν_p	PR/B,133,1403(64)	Mather
U^{235}	α mass spectrometry	AECL-1965(64)	Okazaki
U^{235}	σ_f	DP-817(63)	Baumann
U^{235}	RI	PRIVATE COMM.(63)	Bigham
U^{235}	ν_p	NP,48,433(63)	Hopkins
U^{235}	diffraction	PR5/A,274,122(63)	Willis
U^{235}	α mass spectrometry	JIN,24,1493(62)	Cabell
U^{235}	$\sigma_c \bar{\sigma}_s$	AE,13,368(62)	Gerasimov
U^{235}	η critical concentration	NSE,12,364(62)	Gvin
U^{235}	α mass spectrometry	PR-P-53,6(62)	Hanna

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
^{235}U	η/ν	NEU, TOF, METH, 131(61)	Brooks
^{235}U	σ_f	JNE, 15, 165(61)	Deruytter
^{235}U	σ_f	NSE, 9, 341(61)	Hardy
^{235}U	σ_t	NSE, 11, 312(61)	Saplaoglu
^{235}U	σ_t	NSE, 8, 112(60)	Block
^{235}U	η Mn bath activation	NSE, 8, 210(60)	Macklin
^{235}U	σ_t	60VIENNA, 203(60)	Safford
^{235}U	σ_t	NSE, 7, 187(60)	Simpson
^{235}U	$\bar{\sigma}_s$ analysis	PR, 118, 724(60)	Vogt
^{235}U	π pile osci.	NSE, 5, 225(59)	Muehlhause
^{235}U	σ_f	AERE-R-2998, 9(59)	Raffle
^{235}U	$\sigma_t \sigma_f$ ratio	PR, 113, 1285(59)	Safford
^{235}U	$\sigma_t \bar{\sigma}_s$	NSE, 6, 433(59)	Safford
^{235}U	$\sigma_t \sigma_f$	PR, 113, 1285(59)	Safford
^{235}U	$\sigma_t \bar{\sigma}_s$	NUC, 17, (11), 134(59)	Safford
^{235}U	σ_t	NSE, 6, 433(59)	Safford
^{235}U	σ_f	58GENEVA, 16, 125(58)	Bigham
^{235}U	l_f	58GENEVA, 16, 233(58)	Campbell
^{235}U	$\sigma_t \sigma_f$ ratio	JNE, 6, 285(58)	Cocking
^{235}U	ν_p	58GENEVA, 16, 121(58)	Colvin
^{235}U	α mass spectrometry	58GENEVA, 16, 83(58)	Craig
^{235}U	$\bar{\sigma}_s$	PR, 109, 1641(58)	Foote
^{235}U	ν_p	AERE-R/R-2212(58)	Kenward
^{235}U	η	AERE-R/R-2457(58)	Rose
^{235}U	σ_f	58GENEVA, 16, 103(58)	Saplaoglu
^{235}U	$\bar{\sigma}_s$ analysis	PR, 112, 203(58)	Vogt
^{235}U	σ_t	AERE-NP/R-2104(57)	Egelstaff
^{235}U	delayed neutrons	JNE, 6, 1(57)	Keepin
^{235}U	delayed neutrons	PR, 107, 1044(57)	Keepin
^{235}U	σ_t	HW-33384, 33(57)	Leonard
^{235}U	η pile osci.	AERE-NP/R-2140(57)-	Littler
^{235}U	σ_f	HW-47012, 50(56)	Friesen
^{235}U	σ_f	HW-44525, 34(56)	Friesen
^{235}U	σ_f	BAP, 1, 249(56)	Friesen
^{235}U	η reactivity coefficient	55GENEVA, 4, 301(55)	Alichanov
^{235}U	σ_f	AECD-4167(55)	Clayton
^{235}U	σ_t	JNE, 1, 92(55)	Egelstaff
^{235}U	σ_t	55GENEVA, 4, 210(55)-	Egelstaff
^{235}U	η pile osci.	55GENEVA, 4, 307(55)	Egelstaff
^{235}U	ν_p	55MOSCOW, 131(55)	Kalashnikova
^{235}U	α mass spectrometry	55GENEVA, 4, 315(55)	Kanne
^{235}U	σ_f	55GENEVA, 4, 210(55)	Lynn
^{235}U	$\bar{\sigma}_s$	55GENEVA, 4, 199(55)-	Melkonian
^{235}U	σ_t	55GENEVA, 4, 224(55)	Nikitin
^{235}U	absorption	55GENEVA, 4, 295(55)	Spivak
^{235}U	η neutron density	55GENEVA, 4, 295(55)	Spivak
^{235}U	α mass spectrometry	TID-2019, 405(55)	Tingey
^{235}U	σ_t	JNE, 1, 92(54)	Egelstaff
^{235}U	σ_t	PR, 94, 1086(54)	Palevsky
^{235}U	σ_t	CU-115(53)	Melkonian

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
U ²³⁵	$\bar{\sigma}_f$	ANL-4680,5(51)	Hibdon
U ²³⁵	RI	LA-512(46)	Williams
U ²³⁵	α mass spectrometry	LA-512(46)	Williams
U ²³⁵	π pile osci.	CF-3651(46)	Zinn
U ²³⁵	$\pi\nu_p$	LA-102(44)	Snyder
U ²³⁶	mass spectrometry	AERE-R-6761(71)	Cabell
U ²³⁶	ν_{sp}	JNE,25,331(71)	Conde
U ²³⁶	σ_f	NP/A,141,577(70)	Carlson
U ²³⁶	RI activation	BAP,14,497(69)	Schuman
U ²³⁶	reduction rate	68WASH,2,1271(68)	Henneley
U ²³⁶	activation	NSE,32,265(68)	Baumann
U ²³⁶	activation	PRIVATE COMM.(62)	Berreth
U ²³⁶	activation	JNE,7,81(58)	Cabell
U ²³⁶	activation	58GENEVA,16,64(58)	Halperin
U ²³⁶	activation	NSE,3,395(58)	Halperin
U ²³⁶	σ_t	JNE,6,181(58)	McCallum
U ²³⁶	activation	JPR,17,564(56)	Charon
U ²³⁶	activation	AE,1,(5),130(56)	Efimov
U ²³⁶	activation	55GENEVA,4,235(55)	Auclair
U ²³⁶	activation	ANL-4873,9(52)	Huizenga
U ²³⁶	pile osci.	ORNL-CF51-12-151(51)	Pomerance
U ²³⁷	production rates	68WASH,2,1271(68)	Henneley
U ²³⁷	σ_f	PRIVATE COMM.(68)	Barr
U ²³⁷	σ_a	NSE,31,149(68)	Cornman
U ²³⁷	chemical separation	ANS,10,230(67)	Cornman
U ²³⁷	mass spectrometry	ORNL-3994,1(66)	Halperin
U ²³⁷	σ_f	LA-1669(55)	Cowan
U ²³⁸	I _y activation	JIN,34,2699(72)	Steinnes
U ²³⁸	ν_{sp}	JNE,25,331(71)	Conde
U ²³⁸	activation	JNE,23,705(69)	Hunt
U ²³⁸	activation	PRIVATE COMM.(68)	Bigham
U ²³⁸	RI,activation	ANS,7,27(64)	Baumann
U ²³⁸	ν_{sn}	JNE,15,213(63)	Asplund- Nilsson
U ²³⁸	diffraction	PRS/A,274,122(63)	Willis
U ²³⁸	RI,activation	NSE,14,358(62)	Hardy
U ²³⁸	diffraction	ACR,15,351(62)	Roof
U ²³⁸	ν_{sp}	JPR,21,617(60)	Leroy
U ²³⁸	RI,absorption	JNE,12,32(60)	Tattersall
U ²³⁸	ν_{sp}	ZET,37,406(59)	Kuzminov
U ²³⁸	mass spectrometer	NSE,3,395(58)	Halperin
U ²³⁸	RI,absorption	AE,3,507(57)	Klimentov
U ²³⁸	RI,activation	JNE,2,243(56)	Macklin
U ²³⁸	σ_c ratio	NRDC-84,9(55)-	Cocking

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
U ²³⁸	RI, activation	JNE, 1,234(55)	Crocker
U ²³⁸	σ_c	JNE, 1,92(55)	Egelstaff
U ²³⁸	σ_c	NRDC-84,9(55)	Egelstaff
U ²³⁸	σ_s	SSGENEVA, 4,147(55)-	Palevsky
U ²³⁸	pile osci.	JNE, 1,319(55)	Small
U ²³⁸	pile osci.	ANL-5032,7(53)	Harris
U ²³⁸	ν_{sp}	PR, 86,21(52)	Segre
U ²³⁸	$\bar{\sigma}_s$	ANL-4680,5(51)	Hibdon
U ²³⁸	oscillator	ORNL-CF51-12-151(51)	Pomerance
U ²³⁸	reactivity	CP-2079(44)	Anderson
U ²³⁸	activation	MC-70(44)	Grummitt
U ²³⁸	activation	CP-2376(44)	Seren
U ²³⁹	σ_f	PRIVATE COMM.(56)	Crane
U ²³⁹	σ_f	NSE, 2,33(57)	Fields
U ²³⁹	activation	ANL-4667(51)	Studier

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
U ²³²	σ_f	-0.6-74.24	NP/A, 112,329(68)	Auchampaugh
U ²³²	σ_f		BAP, 13,1409(68)+	Farrell
U ²³²	σ_t	-0.6-27.75	NSE, 29,415(67)	Simpson
U ²³²	σ_f	5.93-258.	NP, 55,517(64)	James
U ²³²	σ_t	5.95-27.65	ANS, 6,44(63)	Berreth
U ²³²	σ_t	5.95-27.65	IDO-16917,14(63)	Berreth
U ²³³	σ_f	6.82-52.1	NSE, 51,130(73)+	Blons
U ²³³	σ_f	1.55-29.54	PRIVATE COMM.(72)	Felvinci
U ²³³	σ_f	1.55-29.54	71KNOX, 2,855(71)	Felvinci
U ²³³	σ_t	1.79-20.6	YF, 13,457(71)	Ryabov
U ²³³	$\bar{\sigma}_s$	6.8-12.4	NP/A, 164,34(71)	Simpson
U ²³³	σ_f	-2.79-64.77	70HELKINKI, 1,419(70)	Cao
U ²³³	$\sigma_f \sigma_f$	-2.81-64.30	70HELKINKI, 2,1757(70)	DeSaussure
U ²³³	σ_t	2.80-52.15	70HELKINKI, 1,387(70)	Kolar
U ²³³	σ_t	1.79-20.6	JINR-P3-4992(70)	Ryabov
U ²³³	σ_γ	4.8-16.3	PRIVATE COMM.(69)	Felvinci
U ²³³	$\sigma_f \sigma_\gamma$	20.58-62.72	PR, 166,1178(68)	Bergen
U ²³³	$\bar{\sigma}_s$	1.59-30.76	PR, 174,1413(68)	Sauter
U ²³³	analysis	0.17-61.3	68WASH, 1,615(68)	Schneider
U ²³³	analysis	-0.590-10.37	AUJ, 20,617(67)	Musgrove
U ²³³	σ_f	1.823-29.54	65SALZBURG, 1,245(65)	Nifenecker
U ²³³	σ_f	1.785-5903	JPR, 24,254(64)	Nifenecker
U ²³³	σ_f	1.799-38.05	JPR, 25,877(64)	Nifenecker
U ²³³	σ_f	1.78-55	JPR, 24,254(64)	Nifenecker
U ²³³	σ_f	1.799-59.3	JPR, 24,254(64)	Nifenecker
U ²³³	analysis	-0.5-2.29	AE, 11,408(62)	Gordeev

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
U ²³³	$\sigma_t \sigma_f$	0.150-10.47	PR,118,714(60)	Moore
U ²³³	$\sigma_t \sigma_f$	0.150-10.47	PR,118,718(60)	Moore
U ²³³	$\sigma_t \sigma_f$	0.150-10.476	PR,118,718(60)	Moore
U ²³³	$\sigma_t \sigma_f$	0.150-10.476	PR,118,714(60)	Moore
U ²³³	σ_t	-1.0-25.48	60KINGSTON,882(60)	Pattenden
U ²³³	$\sigma_t \sigma_f$ mla	0.10-6.8	PR,118,724(60)	Vogt
U ²³³	$\sigma_t \sigma_f$ anal.	0.10-6.77	PR,118,724(60)	Vogt
U ²³³	σ_f	1.47-19.0	AE,5,69(58)	Vladimirskii
U ²³³	σ_f	1.77-3.60	JNE,6,114(57)	Sanders
U ²³³	σ_t	6.80-58.0	AE,2,129(57)	Sokolovskii
U ²³³	σ_f	-5.0-10.47	BAP,1,327(56)	Moore
U ²³³	σ_f	-5.0-4.7	BAP,1,327(56)	Moore
U ²³³	σ_t	1.78-11	JNE,3,28(56)	Pattenden
U ²³³	σ_f	1.82-16	55GENEVA,4,216(55)	Adamchuk
U ²³³	σ_f	1.82-10.7	55GENEVA,4,216(55)	Adamchuk
U ²³³	$\sigma_f \sigma_t$	1.45-12.2	55MOSCOW,81(55)	Nikitin
U ²³³	σ_t	1.775-98.1	55GENEVA,4,210(55)	Lynn
U ²³³	σ_t	3.21-19.0	PRIVATE COMM.(55)	Pilcher
U ²³³	σ_t	3.21-19.0	PRIVATE COMM.(55)	Pilcher
U ²³³	σ_t	1.785-10.4	PR,100,1249(55)+	Sailor
U ²³³	σ_t	1.785-9.25	PR,100,1249(55)+	Sailor
U ²³⁴	$\bar{\sigma}_s$	5.19	NP/A,164,34(71)	Simpson
U ²³⁴	σ_t	5.19	JINR-P3-4992(70)	Ryabov
U ²³⁴	σ_t	5.19-817.6	NP/A,139,471(69)	James
U ²³⁴	σ_f	5.19-13939.	NP/A,118,313(68)	James
U ²³⁴	σ_f	5.20	BAP,6,8(61)	Leonard
U ²³⁴	σ_f	5.20	HW-64866,4(61)	Odegaarden
U ²³⁴	σ_t	5.20-369	PR,109,471(58)	Harvey
U ²³⁴	σ_t	-2.0-5.19	JNE,6,181(58)	McCallum
U ²³⁴	σ_t	5.18	AE,2,129(57)	Sokolovskii
U ²³⁵	σ_γ (spectra)	2.04-41.9	NP/A,203,145(73)	Corvi
U ²³⁵	multiplicity	8.79-39.4	PRIVATE COMM.(73)	Corvi
U ²³⁵	$\sigma_f \sigma_\gamma$	-1.97-60.9	PR/C,7,2018(73)	DeSaussure
U ²³⁵	polarization	0.29-14.0	PRIVATE COMM.(73)	Reddingius
U ²³⁵	$\sigma_t \sigma_f$ polar.	1.13-56.6	PRIVATE COMM.(73)	Keyworth
U ²³⁵	σ_f	6.82-52.1	PRIVATE COMM.(72)	Blons
U ²³⁵	multiplicity	2.04-41.90	JP,33,20(72)	Corvi
U ²³⁵	multiplicity	0.29-26.48	COO-3058,29(72)	Reed
U ²³⁵		6.59-32.05	NP/A,194,657(72)	Wagnemans
U ²³⁵	σ_f	1.13-45.04	PRIVATE COMM.(71)	Felvinci
U ²³⁵	σ_γ (spectra)	2.04-32.1	BAP,16,1181(71)+	Graves
U ²³⁵	$\bar{\sigma}_s$	8.79-19.29	NP/A,164,34(71)	Simpson
U ²³⁵	σ_f	9.28-147.35	71KNOX.,2,829(71)	Blons
U ²³⁵	analysis	2.775-49.42	71KNOX.,1,410(71)	Krebs
U ²³⁵	analysis	-1.49-29.64	ANCR-1016,292(71)	Smith
U ²³⁵		19.3-61.1	PR/C,2,615(70)	Cowan

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
U ²³⁵	σ_{γ} (spectra)	2.04-6.39	PRL,25,953(70)	Kane
U ²³⁵	$\bar{\sigma}_s$	8.78-56.49	70HELSINKI,1,449(70)	Poortmans
U ²³⁵	$\sigma_c \sigma_f \sigma_f$	2.026-50.2	JINR-P3-4992(70)	Ryabov
U ²³⁵	multiplicity	1.14-39.4	PRIVATE COMM.(69)	Bowman
U ²³⁵	σ_f	16.67-70.88	NP/A,126,471(69)	Cramer
U ²³⁵	σ_{γ} (spectra)	6.39-39.41	NP/A,134,535(69)	Weigmann
U ²³⁵	σ_j multiplic.	6.39-23.65	69VIENNA,477(69)	Weinstein
U ²³⁵	multiplicity	1.13-39.41	PL,826,664(68)	Asghar
U ²³⁵	σ_f	6.39-147	JNE,22,211(68)	Cao
U ²³⁵	polarization	0.275-2.08	PR,167,1121(68)	Schermer
U ²³⁵	analysis	0.286-37.0	BNL-50045(67)	Adler
U ²³⁵	analysis	2.806-62.443	66PAR15,2,251(66)	Dravbaugh
U ²³⁵	$\bar{\sigma}_s$	8.8-12.4	66PAR15,2,211(66)	Poortmans
U ²³⁵		8.78-39.5	65SALZBURG,2,355(65)	Melkonian
U ²³⁵	$\sigma_c \sigma_f$	1.14-147.35	NP,69,545(65)	Michaudon
U ²³⁵	σ_c	18.04-99.50	65ANTWERP,95(65)	Rainwater
U ²³⁵	σ_f	2.026-39.47	AE,19,43(65)	Hang
U ²³⁵	σ_f	2.026-72.49	AE,19,43(65)	VanShi-di
U ²³⁵	$\sigma_f \sigma_{\gamma}$	0.282-50.2	65SALZBURG,1,287(65)	VanShi-di
U ²³⁵	σ_c	18.04-300.5	PRIVATE COMM.(64)	Garg
U ²³⁵	$\sigma_c \eta$	-2.0-19.4	AE,16,110(64)	Ignatiev
U ²³⁵	σ_c analysis	0.3-6.20	AE,16,211(64)	Kirpichnikov
U ²³⁵	$\sigma_c \sigma_f$	1.14-147.35	CEA-R-2552(64)	Michaudon
U ²³⁵	$\sigma_c \sigma_f$	2.03-50.1	PRIVATE COMM.(64)	Michaudon
U ²³⁵	σ_f	2.026-39.47	JINR-P-1761(64)	Hang
U ²³⁵	σ_f	5.5-38.25	PR,130,1482(63)	Bowman
U ²³⁵		8.8-39.4	PR,130,2380(63)	Covan
U ²³⁵		0.282-61.0	PR,122,1286(61)	Covan
U ²³⁵	σ_f	48.15-95.52	JPR,21,429(60)	Michaudon
U ²³⁵	$\sigma_c \sigma_f$ anal	-0.95-3.16	PR,118,724(60)	Vogt
U ²³⁵	$\sigma_f \sigma_c$	6.1-24.4	NRDC-117(59)	Collins
U ²³⁵	η/ν	6.1-48.5	NRDC-123(59)	Brooks
U ²³⁵	$\sigma_c \sigma_f$	6.2-64.4	PR,116,1538(59)	Havens
U ²³⁵	$\sigma_c \sigma_f$	0.290-7.16	NSE,3,435(58)	Melkonian
U ²³⁵	$\sigma_c \sigma_f$	-1.45-8.795	PR,112,191(58)	Shore
U ²³⁵	$\sigma_c \sigma_f$	0.29-35.4	JNE,5,389(57)	Sokolovskii
U ²³⁵	σ_c	0.290-35.3	PR,103,1342(56)+	Pilcher
U ²³⁵	σ_f	0.30-34	NRDC-81(56)	Price
U ²³⁵	σ_t	14.1-61.0	PR,103,971(56)	Simpson
U ²³⁵	σ_f	8.8-19.3	PR,104,479(56)	Yeater
U ²³⁵	$\sigma_c \sigma_f$	5.15-20	55MOSCOW,81(55)	Nikitin
U ²³⁵	σ_f	12.2-13.9	JNE,2,128(55)	Price
U ²³⁶	σ_c	153.6-747.06	72BUD,200(72)	Carraro
U ²³⁶	σ_f	5.45-415.	NP/A,181,639(72)	Theobald
U ²³⁶	σ_{γ}	-9.7-956.	NP/A,141,577(70)	Carlson
U ²³⁶	σ_c	5.46-376.	IN-1317,10(69)	Harlan
U ²³⁶	integral	5.48	NSE,32,265(68)	Baumann
U ²³⁶	measurement	5.48	NSE,32,265(68)	Baumann

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
U ²³⁶	σ_f	5.49	BAP,6,8(61)	Leonard
U ²³⁶	σ_t	5.49-384	PR,109,471(58)	Harvey
U ²³⁶	σ_c	-8.-5.49	JNE,6,181(58)	McCallum
U ²³⁷	σ_f	46.2-235	LA-4420,91(70)+	McNally
U ²³⁷	σ_f	46.2-235	BAP,13,1665(68)+	McNally
U ²³⁸	σ_f	720-1210	PRL,31,247(73)+	Block
U ²³⁸	σ_γ	511-598	NSE,51,385(73)	DeSaussure
U ²³⁸	σ_t	6.65-3456.3	NSE,51,119(73)	Wyncharik
U ²³⁸	$\sigma_t \sigma_\gamma$	66-1197	AE,32,49(72)	Maletski
U ²³⁸	$\sigma_t \sigma_\gamma \sigma_\gamma(51)$	6.7-4593	PR/C,6,1854(72)	Rahn
U ²³⁸	σ_t	765-3597	71KNOX,2,701(71)	Carraro
U ²³⁸	σ_s	6.7-66.2	NP/A,164,34(71)	Simpson
U ²³⁸	$\sigma_\gamma(\text{spectra})$	10.2-264	PR/C,4,900(71)	Wasson
U ²³⁸	σ_t	66-5762	70HELSINKI,1,403(70)	Carraro
U ²³⁸	σ_γ	66-1055	70HELSINKI,1,413(70)	Rohr
U ²³⁸	σ_t	4.4-190	PR,171,1293(68)	Bollinger
U ²³⁸	σ_γ	4.4-2031	68WASH,1,573(68)	Glass
U ²³⁸	σ_γ	6.7-823	NP,85,305(66)	Asghar
U ²³⁸	σ_t	6.7-3904	PR/B,134,985(64)	Garg
U ²³⁸	σ_t	6.7-1802	NP,41,614(63)	Firk
U ²³⁸	σ_t	6.7	PR,127,461(62)	Jackson
U ²³⁸	σ_t	6.7	CR,255,2086(62)	Michaudon
U ²³⁸	σ_γ	36.5-705	PRIVATE COMM.(62)	Moxon
U ²³⁸	σ_f	6.7	BAP,6,8(61)	Leonard
U ²³⁸	$\sigma_\gamma(51)$	6.7-997	PR,118,687(60)	Rosen
U ²³⁸	σ_t	6.7-237	PR,105,661(57)	Bollinger
U ²³⁸	σ_t	6.7-405	JNE,5,92(57)	Radkevich
U ²³⁸	σ_t	21.2-200	PR,103,1778(56)	Fluharty
U ²³⁸	σ_t	6.7-37.1	PR,101,1328(56)	Levin
U ²³⁸	σ_t	6.7-418	PR,99,10(55)+	Harvey
U ²³⁸	σ_t	6.7-118	55GENEVA,1,210(55)	Lynn

²³⁴
93 **Np**
[4.4 day]

THERMAL CROSS SECTIONS

$$\sigma_f = 900 \pm 300 \text{ b}$$

²³⁵
93 **Np**
[396 day]

THERMAL CROSS SECTIONS

$$\begin{aligned} \sigma_f &= 1600 \pm 200 \text{ b [22.5 hr } ^{235}\text{Np}^{\text{m}}\text{]} \\ \sigma_f &= 184 \pm 4 \text{ b [1.29X10}^6\text{ yr } ^{235}\text{Np}^{\text{g}}\text{]} \end{aligned}$$

²³⁶
93 **Np**
[1.29 × 10⁸ yr]

THERMAL CROSS SECTIONS

$$\begin{aligned} \sigma_f &= 2500 \pm 150 \text{ b} \\ \nu_{sp} &= 3.12 \pm 0.14 \end{aligned}$$

THERMAL CROSS SECTIONS

$$\sigma_f = 169 \pm 3 \text{ b}$$

$$\sigma_p = 0.019 \pm 0.003 \text{ b}$$

$$a_{\text{coh}} = 10.56 \pm 0.10 \text{ fm}$$

RESONANCE PROPERTIES

$$I_p = 660 \pm 50 \text{ b}$$

$$<0> = 0.7 \pm 0.1 \text{ eV}$$

$$S_0 = 1.0 \pm 0.1$$

RESONANCE PARAMETERS

$S_n = 5487.3 \pm 2.0 \text{ keV}$

$I^* = 5/2^+$

E_0 (eV)	Γ (meV)	$2\Gamma_n$ (meV)	J	Γ_f (meV)	$2\Gamma_n^0$ (meV)	Γ_f (meV)
489 ± .002	34 ± 2	.032 ± .002	3	34 ± 2	.0458 ± .0003	1.24 ± .26
1.33 ± .01	38.8 ± .8	.032 ± .004	2	39.8 ± .8	.0277 ± .0035	5.10 ± 1.02
1.48 ± .01	48.3 ± 1.0	.143 ± .002	2	48.2 ± 1.0	.118 ± .002	1.41 ± .32
1.97 ± .01	41.2 ± 1.3	.0166 ± .0003	3	41.2 ± 1.3	.01183 ± .00024	5.43 ± 1.66
3.07 ± .01			[3]			
3.86 ± .01	41.6 ± 1.3	.240 ± .004	3	41.4 ± 1.3	.122 ± .002	3.0 ± .5
4.26 ± .01	37.5 ± 1.9	.027 ± .001	2	37.5 ± 1.9	.0131 ± .0005	.2 ± .2
4.87 ± .01	38.7 ± 1.9	.034 ± .002	2	38.7 ± 1.9	.0154 ± .0009	.07 ± .07
5.77 ± .01	44.8 ± 1.8	.628 ± .012	3	44.2 ± 1.8	.261 ± .005	5.0 ± 0.5
6.38 ± .02	38.2 ± 1.9	.094 ± .004	3	38.1 ± 1.9	.0372 ± .0016	1.4 ± .8
6.67 ± .02	48 ± 12	.012 ± .002	2	48 ± 12	.0047 ± .0005	2.9 ± 1.6
7.19 ± .02	35 ± 14	.0078 ± .0012	[21]	35 ± 14	.0029 ± .0005	1.5 ± 1.5
7.43 ± .02	40 ± 2	.148 ± .002	3	40 ± 2	.0543 ± .0007	4.2 ± 1.0
8.31 ± .02	38 ± 2	.107 ± .004	3	38 ± 2	.0371 ± .0014	2.1 ± 0.6
8.98 ± .02	38.5 ± 2.5	.125 ± .006	3	38.4 ± 2.5	.0417 ± .0020	8.8 ± 1.2
9.30 ± .02	42.7 ± 2.6	.522 ± .005	2	42.2 ± 2.6	.171 ± .002	0.3 ± 0.1
10.23 ± .02	38 ± 12	.025 ± .002	2	38 ± 12	.0078 ± .0008	1.3 ± 1.3
10.68 ± .02	36 ± 2	.510 ± .020	3		.155 ± .006	1.5 ± 0.3
10.84 ± .02	45 ± 3	.87 ± .03	3	44 ± 3	.284 ± .009	0.8 ± 0.3
11.09 ± .02	44 ± 3	.89 ± .02	2	43 ± 3	.267 ± .006	0.4 ± 0.1
12.20 ± .02	50 ± 8	.062 ± .003	[3]	50 ± 8	.0178 ± .0009	1.9 ± 1.3
12.62 ± .02	43 ± 3	.795 ± .008	2	42 ± 3	.224 ± .002	0.5 ± 0.2
13.14 ± .02	40 ± 20	.020 ± .003	[3]		.0052 ± .0008	1.6 ± 1.6
15.81 ± .02		.12 ± .02	[3]		.030 ± .005	1.8 ± 1.3
16.08 ± .02	50 ± 4	.93 ± .02	2	49 ± 4	.232 ± .005	0.5 ± 0.2

⁹³Np
237
[2.14 × 10⁶ yr]

E_0 (eV)	Γ (meV)	$2\sigma\Gamma_n$ (meV)	J	Γ_γ (meV)	$2\sigma\Gamma_n$ (meV)	Γ_γ (μeV)
16.87 ± .02	35 ± 4	.243 ± .006	2	35 ± 4	.0592 ± .0015	0.3 ± 0.3
17.02 ± .02	40 ± 4	.006 ± .003			.0014 ± .0007	4.9 ± 4.9
17.59 ± 0.02	40 ± 4	.184 ± .007	3	40 ± 4	.0439 ± .0017	0.5 ± 0.3
17.89 ± .02	40 ± 20	.018 ± .004			.0043 ± .0009	3.9 ± 2.8
18.88 ± .02	40 ± 20	.037 ± .011	2		.0084 ± .0023	2.6 ± 2.0
19.12 ± .02	48 ± 17	.106 ± .011	3		.0243 ± .0023	3.1 ± 1.1
19.90 ± .02	36 ± 13	.071 ± .007	[3]	36 ± 13	.0159 ± .0016	3.0 ± 1.8
20.39 ± .02	43 ± 3	1.13 ± .02	2	42 ± 3	.250 ± .005	0.7 ± 0.4
21.09 ± .02	35 ± 5	.53 ± .03	3	35 ± 5	.115 ± .007	1.9 ± 0.7
21.30 ± .02	40 ± 20	.023 ± .007			.0050 ± .0015	5.8 ± 5.8
22.01 ± .02	42 ± 4	1.26 ± .03	2	41 ± 4	.269 ± .005	1.0 ± 0.4
22.86 ± .02	40 ± 6	.440 ± .014	3	40 ± 6	.0920 ± .0029	4.1 ± 1.1
23.67 ± .02	44 ± 5	1.69 ± .03	3	42 ± 5	.347 ± .007	0.3 ± 0.1
23.97 ± .02	61 ± 13	.17 ± .02	2		.035 ± .004	0.6 ± 0.6
24.37 ± .02	52 ± 4	4.61 ± .07	3	47 ± 4	.923 ± .014	3.6 ± 0.5
26.19 ± .02	40 ± 10	.26 ± .02	3		.0508 ± .0039	30.6 ± 8.5
26.56 ± .02	45 ± 5	2.80 ± .08	3	42 ± 5	.543 ± .016	22.5 ± 3.2
27.07 ± .02	40 ± 20	.025 ± .006	2		.0047 ± .0011	4.3 ± 4.3
28.48 ± .02	40 ± 20	.146 ± .015			.0274 ± .0028	0.2 ± 0.2
28.92 ± .02	40 ± 20	.17 ± .01	[2]		.032 ± .002	0.1 ± 0.1
29.46 ± .02	40 ± 20	.086 ± .013			.0158 ± .0024	9.9 ± 6.1
30.42 ± .02	47 ± 5	3.76 ± .05	3	42 ± 5	.644 ± .018	79.8 ± 10.2
30.75 ± .03	54 ± 13	.30 ± .03		54 ± 13	.054 ± .005	5.1 ± 2.7
31.32 ± .03	36 ± 7	.26 ± .02	3		.0465 ± .0036	6.9 ± 2.4
31.65 ± .03	40 ± 20	.048 ± .012			.0085 ± .0021	3.3 ± 3.9
33.43 ± .03	28 ± 7	.46 ± .02	3	28 ± 7	.080 ± .004	3.7 ± 1.5
33.90 ± .03	66 ± 10	.44 ± .02	2	66 ± 10	.076 ± .003	4.1 ± 2.0
34.67 ± .03	40 ± 20	.184 ± .014	3		.0313 ± .0024	6.6 ± 4.4
35.20 ± .03	37 ± 10	.33 ± .02	2	37 ± 10	.056 ± .003	2.1 ± 1.1
36.36 ± .03	69 ± 24	.159 ± .021	3		.0264 ± .0033	12.7 ± 5.1
36.81 ± .03	40 ± 20	.072 ± .014			.012 ± .002	34.7 ± 24.4
37.14 ± .03	47 ± 8	1.36 ± .04	3	45 ± 8	.223 ± .007	142.3 ± 28.5
37.92 ± .03	40 ± 20	.064 ± .032			.010 ± .005	50.6 ± 25.0
38.16 ± .03	62 ± 12	1.61 ± .06	3		.261 ± .010	8.6 ± 3.0
38.92 ± .03	58 ± 12	1.29 ± .06	3	56 ± 12	.207 ± .010	380.2 ± 84.0
39.24 ± .03	47 ± 14	.650 ± .045	3	46 ± 14	.104 ± .007	333.1 ± 105.8
39.69	40 ± 20	.062				1686.9 ± 800
39.90 ± .04	80 ± 14	.56 ± .03	3	74 ± 13	.105 ± .004	864.7 ± 122.7
41.34 ± .04	40 ± 6	2.26 ± .05	3	37 ± 6	.352 ± .007	216.7 ± 32.5
42.38 ± .04	40 ± 20	.091 ± .02			.014 ± .004	11.1 ± 7.3
42.80 ± .04	40 ± 20	.12 ± .03			.018 ± .004	236.8 ± 153.4

E_0 (eV)	Γ (meV)	$2g_{\gamma}^0$ (meV)	J	Γ_{γ} (meV)	$2g_{\gamma}^0$ (meV)	Γ_{γ} (meV)
43.65 ± .04	42 ± 13	.30 ± .03	2	42 ± 13	.045 ± .005	5.3 ± 2.5
45.70 ± .04	63 ± 19	.48 ± .06	2		.071 ± .009	4.7 ± 2.1
46.01 ± .04	50 ± 20	.66 ± .04	3		.097 ± .006	276.1 ± 139.8
46.35 ± .04	52 ± 5	3.07 ± .06	3	49 ± 5	.451 ± 0.009	2.4 ± 1.1
47.30 ± .04	47 ± 5	2.40 ± .05	2	45 ± 5	.349 ± .007	.4 ± .3
48.47 ± .04	40 ± 20	.11 ± .02	2		.016 ± .003	12.3 ± 8.6
48.78 ± .04	40 ± 20	.53 ± .03	2		.076 ± .004	7.9 ± 4.9
49.84 ± .04	47 ± 7	5.09 ± .09	3	39 ± 7	.721 ± .013	4.6 ± 1.6
50.37 ± .04	62 ± 5	8.93 ± .16	3	53 ± 5	1.26 ± .02	23.2 ± 5.9
51.69 ± .04	40 ± 20	0.081 ± 0.033	2		.013 ± .005	8.7 ± 4.7
52.19 ± .04	40 ± 20	0.37 ± 0.05	2		.052 ± .007	0.7 ± 0.5
52.65 ± .05	40 ± 20	.72 ± .06	2		.039 ± .008	2.8 ± 1.9
53.03 ± .05	40 ± 20	.062 ± .015	2		.0085 ± .0021	18.1 ± 12.7
53.86 ± .05	40 ± 20	.39 ± .04	2		.053 ± .006	3.2 ± 2.0
54.22 ± .05	40 ± 20	.13 ± .02	3		.018 ± .003	6.9 ± 4.5
55.02 ± .05	40 ± 20	.32 ± .03	3		.043 ± .004	15.5 ± 11.0
56.08 ± .05	109 ± 22	1.99 ± .06	[2]		.266 ± .008	1.1 ± 0.5
58.36 ± 0.05	40 ± 20	.46 ± .07	3		.061 ± .009	1.3 ± 0.8
58.60 ± .05	40 ± 20	.295 ± .044	2		.039 ± .006	13.0 ± 10.1
59.49	45 ± 9	2.01 ± .08	2	43 ± 9	.261 ± .010	1.1 ± 0.9
60.02	46 ± 9	2.6 ± .1	3	39 ± 9	.34 ± .01	5.1 ± 5.1
60.93	41 ± 9	1.6 ± 0.2	3		.21 ± .03	0.6 ± 0.5
61.62	40 ± 20	.52 ± .05	3		.066 ± .006	2.9 ± 2.3
62.45	82 ± 18	1.9 ± .2	3		.24 ± .03	4.9 ± 4.9
62.89	47 ± 12	1.7 ± .1	3		.214 ± .013	1.2 ± 0.6
63.94	40 ± 20	.28 ± .03	[3]		.035 ± .004	5.4 ± 4.9
64.94	40 ± 13	1.01 ± .06	3		.125 ± .007	0.3 ± 0.3
65.86	51 ± 9	4.55 ± .06	[3]		.561 ± .010	1.7 ± 0.8
66.7						
67.46	44 ± 8	5.8 ± .1	3		.70 ± .01	2.1 ± 0.7
67.94	46 ± 10	2.39 ± .11	2		.290 ± .013	1.3 ± 0.9
68.75	40 ± 20	.359 ± .032	3		.0433 ± .0039	2.1 ± 2.1
70.23	68 ± 14	2.14 ± .09	3		.256 ± .011	1.6 ± 0.9
70.66	40 ± 20	.50 ± .04	3		.060 ± .005	4.8 ± 4.7
71.18	40 ± 20	2.30 ± .46			.273 ± .055	1.2 ± 1.0
71.44	40 ± 20	2.68 ± .94			.317 ± .064	0.9 ± 0.8
73.06	40 ± 20	.31 ± .03	[2]		.036 ± .003	9.6 ± 9.0
74.26	40 ± 20	1.47 ± .07			.171 ± .008	1.4 ± 1.3
74.54	40 ± 20	.51 ± .06			.059 ± .007	5.9 ± 5.8
75.09	40 ± 20	.11 ± .03			.013 ± .004	5.5 ± 5.5
76.53	40 ± 20	.19 ± .03			.021 ± .003	0.7 ± 0.7

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_γ (μeV)
76.97	40 ± 20	.38 ± .03			.043 ± .003	2.8 ± 2.8
78.33	79 ± 16	2.45 ± .10	3		.277 ± 0.011	2.8 ± 2.8
79.24	54 ± 11	2.52 ± .08	2		.283 ± .008	2.0 ± 2.0
80.35	40 ± 20	.16 ± .08			.018 ± .008	4.9 ± 4.9
80.60	40 ± 20	.54 ± .07	3		.060 ± .007	0.9 ± 0.9
81.59	40 ± 20	.42 ± .02			.047 ± .002	2.6 ± 1.9
82.09	40 ± 20	.82 ± .04	3		.090 ± .004	1.2 ± 0.9
83.39	40 ± 20	3.1 ± .6			.34 ± .07	1.0 ± 0.7
83.70	40 ± 20	5.6 ± 1.1			.61 ± .12	1.1 ± 0.7
85.19	64 ± 16	1.2 ± .1			.13 ± .01	8.8 ± 4.0
86.07	40 ± 20	.84 ± .12			.090 ± .013	4.5 ± 2.8
86.50	49 ± 10	5.7 ± .2	3		.62 ± .03	2.0 ± 0.7
87.65	40 ± 10	3.7 ± .1	2		.40 ± .01	0.7 ± 0.4
88.13	40 ± 20	1.03 ± .06			.110 ± .006	3.6 ± 2.3
88.90	40 ± 20	1.85 ± .07			.196 ± .007	1.8 ± 1.1
89.43	51 ± 11	4.29 ± .17			.454 ± .018	2.9 ± 1.1
90.84	54 ± 13	4.98 ± .20	3		.52 ± .02	1.6 ± 0.8
91.32	40 ± 20	.16 ± .05			.017 ± .005	3.2 ± 2.3
91.95	40 ± 20	.51 ± .07			.053 ± .007	8.6 ± 5.5
92.75	40 ± 20	.19 ± .03			.020 ± .003	9.1 ± 5.9
93.35	49 ± 17	1.8 ± .13	2		.19 ± .01	3.1 ± 1.7
94.22	40 ± 20	.37 ± .06			.038 ± .006	1.4 ± 1.0
95.37	40 ± 20	.36 ± .06			.037 ± .006	7.0 ± 4.7
96.14	40 ± 20	.055 ± .027			.056 ± .028	2.7 ± 2.2
96.61	40 ± 20	.35 ± .09			.036 ± .009	1.8 ± 1.3
97.72	65 ± 14	3.48 ± .14	2		.352 ± .014	2.3 ± 1.2
98.46	77 ± 19	2.38 ± .10	2		.240 ± .010	4.1 ± 2.0
98.99	40 ± 20	.10 ± .05			.010 ± .005	21.3 ± 19.1
99.49	52 ± 17	1.94 ± .14			.195 ± .014	3.2 ± 1.7
100.19	58 ± 12	5.30 ± .16	3		.530 ± .016	1.9 ± 0.9
101.03	63 ± 13	5.41 ± .16	2		.538 ± .016	4.2 ± 2.3
101.62		1.23 ± .25			.122 ± .025	5.1 ± 3.3
101.92		1.67 ± .33			.165 ± .034	0.5 ± 0.3
102.15	40 ± 20	.30 ± .15			.030 ± .015	2.6 ± 2.2
103.76	40 ± 20	1.60 ± .08			.157 ± .006	3.0 ± 2.1
104.52	40 ± 20	.34 ± .07			.033 ± .007	6.0 ± 4.4
105.18	80 ± 28	2.18 ± .21			.212 ± .020	5.1 ± 3.0
105.70	44 ± 13	3.29 ± .25			.320 ± .019	12.7 ± 4.5
107.21	40 ± 20	.51 ± .06			.049 ± .006	7.0 ± 5.0
108.79	40 ± 20	0.81 ± 0.12			0.078	1.2 ± 1.2
109.12	40 ± 20	2.29 ± 0.13			0.219	2.1 ± 1.6

E _γ (keV)	Γ (meV)	2g _γ (meV)	J	Γ _γ (meV)	2g _γ ⁰ (meV)	Γ _γ (μeV)
110.30	40 ± 20	1.21 ± 0.31	3		0.115	1.9 ± 1.9
110.58	40 ± 20	1.09 ± 0.23			0.104	3.4 ± 2.1
110.96	68 ± 16	3.07 ± 0.32			0.291	0.1 ± 0.1
111.71	40 ± 20	3.27 ± 0.10			0.309	0.1 ± 0.1
112.22	40 ± 20	.40 ± .28			0.038	12.3 ± 12.3
113.33	40 ± 20	1.21 ± .20			0.114	3.2 ± 3.1
113.71	95 ± 10	4.30 ± 0.31			0.403	0.5 ± 0.5
114.73	44 ± 11	2.21 ± 0.15			0.206	0.4 ± 0.4
115.46	40 ± 20	0.50 ± 0.27			0.046	4.5 ± 4.0
115.79	68 ± 20	2.08 ± 0.39			0.193	22.5 ± 8.8
116.76	40 ± 20	0.44 ± 0.07			0.041	5.7 ± 5.7
117.62	42 ± 10	2.02 ± 0.14			0.186	37.7 ± 11.9
118.07	40 ± 20	1.24 ± 0.11			0.114	547.4 ± 137.0
119.46	40 ± 20	0.75 ± 0.11			0.069	2276.0 ± 181.0
120.10	40 ± 20	0.33 ± 0.08			.030	122.8 ± 70.1
121.96	40 ± 20	0.35 ± 0.08			0.032	64.3 ± 39.0
123.76	40 ± 20	0.40 ± 0.08			0.036	66.0 ± 39.7
125.01	40 ± 20	1.21 ± 0.09			0.108	31.0 ± 17.3
125.68	40 ± 20	2.71 ± 0.11			0.242	4.6 ± 4.6
126.20	40 ± 20	1.74 ± 0.10			0.155	4.3 ± 3.8
127.12	40 ± 20	0.50 ± 0.13			0.044	3.5 ± 3.4
127.50	40 ± 20	0.41 ± 0.13			0.036	2.7 ± 2.5
129.48	40 ± 20	0.97 ± 0.11			0.085	1.3 ± 1.3
129.72	40 ± 20	0.20 ± 0.20			0.018	25.0 ± 25.0
131.41		0.63 ± 0.10			0.055	4.0 ± 2.4
131.65		1.14 ± 0.10			0.099	6.6 ± 4.5
132.81		0.20 ± 0.20			0.017	6.3 ± 6.3
133.48		5.54 ± 0.22			0.480	2.3 ± 2.3
134.06		0.41 ± 0.10			0.035	18.4 ± 18.4
137.44	124 ± 42	3.52 ± 0.30			0.300	7.2 ± 7.2
138.47	419 ± 47	4.98 ± 1.50			0.423	2.0 ± 2.0
138.98		1.67 ± 0.98			0.141	9.3 ± 9.3
140.04		1.35 ± 0.48			0.114	8.0 ± 8.0
141.24		1.69 ± 0.11			0.142	3.0 ± 3.0
142.20	82 ± 29	0.44 ± 0.09			0.037	5.7 ± 5.7
144.30		4.93 ± 0.26			0.410	2.0 ± 1.3
145.50		0.64 ± 0.12			0.053	3.9 ± 3.9
146.58		1.59 ± 0.14			0.131	1.6 ± 1.6
147.23		1.90 ± 0.15			0.157	4.0 ± 4.0
148.50		1.03 ± 0.14			0.085	6.1 ± 6.1
149.69		1.94 ± 0.17			0.159	1.3 ± 1.3

E_0 (eV)	Γ (meV)	$2g_{\pi}^0$ (meV)	J	Γ_{γ} (meV)	$2g_{\pi}^0$ (meV)	Γ_{γ} (meV)
150.27		3.02 $\pm$ 0.75			0.246	3.3 $\pm$ 2.5
150.55		3.23 $\pm$ 0.80			0.263	0.8 $\pm$ 0.8
152.22		2.87 $\pm$ 0.28			0.232	1.7 $\pm$ 1.7
154.17	98 $\pm$ 49	2.73 $\pm$ 0.24			0.220	0.7 $\pm$ 0.7
155.35		1.17 $\pm$ 0.12			0.094	6.4 $\pm$ 6.4
156.35		1.82 $\pm$ 0.19			0.146	
156.78		0.82 $\pm$ 0.14			0.066	
157.98		1.50 $\pm$ 0.25			0.119	
158.38		3.99 $\pm$ 0.24			0.317	
160.61	74 $\pm$ 27	5.32 $\pm$ 0.25			0.420	
161.83		0.96 $\pm$ 0.13			0.077	
162.91	46 $\pm$ 34	3.92 $\pm$ 0.24			0.307	
164.25		2.21 $\pm$ 0.14			0.172	
165.11		0.59 $\pm$ 0.13			0.030	
166.79		4.78 $\pm$ 0.21			0.370	
168.93		5.05 $\pm$ 0.21			0.389	
169.96		1.58 $\pm$ 0.17			0.121	
170.95		3.85 $\pm$ 0.20			0.295	
172.25		1.14 $\pm$ 0.17			0.087	
173.02		2.38 $\pm$ 0.19			0.180	
174.78		1.26 $\pm$ 0.29			0.095	
175.22		2.85 $\pm$ 0.31			0.215	
176.20		4.46 $\pm$ 0.23			0.336	
176.85		6.44 $\pm$ 0.26			0.484	
180.07	94 $\pm$ 35	6.90 $\pm$ 0.39			0.514	
181.00		2.92 $\pm$ 0.19			0.217	
182.34		2.36 $\pm$ 0.19			0.175	
183.23		1.92 $\pm$ 0.19			0.142	
184.04	82 $\pm$ 42	6.01 $\pm$ 0.40			0.443	
185.65		0.34 $\pm$ 0.21			0.025	
186.18		0.72 $\pm$ 0.21			0.052	
187.93	26 $\pm$ 24	11.89 $\pm$ 0.44	2		0.867	
189.06	41 $\pm$ 25	6.35 $\pm$ 0.40			0.462	
190.62		6.07 $\pm$ 0.27			0.440	
191.63		1.24 $\pm$ 0.22			0.090	
193.52		3.33 $\pm$ 0.24			0.239	
194.47		1.32 $\pm$ 0.22			0.095	
195.67		3.00 $\pm$ 0.54	2		0.215	
196.57	52 $\pm$ 26	15.48 $\pm$ 0.62			1.104	
198.44		0.57 $\pm$ 0.22			0.041	
199.82		1.28 $\pm$ 0.24			0.091	

E ₀ (eV)	Γ (meV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ ₀ (meV)	Γ _γ (μeV)
200.78		2.27 ± 0.21	3		0.160	
202.94		0.53 ± 0.19			0.037	
204.22		3.25 ± 0.23			0.227	
205.60		1.28 ± 0.64	3		0.089	
206.58		8.65 ± 0.92			0.602	
207.85		3.39 ± 0.73			0.235	
210.28		7.00 ± 0.87			0.483	
213.02		1.81 ± 0.70			0.124	
214.52		1.34 ± 0.69			0.092	
216.97		12.93 ± 1.20			0.878	
218.45		2.15 ± 0.30			0.146	
219.23		0.78 ± 0.28			0.053	
220.12		1.43 ± 0.29			0.086	
221.97		4.18 ± 0.70			0.281	
224.20		4.12 ± 0.32			0.275	
226.42		14.05 ± 0.67	2		0.934	
228.17		2.28 ± 0.32			0.151	
229.00		4.39 ± 0.35			0.290	
231.53		15.15 ± 0.76	2		0.995	
232.83		2.48 ± 0.34			0.163	
233.97		2.56 ± 0.35			0.167	
235.30		2.64 ± 0.37	3		0.172	
253						
283						
370			[2]			
373			2			
427			2			
476			3			
668			2			
718			3			
808			3			
873			3			
884			3			

Note - Single-level Breit-Wigner parameters.

$^{238}_{93}\text{Np}$
[2.12 day]

THERMAL CROSS SECTIONS

$$\sigma_f = 2070 \pm 30 \text{ b}$$

RESONANCE PROPERTIES

$$I_f = 880 \pm 70 \text{ b}$$

$^{239}_{93}\text{Np}$
[2.35 day]

THERMAL CROSS SECTIONS

$$\begin{aligned} \sigma_{\gamma} &= 31 \pm 6 \text{ b [7.5 min } ^{240}\text{Np}^{\text{m}}] \\ \sigma_{\gamma} &= 14 \pm 14 \text{ b [65 min } ^{240}\text{Np}^{\text{g}}] \\ \sigma_f &< 1 \text{ b} \end{aligned}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Np ²³⁴	σ_f	ANL-4152(48)	Hyde
Np ²³⁴	σ_f	CC-3699,6(46)	Bentley
Np ²³⁶	$\sigma_f v_{sp}$	BNL-732(N-6),2(62)-	Jaffey
Np ²³⁶	$\sigma_f v_{sp}$	ANL-6600,124(61)+	Jaffey
Np ²³⁶	σ_f	PR,97,68(55)	Studier
Np ²³⁷	σ_γ chemical separation	UCRL-51263(72)	Landrum
Np ²³⁷	$\sigma_\gamma l_\gamma$	KFK-1456,47(71)	Eberle
Np ²³⁷	RI pile osci.	BNL-50242(70)	Hellstrand
Np ²³⁷	l_γ activation	BAP,14,497(69)	Schuman
Np ²³⁷	l_a reactivity	JN-1195(68)	Scoville
Np ²³⁷	$l_a \sigma_f$ production rate	68WASH,2,1271(68)	Henneley
Np ²³⁷	diffraction	PCS,28,1649(67)	Cox
Np ²³⁷	diffraction	PCS,28,1651(67)	Heaton
Np ²³⁷	l_a reactivity	ANS,10,259(67)	Rogers
Np ²³⁷	$\sigma_a l_a$ pile osci.	JNE,12,32(60)	Tattersall
Np ²³⁷	σ_f	BAP,4,31(60)	Leonard
Np ²³⁷	σ_f	HW-59126,3(59)	Leonard
Np ²³⁷	σ_c	PR,107,525(57)	Smith
Np ²³⁷	σ_γ alpha counting	JIN,2,205(56)	Brown
Np ²³⁷	σ_γ activation	IDO-16226(55)	Smith
Np ²³⁷	σ_γ activation	ANL-4030(47)	Jaffey
Np ²³⁷	σ_f	TRANSU.EL.,2,148(49)	Ghiorso
Np ²³⁷	σ_f	PRIVATE COMM.(46)	Farwell
Np ²³⁸	σ_f RI	ANS,12,284(69)	Spencer
Np ²³⁸	$\sigma_f \sigma_a$ production rates	68WASH,2,1271(68)	Henneley
Np ²³⁸	σ_γ activation	BAP,1,62(56)	Lefevre
Np ²³⁸	σ_f	PRIVATE COMM.(51)	Perlman
Np ²³⁸	σ_f	CF-3762(47)	Studier
Np ²³⁹	σ_γ analysis	NSE,6,100(59)	Stoughton
Np ²³⁹	σ_γ activation	NSE,5,264(59)	Kinderman
Np ²³⁹	σ_f	58GENEVA,16,54(58)	Eastwood
Np ²³⁹	σ_γ mass spectrometry	NSE,1,108(56)	Halperin
Np ²³⁹	σ_γ activation	55GENEVA,7,258(55)	Halperin
Np ²³⁹	σ_γ activation	HW-38202,37(55)	Lefevre
Np ²³⁹	σ_f	PRIVATE COMM.(46)	Borst

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Np ²³⁷	$\sigma_c \sigma_f$ polar.	1.47-884	PRIVATE COMM.(73)	Keyworth
Np ²³⁷	σ_f	3.86-155.35	THESIS(73)	Plattard
Np ²³⁷	$\sigma_c \sigma_f$	1.32-235.3	PRIVATE COMM.(72)	Paya
Np ²³⁷	σ_f	20.40-50.37	ZP,248,355(71)	Kolar
Np ²³⁷	$\sigma_c \bar{\sigma}_s$	5.77-50.40	71KNOX,2,667(71)	Poortmans
Np ²³⁷	σ_f	8.32-56.1	PRIVATE COMM.(71)	Weigmann
Np ²³⁷	σ_f	0.49-7.5	AE,28,362(70)	Gavrilov
Np ²³⁷	σ_f	30.4-50.4	PL,830,624(69)	Weigmann
Np ²³⁷	$\sigma_c \sigma_f$	1.32-107.21	PRIVATE COMM.(67)	Paya
Np ²³⁷	$\sigma_c \sigma_f$	1.32-107.21	66PARIS,2,128(66)	Paya
Np ²³⁷	σ_f	0.49-1.47	BAP,4,31(60)	Leonard
Np ²³⁷	σ_c	0.5-4	55GENEVA,4,210(55)	Adamchuk
Np ²³⁷	σ_c	3.86-18.9	AE,6,569(55)	Adamchuk

THERMAL CROSS SECTIONS

$$\sigma_f = 165 \pm 20 \text{ b}$$

$$\nu_{sp} = 2.21 \pm 0.18$$

²³⁶₉₄Pu
[2.85 yr]

THERMAL CROSS SECTIONS

$$\sigma_f = 2400 \pm 300 \text{ b}$$

²³⁷₉₄Pu
[45.6 day]

THERMAL CROSS SECTIONS

$$\sigma_f = 547 \pm 20 \text{ b}$$

$$\sigma_f = 16.5 \pm 0.5 \text{ b}$$

$$\sigma_a = 564 \pm 20 \text{ b}$$

$$\sigma_t = 588 \pm 20 \text{ b}$$

$$\nu_p = 2.90 \pm 0.03$$

$$\nu_{sp} = 2.24 \pm 0.08$$

²³⁸₉₄Pu
[87.8 yr]

RESONANCE PROPERTIES

$$I_\gamma = 141 \pm 15 \text{ b}$$

$$I_f = 24 \pm 4 \text{ b}$$

$$I_a = 165 \pm 15 \text{ b}$$

$$\langle D \rangle = 9.5 \pm 0.7 \text{ eV}$$

$$S_0 = 1.3 \pm 0.3$$

RESONANCE PARAMETERS

$$I^n = 0^\circ$$

$$S_n = 5656 \pm 4 \text{ ke}$$

E ₀ (eV)	gΓ _n (meV)	Γ _γ (meV)	gΓ _n ⁰ (meV)	Γ _f (meV)
Bound level				
2.90 ± .02	.075 ± .003	38 ± 2	.044 ± .002	<.08
9.98 ± .02	.215 ± .01	37 ± 6	.066 ± .004	<.2
18.6 ± .1	3.8 ± .4	37 ± 6	0.88 ± .09	1.6 ± 0.4
32.2 ± .1	.068 ± .04	(34)	.012 ± .007	4.8
36.6 ± .1	.024 ± .012	(34)	.004 ± .002	5.9
59.8 ± .1	1.4 ± 0.1	(36 ± 2)	0.18 ± .01	.67 ± .17
70.2 ± 0.1	2.51 ± .16	(36 ± 2)	.30 ± .04	7.8 ± .8
77.7 ± .1	.026 ± .018	(36 ± 2)	.003 ± .002	9.4
83.1 ± 0.1	19.1 ± 1.9	(36 ± 2)	2.10 ± .21	4.0 ± .4
96.2 ± .1	.056 ± .030	(36 ± 2)	.0057 ± .0031	4.8
99.6 ± .1	.26 ± .07	(36 ± 2)	.026 ± .007	5.1 ± 2.1
110.1 ± .1	5.5 ± .8	(36 ± 2)	0.53 ± .08	5.0 ± 0.8
111.2 ± .1	.13 ± .06	(36 ± 2)	.012 ± .006	3.1 ± 2.1

²³⁸₉₄Pu

E ₀ (eV)	gΓ _n (meV)	Γ _γ (meV)	gΓ _n ⁰ (meV)	Γ _f (meV)
113.7 ± .1	11.3 ± 1.4	(36 ± 2)	1.06 ± .13	5.4 ± 1.0
118.6 ± .1	31.3 ± 4.0	(36 ± 2)	2.87 ± 0.37	2.0 ± .4
122.4 ± .1	28.8 ± 4.4	(36 ± 2)	2.62 ± 0.40	8.6 ± 1.6
129.0 ± .1	.22 ± .17	(36 ± 2)	.019 ± .015	1.0
132.4 ± .1	.85 ± .18	(36 ± 2)	.074 ± .016	5.3 ± 1.8
139.7 ± .1	2.8 ± .4	(36 ± 2)	.24 ± .03	6.3 ± 1.6
151.1 ± .1	18 ± 4	(36 ± 2)	1.5 ± 0.3	9.2 ± 2.4
165.0 ± .2	.22 ± .10	(36 ± 2)	.017 ± .008	10.7
171.1 ± .2	55 ± 10	(36 ± 2)	4.00 ± .73	.72 ± .18
176.8 ± .2	2.7 ± .4	(36 ± 2)	.20 ± .03	44 ± 17
182.7 ± .2	30 ± 5	(36 ± 2)	2.22 ± 0.37	7.1 ± 1.8
192.5	15.5 ± 3.7	(36 ± 2)	1.12 ± .27	130
203	4.9 ± .6	(34)	.35 ± .04	2.2 ± .5
216	17.6 ± 3.5	(34)	1.20 ± .24	23 ± 7
221	59.0 ± 25.6	(34)	3.97 ± 1.72	1.2 ± .3
232	.72 ± .29	(34)	.047 ± .019	.84 ± .44
245	6.7 ± 1.4	(34)	.43 ± .09	25 ± 10
252	16 ± 5	(34)	.98 ± .29	57
261		(34)	.016 ± .010	7
285	26.0 ± 9.6	(34)	1.54 ± .57	3500 ± 500
289	37.6 ± 11.6	(34)	2.21 ± .68	24 ± 7
300	55.5 ± 23.0	(34)	3.20 ± 1.33	102
305	8.0 ± 1.8	(34)	.46 ± .10	68
320	180 ± 180	(34)	10 ± 10	5.5 ± 1.4
327	27.7 ± 6.7	(34)	1.53 ± .37	15 ± 4
337	15.4 ± 2.7	(34)	.84 ± .15	8.4 ± 2.2
361	.80 ± .53	(34)	.042 ± .028	7
368	17.3 ± 4.4	(34)	.90 ± .23	4.4 ± 1.3
382	.39 ± .24	(34)	.020 ± .012	17
391	13 ± 3	(34)	.66 ± .15	2.8 ± .9
408	18.6 ± 3.6	(34)	.92 ± .18	2.5 ± .7
419	53 ± 27	(34)	2.6 ± 1.3	29 ± 12
426	47.7 ± 21.7	(34)	2.31 ± 1.05	11.3 ± 3.5
448	6.56 ± 1.69	(34)	.31 ± .08	71
461	49.6 ± 23.2	(34)	2.31 ± 1.08	6.7 ± 2.1
465	85.6 ± 60.8	(34)	3.97 ± 2.82	6.7 ± 2.1
473	23.1 ± 6.7	(34)	1.06 ± .31	2.3 ± .7
496	9.5 ± 2.0	(34)	.42 ± .09	6.8 ± 2.2

* See Young(67) for parameters of bound levels.

Note - Single-level Breit-Wigner parameters. Resonances in the energy region around 285 eV have been fitted by a multilevel Breit-Wigner formula. Fission widths with no associated errors have large uncertainties in them.

THERMAL CROSS SECTIONS

$$\begin{aligned}
 \sigma_T &= 268.8 \pm 3.0 \text{ b} \\
 \sigma_f &= 742.5 \pm 3.0 \text{ b} \\
 \sigma_a &= 1011.3 \pm 4.2 \text{ b} \\
 \bar{\sigma}_a &= 7.7 \pm 0.5 \text{ b} \\
 \sigma_c &= 1019 \pm 6 \text{ b} \\
 \alpha &= 0.362 \pm 0.004 \\
 \eta &= 2.108 \pm 0.008 \\
 \nu &= 2.871 \pm 0.006 \\
 a_{coh} &= 7.5 \pm 0.3 \text{ fm}
 \end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}
 l_f &= 200 \pm 20 \text{ b} \\
 l_f &= 301 \pm 10 \text{ b} \\
 \langle D \rangle &= 2.3 \pm 0.1 \text{ eV} \\
 S_0 &= 1.3 \pm 0.1 \\
 S_1 &= 2.3 \pm 0.4
 \end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 1/2^+$$

$$S_n = 6534 \pm 0.8 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_f (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
.296 ± .002	99 ± 4	0.110 ± .005	1	39 ± 3	.202 ± .009	60 ± 4
7.82 ± .01	88 ± 4	1.23 ± .03	1	40.0 ± 2.3	.440 ± .011	47 ± 3
10.93 ± .01	185 ± 10	2.75 ± .10	1	46 ± 6	.832 ± .032	138 ± 6
11.48 ± .01		.26 ± .15			.077 ± .044	
11.89 ± .01	67 ± 4	1.52 ± .08	1	42 ± 4	.441 ± .023	24 ± 3
14.31 ± .01	102 ± 6	.89 ± .05	1	37 ± 6	.235 ± .013	65 ± 7
14.68 ± .01	79 ± 5	2.80 ± .05	1	38 ± 4	.731 ± .013	33 ± 3
15.46 ± .01	700 ± 50	.94 ± .08	0	37 ± 6	.24 ± .02	662 ± 50
17.66 ± .01	82 ± 7	2.68 ± .05	1	43 ± 5	.638 ± .012	38 ± 4
22.29 ± .01	112 ± 10	3.8 ± 0.2	1	44 ± 4	.805 ± .042	65 ± 5
23.90 ± .01	73 ± 8	.13 ± .01	1	32 ± 10	.0266 ± .0020	41 ± 7
26.24 ± .01	81 ± 4	2.23 ± .10	1	37 ± 6	.435 ± .020	43 ± 5
27.24 ± .01	43 ± 5	.20 ± .01		39 ± 7	.038 ± .002	4 ± 1
32.31 ± .01	154 ± 15	.42 ± .02	0	43 ± 6	.074 ± .004	110 ± 15
34.60 ± .01		.02			.0034	
35.50 ± 0.02	45 ± 4	.45 ± .02	1	40 ± 4	.076 ± .003	5 ± 2
41.42 ± .02	52 ± 8	6.20 ± .20	1	44 ± 8	.963 ± .031	4 ± 1

^{239}Pu
 $[2.439 \times 10^{-4} \text{ yr}]$

E_β (eV)	Γ (meV)	$2g_\beta^n$ (meV)	J	Γ_γ (meV)	$2g_\gamma^n$ (meV)	Γ_γ (meV)
41.66 ± .02	105 ± 16	2.3 ± .2	1	54 ± 11	.36 ± .03	50 ± 12
44.48 ± .02	55 ± 6	9.1 ± 0.2	1	44 ± 6	1.36 ± .03	5 ± 1
47.60 ± .02	300 ± 20	2.95 ± .15	0	44 ± 16	.426 ± .022	230 ± 30
49.60 ± .02	810 ± 200	2.0 ± .2	0		.284 ± .028	746 ± 200
50.08 ± .02	57 ± 10	4.45 ± .20	1	42 ± 8	.629 ± .028	13 ± 3
52.60 ± .02	63 ± 6	15.7 ± .3	1	43 ± 6	2.16 ± .041	8 ± 2
55.63 ± .02	63 ± 10	2.20 ± .12	1	35.6 ± 8.0	.295 ± .016	23 ± 3
57.44 ± .03	530 ± 60	7.2 ± 0.7	0	56 ± 17	.85 ± .09	459 ± 60
58.84 ± .03	900 ± 200	4.5 ± .5	[0]	42 ± 15	.59 ± .07	849 ± 200
59.22 ± .03	190 ± 12	8.6 ± .5	1	44 ± 6	1.12 ± .07	140 ± 13
60.94 ± .03	6800	11	0		1.40	6736
63.08 ± .03	155 ± 17	1.20 ± .25	1		.15 ± .031	111 ± 30
65.36 ± .03		.54			.067	
65.71 ± .03	130 ± 13	18.2 ± 0.5	1	48 ± 8	2.25 ± .06	70 ± 8
74.05 ± .04	71 ± 8	4.75 ± .20	1	36 ± 5	.552 ± .023	32 ± 4
74.95 ± .04	152 ± 10	34.5 ± 1.5	1	40 ± 5	3.99 ± .17	89 ± 9
78.95 ± .04	180	.06		(40)	.007	140
81.76 ± .04	2050	6	0		.66	1996
82.68 ± .04	70	.75 ± .15		(40)	.083 ± .017	49
83.52 ± .04	1750	1.2			.13	1706
85.32 ± .04	~2300	28 ± 4			3.03 ± .43	~2100
85.48 ± .04	80 ± 10	11.80 ± .36	[0]	41 ± 10	1.277 ± .039	17 ± 9
90.75 ± .05	60 ± 10	18.45 ± .42	1	39 ± 6	1.937 ± .044	9 ± 2
92.97 ± .05	57 ± 5	1.05 ± .04	[1]	47 ± 6	.109 ± .004	9 ± 3
95.36 ± .05	98 ± 10	3.15 ± .15	1		.32 ± .02	33 ± 5
96.49 ± .05	1700 ± 350	6.68 ± .26	0		.680 ± .026	1645 ± 350
100.25 ± .06	6000	5.6			.559	5947
102.99 ± .06	48 ± 5	2.42 ± .08	[1]	35 ± 5	.239 ± .008	11 ± 3
105.30 ± .06	48 ± 7	7.2 ± .4	1	37 ± 7	.70 ± .04	6 ± 1
106.67 ± .06	75 ± 4	13.0 ± .6	1	40 ± 4	1.25 ± .06	26 ± 2
110.38 ± .06	43 ± 16	.86 ± .07	[1]		.0628 ± .007	13 ± 3
114.44 ± .07	1500	.8			.075	1456
115.10 ± .07	200	.32 ± .10	[1]	(40)	.030 ± .009	160
116.03 ± .07	245 ± 15	5.41 ± .13	0	30	.502 ± .012	205 ± 20
118.83 ± .07	102 ± 6	25.92 ± .60	1	42 ± 5	2.38 ± .06	43 ± 3
120.99 ± .07	78 ± 12	3.77 ± .15	[0]	35 ± 7	.343 ± .014	39 ± 7
123.44 ± .08	63 ± 13	.75 ± .08	[1]		.068 ± .007	39
126.20 ± .08	86 ± 10	2.96 ± .12	[0]		.264 ± .011	20
127.51 ± .08	64 ± 10	.80 ± .06	1		.071 ± .007	25
131.75 ± .09	3800 ± 250	18.0 ± 1.2	[0]	(40)	1.56 ± .11	3724
133.78 ± .09	56 ± 6	8.38 ± .30	1	44 ± 7	.725 ± .026	6 ± 2

E_0 (eV)	Γ (meV)	$2g_n$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)	Γ_γ (meV)
135.75 ± .09	126 ± 10	5.12 ± .15	0	.32 ± 8	.438 ± .014	84 ± 10
139.28 ± .09		.18			.015	
142.92 ± .09	137 ± 20	5.0 ± .5	1	54	.42 ± .04	80 ± 15
143.47 ± .10	83 ± 12	6.3 ± .2	1	42 ± 13	.53 ± .02	37 ± 5
146.25 ± .10	73 ± 7	10.8 ± .3	{0}	40 ± 7	.893 ± .025	12 ± 2
147.44 ± .10	1000	1.6 ± .2	0		.13 ± .02	956
149.21 ± .10	150	.70 ± .10			.058 ± .008	102
149.42 ± .10	100 ± 15	2.50 ± .12	1	47 ± 15	.205 ± .010	52 ± 13
157.08 ± .11	700 ± 50	17.2 ± .4	0	(40)	1.37 ± .03	626 ± 50
160.8 ± .11		.2			.016	
161.96 ± .11	150	.21 ± .07		(40)	.0165 ± .006	110
164.54 ± .12	78 ± 10	41	1	42.7 ± 8.0	3.20 ± .23	8 ± 1
167.10 ± .12	110 ± 8	8.68 ± .30	1	32 ± 6	.671 ± .023	72 ± 7
170.49 ± .12	158 ± 60	.86 ± .02	(40)	(40)	.066 ± .002	117 ± 60
171.08 ± .12	900 ± 200	.89 ± .30	(40)	(40)	.068 ± .023	900 ± 200
174.56 ± .12		.05 ± .01			.0038 ± .0008	
175.98 ± .13	73 ± 5	3.14 ± .10		41 ± 8	.237 ± .008	31 ± 6
177.22 ± .13	51 ± 6	5.36 ± .18	1	41 ± 6	.403 ± .014	6 ± 2
178.90 ± .13	58 ± 9	1.83 ± .06	[1]	43 ± 7	.137 ± .005	14 ± 3
183.64 ± .13		2.4 ± .2		(40)	.18 ± .02	28
184.87 ± .14	2100 ± 200	8 ± 1	(0)	(40)	.59 ± .07	2028 ± 500
188.27 ± .14	53 ± 10	.78 ± .07		41 ± 10	.056 ± .005	10 ± 2
190.64 ± .14	67 ± 9	2.51 ± .09	{0}	51 ± 10	.182 ± .007	11 ± 3
195.36 ± .15	428 ± 40	28.5 ± 1.5	0	36 ± 12	2.04 ± .11	335 ± 40
196.69 ± .15	112 ± 18	7.23 ± .35	1	46 ± 11	.516 ± .025	61 ± 12
199.39 ± .15	133 ± 13	14.0 ± .5	1	41 ± 8	.992 ± .035	83 ± 10
203.46 ± .16		6			.42	
203.93 ± .16	410 ± 40	27.1 ± 1.0	0	(40)	1.90 ± .07	316
207.37 ± .16	57 ± 3	10.5 ± .4	1	43.6 ± 5.0	.729 ± .028	6 ± 2
211.09 ± .17	800	1.6 ± .3			.11 ± .02	745
212.02 ± .17	1500	1.2			.082	1456
213.28 ± .17	200 ± 60	.7			.048	163
216.53 ± .17	67 ± 5	9.5 ± 0.2	1	39 ± 6	.646 ± .014	11 ± 4
219.49 ± .18	70 ± 10	5.36 ± .27	1	40 ± 12	.362 ± .018	26 ± 6
220.22 ± .18	52 ± 8	11.6 ± .5	1	33 ± 9	.782 ± .033	11 ± 3
223.16 ± .18	59 ± 6	5.0 ± 0.2	1		.335 ± .013	9
224.89 ± .18	85 ± 17	2.56 ± .15		(40)	.171 ± .010	25
227.77 ± .19	8000 ± 1000	17 ± 3	(0)		1.13 ± .20	7926
227.89 ± .19	67 ± 10	2.54 ± .15	1	33 ± 14	.168 ± .010	32 ± 10
231.40 ± .19	56 ± 8	17.3 ± 1.0	1	39 ± 8	1.14 ± .07	5 ± 2
232.63 ± .20		.66 ± .15			.043 ± .010	

E_0 (eV)	Γ (eV)	$2g_n^0$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)	Γ_γ (meV)
234.32 ± .20	74 ± 6	15.0 ± .6	[1]	49 ± 6	.98 ± .04	15 ± 2
239.04 ± .21	73 ± 8	7.9 ± .4	1	52 ± 9	.51 ± .03	16 ± 4
240.60 ± .24		.05			.003	
242.68 ± .21	97 ± 6	9.4 ± .4	1	35 ± 7	.60 ± .03	56 ± 6
247.50 ± .22	312 ± 60	1.39 ± .20			.088 ± .013	227
248.86 ± .22	62 ± 6	22.13 ± .72	1	42 ± 6	1.403 ± .046	5 ± 1
251.23 ± .22	83 ± 5	40.0 ± 1.2	1	40 ± 7	2.52 ± .08	16 ± 2
254.58 ± .22	55 ± 5	4.0 ± .3	1		.25 ± .02	25 ± 6
256.11 ± .22	91 ± 16	9.0 ± .5	1		.56 ± .03	32 ± 7
259.00 ± .23		.4 ± .1	1		.025 ± .006	
262.37 ± .23	6300	46 ± 4	0		2.84 ± .25	6146
262.74 ± .23	60 ± 10	3.64 ± .45			.22 ± .03	10
264.23 ± .24		.25			.015	
269.11 ± .24	140	2.1 ± .5			.13 ± .03	83
269.54 ± .24	72 ± 20	6.2 ± .6	1		.39 ± .04	28 ± 10
272.62 ± .25	92 ± 10	40.3 ± 1.5	1		2.44 ± .09	31 ± 12
274.80 ± .25	800	14.0 ± 2.0			.845 ± .121	730
275.57 ± .25	150 ± 30	36.6 ± 1.5	1		2.20 ± .09	72 ± 20
277.23 ± .26	5300	9			.54	5260
279.59 ± .26	111 ± 8	11.0 ± 0.2	0		.658 ± .012	56 ± 8
282.92 ± .27	85 ± 6	37.2 ± 2.7	1		2.21 ± .16	11 ± 2
285.73 ± .27		.10			.006	
288.00 ± .27	7000	15			.88	6028
288.30 ± .28		.08			.0047	
292.33 ± .28	115 ± 13	5.94 ± .24	0		.347 ± .014	72 ± 12
295.46 ± .29	81 ± 12	4.8 ± .2	1		.279 ± .012	30
298.59 ± .29	74 ± 7	15.8 ± .6	1		.914 ± .035	20 ± 5
301.81 ± .29	108 ± 6	27.3 ± 1.0	1		1.57 ± .06	48 ± 10
308.20 ± .30	30 ± 12	4.40 ± .27	1		.25 ± .015	98 ± 45
309.01 ± .30		21.10 ± .72	1		1.20 ± .04	24 ± 5
311.12 ± .31		.73 ± .18			1.15 ± .04	10 ± 3
313.62 ± .31	62 ± 6	20.40 ± .72	1		.436 ± .017	25 ± 5
316.66 ± .32	73 ± 10	7.75 ± .30	1		.041 ± .010	
321.75 ± .32		.20 ± .08			.011 ± .005	
323.36 ± .32	160 ± 20	30.2 ± .9	[0]		1.68 ± .050	47 ± 9
325.30 ± .33	135 ± 9	12.8 ± .5	1		.710 ± .028	46 ± 12
329.65 ± .34	2000	5.6			.31	1947
333.91 ± .34	67 ± 7	8.24 ± .30	1		.451 ± .016	10
335.93 ± .34	83 ± 6	26.60 ± .72	1		1.45 ± .04	18 ± 4
337.95 ± .35	74 ± 7	12.09 ± .42	1		.658 ± .023	11 ± 4
339.24 ± .35	81 ± 12	4.92 ± .21	0		.267 ± .011	33 ± 12

E ₀ (eV)	Γ (meV)	2g _{1/2} (meV)	J	Γ _γ (meV)	2g ₀ (meV)	Γ _f (meV)
343.18 ± .35	75 ± 6	23.59 ± .78	1		1.28 ± .04	18 ± 3
346.56 ± .36	1200	5.2 ± .6			.28 ± .03	1148
350.30 ± .36	97 ± 6	32.25 ± .90	1		1.72 ± .05	35 ± 4
352.82 ± .37	69 ± 13	5.84 ± .24	1		.311 ± .013	17 ± 5
354.89 ± .38	100	.60 ± .10			.032 ± .005	
357.87 ± .38	6000	4.5			.24	5949
359.99 ± .39	114 ± 20	1.66 ± .18			.088 ± .010	80
361.28 ± .39		.33 ± .10			.017 ± .005	
366.0 ± .40	5000	5.4			.28	4947
368.33 ± .40		.60 ± .20			.031 ± .010	
370.31 ± .40	105 ± 20	3.90 ± .24			.203 ± .012	23
371.72 ± .40	3400	11.5 ± 1.4			.57 ± .07	3335
375.02 ± .41	43 ± 12	4.0 ± .3	0		.21 ± .02	6
377.10 ± .41	100 ± 20	2.98 ± .30			.154 ± .015	39 ± 16
378.04 ± .41	223 ± 60	1.88 ± .30			.097 ± .015	
382.43 ± .41	130	.63 ± .15			.032 ± .008	85
384.26 ± .42	109 ± 30	8.55 ± .50	1		.434 ± .026	75 ± 25
385.90 ± .42	1000	1.4			.071	955
389.51 ± .43	74 ± 14	2.09 ± .18			.106 ± .009	21
391.52 ± .44	142 ± 28	1.89 ± .18			.0955 ± .009	68
394.43 ± .44	106 ± 13	9.78 ± .33	1		.492 ± .017	52 ± 10
396.91 ± .44	108 ± 20	3.17 ± .21			.159 ± .011	61 ± 20
401.56 ± .45	220 ± 20	29.1 ± 1.2	1		1.45 ± .06	154 ± 25
404.24 ± .45	155 ± 25	34.8 ± 1.3	1		1.73 ± .07	76 ± 15
406.03 ± .45	320	2.73 ± .60			.135 ± .030	
406.95 ± .46	330	1.40 ± .60			.072 ± .030	302
408.71 ± .46	150	1.94 ± .30			.0960 ± .015	58
412.31 ± .47	145 ± 15	13.41 ± .63	1		.660 ± .031	70 ± 13
415.66 ± .47	152 ± 30	4.89 ± .36			.240 ± .018	18
417.60 ± .48	267 ± 64	2.40 ± .36			.117 ± .018	178
419.85 ± .48	139 ± 25	9.11 ± .45	1		.445 ± .022	74 ± 20
425.67 ± .49		.40			.019	
426.37 ± .49	7000	14.8			.72	6913
429.64 ± .50	780	5.66 ± .81			.273 ± .039	727
431.29 ± .50	3500	7.3			.35	3443
432.73 ± .50		1.54 ± .30			.074 ± .014	
437.76 ± .51	62 ± 15	4.04 ± .30	1		.193 ± .014	10
438.72 ± .52	61 ± 15	4.36 ± .30	1		.208 ± .014	3
440.07 ± .52		.42 ± .15			.020 ± .007	
442.41 ± .52		10.5 ± .5	0		.489 ± .024	337 ± 70
449.75 ± .53		2.0 ± .3			.094 ± .014	

E_0 (eV)	Γ (meV)	$2\Gamma_n$ (meV)	J	Γ_γ (meV)	$2\Gamma_n^0$ (meV)	Γ_f (meV)
451.35 $\pm$.53	58	21.1 $\pm$ 1.4	1		.99 $\pm$.07	3.7
454.45		0.7			.033	
455.73 $\pm$.53	614	39.7 $\pm$ 2.5	0	(40)	1.86 $\pm$.12	495
457.33		11.1 $\pm$ 1.1			.52 $\pm$.05	118
458.80	78	6.9 $\pm$.6	1	(40)	.32 $\pm$.02	33
461.26		3.5 $\pm$ 0.4			0.16 $\pm$.02	52.4
462.64		.8 $\pm$.2			.04 $\pm$.01	86
468.20	2098	6.5		(40)	.30	2045
470.0	5100	15		(40)	.69	5030
473.10	54	6.2 $\pm$.4	1	(40)	.29 $\pm$.02	10
475.31	586	5.7		(40)	.26	535
478.90	1995	2.7		(40)	0.12	1950
479.24		0.2			.009	
484.15		3.9 $\pm$ 0.4			.18 $\pm$.02	
487.29		3.3			0.15	
487.81		5.2			.24	
490.65		20 $\pm$ 3			.90 $\pm$.14	2220
494.10	115	6.9 $\pm$.4	1	(40)	.31 $\pm$.02	70
495.63		1.2			.054	
500.50	75	5.1 $\pm$ 1.3	1	(40)	.23 $\pm$.06	32
502.86	84	17.8 $\pm$ 1.4	1	(40)	.793 $\pm$.062	32
505.78		0.9			0.04	
508.22		0.7			0.031	
509.74	363	78.2 $\pm$ 4.0	1	(40)	3.46 $\pm$.18	167
511.52	3366	12.9	0	(40)	.57	3300
515.16		1			.044	
516.57		.3			.013	
517.98		.7			.03	
520.22	98	22.4 $\pm$ 1.8	1	(40)	.98 $\pm$.08	43
524.21	91	45.9 $\pm$ 4.8	1	(40)	2.00 $\pm$.21	20
525.40	10782	121	0	(40)	5.28	10500
526.00		1.5			.065	51
527.38		1.5			.065	~16
530.52	243	63.8 $\pm$ 5.1	0	(40)	2.77 $\pm$.22	75
539.17	54	17.1 $\pm$ 3.0	1	(40)	.736 $\pm$.129	2.4
540.71		4			.17	
541.55		8			.34	
543.08	57	17.6 $\pm$ 3.0	1	(40)	.755 $\pm$.129	5
545.85	1195	17.5 $\pm$ 2.5	0	(40)	.749 $\pm$.11	1120
547.14		1.8			.077	
549.67	59	17.7 $\pm$ 1.5	1	(40)	.755 $\pm$.064	7

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
553.50	68	17	1	(40)	.72	~3
554.13	1284	52.2	0	(40)	2.22	1140
555.72		4.9			.21	
559.16	88	40.8 $\pm$ 2.4	1	(40)	1.73 $\pm$.10	21
562.84		53.6 $\pm$ 4.0			2.26 $\pm$.17	
564.03		9.8 $\pm$ 1.6			.412 $\pm$.067	~2
565.81		14.2 $\pm$ 1.2			.597 $\pm$.050	5
571.11	82	12.9 $\pm$.9	1	(40)	.540 $\pm$.038	33
574.00	419	79.5 $\pm$ 6.0	0	(40)	3.32 $\pm$.25	220
575.77	88	59.7 $\pm$ 5.6	1	(40)	2.49 $\pm$.23	8
578.00		2.5		(40)	.10	36
579.04	54	10.3 $\pm$.9	1	(40)	.428 $\pm$.037	7
584.81		.7		(40)	.029	
588.09	61	16.9 $\pm$ 1.2	1	(40)	.697 $\pm$.049	10
589.94		.5		(40)	.021	
593.52		3.2 $\pm$.5		(40)	.13 $\pm$.02	4
597.35	54	12.9 $\pm$ 1.5	1	(40)	.528 $\pm$.061	5
598.04	5998	21.6 $\pm$ 4.0	0	(40)	.88 $\pm$.16	5915
604.01	65	37.6 $\pm$ 3.3	1	(40)	1.53 $\pm$.13	3.5
607.64	57	14.6 $\pm$ 1.2	1	(40)	.592 $\pm$.049	7.7
609.29	62	23.6 $\pm$ 2.4	1	(40)	.956 $\pm$.097	6.6
612.82		8.8 $\pm$.8		(40)	.36 $\pm$.03	14
620.24	57	17.8 $\pm$ 1.5	1	(40)	.715 $\pm$.060	5.4
622.39		14.7 $\pm$ 1.2	1	(40)	.589 $\pm$.048	9.8
625.17		11.8 $\pm$ 1.2	1	(40)		7.5
628.21		2.2 $\pm$.7		(40)	.088 $\pm$.028	9
632.97	3908	34 $\pm$ 4	0	(40)	1.35 $\pm$.16	3800
636.47		8.0 $\pm$ 1.2		(40)	.32 $\pm$.05	16
639.28	55	13.9 $\pm$ 1.5	1	(40)	.550 $\pm$.059	6
641.42		.7		(40)	.027	
644.94	49	8.8 $\pm$ 1.2	1	(40)	.35 $\pm$.05	3
646.65		1.5			.059	
658.29	140	122 $\pm$ 13	1	(40)		19

Note - Single-level Breit-Wigner parameters. For multi-level parameters see Derrien 70 and Farrel 67.

²⁴⁰₉₄Pu
[6540 yr]

THERMAL CROSS SECTIONS

$\sigma_f = 289.5 \pm 1.4$ b
 $\sigma_f = 0.030 \pm 0.045$ b
 $\bar{\sigma}_f = 1.54 \pm 0.09$ b
 $\sigma_c = 291.1 \pm 1.4$ b
 $\nu_{sp} = 2.17 \pm 0.01$
 $a_{coh} = 3.5 \pm 0.1$ fm

RESONANCE PROPERTIES

$\Gamma_\gamma = 8013 \pm 960$ b
 $\langle D \rangle = 13.6 \pm 0.4$ eV
 $S_0 = 0.94 \pm 0.09$

RESONANCE PARAMETERS

$I^\pi = 0^+$ $S_n = 5240.6 \pm 3.0$ keV

E_0 (eV)	Γ (meV)	$g_{\Gamma_n}^2$ (meV)	Γ_γ (meV)	$g_{\Gamma_n}^2$ (meV)	Γ_f (meV)
1.056 ± .002	33.3 ± 3.0	2.30 ± .15	31 ± 3	2.24 ± .15	
20.46 ± .01	31.1 ± 3.4	2.65 ± .07	32.2 ± 3.4	.586 ± .016	
36.34 ± .02		17.5 ± .5		2.83 ± .08	
41.64 ± .02		16.3 ± .5	32.8 ± 1.0	2.53 ± .08	
66.62 ± .04		53.2 ± 1.0	28 ± 1	6.52 ± .12	
72.80 ± .04		21.0 ± .5	28 ± 1	2.46 ± .06	
90.78 ± .06		13.0 ± .3		1.36 ± .03	
92.51 ± .06		3.2 ± .1		.33 ± .01	
105.05 ± .07		46.0 ± 1.5	36.5 ± 1.0	4.49 ± .15	
121.67 ± .09		14.5 ± .5		1.31 ± .05	
130.8 ± .1		.17 ± .03		.015 ± .003	
135.3 ± .1		18.5 ± 1.0		1.59 ± .09	
151.9 ± .1		13.8 ± .5	29.5 ± 1.1	1.12 ± .04	
162.7 ± .1		9.0 ± .3	27.5 ± .9	.706 ± .024	
170.2 ± .1		16 ± 1	27.3 ± .9	1.23 ± .08	
186.2 ± .2		17.5 ± .5	28.8 ± .9	1.28 ± .04	
192.1 ± .2		.30 ± .04		.022 ± .003	
199.6 ± .2		1.0 ± .1		.071 ± .007	
238.2 ± .2		13.1 ± .6	27.7 ± 1.0	.847 ± .004	
260.5 ± .2		24 ± 1	31.0 ± 1.0	1.49 ± .06	
287.1 ± .2		136 ± 1	32.0 ± 1.1	8.03 ± .06	
304.9 ± .2		7.4 ± .2		.42 ± .01	

E ₀ (eV)	Γ (meV)	g ₁ ⁰ (meV)	Γ ₁ (meV)	g ₁ ⁰ (meV)	Γ ₁ (meV)
316.4 ± .2		6.1 ± .3		.34 ± .02	
320.8 ± .2		19.6 ± .4		1.09 ± .02	
338.5 ± .2		7.3 ± .4		.40 ± .02	
346.1 ± .2		17.2 ± .5		.925 ± .03	
363.7 ± .2		30.5 ± 1.0	32.8 ± 1.7	1.60 ± .05	
372.0 ± .2		14.2 ± .8	27.5 ± .3	.74 ± .04	
405.0 ± .2		105 ± 5	30.2 ± .2	5.22 ± .25	
419.0 ± .2		6.2 ± .3		.30 ± .15	
445.8 ± .3		1.9 ± .3		.090 ± .014	
449.8 ± .2		17.2 ± 1.5		.81 ± .07	
466.5 ± .2		2.7 ± .3		.125 ± .014	
473.3 ± .2		4.2 ± .3		.19 ± .01	
493.9 ± .2		6.1 ± .5		.27 ± .02	
499.3 ± .3		18 ± 1	33.5 ± 1.5	.81 ± .05	
514.3 ± .3		21.5 ± 1.5		.95 ± .070	
526.1 ± .4		.82 ± .48		.040 ± .021	
530.8 ± .4		.70 ± .40		.030 ± .017	
546.8 ± .3		30.0 ± .7	36 ± 4	1.28 ± .03	
553.3 ± .3		17.5 ± 1.5		.74 ± .06	
566.4 ± .3		31.5 ± 1.7	29.5 ± 2.0	1.32 ± .07	
584.1 ± .5		1.2 ± .6		.05 ± .02	
596.8 ± .2		57.5 ± 2.5	33.5 ± 2.0	2.35 ± .10	
608.1 ± .2		22.8 ± 1.4	31.5 ± 3.0	.924 ± .057	
632.5 ± .2		13.3 ± 1.3		.53 ± .05	
637.5 ± .2		13.5 ± 1.0		.53 ± .04	
665.1 ± .2		196 ± 8	33 ± 2	7.64 ± .31	
678.6 ± .2		26.0 ± 1.8		1.00 ± .07	
712.1 ± .3		1.3 ± .6		.050 ± .023	
743.3 ± .3		1.0 ± .7		.037 ± .026	
750.0 ± .3		68.2 ± 3.4	(30 ± 2)	2.49 ± .12	9.5 ± 2.0
758.9 ± .3		6.0 ± .9		.22 ± .03	
778.3 ± .3		1.2 ± .8		.04 ± .03	
782.2 ± .3		2.6 ± 1.0		.10 ± .04	
791.0 ± .3		23.9 ± 1.4		.85 ± .05	~132
810.5 ± .3		213 ± 10	(30 ± 2)	7.52 ± .35	16.3 ± 1.7
819.9 ± .3		110.0 ± 5.5	30 ± 3	3.84 ± .19	10.2 ± 1.2
845.6 ± .3		10.3 ± 1.0		.35 ± .03	1.4 ± .2
854.9 ± .3		48.0 ± 2.5		1.64 ± .09	
876.5 ± .3		13.9 ± 1.3		.47 ± .04	
891.5 ± .3		94.5 ± 4.5		3.16 ± .15	
903.9 ± .3		21.8 ± 1.5		.73 ± .05	

E_0 (eV)	Γ (meV)	g_n^0 (meV)	Γ_γ (meV)	g_n^0 (meV)	Γ_f (meV)
908.9 ± .3	79.1 ± 4.0	2.62 ± .13			
915.3 ± .3	36.1 ± 2.2	1.19 ± .07			
943.5 ± .3	122.8 ± 5.5	4.00 ± .18			
958.4 ± .3	71.5 ± 3.5	2.31 ± .12			
971.3 ± .3	80.4 ± 4.0	2.58 ± .13			
979.2 ± .3	7.3 ± 1.5	.23 ± .05			
1001.8 ± .3	98.2 ± 5.0	3.10 ± .16			
1024.1 ± .4	5.0 ± 1.5	.16 ± .05			
1041.6 ± .4	12.7 ± 1.9	.39 ± .06			
1045.7 ± .4	4.0 ± 1.6	.12 ± .05			
1072.6 ± .4	109.3 ± 5.5	3.34 ± .17			
1099.8 ± .4	84.1 ± 8.5	2.54 ± .26			
1115.7 ± .5	2.6 ± 1.6	.08 ± .05			
1128.8 ± .4	50.1 ± 3.0	1.49 ± .09			
1133.8 ± .4	6.7 ± 2.0	.20 ± .06			
1142.7 ± .4	40.6 ± 2.7	1.20 ± .08			
1159.6 ± .4	22.1 ± 2.0	.65 ± .06			
1185.5 ± .4	157.5 ± 8.0	4.57 ± .23			
1190.8 ± .4	114.9 ± 5.9	3.33 ± .17			
1208.9 ± .4	62.9 ± 3.8	1.81 ± .11			
1228.0 ± .4	10.0 ± 2.0	.29 ± .06			
1236.5 ± .4	11.4 ± 2.2	.32 ± .06			
1254.7 ± .4	76.8 ± 4.6	2.17 ± .13			
1281.4 ± .4	4.3 ± 2.1	.12 ± .06			
1300.7 ± .4	245.0 ± 12.5	6.79 ± .35			
1328.1 ± .4	369.0 ± 18.5	10.13 ± .51			
1345.0 ± .5	26.1 ± 3.1	.71 ± .08			
1350.7 ± .6	8.3 ± 2.5	.23 ± .07			
1362.9 ± .6	7.4 ± 3.0	.20 ± .08			
1377.0 ± .5	64.7 ± 4.5	1.74 ± .12			
1389.0 ± .6	14.2 ± 2.8	.38 ± .07			
1401.2 ± .6	5.2 ± 3.1	.14 ± .08			
1408.6 ± .6	10.9 ± 2.5	.29 ± .07			60.0±16.2
1426.1 ± .5	36.7 ± 3.7	.97 ± .10	(30 ± 2)		60.0±38.3
1429.0 ± .5	15.0 ± 3.0	.40 ± .08			5.1 ± .5
*1450.2 ± .5	64.6 ± 5.2	1.67 ± .14	(30 ± 2)		3.5
1462.9 ± .5	21.0 ± 3.3	.55 ± .09			
1481.2 ± .7	9.4 ± 3.0	.24 ± .08			
1540.7 ± .5	101.0 ± 6.1	2.57 ± .16			
1549.5 ± .5	156.7 ± 8.6	3.98 ± .22			
1563.7 ± .5	114.7 ± 8.0	2.90 ± .20			

E_0 (eV)	Γ (meV)	g^0_n (meV)	Γ_γ (meV)	g^0_n (meV)	Γ_f (meV)
1575.3 ± .5		126.2 ± 7.6		3.18 ± .19	
1609.6 ± .6		34.8 ± 3.9		.87 ± .10	
1621.4 ± .6		28.6 ± 3.7		.71 ± .09	
1643.0 ± .6		107.1 ± 7.0		2.65 ± .17	
1662.6 ± .6		63.9 ± 5.2		1.59 ± .13	
1687.9 ± .6		32.7 ± 4.3		.80 ± .10	
1724.1 ± .6		83.5 ± 6.7		2.01 ± .16	
1741.6 ± .6		24.9 ± 4.3		.60 ± .10	
1763.7 ± .6		51.7 ± 4.8		1.23 ± .11	
1771.4 ± .8		9.8 ± 5.0		.23 ± .12	
1779.0 ± .6		491 ± 25		11.7 ± .6	
1841.2 ± .7		125.8 ± 9.0	(30 ± 2)	2.93 ± .21	10.6 ± 1.2
1852.7 ± .7		34.4 ± 5.5		.80 ± .13	
1872.7 ± .7		77.4 ± 7.0		1.79 ± .16	
1901.6 ± .7		209.0 ± 12.5	(30 ± 2)	4.80 ± .29	
1916.6 ± .7		35.9 ± 6.1		.82 ± .14	50 ± 10
1943.3 ± .9		8.0 ± 5.0		.18 ± .11	
1949.1 ± .7		82.5 ± 7.6		1.87 ± .17	
1956.2 ± .7		261 ± 16		5.90 ± .36	
1973.1 ± .7		68.1 ± 7.5		1.53 ± .17	28 ± 4
1991.5 ± .7		114.5 ± 9.5		2.57 ± .21	
1998.3 ± .7		5.6 ± 4.0		.12 ± .09	
2016.7 ± .7		52.5 ± 7.5		1.17 ± .17	
2022.9 ± .7		55.5 ± 7.5		1.23 ± .17	
2033.4 ± .7		101.5 ± 9.5	(30 ± 2)	2.25 ± .21	7.6 ± .9
2055.6 ± .8		68.5 ± 7.5	(30 ± 2)	1.51 ± .17	2.0 ± .2
2082.8 ± .8		98.8 ± 9.5		2.16 ± .21	
2110.7 ± 1.0		13.7 ± 5.5		.30 ± .12	
2154.0 ± 1.1		14.3 ± 7.0		.31 ± .15	
2182.0 ± .8		85.6 ± 8.5		1.83 ± .18	
2196.2 ± .8		130.0 ± 10.5		2.77 ± .22	
2240.6 ± .8		34.1 ± 7.5		.72 ± .16	
2256.6 ± .8		134.5 ± 11.0		2.83 ± .23	
2277.9 ± .8		427 ± 26		8.94 ± .55	
2290.7 ± .9		208.5 ± 17.0		4.36 ± .36	
2303.3 ± 1.2		17.2 ± 7.0		.36 ± .15	
2334.4 ± .9		36.6 ± 7.5		.76 ± .16	
2350.9 ± .9		31.6 ± 8.0		.65 ± .17	
2365.8 ± .9		241 ± 17		4.95 ± .35	
2373.4 ± .9					
2365.1 ± .9		18.7 ± 7.5		.38 ± .15	

E_0 (eV)	Γ (meV)	g_n^0 (meV)	Γ_γ (meV)	g_n^0 (meV)	Γ_f (meV)
2405.0 ± 9		25.1 ± 7.5		.51 ± .15	
2416.0 ± 9		64.9 ± 9.0		1.32 ± .18	
2434.3 ± 9		205 ± 15		4.16 ± .31	
2459.4 ± 9		25.6 ± 8.5		.52 ± .17	
2470.8 ± 9		45.5 ± 8.0		.92 ± .16	
2485.3 ± 9		21.2 ± 8.5		.42 ± .17	
2521.0 ± 1.0		109.5 ± 11.0		2.18 ± .22	
2538.6 ± 1.0		267.5 ± 20.0		5.70 ± .40	
2549.2 ± 1.0		79.7 ± 12.0		1.58 ± .24	
2575.3 ± 1.0		47.5 ± 9.5		.94 ± .19	
2639.5 ± 1.0		426 ± 42		8.29 ± .83	
2652.4 ± 1.0		36.3 ± 8.0		.71 ± .16	
2692.8 ± 1.0		345 ± 26		6.64 ± .50	95.7 ± 11.7
2717.7 ± 1.0		40.7 ± 10.0		.78 ± .19	
2739.2 ± 1.0		177 ± 18		3.38 ± .34	
2748.4 ± 1.0		102 ± 13	(30 ± 2)	1.95 ± .25	11.3 ± 1.3
2817.6 ± 1.1		41.2 ± 10.0		.78 ± .19	
2843.5 ± 1.1		157 ± 16		2.94 ± .30	
2859.7 ± 1.1		27 ± 11		.51 ± .21	
2882.0 ± 1.1		30 ± 12		.55 ± .22	
2885.6 ± 1.1		60 ± 12		1.11 ± .26	
2905.0 ± 1.1		115 ± 14		2.13 ± .26	
2930.0 ± 1.1		132 ± 15		2.43 ± .28	
2958.6 ± 1.1		85.0 ± 13.5		1.55 ± .25	
2980.5 ± 1.2		108 ± 20		1.98 ± .37	
2986.2 ± 1.2		12.5 ± 8.0		.23 ± .15	
2994.7 ± 1.2		55.8 ± 11.5		1.02 ± .21	
3004.0 ± 1.2		76.5 ± 13.0		1.39 ± .24	
3018.0 ± 1.2		117 ± 18		2.12 ± .33	
3029.0 ± 1.2		21.0 ± 11.0		.38 ± .20	
3054.7 ± 1.2		47.0 ± 15.0		.85 ± .27	
3077.4 ± 1.2		128 ± 19	(30 ± 2)	2.31 ± .34	12.9 ± 1.7
3086.0 ± 1.2		35.0 ± 17.0		.63 ± .31	
3112.7 ± 1.2		38.5 ± 14.0		.68 ± .25	
3172.5 ± 1.3		225 ± 23		3.99 ± .41	
3192.5 ± 1.3		349 ± 35		6.17 ± .62	
3237.5 ± 1.3		72 ± 15		1.26 ± .26	
3268.5 ± 1.3		134 ± 20		2.34 ± .35	
3332.0 ± 1.3		14.5 ± 10.0		.25 ± .17	
3423.0 ± 1.4		34.5 ± 12.0		.59 ± .21	
3458.0 ± 1.4		68.0 ± 13.5		1.16 ± .23	126.9 ± 43.9

E_0 (eV)	Γ (meV)	g_n^0 (meV)	Γ_γ (meV)	g_n^0 (meV)	Γ_f (meV)
3455.5 ± 1.4		344 ± 35		5.64 ± .58	
3493.5 ± 1.4		65.0 ± 13.5		1.11 ± .23	
3555.0 ± 1.4		91.0 ± 15.5		1.52 ± .26	
3567.5 ± 1.4		162 ± 20		2.71 ± .34	
3595.0 ± 1.4		28.5 ± 13.5		.47 ± .22	
3657.0 ± 1.5		293 ± 30		4.85 ± .50	
3665.0 ± 1.5		54.5 ± 19.0		.90 ± .32	
3702.0 ± 1.5		51 ± 17		.84 ± .28	
3723.0 ± 1.5		60 ± 20		.98 ± .33	
3800.0 ± 1.6		101 ± 23		1.64 ± .38	
3844.0 ± 1.6		76 ± 20		1.23 ± .32	
3852.0 ± 1.6		98 ± 20		1.59 ± .33	
3872.0 ± 1.6		46 ± 19		.74 ± .31	
3900.0 ± 1.6		209 ± 27		3.35 ± .43	
3917.0 ± 1.6		163 ± 23		2.61 ± .37	
3954.0 ± 1.6		92 ± 21		1.47 ± .33	
3975.0 ± 1.7		102 ± 22		1.62 ± .35	
3990.0 ± 1.7		29 ± 16		.47 ± .29	
4031.0 ± 1.7		109 ± 21		1.71 ± .33	
4084.0 ± 1.7		120 ± 23		1.88 ± .36	
4100.0 ± 1.7		257 ± 28		4.02 ± .44	
4122.0 ± 1.7		497 ± 40		7.74 ± .63	
4134.0 ± 1.7		67 ± 23		1.05 ± .36	
4149 ± 1.7		265 ± 29		4.11 ± .45	
4161.0 ± 1.7		89 ± 24		1.39 ± .38	
4203.0 ± 1.8		438 ± 43		6.75 ± .66	
4221.0 ± 1.8		68 ± 21		1.05 ± .32	
4270.0 ± 1.8		159 ± 27		2.43 ± .41	
4288.0 ± 1.8		316 ± 41		4.83 ± .61	
4329.0 ± 1.8		302 ± 35		4.58 ± .53	
4376.0 ± 1.8		82 ± 30		1.24 ± .45	
4386.0 ± 1.8		32 ± 24		.48 ± .36	
4396.0 ± 1.9		78 ± 25		1.17 ± .37	
4422.0 ± 1.9		61 ± 24		.91 ± .36	
4433.0 ± 1.9		47 ± 22		.71 ± .33	
4458.0 ± 1.9		102 ± 27		1.52 ± .40	
4570.0 ± 1.9		220 ± 45		3.26 ± .67	
4588.0 ± 1.9		526 ± 60		7.76 ± .89	
4599.0 ± 1.9		75 ± 30		1.11 ± 2.44	
4615 ± 2		262 ± 63		3.85 ± .93	
4646 ± 2		149 ± 45		2.18 ± .66	

E_0 (eV)	Γ (meV)	g_n^+ (meV)	Γ_γ (meV)	g_n^0 (meV)	Γ_t (meV)
4721 ±2		510 ±75		7.43 ±1.10	
4745 ±2		245 ±50		3.56 ±.73	
4755 ±2		56 ±28		.82 ±.41	
4766 ±2		15 ±15		.22 ±.22	
4771 ±2		22 ±20		.32 ±.29	
4779 ±2		34 ±25		.49 ±.36	
4792 ±2		133 ±34		1.93 ±.49	
4812 ±2		172 ±35		2.48 ±.50	
4823 ±2		63 ±25		.91 ±.36	
4894 ±2		59 ±27		.85 ±.39	
4958 ±2		291 ±55		4.13 ±.78	
4969 ±2		158 ±50		2.23 ±.70	
4993 ±2		92 ±35		1.30 ±.49	
5072 ±2		509 ±50		7.15 ±.70	
5113 ±2		93 ±35		1.30 ±.49	
5134 ±2		42 ±30		.58 ±.41	
5148 ±2		50 ±35		.70 ±.49	
5162 ±2		40 ±30		.55 ±.41	
5194 ±2		313 ±55		4.26 ±.75	
5215 ±2		163 ±40		2.21 ±.54	
5249 ±2		524 ±70		7.24 ±.97	
5279 ±2		140 ±45		1.93 ±.62	
5289 ±2		270 ±45		3.71 ±.62	
5334 ±2		203 ±50		2.78 ±.69	
5350 ±2		153 ±50		2.09 ±.68	
5367 ±2		70 ±40		.96 ±.55	
5393 ±2		84 ±42		1.14 ±.57	
5417 ±2		255 ±50		3.47 ±.68	
5489 ±2		50 ±40		.67 ±.54	
5499 ±2		87 ±40		1.17 ±.54	
5510 ±2		355 ±70		4.78 ±.94	
5522 ±3		172 ±45		2.32 ±.61	
5544 ±3		582 ±90		7.82 ±1.20	
5574 ±3		758 ±90		10.2 ±1.2	
5592 ±3		207 ±60		2.77 ±.80	
5615 ±3		62 ±50		.83 ±.67	
5681 ±3		106 ±50		1.40 ±.66	
5692 ±3		91 ±46		1.21 ±.61	

* Probably doublet.

Note - Single-level Breit-Wigner parameters.

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_f &= 368 \pm 10 \text{ b} \\ \sigma_f &= 1009 \pm 8 \text{ b} \\ \sigma_a &= 1377 \pm 10 \text{ b} \\ \sigma_s &= 11 \pm 1 \text{ b} \\ \sigma_t &= 1388 \pm 10 \text{ b} \\ \alpha &= 0.365 \pm 0.009 \\ \eta &= 2.145 \pm 0.014 \\ \nu_p &= 2.927 \pm 0.014\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 162 \pm 8 \text{ b} \\ I_f &= 570 \pm 15 \text{ b} \\ <D> &= 1.0 \pm 0.1 \text{ eV} \\ S_0 &= 0.99 \pm 0.14\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$S_n = 6309.5 \pm 0.7 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
Bound level						
.257 ± .005	132 ± 13	.060 ± .005	3	35 ± 11	.12 ± .01	97 ± 10
4.28 ± .01	77 ± 10	.53 ± .12	3	32 ± 8	.26 ± .06	45 ± 10
4.58 ± .01	170 ± 10	.30 ± .04	2	(35)	.14 ± .02	135 ± 10
5.97 ± .05	1338 ± 100	2.7 ± 0.2	2	(35)	1.1 ± .1	1300 ± 100
6.93 ± .02	156 ± 20	0.72 ± .05	3	(35)	.27 ± .02	120 ± 20
8.68 ± .03	131 ± 30	0.80 ± .15	3	30 ± 10	.27 ± .05	100 ± 30
9.57 ± .04	385	0.44 ± .08	2	(35)	.14 ± .03	350
10.05 ± .05	636	1.1 ± .4	2	(35)	.35 ± .13	600
12.79 ± .03	281 ± 5	0.79 ± .04	3	50 ± 7	.22 ± .01	230 ± 20
13.40 ± .03	79 ± 10	2.7 ± 0.2	2	36 ± 2	.74 ± .06	40 ± 10
14.74 ± .03	157 ± 6	6.2 ± 0.2	3	41 ± 5	1.62 ± .05	110 ± 10
15.97 ± .04	556 ± 30	1.44 ± .12	3	(35)	.360 ± .030	520 ± 30
16.67 ± .04	213 ± 9	1.28 ± .08	2	42 ± 9	.314 ± .020	170 ± 20
17.83 ± .04	65 ± 4	3.18 ± .20	2	39 ± 3	.753 ± .047	23 ± 5
18.22 ± .04	80 ± 20	0.15 ± .04	2	(35)	.035 ± .009	40 ± 16
20.38 ± .05	40 ± 20	.14 ± .02	3	43 ± 6	.031 ± .004	10
20.69 ± .05	105 ± 5	.36 ± .04		(35)	.079 ± .009	62 ± 8
21.05 ± .06	335 ± 100	.060			.013	300 ± 100

²⁴¹₉₄Pu
[15 yr]

E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)	Γ_f (meV)
21.91 ± .05	70 ± 20	.17 ± .02		50 ± 20	.036 ± .004	20
23.00 ± .05	370 ± 20	1.15 ± .08	3	(35)	.240 ± .017	335 ± 50
23.70 ± .06	350 ± 50	.39 ± .08		55 ± 15	.080 ± .016	325 ± 30
24.04 ± .06	127 ± 6	1.38 ± .14	3	46 ± 7	.281 ± .029	80 ± 20
24.61 ± .06		0.35 ± .15			.071 ± .030	
26.39 ± .06	310 ± 10	4.5 ± 0.2	3	45 ± 10	.875 ± .039	265 ± 20
27.50 ± .12		.08 ± .04			.015 ± .008	
28.89 ± .07	700 ± 30	4.8 ± 0.2	2	(40)	.893 ± .037	655 ± 30
29.42 ± .07	125 ± 30	.55 ± .06	(3)	(40)	.10 ± .01	85 ± 30
30.96 ± .07	300 ± 20	2.57 ± .13	3	56 ± 14	.462 ± .023	241 ± 11
32.20 ± .14		.017		(40)	.0030	
33.30 ± .07	160 ± 30	.26 ± .05		40 ± 15	.045 ± .009	120 ± 30
33.77 ± .07	140 ± 20	0.36 ± .12		(40)	.082 ± .021	100 ± 20
34.90 ± .08	1142 ± 200	2.07 ± 0.21		(40)	.350 ± .036	1100 ± 200
34.98 ± .08	55.4	.74 ± .32		(40)	.13 ± .06	
36.15 ± .08	75 ± 4	.13 ± .07		(40)	.022 ± .012	35 ± 4
37.50 ± .08	640 ± 200	.24 ± .04		(40)	.039 ± .007	600 ± 200
38.14 ± .08	240 ± 30	.50 ± .07		(40)	.081 ± .011	200 ± 30
39.35 ± .08	202 ± 10	1.52 ± .08		(40)	.242 ± .013	160 ± 10
39.89 ± .08	110 ± 12	1.61 ± .08		53 ± 13	.255 ± .013	55 ± 5
40.87 ± .09		2.36 ± .18			.369 ± .028	1000 ± 200
42.75 ± .09		.35 ± .04			.034 ± .006	200 ± 50
43.40 ± .09	70 ± 20	.27 ± .04		(40)	.041 ± .006	30 ± 5
46.52 ± .09	282 ± 10	1.71 ± .17		(40)	.251 ± .025	240 ± 40
46.11 ± .09	446 ± 80	6.2 ± 0.7		(40)	.89 ± .10	400 ± 80
50.33 ± .09	371 ± 40	.69 ± .15		(40)	.097 ± .021	330 ± 40
52.07 ± .09	140 ± 50	.04		(40)	.0055	100 ± 50
58.30 ± .05	622 ± 70	1.9 ± 0.2		(40)	.25 ± .03	580 ± 70
59.18 ± .05	580 ± 50	2.20 ± .11		(40)	.285 ± .014	540 ± 80
60.48 ± .05	192 ± 8	5.0 ± .5		27 ± 8	.64 ± .06	160 ± 10
62.20 ± .06	446 ± 100	5.7 ± 1.0		(40)	.72 ± .13	400 ± 100
62.65 ± .06	823 ± 100	2.9 ± 0.3		(40)	.37 ± .04	780 ± 120
64.52 ± .06		.25 ± .06			.031 ± .008	276 ± 50
65.66 ± .06	343 ± 20	5.40 ± .14		39 ± 12	.666 ± .017	300 ± 20
66.51 ± .06	195 ± 22	-3.04		(40)	.373	152
67.44 ± .06		.32 ± .09			.039 ± .011	80 ± 43
68.19 ± .06	141 ± 10	1.27 ± .09		(40)	.154 ± .011	100 ± 10
69.15 ± .06	136 ± 20	1.19 ± .12			.143 ± .014	60 ± 10
72.12 ± .07	412 ± 100	1.53 ± .24		(40)	.180 ± .028	370 ± 100
73.80 ± .07	54 ± 2	0.50 ± .07		(40)	.058 ± .008	13 ± 2
75.94 ± .07	160 ± 13	5.0 ± 0.3		52 ± 17	.57 ± .03	103 ± 15

E_0 (eV)	Γ (meV)	$2g^2_{\gamma n}$ (meV)	J	Γ_{γ} (meV)	$2g^2_{\gamma n}$ (meV)	Γ_{γ} (meV)
77.05						
77.73	800 $\pm$ 120	5.3 $\pm$ 0.9			.60 $\pm$.10	
80.14 $\pm$.08	145 $\pm$ 30	-1.70			~.19	
81.36 $\pm$.08	262 $\pm$ 20	5.4 $\pm$.6		(40)	.60 $\pm$.07	100 $\pm$ 30
81.98 $\pm$.08	1018 $\pm$ 100	6.9 $\pm$ 0.3		(40)	.77 $\pm$.03	215 $\pm$ 20
83.12 $\pm$.08	113 $\pm$ 25	2.9 $\pm$ 0.2		(40)	.32 $\pm$.02	975 $\pm$ 100
83.35 $\pm$.08	201	5.4 $\pm$ 0.3		(40)	.59 $\pm$.03	73 $\pm$ 13
85.67 $\pm$.08	273 $\pm$ 50	3.5 $\pm$ 0.4		52	.38 $\pm$.04	145
86.00 $\pm$.09	350 $\pm$ 50	2.8 $\pm$ 0.3		(40)	.30 $\pm$.03	230 $\pm$ 50
86.93 $\pm$.09	130 $\pm$ 20	~.72		(40)	~.078	310 $\pm$ 50
87.80 $\pm$.09	322 $\pm$ 50	7.4 $\pm$ 0.3		43	.79 $\pm$.03	80 $\pm$ 20
89.12 $\pm$.09	792 $\pm$ 150	2.35 $\pm$.13		(40)	.25 $\pm$.01	280 $\pm$ 50
90.54 $\pm$.10	218 $\pm$ 40	2.23 $\pm$ 0.18		(40)	.236 $\pm$.019	750 $\pm$ 150
91.34 $\pm$.10		2.7 $\pm$ 0.4		(40)	0.28 $\pm$.04	175 $\pm$ 40
91.74 $\pm$.10						
93.71 $\pm$.10		.36 $\pm$.14			.037 $\pm$.015	
95.24 $\pm$.10		.49 $\pm$.20			.050 $\pm$.020	
96.12 $\pm$.10	860 $\pm$ 60	1.67 $\pm$.20		(40)		818 $\pm$ 100
97.53 $\pm$.11	500 $\pm$ 50	.59 $\pm$.18		(40)	.17 $\pm$.02	459 $\pm$ 50
98.28 $\pm$.11	193 $\pm$ 10	7.30 $\pm$.16		(40)	.736 $\pm$.016	146 $\pm$ 10
99.66 $\pm$.11		1.81 $\pm$.14			.181 $\pm$.014	
100.50		-1.3			~.13	*14.3
101.42	~148	1.61		72	.160	74
102.33		-1.40			~.136	*17.3
103.52		1.53			0.150	*7.2
107.54		0.50			0.048	*.7
107.85	84	1.20			0.116	51
108.05	470	1.82			0.184	450
110.20	800	0.45			0.043	751
113.13	80	0.75		34	0.071	46
115.40	~1600	-1.70			~.158	~1540
117.23	360	3.48		43	0.321	314
120.33	~600	-0.80			~.0729	~505
122.11	480	6.95		54	0.629	419
123.24	105	2.35		43	0.212	59
124.08						*3.9
125.34						*.9
125.96						*1.7
128.06	~1000	-1.50			0.133	~968
128.43	90	5.10		45	0.450	40
128.96	380	1.75			0.15 ⁶	333

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
130.64	96	10.77		41	0.942	44
132.90	600	1.90		35	0.165	563
133.57	76	5.51		38	0.477	32
134.73	1260	2.82			0.243	1188
136.50	80	0.92		44	0.0787	35
138.24	400	3.96			0.337	329
140.05	200	5.84		44	0.493	150
141.33						*5.0
142.03	180	14.64		57	1.23	
144.91	~330	1.06			0.08806	~299
146.01	220	6.88		57	0.56937	156
147.11	1500					*12.0
148.73	146	1.94		39	0.159	105
149.90		4.40			0.359	*29.6
151.01	220	2.14		35	0.174	183
151.84	~1100	2.20			0.179	~1065
153.55	380	7.27		33	0.587	341
155.34	154	1.90		42	0.152	110
158.84	209	5.00		63	0.397	141
159.54		~1.55			~.123	*9.6
160.51	430	3.07		51	.242	376

* $\sigma_0\Gamma_f$ (b-eV). for the 100.50 and 102.33 eV resonances, values are approximate.

Note - Single-level Breit-Wigner parameters.

²⁴¹Pu
₉₄

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 18.5 \pm 0.4 \text{ b} \\ \sigma_f &< 0.2 \text{ b} \\ \sigma_s &= 8.0 \pm 0.2 \text{ b} \\ \sigma_c &= 26.5 \pm 0.5 \text{ b} \\ \nu_{sp} &= 2.10 \pm 0.02 \\ a_{coh} &= 8.1 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 1130 \pm 60 \text{ b} \\ I_f &= 5 \text{ b} \\ R' &= 9.6 \pm 0.2 \text{ fm} \\ \langle D \rangle &= 16.5 \pm 0.5 \text{ eV} \\ S_0 &= 0.9 \pm 0.1\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^\circ$$

$$S_n = 5037 \pm 6 \text{ keV}$$

E_0 (eV)	Γ (meV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)	Γ_f (meV)
2.67 ± .01	27 ± 2	2.00 ± .08	25 ± 2	1.22 ± .05	
14.60 ± .01		.061 ± .013		.016 ± .003	
22.57 ± .01	23.3 ± 5.0	.29 ± .02	23 ± 5	.060 ± .004	
40.95 ± .01	27.5 ± 4.0	.45 ± .04	27 ± 4	.070 ± .006	
53.46 ± .01	73.2 ± 2.0	52 ± 1	21.2 ± 1.7	7.11 ± .02	.044
67.60 ± .02	27.5 ± 3.0	4.5 ± .4	23 ± 3	.55 ± .05	.077
88.45 ± .02		.66 ± .05		.070 ± .005	.032
107.32 ± .03	38 ± 2	17 ± 1	21 ± 2	1.64 ± .01	.051
131.4 ± .1	32.1 ± 1.0	6.1 ± .2	26 ± 1	.53 ± .02	.049
141.43			(29)	.010 ± .002	
149.7 ± .1	37.0 ± 2.0	14.0 ± .5	23 ± 2	1.14 ± .04	.049
163.5 ± .1				.041 ± .004	
204.8 ± .1	73 ± 4	52 ± 3	21 ± 2	3.6 ± .2	.49
210.0 ±				.029 ± .006	
215.3 ± .1				.358 ± .007	.19
219.3 ±		.30 ± .03		.020 ± .002	
232.7 ±		4.9 ± .3		.32 ± .02	.074
264.5 ± .2		0.36 ± .04		.022 ± .002	
271.95				.010 ± .002	.091
273.6 ± .2	38.6 ± 2.0	16.6 ± .5	22 ± 2	1.00 ± .03	

$^{242}_{94}\text{Pu}$
[3.87 × 10⁵ yr]

E_0 (eV)	Γ (meV)	g_{γ}^0 (meV)	Γ_{γ} (meV)	g_{γ}^0 (meV)	Γ_{γ} (meV)
274.75		.17 ± .03		.010 ± .002	
281.05		.13 ± .05		.008 ± .003	
298.7 ± .2	33 ± 7	8.0 ± .3	26 ± 7	.48 ± .02	
303.6 ± .2	40.8 ± 2.2	18.3 ± .9	22.5 ± 2.0	1.05 ± .05	.11
319.9 ± .2	251 ± 8	229 ± 7	22 ± 3	12.8 ± .4	.23
327.6 ± .2		.5 ± .3		.028 ± .017	
332.4 ± .2	96 ± 4	71 ± 2	25 ± 3	3.9 ± .1	.10
374.3 ± .2		6.4 ± .4		.33 ± .02	
379.63 ± .2		0.27 ± .04		.014 ± .002	
382.2 ± .2	69.4 ± 3.2	45.9 ± 2.5	23.5 ± 2.0	2.60 ± .13	.084
386.1		2.5 ± 1.0		.13 ± .05	
389.9 ± .2		1.8 ± .2		.09 ± .01	
410.6 ± .2		7.5 ± .4		.37 ± .02	
424.1 ± .2		4.1 ± .4		.20 ± .02	
425.15		.28 ± .04		.0134 ± .002	
473.7 ± .2		.96 ± .09		.044 ± .004	
482.5 ± .2	44.4 ± 2.7	20.9 ± 1.8	23.5 ± 2.0	.95 ± .08	
494.75		.27 ± .07		.012 ± .003	
503.9 ± .3		150 ± 50		6.86 ± 2.23	
536.6 ± .3	121 ± 5	100 ± 5	21 ± 2	4.32 ± .22	
548.6 ± .3	99 ± 4	74 ± 3	25 ± 2	3.16 ± .13	
576.4 ± .3		30 ± 5		1.25 ± .21	
595.0 ± .3		31.8 ± 3.0		1.30 ± .12	
599.8 ± .3		8.7 ± .8		.36 ± .03	.026 ± .007
610.8 ± .3		11 ± 2		.45 ± .08	.134 ± .043
638.5 ± .3		4.4 ± .6		.17 ± .02	.084 ± .026
665.0 ± .3		2.7 ± .5		.105 ± .019	<.05
669.3 ± .3		13.0 ± 1.0		.50 ± .04	<.08
693.2 ± .3	57 ± 4	35 ± 3	22 ± 2	1.33 ± .11	.11 ± .04
711.6 ± .3	140 ± 10	120 ± 10	20 ± 2	4.50 ± .37	.28 ± .06
727.6 ± .3		3.2 ± .8		.12 ± .03	.048 ± .017
736.7 ± .3		105 ± 5		3.87 ± .18	<.06
755.1 ± .4	154.5 ± 6.0	132 ± 5	22.5 ± 2.5	4.80 ± .18	.61 ± .14
761.2 ± .4		3.8 ± 0.5		.14 ± .02	1.65 ± .39
788.5 ± .4		64 ± 14		2.28 ± .50	>.80
794.0 ± .4		120 ± 40		4.26 ± .42	1.24 ± .49
824.5 ± .5		3 ± 1		.10 ± .04	.043 ± .009
837.7 ± .5		38 ± 2		1.31 ± .07	.17 ± .06
856.6 ± .5	57 ± 4	35 ± 2	22 ± 3	1.20 ± .07	.049 ± .017
855.6 ± .5		10.5 ± 1.0		.36 ± .03	.17 ± .06
878.1 ± .5	84 ± 4	58 ± 3	26 ± 3	1.96 ± .10	.048 ± .018
					.031 ± .012

E ₀ (eV)	Γ (meV)	g ₁ ⁿ (meV)	Γ _γ (meV)	g ₁ ⁰ (meV)	Γ _γ (meV)
886.5 ± .5	51.8 ± 10	22.8 ± 1.5	29 ± 10	.77 ± .05	.015 ± .006
923.2 ± .5	78 ± 4	60 ± 3	18 ± 3	1.97 ± .10	.037 ± .011
935.4		11 ± 2		.36 ± .07	
939.6		10 ± 3		.33 ± .10	
949.1	40 ± 6	14.0 ± 1.5	26 ± 6	.45 ± .05	
977.9		14.5 ± 1.5		.46 ± .05	
1004		43 ± 3		1.36 ± .09	
1030		46.0 ± 2.5		1.43 ± .08	
1045		118 ± 10		3.65 ± .31	
1062.5		33 ± 3		1.0 ± .09	
1087.5		200 ± 10		6.0 ± .3	
1117		5 ± 3		.15 ± .09	
1129.5		10 ± 5		.30 ± .15	
1148		300 ± 100		9 ± 3	
1182.5		13 ± 3		.40 ± .09	
1197		95 ± 6		2.75 ± .17	
1207		40 ± 5		1.15 ± .14	
1248		9 ± 3		.25 ± .08	
1267		27 ± 3		.76 ± .08	
1286		59 ± 5		1.65 ± .14	
1308					
1403					
1457					
1696					
1708					
1737					
1739					
1751					
1762					
1783					
1789					
1806					
1820					
1836					
1862					
1881					
1891					
2689					
2734					
2741					
2756					

E_0 (eV)	Γ (meV)	g_n^0 (meV)	Γ_γ (meV)	g_n^0 (meV)	Γ_γ (meV)
2772					
3107		2.8 ± 1.0		$.053 \pm .019$	0.91 ± 0.42
3112		$.28 \pm .05$		$.0050 \pm .0009$	>3.4
3135		$1.2 \pm .1$		$.022 \pm .002$	>5.8
3142		226 ± 32		$4.04 \pm .57$	
3156		40.2 ± 12.1		$.72 \pm .22$	$1.22 \pm .25$
3164		52.3 ± 11.9		$.93 \pm .21$	$0.10 \pm .04$
3412		3.0 ± 1.5		$.053 \pm .027$	0.8 ± 0.5
3422		380 ± 61		6.51 ± 1.04	$.09 \pm .03$
3438		10.4 ± 5.0		$.178 \pm .085$	$<.3$
3451		7.8 ± 4.0		$.13 \pm .07$	$<.3$
3472		220 ± 29		$3.75 \pm .49$	$.13 \pm .03$
3485		78 ± 17		$1.32 \pm .29$	$<.1$
3496		102 ± 19		$1.73 \pm .32$	$.28 \pm .08$
3521		122 ± 23		$2.06 \pm .39$	$.36 \pm .10$
3532		95 ± 21		$1.60 \pm .35$	$<.2$
3558		$.32 \pm .05$		$.00054 \pm .00008$	>3
3568		$.12 \pm .03$		$.0020 \pm .0005$	
3581		$1.2 \pm .1$		$.020 \pm .002$	
3588		143 ± 24		$2.39 \pm .40$	$.18 \pm .05$
3620		8.2 ± 4.0		$.14 \pm .07$	$<.8$
3629		13.7 ± 5.0		$.23 \pm .08$	$.29 \pm .16$
3651		5.5 ± 3.0		$.091 \pm .050$	<1.9
3670		155 ± 25		$2.57 \pm .41$	$.67 \pm .18$
3698		13.9 ± 5.0		$.23 \pm .08$	7.1 ± 3.2
3712		13.1 ± 5.0		$.22 \pm .08$	$<.3$
3721		12.2 ± 5.0		$.20 \pm .08$	$.81 \pm .38$
3734		940 ± 200		15.41 ± 3.28	$.05 \pm .03$
3773		9.4 ± 5.0		$.15 \pm .08$	$.19 \pm .16$
3790		246 ± 44		$4.00 \pm .72$	$.21 \pm .08$
3812		62 ± 22		$1.01 \pm .36$	$.07 \pm .04$
3836		683 ± 130		11.06 ± 2.11	$.15 \pm .06$
		948 ± 161		15.31 ± 2.60	$.05 \pm .02$

■ Probably doublet.

Note - Single-level Breit-Wigner parameters.

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 60 \pm 30 \text{ b} \\ \sigma_f &= 196 \pm 16 \text{ b}\end{aligned}$$

²⁴³₉₄Pu
[4.96 hr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 1.7 \pm 0.1 \text{ b} \\ \nu_{sp} &= 2.30 \pm 0.19\end{aligned}$$

²⁴⁴₉₄Pu
[8.3 × 10⁷ yr]

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 43 \pm 4 \text{ b} \\ \langle D \rangle &= 2.4 \pm 0.5 \text{ eV}\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^*$$

$$S_n = 4720 \pm 32 \text{ keV}$$

E_0 (eV)	$\sigma_0 \Gamma_{\gamma}$ (b-eV)	E_0 (eV)	$\sigma_0 \Gamma_{\gamma}$ (b-eV)	E_0 (eV)	$\sigma_0 \Gamma_{\gamma}$ (b-eV)
30.7	408 ± 16	102	864 ± 16	227	534 ± 31
40.3	157 ± 8	128	134 ± 16	233	94 ± 16
53.5	94 ± 8	161	75 ± 14	285	456 ± 47
64.3	880 ± 16	185	424 ± 16		
87.6	204 ± 16	191	94 ± 16		

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 150 \pm 30 \text{ b}$$

RESONANCE PROPERTIES

$$i_{\gamma} = 220 \pm 40 \text{ b}$$

²⁴⁵₉₄Pu
[16.5 hr]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pu^{238}	σ_f	PRIVATE COMM.(61)	Mulet
Pu^{238}	σ_f	PR.115.1271(59)	Gindler
Pu^{238}	ν_{sp}	PR.101.1016(56)	Hicks
Pu^{238}	ν_{sp}	PR.101.1804(56)	Crane
Pu^{239}	σ_f	PRIVATE COMM.(61)	Mulet
Pu^{239}	σ_f	PR.115.1271(59)	Gindler
Pu^{238}	ν_p	MP/A.145.1(70)	Jaffey
Pu^{238}	ν_p	ME.29.95(70)	Kroshkin
Pu^{238}	ν_p	70HEL5INK1.2.182(70)	Zamyatin
Pu^{238}	production rate	66UNSH.2.1271(68)	Mermetley
Pu^{238}	σ_t	NSE.30.355(67)	Young
Pu^{238}	σ_t	BNP.7.305(62)	Young
Pu^{238}	σ_t	58GENEVA.16.54(58)	Eastwood
Pu^{238}	σ_t	KNPL-1781(57)	Agham
Pu^{238}	mass spectrometry	CJP.35.147(57)	Butler
Pu^{238}	$\sigma_{\gamma f}$	PR.107.1294(57)	Mulet
Pu^{238}	σ_f	PR.81.893(51)	Hanna
Pu^{238}	activation	NR.-4215.17(48)	Brushman
Pu^{238}	σ_f	NR.-4112(48)	Reed
Pu^{239}	delayed neutrons	NSE.44.1731(71)	Conant
Pu^{239}	l_f	NSE.44.1801(71)	Eiland
Pu^{239}	α mass spectrometry	NMS.14.371(71)	Iskenderian
Pu^{239}	α analysis	NSE.44.266(71)	Ragnusson
Pu^{239}	l_f alpha counting	ME.28.358(70)	Bah
Pu^{239}	ν_{sp}	THE515(70)	Goldman
Pu^{239}	ν_p	THE515(70)	Goldman
Pu^{239}	σ_f	70HEL5INK1.1.117(70)	Deruytter
Pu^{239}	$\sigma_{\gamma f}$	70HEL5INK1.1.287(70)	Lounsbury
Pu^{239}	σ_f fission chamber	JNE.22.477(68)	Keith
Pu^{239}	ν_{sp}	NRCE-172(67)	Goldman
Pu^{239}	α reactivity	JN-1060(67)	Fest
Pu^{239}	l_f	NSI.4.43(67)	Tasuno
Pu^{239}	α	66PNNIS.2.3(66)	Cabell
Pu^{239}	$\sigma_{\gamma f}$ mass spectrometry	JNH.28.2467(66)	Cabell
Pu^{239}	α	66PNNIS.2.17(66)	Durham
Pu^{239}	α Mn bath	100-17083(66)	Smith
Pu^{239}	α Mn bath	66UNSH.2.919(66)	Smith
Pu^{239}	σ_f ratio to U-235	66PNNIS.2.25(66)	White
Pu^{239}	ν	65SALZBURG.2.251(65)	Colvin
Pu^{239}	σ_f	65SALZBURG.1.255(65)	Frayssé
Pu^{239}	l_f	ME-181(65)	Hellstrand
Pu^{239}	ν_p liquid scintillator	MP.66.149(65)	Hether
Pu^{239}	σ_f	C'9P-1183(64)	Bigham
Pu^{239}	σ	JNE.18.105(64)	Carter
Pu^{239}	ν_p liquid scintillator	MP.40.433(63)	Hopkins
Pu^{239}	α mass spectrometry	JNH.24.607(62)	Cabell

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pu^{239}	σ	HSE, 12, 359(62)	Gvin
Pu^{239}	σ Mn bath	HSE, 14, 101(62)	Nachlin
Pu^{239}	diffraction	ACR, 15, 351(62)	Roof
Pu^{239}	σ_f	HSE, 9, 341(61)	Hardy
Pu^{239}	σ_f	HSE, 11, 65(61)	Safford
Pu^{239}	ν_p Hornyak button	HSE, 5, 49(59)	DeSausure
Pu^{239}	σ pile osci.	HSE, 5, 225(59)	Huehlhouse
Pu^{239}	σ_f	AERE-R-2998, 20(59)	Raffie
Pu^{239}	σ_f	SSGENEVA, 16, 125(58)	Bighan
Pu^{239}	σ_f	SSGENEVA, 15, 127(58)	Bollinger
Pu^{239}	σ_{σ_f}	JNE, 6, 285(58)	Cocking
Pu^{239}	i_f	SSGENEVA, 16, 233(58)	Campbell
Pu^{239}	ν_p	SSGENEVA, 16, 121(58)	Colvin
Pu^{239}	σ reactivity	HSE, 3, 758(58)	Gaertner
Pu^{239}	ν_p BF3 counters	CEA-652(58)	Jacob
Pu^{239}	σ pile osci.	SSGENEVA, 16, 34(58)	Rose
Pu^{239}	σ_f pile osci.	AERE-R/R-2457(58)	Rose
Pu^{239}	delayed neutrons	JNE, 6, 1(57)	Keepin
Pu^{239}	delayed neutrons	PA, 107, 1044(57)	Keepin
Pu^{239}	σ_f	HL-4893, 90(57)	Leonard
Pu^{239}	σ_f ratio	T10-7547, 115(57)	Leonard
Pu^{239}	σ_f	HL-44525(56)	Leonard
Pu^{239}	σ_f	JNE, 2, 187(56)	Pattenden
Pu^{239}	σ_f	ORNL-2001, 102(56)	Pratt
Pu^{239}	ν_p BF3 counters	JNE, 2, 247(56)	Sanders
Pu^{239}	σ reactivity	SSGENEVA, 4, 301(55)	Alichanov
Pu^{239}	σ reactivity	SSGENEVA, 4, 307(55)	Egelstaff
Pu^{239}	ν_p BF3 counters	SSMOSCOM, 123(55)	Kalashnikova
Pu^{239}	ν_p BF3 counters	SSMOSCOM, 131(55)	Kalashnikova
Pu^{239}	σ reactivity	SSGENEVA, 4, 315(55)	Kanne
Pu^{239}	σ_f	SSGENEVA, 4, 224(55)	Nikitin
Pu^{239}	σ_f	KAPL-1464(55)	McMillan
Pu^{239}	ν_p BF3 counters	KAPL-1464(55)	McMillan
Pu^{239}	σ reactivity	KAPL-1464(55)	McMillan
Pu^{239}	σ_f	PRIVATE COMM.(55)	Palavsky
Pu^{239}	σ_f n density changes	SSGENEVA, 4, 295(55)	Spivak
Pu^{239}	σ n density	SSGENEVA, 4, 295(55)	Spivak
Pu^{239}	absorption, n density	SSGENEVA, 4, 295(55)	Spivak
Pu^{239}	σ_f ratio	JPR, 15, 16.(54)	Leveque
Pu^{239}	σ_f	CUD-92(51)	Havens
Pu^{239}	σ_f	CRRP-458(51)	Tunnicliffe
Pu^{239}	σ_f	LA-266(45)	Anderson
Pu^{239}	σ	LA-102(44)	Snyder
Pu^{239}	ν_p ratio	LA-104(44)	DeMire
Pu^{239}	ν_p ratio	LA-102(44)	Snyder
Pu^{240}	diffraction	ACR/B, 27, 2284(71)	Lander
Pu^{240}	ν_{sp}	NE, 30, 250(71)	Prokhorova
Pu^{240}	σ_f	70MELSIK1.1, 287(70)	Lounsbury

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pu ²⁴⁰	ν_{sp}	JNE,22,63(68)	Boldeman
Pu ²⁴⁰	ν_{sp}	66PARIS,2,57(66)	Baron
Pu ²⁴⁰	mass spectrometry	JIN,28,2467(66)	Cabell
Pu ²⁴⁰	ν	65SALZBURG,2,25(65)	Colvin
Pu ²⁴⁰	ν_{sp}	NSE,15,213(63)	Asplund- Nilsson
Pu ²⁴⁰	ν_{sp}	NP,48,433(63)	Hopkins
Pu ²⁴⁰	pile osci. RI absorption	AEEU-R-115(62)	Tattersall
Pu ²⁴⁰	ν_{sp}	JNE,15,102(61)	Moat
Pu ²⁴⁰	σ_t	NSE,8,112(60)	Block
Pu ²⁴⁰	σ_t	60VIENNA,535(60)	Block
Pu ²⁴⁰	activation	CJP,38,57(60)	Walker
Pu ²⁴⁰	ν_{sp}	TNCC(UK)-43(59)	Colvin
Pu ²⁴⁰	pile osci.	JIN,9,1(59)	Halperin
Pu ²⁴⁰	σ_t	JNE,11,14(59)	Pattenden
Pu ²⁴⁰	σ_f	CJP,36,503(58)	Bigham
Pu ²³⁹	I_f	SBGENEVA,16,233(58)	Campbell
Pu ²⁴⁰	σ_f	SBGENEVA,16,54(58)	Eastwood
Pu ²⁴⁰	RI,pile osci.	SBGENEVA,16,34(58)	Rose
Pu ²⁴⁰	σ_f	KAPL-1781(57)	Butler
Pu ²⁴⁰	RI,absorption	JNE,4,86(57)	Erozolimsky
Pu ²⁴⁰	RI,absorption	JNE,6,155(57)	Krupchinsky
Pu ²⁴⁰		CRC-633(56)	Cornish
Pu ²⁴⁰	ν_{sp}	PR,101,1804(56)	Crane
Pu ²⁴⁰	ν_{sp}	PR,101,1012(56)	Oiven
Pu ²⁴⁰	σ_t mass spectrometry	NSE,1,62(56)	Fields
Pu ²⁴⁰	σ_f	PR,102,1621(56)	Hulet
Pu ²⁴⁰	σ_f	ORNL-2081,102(56)	Pratt
Pu ²⁴⁰	ν_{sp}	PR,100,190(55)	Carter
Pu ²⁴⁰	ν_{sp}	AERE-NP/R-1912(55)	Johnstone
Pu ²⁴⁰	ν_{sp}	SSMOSCON,123(55)	Kalushnikova
Pu ²⁴⁰	ν_{sp}	AERE-PP/R-1655(55)	Sanders
Pu ²⁴⁰	ν_{sp}	AERE-NP/R-831(51)	Barclay
Pu ²⁴⁰	ν_{sp}	LA-491(46)	Segre
Pu ²⁴¹	$I_\gamma I_\gamma$	NSE,44,180(71)	Eiland
Pu ²⁴¹	α	ANS,14,371(71)	Iskenderian
Pu ²⁴¹	I_γ	AE,28,359(70)	Bak
Pu ²⁴¹	ν_p	THESIS(70)	Boldeman
Pu ²⁴¹	ν_p	NP/A,145,1(70)	Jaffey
Pu ²⁴¹	η	68WASH,1,589(68)	Smith
Pu ²⁴¹	σ_t (0.002,0.1 eV)	PRIVATE COMM.(68)	Young
Pu ²⁴¹	ν_p	ANEC/E-172(67)	Boldeman
Pu ²⁴¹	η	IN-1060(67)	Fast
Pu ²⁴¹	$\sigma_f \sigma_t$ mass spectrometry	JIN,28,2467(66)	Cabell
Pu ²⁴¹	α	66PARIS,2,3(66)	Cabell
Pu ²⁴¹	σ_f ratio	66PARIS,2,29(66)	White
Pu ²⁴¹	α	JIN,27,2481(65)	Cabell
Pu ²⁴¹	ν	65SALZBURG,2,25(65)	Colvin

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pu ²⁴¹	σ_f	AECL-1910(64)	Bigham
Pu ²⁴¹	σ_t	CJP, 42, 2384(64)	Craig
Pu ²⁴¹	σ_f	100, 16995(64)	Hatanabe
Pu ²⁴¹	delayed neutrons	PR, 123, 1735(61)	Cox
Pu ²⁴¹	σ_f	NSE, 9, 341(61)	Hardy
Pu ²⁴¹	σ_t	NSE, 11, 111(61)	Simpson
Pu ²⁴¹	ν_p	PR, 123, 2140(61)	Smith
Pu ²⁴¹	ν_p	NSE, 8, 66(60)	Evans
Pu ²⁴¹	ν_p	NSE, 5, 49(59)	DeSaussure
Pu ²⁴¹	ν_p	JNE, 11, 21(59)	Jaffey
Pu ²⁴¹	σ_f ratio	HU-62727, 19(59)	Leonard
Pu ²⁴¹	σ_f	AECL-R-2998, 23(59)	Raffie
Pu ²⁴¹	σ_f	SSGENEVA, 16, 125(58)	Bigham
Pu ²⁴¹	ν_p	SSGENEVA, 16, 121(58)	Colvin
Pu ²⁴¹	σ	NSE, 3, 758(58)	Gaerttner
Pu ²⁴¹	σ_t	BAP, 3, 176(58)	Schwartz
Pu ²⁴¹	σ_f	HU-48893, 98(57)	Leonard
Pu ²⁴¹	mass spectrometry	NSE, 1, 62(56)	Fields
Pu ²⁴¹	σ_f	NSE, 1, 62(56)	Fields
Pu ²⁴¹	ν_p	JNE, 2, 247(56)	Sanders
Pu ²⁴¹	σ_f	ANL-5397(55)	Jaffey
Pu ²⁴¹	ν_p	SSNOSCOU, 131(55)	Kalashnikova
Pu ²⁴¹	ν_p	SSNOSCOU, 123(55)	Kalashnikova
Pu ²⁴¹	ν_p	KAPL-1464(55)	McMillan
Pu ²⁴¹	σ	KAPL-1464(55)	McMillan
Pu ²⁴¹	σ_f	SSGENEVA, 4, 107(55)	Raffie
Pu ²⁴²	absorption 0.08	ACR/8, 27, 2284(71)	Lander
Pu ²⁴²	diffraction 0.08	ACR/8, 27, 2284(71)	Lander
Pu ²⁴²	σ_t	NSE, 43, 341(71)	Young
Pu ²⁴²	Am-243 production	CJP, 46, 716(70)	Durham
Pu ²⁴²	σ_t	100-1407, 63(70)	Young
Pu ²⁴²	σ_t	NSE, 40, 389(70)	Young
Pu ²⁴²	ν	JNE, 22, 63(68)	Bolceman
Pu ²⁴²	mass spectrometry	68UNSH, 2, 1279(68)	Folger
Pu ²⁴²	ν	AE, 25, 530(68)	Prokhorova
Pu ²⁴²	σ_t	PR, 146, 840(66)	Auchampaugh
Pu ²⁴²	production	DP-MS-66-69(66)	Ice
Pu ²⁴²	activation	ORNL-3679, 14(64)	Halperin
Pu ²⁴²	σ_f	SSGENEVA, 16, 54(58)	Eastwood
Pu ²⁴²	σ_f	KAPL-1781(57)	Bigham
Pu ²⁴²	activation	CJP, 35, 147(57)	Butler
Pu ²⁴²	ν	PR, 101, 1004(56)	Crane
Pu ²⁴²	mass spectrometry	NSE, 1, 62(56)	Fields
Pu ²⁴²	ν	PR, 101, 1016(56)	Hicks
Pu ²⁴²	mass spectrometry	PR, 93, 1433(54)	Studier
Pu ²⁴³	σ_f ion chamber	JIN, 30, 2553(68)	Diamond

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pu ²⁴³	σ_f mass spectrometry	DP-1046(66)	Dukes
Pu ²⁴³	σ_f mass spectrometry	DP-M5-66-69(66)	Ice
Pu ²⁴³	σ_f activation	NSE,1,62(56)	Fields
Pu ²⁴³	σ_f mass spectrometry	PR,93,1433(54)	Studier
Pu ²⁴³	σ_f mass spectrometry	ANL-4983,1(52)	Inghram
Pu ²⁴⁴	$\sigma_{f,1}$	ORNL-4706,55(71)	Druschel
Pu ²⁴⁴	ν_{sp}	NSE,43,54(71)	Orth
Pu ²⁴⁴	σ_f RI, activation	PRIVATE COMM.(69)	Schuman
Pu ²⁴⁴	σ_f chemical separation	PR,103,634(56)	Butler
Pu ²⁴⁴	σ_f activation	NSE,1,62(56)	Fields
Pu ²⁴⁴	σ_f activation	JIN,1,262(55)	Fields
Pu ²⁴⁵	$\sigma_{f,1}$	ORNL-4706,55(71)	Druschel
Pu ²⁴⁵	σ_f activation	NSE,1,62(56)	Fields

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pu ²³⁸	σ_f	18.6-496.	PRIVATE COMM.(73)	Silbert
Pu ²³⁸	σ_f	18.6-496.	PRIVATE COMM.(73)	Silbert
Pu ²³⁸	σ_f	2.91-122.	PR,18,15(67)	Bowman
Pu ²³⁸	σ_c	-10.-192.0	NSE,30,355(67)	Young
Pu ²³⁸	σ_f	2.91-280.	PR,154,1111(67)	Stubbins
Pu ²³⁸	σ_f	2.89-83.2	YF,4,985(66)	Gerasimov
Pu ²³⁸	σ_f	2.89-83.2	66PAR15,2,129(66)	Gerasimov
Pu ²³⁸	σ_f	-.5-18.57	65SALZBURG,1,235(65)	James
Pu ²³⁸	σ_c	-.5-83.2	100-16805,8(62)*	Young
Pu ²³⁹		0.296-50.1	3ROCHESTER(73)	Deruytter
Pu ²³⁹	analysis	0.296-628.29	CEA-N-1484(71)	Ribon
Pu ²³⁹	$\bar{\sigma}_s$	7.82-119.0	NP/A,164,34(71)	Simpson
Pu ²³⁹	analysis	-0.22-44.5	ANCR-1016,283(71)	Simpson
Pu ²³⁹	$\sigma_f \sigma_f$	-1.6-100.1	ORNL-4707(71)	Guin
Pu ²³⁹	analysis	-2.2-298.6	ANCR-1045(71)	Simpson
Pu ²³⁹	analysis	7.8-44.51	70HELSINKI,2,777(70)	Adler
Pu ²³⁹	σ_f	0.3-658.29	70HELSINKI,1,513(70)	Blons
Pu ²³⁹	σ_f (spectra)	0.3-41.8	70HELSINKI,1,377(70)	Chrien
Pu ²³⁹	$\sigma_c \sigma_f$	0.296-157.0	70HELSINKI,1,481(70)	Berrien
Pu ²³⁹	α	0.3-90.8	NSE,40,306(70)	Guin
Pu ²³⁹	$\sigma_f \sigma_f$	0.3-90.8	NSE,40,306(70)	Guin
Pu ²³⁹	analysis		NSE,40,342(70)	Lambropoulos
Pu ²³⁹	$\sigma_c \sigma_f \sigma_f$	7.84-85.7	JINR-P3-4592(70)	Ryabov
Pu ²³⁹	$\bar{\sigma}_s$	14.7-658.5	70HELSINKI,1,495(70)	Trochon
Pu ²³⁹	$\bar{\sigma}_s$	41.7-117.9	NP/A,138,556(68)	King
Pu ²³⁹	multiplicity	22.3-81.0	PR,22,195(69)	Weinstein

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pu ²³⁹	analysis	14.29-85.60	PR,165,1371(68)	Farrell
Pu ²³⁹	analysis	60.34-100.25	JNE,22,263(68)	James
Pu ²³⁹	$\sigma_T \sigma_f$	7.84-85.7	YF,5,925(67)	Ryabov
Pu ²³⁹	$\bar{\sigma}_s$	14.68-303.2	NP/A,98,33(67)	Azghar
Pu ²³⁹	$\bar{\sigma}_s$	14.68-303.2	66PARIS,2,185(66)	Azghar
Pu ²³⁹		15.42-81.7	PR,144,979(66)	Cowan
Pu ²³⁹	$\sigma_c \sigma_f$	0.3-442.41	66PARIS,2,195(66)	Derrien
Pu ²³⁹	σ_f	7.83-101.2	65SALZBURG,1,205(65)	DeSaussure
Pu ²³⁹	σ_f	7.84-75.0	EON,2,77(65)	Ignatiev
Pu ²³⁹	σ_f	55.8-85.6	65SALZBURG,1,235(65)	James
Pu ²³⁹		7.8-73.6	65SALZBURG,2,355(65)	Melkonian
Pu ²³⁹	$\bar{\sigma}_s$	7.9-85.6	PRL,15,761(65)	Sauter
Pu ²³⁹	σ_c	102.9-195.1	65ANTWERP,98(65)	Uttley
Pu ²³⁹	$\sigma_c \eta$	7.84-95.5	AE,16,110(64)	Ignatiev
Pu ²³⁹	$\sigma_c \eta$ anal.	0-22.6	AE,16,211(64)	Kirpichnikov
Pu ²³⁹	$\bar{\sigma}_s$ analysis	7.8-44.5	NP,30,269(62)	Fraser
Pu ²³⁹	analysis	1.200-15.50	PR,118,724(60)	Vogt
Pu ²³⁹	$\sigma_c \sigma_f \nu$	-0.26-52.6	58GENEVA,15,127(58)	Bollinger
Pu ²³⁹	σ_c	0.296-38.5	JNE,6,303(58)	Egelstaff
Pu ²³⁹	$\sigma_c \sigma_f \eta$	0.3-26.10	JNE,6,163(57)	Kirpichnikov
Pu ²³⁹	σ_c	7.85-85.9	AE,2,129(57)	Sokolovskii
Pu ²³⁹	σ_c	7.85-32.5	NRDC-81,19(56)	Lynn
Pu ²³⁹	σ_c	0.01-7.8	JNE,2,187(56)	Pattendan
Pu ²³⁹	σ_f	0.297-26.8	JNE,2,177(56)	Richmond
Pu ²³⁹	σ_c	-1-0.300	55MOSCOW,209(55)	Abou
Pu ²³⁹	σ_f	0.295-13.7	55GENEVA,4,216(55)	Adamchuk
Pu ²³⁹	σ_c	-0.19-0.299	55GENEVA,4,193(55)-	Anderson
Pu ²³⁹	$\sigma_c \sigma_f$	0.297	55GENEVA,4,235(55)	Auclair
Pu ²³⁹	σ_c	-0.23-0.298	55GENEVA,4,193(55)-	Havens
Pu ²³⁹	σ_f	-0.19-0.299	55GENEVA,4,193(55)	Leonard
Pu ²³⁹	σ_c	.295-22.8	55GENEVA,4,224(55)	Nikitin
Pu ²³⁹	$\sigma_c \eta$	.295-22.8	55MOSCOW,81(55)	Nikitin
Pu ²³⁹	σ_c	0.295	PRIVATE COMM.(55)	Palevsky
Pu ²³⁹	σ_f	0.297-26.8	55GENEVA,4,187(55)	Raffle
Pu ²⁴⁰	σ_f	749-2033	C00-3058-27,6(72)	Hockenbury
Pu ²⁴⁰	$\sigma_c \sigma_f \sigma_f$	20.46-499.4	NSE,49,153(72)	Hockenbury
Pu ²⁴⁰	$\sigma_c \sigma_f \sigma_f$	20.46-499.4	72BUD,224(72)	Hockenbury
Pu ²⁴⁰		20	JNE,26,643(72)-	Moyn
Pu ²⁴⁰	σ_f	38.34-665.5	JNE,26,643(72)	Weigmann
Pu ²⁴⁰	$\sigma_f \sigma_c$	20.46-499.7	71KNOX,2,721(71)	Hockenbury
Pu ²⁴⁰	σ_c	1.059	70HELSINKI,1,553(70)	Ramakrishna
Pu ²⁴⁰	$\bar{\sigma}_s$	20.45-287.1	68UMSH,1,513(68)	Cao
Pu ²⁴⁰	σ_c	20.45-5692	68UMSH,1,519(68)	Kolar
Pu ²⁴⁰	σ_c	20.45-5692	JNE,22,299(68)	Kolar
Pu ²⁴⁰	σ_f	750-3380	NP/A,112,603(68)	Migneco
Pu ²⁴⁰	σ_f	750-3380	68UMSH,1,527(68)	Migneco
Pu ²⁴⁰	σ_f	38.34-820.4	68UMSH,1,533(68)	Weigmann
Pu ²⁴⁰	σ_f	38.34-820.4	JNE,22,317(68)	Weigmann

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pu ²⁴⁰	σ_c	20.42-949	66PARIS,2,145(66)	Asghar
Pu ²⁴⁰	$\bar{\sigma}_s$	20.42-135.4	66PARIS,2,145(66)	Asghar
Pu ²⁴⁰	σ_y	20.42-287.9	66PARIS,2,145(66)	Asghar
Pu ²⁴⁰	$\bar{\sigma}_s$	20.42-135.4	PRIVATE COMM.(66)	Asghar
Pu ²⁴⁰	σ_y	20.42-287.9	PRIVATE COMM.(66)	Asghar
Pu ²⁴⁰	σ_c	20.42-949	PRIVATE COMM.(66)	Asghar
Pu ²⁴⁰	σ_c	20.46-5071	66PARIS,2,135(66)	Boeckhoff
Pu ²⁴⁰	σ_y	1.05-320	AERE-PR/NP-4,16(63)	Moxon
Pu ²⁴⁰	σ_f	1.06-20.4	PRIVATE COMM.(61)	Leonard
Pu ²⁴⁰	σ_t	1.053-38.2	PR,114,505(59)	Cote
Pu ²⁴⁰	σ_c	1.056	NSE,5,32(59)	Leonard
Pu ²⁴⁰	σ_c	1.0575	JNE,11,14(59)	Pattenden
Pu ²⁴⁰	σ_c	1.057-37.8	JNE,6,303(58)	Egelstaff
Pu ²⁴⁰	σ_c	1.06-119	PTR-203(57)	Simpson
Pu ²⁴⁰	σ_c	1.06-119	BP,2,219(57)	Simpson
Pu ²⁴⁰	σ_c	1.053	PRIVATE COMM.(56)	Zimmerman
Pu ²⁴⁰	σ_c	1.075	55MOSCOW,209(55)	Abov
Pu ²⁴⁰	σ_c	1.08	55MOSCOW,81(55)	Nikitin
Pu ²⁴¹	σ_f	4.28-160.51	71KNOX,2,836(71)	Blons
Pu ²⁴¹	$\sigma_c \sigma_f$	12.78-99.5	71KNOX,2,823(71)	Kolar
Pu ²⁴¹	σ_f	4.28-62.40	70HELSINKI,1,469(70)	Blons
Pu ²⁴¹	analysis	-0.209-59.30	IN-1407,57(70)	Smith
Pu ²⁴¹	$\bar{\sigma}_s$	4.27-30.90	PR,174,1413(68)	Sauter
Pu ²⁴¹	σ_f	14.73-62.08	66WASH,2,910(66)	Simpson
Pu ²⁴¹	σ_f	12.84-16.70	NP,65,353(65)	James
Pu ²⁴¹	σ_c	12.80-31.03	CJP,42,2384(64)+	Craig
Pu ²⁴¹	σ_f	4.275-34.90	PR/B,135,945(64)	Moore
Pu ²⁴¹	σ_c	12.75-50.4	AERE-PR/NP-7,6(64)	Pattenden
Pu ²⁴¹	σ_c	14.74-31.03	PRIVATE COMM.(64)	Craig
Pu ²⁴¹	σ_f	12.84-16.70	AERE-PR/NP-6,3(64)	James
Pu ²⁴¹	σ_f	4.275-30.88	PR/B,135,945(64)	Moore
Pu ²⁴¹	σ_c	12.75-50.4	AERE-PR/NP-6,10(64)+	Pattenden
Pu ²⁴¹	σ_f	4.28-8.60	ID0-16954(63)	Marshall
Pu ²⁴¹	σ_f	4.33-16.60	61SACLAY,115(61)	James
Pu ²⁴¹	σ_c	0.264-10.20	PR,123,559(61)	Simpson
Pu ²⁴¹	σ_f	0.255-8.61	HW-62727,19(59)	Leonard
Pu ²⁴¹	σ_c	4.31-6.8	JNE,6,303(58)	Egelstaff
Pu ²⁴¹	σ_c	0.25	BAP,3,176(58)+	Schwartz
Pu ²⁴¹	σ_c	0.25	PRIVATE COMM.(58)	Schwartz
Pu ²⁴¹	σ_f	0.255	JNE,2,177(56)	Richmond
Pu ²⁴²	σ_c	595.2-3836	PR/C,7,2085(73)+	Auchampaugh
Pu ²⁴²	σ_c	2.675-494.7	ORNL-4844,90(73)	Harvey
Pu ²⁴²	$\sigma_y \sigma_c$	22.56-1286	NP/A,207,342(73)	Poortmans
Pu ²⁴²	$\bar{\sigma}_s \sigma_c$	2.68-1286	NP/A,207,342(73)	Poortmans
Pu ²⁴²	$\sigma_c \bar{\sigma}_s \sigma_y$	22.56-1286	72BUD,56(72)+	Poortmans
Pu ²⁴²	σ_c	22.56-494.75	ANCR-1088,32(72)	Simpson

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pu ²⁴²	σ_f	374-110,000	NP/A,171,31(71)	Auchampaugh
Pu ²⁴²	σ_f	53.4-788.2	NP/A,163,577(71)	Bergen
Pu ²⁴²	analysis	-70-386	ANCR-1016,306(71)	Young
Pu ²⁴²	σ_t	2.68-149.6	NSE,40,389(70)	Young
Pu ²⁴²	σ_f	767-2960	NP/A,123,24(69)	James
Pu ²⁴²	σ_t	2.64-386	PR,146,840(66)	Auchampaugh
Pu ²⁴²	σ_t	14.6-311	65ANTWERP,93(65)	Pattenden
Pu ²⁴²	σ_f	2.65	BAP,6,8(61)	Leonard
Pu ²⁴²	σ_t	2.65-53.6	PR,114,505(59)	Cote
Pu ²⁴²	σ_t	2.67	JNE,6,303(58)	Egelstaff
Pu ²⁴⁴	σ_f	30.7-285	NP/A,171,31(71)	Auchampaugh

²⁴¹Am
⁹⁵Am
 [433 yr]

THERMAL CROSS SECTIONS

$\sigma_{\gamma} = 0.10 \pm 0.05$ mb [13 sec ²⁴²Am^{m2}]
 $\sigma_{\gamma} = 83.8 \pm 2.6$ b [152 yr ²⁴²Am^{m1}]
 $\sigma_{\gamma} = 748 \pm 20$ b [16.02 hr ²⁴²Am^{m9}]
 $\sigma_{\gamma} = 832 \pm 20$ b
 $\sigma_f = 3.15 \pm 0.10$ b
 $\nu_p = 3.219 \pm .038$

RESONANCE PROPERTIES

$I_{\gamma} = 202 \pm 20$ b [152 yr ²⁴²Am^{m1}]
 $I_{\gamma} = 1275 \pm 120$ b [16.02 hr ²⁴²Am^{m9}]
 $I_f = 21 \pm 2$ b
 $\langle D \rangle = 0.74 \pm 0.08$ eV
 $S_0 = 1.2 \pm 0.2$

RESONANCE PARAMETERS

$I^{\pi} = 5/2^{-}$

$S_n = 5528 \pm 8$ keV

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
.308±.003	41 ±4	.060±.003	41 ±4	.108±.006	.29 ± .03
.576±.005	40 ±5	.075±0.007	40 ±5	.098±.010	.14 ± .02
1.27 ±.01	44 ±7	.39 ± .02	44 ±7	.345±.018	.30 ± .05
1.68 ±.02		.125±.006	(41 ±5)	.090±.004	.074±.008
1.93 ±.02		.080±.010	(41 ±5)	.052±.008	.17 ± .03
2.36 ±.02		.20 ± .02	(41 ±5)	.124±.012	.12 ± .02
2.60 ±.03		.26 ± .02	(41 ±5)	.130±.013	.15 ± .04
3.99 ±.04		.027±.006	(41 ±5)	.013±.003	<.08
4.40 ±.05		.21 ± .04	(41 ±5)	.094±.020	.28 ± .05
5.03 ±.04		1.08 ± .05	(41 ±5)	.46 ±.02	.41 ± .03
5.46 ±.04		.13 ± .04	(41 ±5)	.052±.004	.29 ± .06
6.10 ±.04		.23 ± .09		.090±.036	
6.78 ±.02		.79 ± .34		.28 ±.12	
7.97 ±.02		.80 ± .34		.28 ±.12	
8.11 ±.03		.13 ± .08		.044±.026	
8.28 ±.04		.42 ± .06	(41 ±5)	.14 ±.02	.06 ± .03
9.13 ±.05		.33 ± .05		.105±.016	1.1 ±0.2
9.90 ±.05		.34 ± .03		.106±.010	
10.38 ±.03		.36 ± .05		.108±.014	
10.99 ±.03		.14 ± .04		.040±.012	
12.86 ±.04		2.4 ± .5	(41 ±5)	0.62 ±.12	.34 ± .04
14.75 ±.07		.17 ± .10		.044±.026	
15.60 ±.05		.16 ± .10		.040±.024	
15.73 ±.05		.14 ± .09		.036±.022	
16.02 ±.05		.97 ± .19		.24 ±.05	
16.38 ±.05		.41 ± .16		.10 ±.04	
16.82 ±.06		.25 ± .10		.060±.024	
17.68		.43 ± .17		.10 ±.04	
18.37		.12 ± .12		.028±.028	
19.48		.27 ± .18		.06 ±.04	
20.64					

²⁴¹₉₅Am

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
23.09		.38 ± .19		.08 ± .04	
23.28		.77 ± .23		.16 ± .05	
24.17		1.08 ± .20		.22 ± .04	
25.61		1.01 ± .41		.20 ± .08	
26.60		.62 ± .21		.12 ± .04	
27.68		.63 ± .21		.12 ± .04	
28.36		.48 ± .15		.090 ± .028	
28.93		.54 ± .16		.10 ± .03	
29.56		.82 ± .27		.15 ± .05	
30.79		.44 ± .33		.08 ± .06	
31.21		1.2 ± .3		.22 ± .06	
32.14		.57 ± .45		.10 ± .08	
34.02		.82 ± .47		.14 ± .08	
35.02		.71 ± .47		.12 ± .08	
35.53		.54 ± .27		.090 ± .046	
37.01		5.2 ± 1.7		.86 ± .28	
38.39		2.85 ± .99		.46 ± .16	
39.71		2.14 ± .63		.34 ± .10	
40.42		1.78 ± .64		.28 ± .10	
41.71		.65 ± .65		.10 ± .10	
42.64		12 ± 5		1.8 ± .8	
43.25		2.5 ± 1.1		.38 ± .16	

^a $\sigma_0\Gamma_f$ (b-eV)

Note - Single-level Breit-Wigner parameters. There is a discrepancy between measured and calculated capture resonance integrals.

²⁴²₉₅Am^{m1}
[152 yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 1400 \pm 860 \text{ b} \\ \sigma_f &= 6600 \pm 300 \text{ b} \\ \sigma_a &= 8000 \pm 800 \text{ b} \\ \nu_f &= 3.264 \pm 0.024\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 7000 \pm 2000 \text{ b} \\ I_f &= 1570 \pm 110 \text{ b} \\ \langle D \rangle &= 0.6 \pm 0.2 \text{ eV}\end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 1^{(-)}$$

$$S_n = 6377 \pm 8 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
.173	280	.213	(50)	.512	230
.61	220	.077	(50)	.098	170
1.02	1050	.342	(50)	.339	1000
1.65	450	.108	(50)	.084	400
2.09	375	.186	(50)	.128	325
3.25	700	.806	(50)	.447	650

Note - Single-level Breit-Wigner parameters.

²⁴²₉₅Am^g
[16.02 hr]

THERMAL CROSS SECTIONS

$$\sigma_f = 2900 \pm 1000 \text{ b}$$

²⁴³
⁹⁵Am
(7370 yr)

THERMAL CROSS SECTIONS

$\sigma_f = 79.3 \pm 2.0$ b
 $\sigma_f = 75.2 \pm 1.8$ b (26 min ²⁴³Am)
 $\sigma_f = 4.1 \pm 0.2$ b (10.1 hr ²⁴³Am)
 $\sigma_f < 0.07$ b
 $\sigma_t = 85 \pm 4$ b

RESONANCE PROPERTIES

$I_\gamma = 1820 \pm 70$ b
 $I_\gamma = 111 \pm 10$ b (10.1 hr ²⁴³Am)
 $\langle D \rangle = 0.67 \pm 0.06$ eV
 $S_0 = 0.96 \pm 0.10$

RESONANCE PARAMETERS

$I'' = 5/2^-$

$S_n = 5362.9 \pm 3.4$ keV

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
-2.0			39	1.16
.420 ± .001	39 ± 2	.00084 ± .00006	39 ± 2	.0013 ± .0001
.983 ± .001	36 ± 2	.0146 ± .0007	38 ± 2	.0147 ± .0007
1.356 ± .002	44 ± 2	1.11 ± .05	43 ± 2	.950 ± .040
1.744 ± .002	38 ± 2	.240 ± .011	39 ± 2	.182 ± .008
3.140 ± .003	32 ± 6	.0113 ± .001	32 ± 6	.0064 ± .0006
3.424 ± .003	38 ± 4	.287 ± .011	38 ± 4	.155 ± .006
3.845 ± .004	43 ± 6	.013 ± .001	43 ± 6	.0067 ± .0006
5.125 ± .005	39 ± 3	.313 ± .014	39 ± 3	.139 ± .006
6.554 ± .006	38 ± 3	.968 ± .038	37 ± 3	.378 ± .015
7.067 ± .006	40 ± 6	.072 ± .005	40 ± 6	.027 ± .002
7.863 ± .006	40 ± 4	1.33 ± .056	39 ± 4	.475 ± .020
8.377 ± .007	39 ± 6	.009 ± .003	39 ± 6	.003 ± .001
8.770 ± .007	37 ± 10	.112 ± .006	37 ± 10	.040 ± .002
9.314 ± .008	39 ± 9	.153 ± .009	39 ± 9	.050 ± .003
10.314 ± .008	50 ± 5	.449 ± .032	49 ± 5	.140 ± .010
10.877 ± .008		.013 ± .007		.004 ± .002
11.278 ± .008	4 ± 6	.285 ± .013	41 ± 6	.085 ± .004
11.693 ± .008	26 ± 14	.106 ± .007	26 ± 14	.031 ± .002
12.122 ± .008	37 ± 11	.174 ± .010	37 ± 11	.050 ± .003
12.877 ± .008	38 ± 6	2.40 ± .11	36 ± 6	.670 ± .020
13.152 ± .008	42 ± 8	1.35 ± .07	41 ± 8	.385 ± .020
15.143 ± .009		.097 ± .027		.025 ± .007
15.404 ± .009	45 ± 11	1.53 ± .12	44 ± 11	.340 ± .030
16.210 ± .009	49 ± 9	.551 ± .028	48 ± 9	.137 ± .007
16.583 ± .009	36 ± 10	.196 ± .016	36 ± 10	.048 ± .004
17.874 ± .009	42 ± 10	.228 ± .127	42 ± 10	.054 ± .030
18.158 ± .009		.060 ± .009	(39)	.014 ± .002
19.533 ± .009		.24 ± .02	(39)	.053 ± .004
19.915 ± .010		.100 ± .018	(39)	.023 ± .004
20.974 ± .010		.50 ± .05	(39)	.109 ± .010
21.115 ± .010		1.00 ± .09	(39)	.218 ± .020
21.872 ± .010		.168 ± .014	(39)	.036 ± .003

²⁴³Am

E_β (eV)	Γ (meV)	$2g\Gamma_\beta$ (meV)	Γ_γ (meV)	$2g\Gamma_\gamma$ (meV)
22.011 ± .010		.052 ± .023 (39)		.011 ± .005
22.600 ± 0.010		.49 ± .05 (39)		.103 ± .011
22.739 ± .010		1.34 ± .14 (39)		.28 ± .03
24.454 ± .011		.952 ± .049 (39)		.193 ± .010
25.415 ± .012		.161 ± .025 (39)		.032 ± .005
26.237 ± .012		.041 ± .020 (39)		.008 ± .004
26.750 ± 0.012		1.66 ± 0.10 (39)		.320 ± .020
27.355 ± .012		.52 ± .05 (39)		.100 ± .010
28.735 ± .012		1.09 ± .05 (39)		.203 ± .010
29.30 ± .01		.73 ± .05 (39)		.135 ± .010
30.13 ± .01		.52 ± .04 (39)		.095 ± .007
31.07 ± .01		.81 ± .06 (39)		.145 ± .010
31.49 ± .01		.17 ± .03 (39)		.031 ± .005
32.42 ± .01		.15 ± .02 (39)		.026 ± .004
33.20 ± .02		.98 ± .06 (39)		.17 ± .01
33.94 ± .02		1.83 ± .09 (39)		.314 ± .016
34.99 ± .02		.96 ± .06 (39)		.162 ± .010
36.67 ± .02		.85 ± .06 (39)		.14 ± .01
37.03 ± .02		2.01 ± .09 (39)		.330 ± .015
37.55 ± .02		.080 ± .031 (39)		.013 ± .005
37.93 ± .02		.62 ± .05 (39)		.100 ± .008
39.50 ± .02		.61 ± .06 (39)		.097 ± .010
40.50 ± .02		.096 ± .045 (39)		.015 ± .007
40.95 ± .02		.32 ± .13 (39)		.05 ± .02
41.26 ± .02		1.2 ± 0.2 (39)		0.19 ± .03
41.54 ± .02		2.4 ± 0.2 (39)		.37 ± .03
42.95 ± .02		2.7 ± 0.2 (39)		.41 ± .03
44.11 ± .02		.49 ± .04 (39)		.074 ± .006
45.35 ± .02		1.15 ± .07 (39)		.170 ± .010
47.11 ± .02		.37 ± .06 (39)		.054 ± .009
48.55 ± .02		.46 ± .07 (39)		0.066 ± 0.010
49.29 ± .02		.76 ± .07 (39)		0.108 ± 0.010
50.20 ± .02		.11 ± .04 (39)		0.015 ± 0.005
51.28 ± .02		1.07 ± .07 (39)		0.150 ± 0.010
52.17 ± .02		.11 ± .04 (39)		0.015 ± 0.005
53.03 ± .02		2.11 ± .15 (39)		.29 ± .02
53.60 ± .02		.095 ± .073 (39)		0.013 ± 0.010
54.02 ± .02		.66 ± .07 (39)		0.090 ± 0.010
54.55 ± .02		1.92 ± .15 (39)		0.260 ± 0.020
54.93 ± .02		.17 ± .07 (39)		0.023 ± 0.010
55.87 ± .02		1.64 ± .15 (39)		0.220 ± 0.020
58.74 ± .02		.45 ± .12 (39)		0.056 ± 0.015
59.13 ± .02		.90 ± .11 (39)		0.117 ± 0.015
59.98 ± .02		.78 ± .09 (39)		0.100 ± 0.012
60.76 ± .02		1.21 ± .16 (39)		0.155 ± 0.020
61.20 ± .02		2.89 ± .15 (39)		0.370 ± 0.020
62.51 ± .03		.27 ± .08 (39)		0.034 ± 0.010
63.19 ± .03		.40 ± .08 (39)		0.050 ± 0.010
64.82 ± .03		.40 ± .08 (39)		0.050 ± 0.010
66.21 ± .03		1.36 ± .14 (39)		0.167 ± 0.017
67.36 ± .03		1.10 ± .12 (39)		0.134 ± 0.014
68.01 ± .03		1.24 ± .12 (39)		0.150 ± 0.015

²⁴³₉₅Am

E_0 (eV)	Γ (meV)	$2q\Gamma_n$ (meV)	Γ_γ (meV)	$2q\Gamma_n^0$ (meV)
68.67 ± .03		1.60 ± .12 (39)		0.193 ± 0.015
69.66 ± .03		3.93 ± .17 (39)		0.471 ± 0.020
70.27 ± .03		2.42 ± .17 (39)		0.289 ± 0.020
71.60 ± .03		.25 ± .13 (39)		0.030 ± 0.015
72.22 ± .03		2.63 ± .17 (39)		0.309 ± 0.020
72.88 ± .03		3.00 ± .17 (39)		0.351 ± 0.020
73.93 ± .03		.36 ± .13 (39)		0.042 ± 0.015
74.34 ± .03		.36 ± .13 (39)		0.042 ± 0.015
74.88 ± .03		.31 ± .13 (39)		0.036 ± 0.015
75.43 ± .03		3.13 ± .17 (39)		0.360 ± 0.020
76.50 ± .03		.21 ± .09 (39)		0.024 ± 0.010
77.00 ± .04		.53 ± .16 (39)		0.060 ± 0.020
77.54 ± .04		1.50 ± .16 (39)		0.170 ± 0.020
78.22 ± .04		.31 ± .09 (39)		0.035 ± 0.010
80.50 ± .04		.94 ± .27 (39)		0.105 ± 0.030
81.00 ± .04		2.38 ± .27 (39)		0.264 ± 0.030
81.10 ± .04		1.71 ± .36 (39)		0.190 ± 0.040
83.10 ± .04		1.04 ± .27 (39)		0.114 ± 0.030
83.52 ± .04		2.51 ± .16 (39)		0.275 ± 0.020
84.19 ± .04		2.20 ± .16 (39)		0.240 ± 0.020
85.56 ± .04		6.81 ± .37 (39)		0.736 ± 0.040
86.63 ± .04		1.58 ± .19 (39)		0.170 ± 0.020
88.36 ± .04		1.45 ± .19 (39)		0.154 ± 0.020
89.00 ± .04		1.28 ± .19 (39)		0.136 ± 0.020
90.43 ± .04		1.43 ± .19 (39)		0.150 ± 0.020
91.75 ± .04		1.15 ± .19 (39)		0.120 ± 0.020
94.72		1.36 ± .20 (39)		0.140 ± 0.020
95.80		.39 ± .15 (39)		0.040 ± 0.015
97.53		2.17 ± .20 (39)		0.220 ± 0.020
99.48		1.00 ± .20 (39)		0.100 ± 0.020
101.12		3.72 ± .40 (39)		0.370 ± 0.040
101.92		2.52 ± .40 (39)		0.250 ± 0.040
104.06		.72 ± .20 (39)		0.071 ± 0.020
104.96		1.95 ± .31 (39)		0.190 ± 0.030
107.17		3.68 ± .52 (39)		0.355 ± 0.050
109.72		1.28 ± .31 (39)		0.122 ± 0.030
111.63		1.40 ± .32 (39)		0.132 ± 0.030
112.12		1.05 ± .32 (39)		0.099 ± 0.030
112.70		1.22 ± .32 (39)		0.115 ± 0.030
113.19		10.35 ± .75 (39)		0.973 ± 0.070
114.24		5.42 ± .53 (39)		0.507 ± 0.050
116.60		7.38 ± .76 (39)		0.683 ± 0.070
119.74		4.72 ± .55 (39)		0.432 ± 0.050
122.31		7.08 ± .66 (39)		0.640 ± 0.060
123.37 ± .06		18.55 ± 1.33 (39)		1.670 ± 0.120
125.18 ± .06		7.92 ± .78 (39)		0.708 ± 0.070
126.40		.73 ± .28 (39)		0.065 ± 0.025
127.38		2.37 ± .34 (39)		0.210 ± 0.030
130.30		.55 ± .17 (39)		0.048 ± 0.015
132.50		.86 ± .23 (39)		0.075 ± 0.020
133.50		1.02 ± .35 (39)		0.088 ± 0.030
134.10		1.45 ± .35 (39)		0.125 ± 0.030

²⁴³
₉₅Am

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
134.70		.75 $\pm$.35	(39)	0.065 $\pm$ 0.030
135.20		.73 $\pm$.35	(39)	0.063 $\pm$ 0.030
139.40		2.44 $\pm$.83	(39)	0.207 $\pm$ 0.070
140.03		6.92 $\pm$.95	(39)	0.585 $\pm$ 0.080
141.20		1.26 $\pm$.24	(39)	0.106 $\pm$ 0.020
144.00		3.80 $\pm$.36	(39)	0.317 $\pm$ 0.030
144.47		6.46 $\pm$.48	(39)	0.537 $\pm$ 0.040
145.00		3.61 $\pm$.48	(39)	0.300 $\pm$ 0.040
146.09		9.00 $\pm$.73	(39)	0.745 $\pm$ 0.060
146.60		4.07 $\pm$.61	(39)	0.336 $\pm$ 0.050
148.38		4.51 $\pm$.61	(39)	0.370 $\pm$ 0.050
149.80		.73 $\pm$.25	(39)	0.060 $\pm$ 0.020
151.10		.98 $\pm$.25	(39)	0.080 $\pm$ 0.020
152.80		2.05 $\pm$.49	(39)	0.166 $\pm$ 0.040
154.00		3.91 $\pm$.75	(39)	0.315 $\pm$ 0.060
154.70		4.12 $\pm$.75	(39)	0.332 $\pm$ 0.060
158.64		4.47 $\pm$.50	(39)	0.355 $\pm$ 0.040
160.64 $\pm$.08		15.13 $\pm$ 1.52	(39)	1.194 $\pm$ 0.120
163.90		.54 $\pm$.26	(39)	0.042 $\pm$ 0.020
164.87		4.96 $\pm$.64	(39)	0.386 $\pm$ 0.050
166.10		2.45 $\pm$.52	(39)	0.190 $\pm$ 0.040
166.80		2.69 $\pm$.52	(39)	0.177 $\pm$ 0.040
168.01		6.52 $\pm$.91	(39)	0.503 $\pm$ 0.070
169.70		1.25 $\pm$.26	(39)	0.096 $\pm$ 0.020
171.70		1.26 $\pm$.26	(39)	0.096 $\pm$ 0.020
172.70		7.48 $\pm$.92	(39)	0.569 $\pm$ 0.070
173.60		7.44 $\pm$.92	(39)	0.565 $\pm$ 0.070
174.70		3.97 $\pm$.66	(39)	0.300 $\pm$ 0.050
175.80		3.99 $\pm$.66	(39)	0.301 $\pm$ 0.050
177.00		8.61 $\pm$.93	(39)	0.647 $\pm$ 0.070
180.00		2.95 $\pm$.54	(39)	0.220 $\pm$ 0.040
180.50		1.92 $\pm$.54	(39)	0.143 $\pm$ 0.040
181.50		2.20 $\pm$.54	(39)	0.163 $\pm$ 0.040
183.00		1.88 $\pm$.54	(39)	0.139 $\pm$ 0.040
184.05		3.34 $\pm$.54	(39)	0.246 $\pm$ 0.040
184.50		4.61 $\pm$.54	(39)	0.339 $\pm$ 0.040
186.20		2.05 $\pm$.41	(39)	0.150 $\pm$ 0.030
186.90		4.79 $\pm$.55	(39)	0.350 $\pm$ 0.040
188.00		8.57 $\pm$.96	(39)	0.625 $\pm$ 0.070
190.60		2.98 $\pm$.55	(39)	0.216 $\pm$ 0.040
191.60		3.18 $\pm$.55	(39)	0.230 $\pm$ 0.040
192.25		4.69 $\pm$.56	(39)	0.338 $\pm$ 0.040
193.35 $\pm$.10		8.77 $\pm$.97	(39)	0.631 $\pm$ 0.070
195.90 $\pm$.10		.14 $\pm$.04	(39)	0.010 $\pm$ 0.003
196.20		1.41 $\pm$.28	(39)	0.101 $\pm$ 0.020
196.90		2.30 $\pm$.28	(39)	0.164 $\pm$ 0.020
197.60		5.58 $\pm$.84	(39)	0.397 $\pm$ 0.060
199.20		1.20 $\pm$.57	(39)	0.085 $\pm$ 0.040
199.85		3.11 $\pm$.57	(39)	0.220 $\pm$ 0.040
202.10		.36 $\pm$.11	(39)	0.025 $\pm$ 0.008
203.70		.69 $\pm$.21	(39)	0.048 $\pm$ 0.015
205.00		3.39 $\pm$.57	(39)	0.237 $\pm$ 0.040

²⁴³
₉₅Am

E ₀ (eV)	Γ (meV)	2g ² ₀ (meV)	Γ _γ (meV)	2g ² ₀ (meV)
206.60		1.77 ± .29	(39)	0.123 ±0.020
208.20		3.75 ± .58	(39)	0.260 ±0.040
209.60		4.07 ± .58	(39)	0.281 ±0.040
210.95		5.69 ± .87	(39)	0.392 ±0.060
211.50		6.35 ± .87	(39)	0.437 ±0.060
213.40		1.85 ± .29	(39)	0.127 ±0.020
214.50		7.06 ± .88	(39)	0.482 ±0.060
217.00		2.84 ± .59	(39)	0.193 ±0.040
220.30		5.28 ± .89	(39)	0.356 ±0.060
221.20		2.75 ± .60	(39)	0.185 ±0.040
222.00		2.62 ± .60	(39)	0.176 ±0.040
224.30		2.40 ± .60	(39)	0.160 ±0.040
225.30		7.58 ±1.05	(39)	0.505 ±0.070
226.20		2.95 ± .60	(39)	0.196 ±0.040
227.30		3.47 ± .75	(39)	0.230 ±0.050
228.80 ± .11		1.12 ± .30	(39)	.074 ± .02
231.80		1.45 ± .46	(39)	.095 ± .030
232.90		8.79 ±1.07	(39)	.576 ± .070
234.10		8.23 ±1.07	(39)	.538 ± .070
236.00		1.75 ± .46	(39)	.114 ± .030
237.50		2.85 ± .62	(39)	.185 ± .040
238.70		1.70 ± .46	(39)	.110 ± .030
239.50		3.93 ± .77	(39)	0.254 ±0.050
241.20		1.72 ± .47	(39)	0.111 ±0.030
242.80		4.55 ± .94	(39)	0.292 ±0.060
244.10		1.45 ± .47	(39)	0.092 ±0.030
244.60		4.61 ± .94	(39)	0.295 ±0.060
246.30		1.85 ± .47	(39)	0.118 ±0.030
247.10		6.23 ± .94	(39)	0.396 ±0.060
248.60		12.8 ±1.9	(39)	0.812 ±0.120
249.70 ± .13		3.48 ± .79	(39)	0.220 ±0.050

Note - Single-level Breit-Wigner parameters.

²⁴⁴
₉₅Am^m
[26 min]

THERMAL CROSS SECTIONS

$$\sigma_f = 1600 \pm 300 \text{ b}$$

²⁴⁴
₉₅Am^g
[10.1 hr]

THERMAL CROSS SECTIONS

$$\sigma_f = 2300 \pm 300 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Am^{241}	$\sigma_{\gamma} I_{\gamma}$ mass spectrometry	NSE, 50, 364(73)	Harbour
Am^{241}	I_{γ}	AE, 28, 359(70)	Bak
Am^{241}	$\sigma_{\gamma} I_{\gamma}$ pile osci.	ORNL-50242(70)	Hellstrand
Am^{241}	ν_p	NP/A, 145(70)	Jaffey
Am^{241}	σ_{γ}	ICD-6, 42(69)	Dovbenko
Am^{241}	σ_f fission isomer	YF, 10, 65(69)	Gangurskii
Am^{241}	I_{γ} activation	BAP, 14, 497(69)	Schuman
Am^{241}	$\sigma_{\gamma} \sigma_{\gamma} I_{\gamma}$	AE, 23, 316(67)	Bak
Am^{241}	σ_f fission isomer	PRIVATE COMM.(67)	Hagemans
Am^{241}	σ_f	PR/8, 137, 326(65)	Bowman
Am^{241}	σ_f fission isomer	PL, 19, 226(65)	White
Am^{241}	RI, chemical separation	PRIVATE COMM.(64)	Deal
Am^{241}	isomeric transition	PR, 120, 934(60)	Asaro
Am^{241}	σ_{γ} alpha counting	JNE, 8, 224(59)	Hoff
Am^{241}	ν_p	AE, 5, 176(58)	Lebedev
Am^{241}	ν_p	JIN, 4, 1(57)	Cunningham
Am^{241}	σ_f	PR, 107, 1294(57)	Hulet
Am^{241}	σ_c	SSGENEVA, 4, 216(55)	Adamchuk
Am^{241}	σ_a pile osci.	ORNL-1879, 50(55)	Pomerance
Am^{241}	σ_{γ} mass spectrometry	PR, 85, 135(52)	Street
Am^{241}	σ_f	PR, 82, 558(51)	Cunningham
Am^{241}	σ_f	PR, 81, 893(51)	Hanna
Am^{241}	σ_{γ} alpha counting	PR, 81, 486(51)	Hanna
Am^{241}	σ_{γ} alpha counting	CS-3471, 4(46)	Seaborg
$\text{Am}^{242\text{m}}$	ν_{sp}	NP/A, 145, 1(70)	Jaffey
$\text{Am}^{242\text{m}}$	ν_{sp}	AE, 29, 95(70)	Kroshkin
$\text{Am}^{242\text{m}}$	ν_{sp}	70HELSTINKI, 2, 182(70)	Zamyatnin
$\text{Am}^{242\text{m}}$	I_{γ} activation	BAP, 15, 497(69)	Schuman
$\text{Am}^{242\text{m}}$	I_{γ}	NSE, 32, 131(68)	Perkins
Am^{242}	$\sigma_f I_{\gamma}$	AE, 23, 316(67)	Bak
$\text{Am}^{242\text{m}}$	ν_p	PR, 152, 1046(66)	Fultz
Am^{242}	σ_f	JNE, 20, 588(66)	Wolfsberg
Am^{242}	σ_f fission chamber	PR, 107, 1294(57)	Hulet
Am^{242}	σ_f	PR, 107, 1294(57)	Hulet
Am^{242}	σ_f fission counter	PR, 94, 735(54)	Higgins
$\text{Am}^{242\text{m}}$	σ_f	PR, 94, 735(54)	Higgins
Am^{242}	σ_f decay alphas	PR, 85, 135(52)	Street
Am^{242}	$\sigma_a \sigma_{\gamma}$	PR, 85, 135(52)	Street
Am^{242}	mass spectrometry	PR, 85, 135(52)	Street
Am^{242}	σ_f fission counting	PR, 85, 135(52)	Street
Am^{242}	$\sigma_a \sigma_f$ alpha counting	PR, 81, 893(51)	Hanna
Am^{243}	$\sigma_{\gamma} I_{\gamma}$	KFK-1456, 47(71)	Eberle
Am^{243}	σ_c	PRIVATE COMM.(70)	Berretth
Am^{243}	I_{γ} activation	BAP, 14, 497(69)	Schuman
Am^{243}	$\sigma_{\gamma} I_{\gamma}$ activation	68WASH, 2, 1279(68)	Folger
Am^{243}	$\sigma_{\gamma} I_{\gamma}$	AE, 23, 316(67)	Bak
Am^{243}	production rate	DP-M5-66-69(66)	Ice
Am^{243}	σ_{γ} RI alpha counting	JIN, 26, 219(64)	Vandenbosch

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Am^{243}	σ_t	PR,114,505(59)	Cote
Am^{243}	σ_f RI alpha counting	CJP,35,147(57)	Butler
Am^{243}	σ_f	PR,107,1294(57)	Hulet
Am^{243}	σ_f production	NSE,1,204(56)	Jaffey
Am^{243}	σ_f	PR,95,581(54)	Harvey
Am^{243}	σ_f	PR,94,974(54)	Stevens
Am^{243}	σ_f spectrometry	PR,94,974(54)	Stevens
Am^{243}	σ_f	PR,94,974(54)-	Thompson
Am^{243}	σ_f alpha counting	PR,79,530(50)	Street
Am^{244}	σ_f	PRIVATE COMM.(61)	Hulet
Am^{244}	σ_f	PRIVATE COMM.(61)	Hulet
Am^{244}	σ_f fission chamber	JIN,23,187(61)	Vandenbosch

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Am^{241}	analysis	4.0-6.20	PRIVATE COMM.(73)	Bowman
Am^{241}	σ_f	0.306-15.04	YF,4,985(66)	Gerasimov
Am^{241}	σ_f	0.306-15.04	56PAR15,2,129(66)	Gerasimov
Am^{241}	σ_f	0.66-15.04	PR/8,137,326(65)	Bowman
Am^{241}	σ_t	1.922-2.325	AERE-PR/NP-6,10(64)	Pattenden
Am^{241}	σ_f	0.307-1.265	PRIVATE COMM.(61)	Leonard
Am^{241}	σ_t	5.44-43.25	ORNL-3085,42(61)	Slaughter
Am^{241}	σ_t	0.306-1700	ORNL-2716,26(59)	Block
Am^{241}	σ_f	0.307-4.0	BAP,4,31(59)	Leonard
Am^{241}	σ_f	0.307-3.4	HU-59126,3(59)	Leonard
Am^{242m}	σ_f	0.173-3.25	PR,166,1219(68)	Bowman
Am^{243}	σ_t	-2.0-249.70	ANCR-1088,34(72)	Simpson
Am^{243}	σ_t	-2.0-249.7	ANCR-1060(72)	Simpson
Am^{243}	σ_t	0.420-7.076	PRIVATE COMM.(69)	Berreth
Am^{243}	σ_t	0.0107-15.3	PR,114,505(59)	Cote

$^{242}_{96}\text{Cm}$
[163 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 16 \pm 5 \text{ b} \\ \sigma_f &< 5 \text{ b} \\ \nu_{sp} &= 2.48 \pm 0.03\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 150 \pm 40 \text{ b}$$

$^{243}_{96}\text{Cm}$
[28 yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 225 \pm 100 \text{ b} \\ \sigma_f &= 600 \pm 50 \text{ b} \\ \sigma_a &= 825 \pm 125 \text{ b} \\ \bar{\sigma}_s &= 825 \pm 125 \text{ b} \\ \nu_p &= 3.430 \pm 0.047\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_a^c &= 2345 \pm 470 \text{ b} \\ I_f &= 1860 \pm 400 \text{ b}\end{aligned}$$

$I^{\pi} = (5/2^{+})$

$S_n = 6799.0 \pm 1.6 \text{ keV}$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)	Γ_{F1} (meV)	Γ_{F2} (meV)
1.49 ± .03	.27 ± .06	(40)	.22 ± .05	-100	350 ± 70
2.27 ± .01	1.90 ± .03	(40)	1.26 ± .02	225	325 ± 80
3.09 ± .01	.74 ± .08	(40)	.42 ± .05	-130 ± 20	
3.34 ± .02	.29 ± .54	(40)	.16 ± .03	80 ± 15	
3.74 ± .02	.78 ± .12	(40)	.40 ± .06	-110 ± 22	
5.40 ± .02	.81 ± .16	(40)	.35 ± .07	150 ± 30	
5.96 ± .05	3.83 ± .98	(40)	1.57 ± .04	-150	1000 ± 230
8.80 ± .05	.92 ± .24	(40)	.31 ± .08	-300 ± 60	
10.32 ± .06	5.1 ± 1.3	(40)	1.6 ± 0.4	100	1400 ± 300
11.07 ± .06	3.33 ± .83	(40)	1.00 ± .25	-90 ± 20	
14.55 ± .08	.95 ± .23	(40)	.25 ± .06	250 ± 80	
15.65 ± .10	1.74 ± .59	(40)	.44 ± .15	-250 ± 80	
21.68 ± .15	4.3 ± 1.4	(40)	.92 ± .30	250 ± 80	
24.44 ± .15	3.0 ± 1.0	(40)	.6 ± .2	-150 ± 35	
25.84 ± .15	2.85 ± .81	(40)	.56 ± .15	150 ± 35	

Note - Multilevel Reich-Moore parameters.

²⁴⁴
⁹⁶Cm
[17.9 yr]

Thermal Cross Sections

$\sigma_T = 13.9 \pm 1.0$ b
 $\sigma_f = 1.2 \pm 0.1$ b
 $\bar{\sigma}_a = 8 \pm 3$ b
 $\sigma_c = 23 \pm 3$ b
 $\nu_{sp} = 2.690 \pm 0.013$

Resonance Properties

$I_\gamma = 650 \pm 50$ b
 $I_f = 12.5 \pm 2.5$ b
 $\langle D \rangle = 14 \pm 2$ eV
 $S_0 = 1.1 \pm 0.2$

Resonance Parameters

$I^\pi = 0^+$

$S_n = 5519.9 \pm 3.3$ keV

E_0 (eV)	$g \Gamma_n$ (meV)	Γ_γ (meV)	$g \Gamma_n^0$ (meV)	Γ_f (meV)
7.69 $\pm$.03	9.71 $\pm$ 0.56	36 $\pm$ 2	3.5 $\pm$ 0.2	
16.81 $\pm$.08	1.80 $\pm$.16	37 $\pm$ 3	.44 $\pm$.04	3.7 $\pm$.3
22.85 $\pm$.05	.86 $\pm$.10	(40)	.18 $\pm$.02	2.51 $\pm$.07
34.95 $\pm$.05	3.49 $\pm$.30	43.5 $\pm$ 8.0	.59 $\pm$.05	1.7 $\pm$.2
52.78 $\pm$.07	.54 $\pm$.07	(37)	.075 $\pm$.010	3.0 $\pm$ 0.3
69.99 $\pm$.07	.55 $\pm$.08	(37)	.066 $\pm$.010	.65 $\pm$.02
85.96 $\pm$.09	22.3 $\pm$ 1.9	(37)	2.4 $\pm$ 0.2	1.54 $\pm$.05
96.12 $\pm$.11	7.0 $\pm$.9	(37)	.71 $\pm$.06	1.17 $\pm$.04
132.8 $\pm$ 0.2	15.3 $\pm$ 1.2	(37)	1.33 $\pm$.10	2.8 $\pm$.3
139.1 $\pm$ 0.2	2.5 $\pm$.3		.21 $\pm$.03	1.3 $\pm$.2
171.2 $\pm$ 0.3	3.3 $\pm$.5		.25 $\pm$.04	2.1 $\pm$.1
181.6 $\pm$ 0.3	9.6 $\pm$.9	(37)	.71 $\pm$.07	1.00 $\pm$.06
197.0 $\pm$ 0.3	37.9 $\pm$ 5.6	(37)	2.7 $\pm$ 0.4	.52 $\pm$.04
209.8 $\pm$ 0.3	42.0 $\pm$ 3.6	(37)	2.90 $\pm$.25	1.25 $\pm$.16
222.1 $\pm$ 0.4	39 $\pm$ 4	(37)	2.6 $\pm$ 0.3	.40 $\pm$.07
230.5 $\pm$ 0.4	23 $\pm$ 5	(37)	2.0 $\pm$.5	.9 $\pm$.3
234.9	3.8 $\pm$ 1.2	(37)	.25 $\pm$.08	>2.2
242.7	1.3 $\pm$ 1.2	(37)	.083 $\pm$.077	.9 $\pm$.4
264.9	10 $\pm$ 5	(37)	.61 $\pm$.31	.6 $\pm$.2
274.1	16 $\pm$ 7	(37)	.97 $\pm$.42	.30 $\pm$.07
316.8	5.5 $\pm$.7	(37)	.31 $\pm$.04	.29 $\pm$.03
329.5	6.6 $\pm$ 1.4	(37)	.36 $\pm$.08	1.16 $\pm$.16
343.6	26 $\pm$ 5	(37)	1.40 $\pm$.27	1.28 $\pm$.11
353.1	101 $\pm$ 23	(37)	5.37 $\pm$ 1.22	1.03 $\pm$.16
361.7	34 $\pm$ 8	(37)	1.79 $\pm$.42	2.1 $\pm$.4
364.4	10 $\pm$ 2	(37)	.52 $\pm$.11	1.11 $\pm$.09
386.2	26 $\pm$ 3	(37)	1.32 $\pm$.15	.66 $\pm$.08
397.6	23 $\pm$ 3	(37)	1.15 $\pm$.15	.27 $\pm$.06
415.0	19 $\pm$ 2	(37)	.93 $\pm$.10	.89 $\pm$.08
420.6	93 $\pm$ 16	(37)	4.53 $\pm$.78	.35 $\pm$.12
426.9	13 $\pm$ 2	(37)	.63 $\pm$.10	.82 $\pm$.11
443.4	86 $\pm$ 19	(37)	4.08 $\pm$.90	1.84 $\pm$.16
470.9	167 $\pm$ 58	(37)	7.7 $\pm$ 2.7	

²⁴⁴Cm
96

E_D (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)	Γ_f (meV)
488.9	15 $\pm$ 2	(37)	.68 $\pm$.09	.50 $\pm$.13
491.9	54 $\pm$ 6	(37)	2.43 $\pm$.27	.47 $\pm$.10
*512.4				.20 $\pm$.04
520.5	26 $\pm$ 4	(37)	1.14 $\pm$.18	2.55 $\pm$.26
*596.4	17 $\pm$ 12	(37)	.70 $\pm$.49	1.0 $\pm$.5
612.4	30 $\pm$ 22	(37)	1.2 $\pm$.9	1.0 $\pm$.5
620.0	27 $\pm$ 10	(37)	1.1 $\pm$.4	.8 $\pm$.2
627.8	7 $\pm$ 4	(37)	.28 $\pm$.16	<.5
637.9	10 $\pm$ 5	(37)	.40 $\pm$.20	.7 $\pm$.4
*646.9				.68 $\pm$.10
652.4	81 $\pm$ 27	(37)	3.2 $\pm$ 1.1	<.1
691.3	13 $\pm$ 5	(37)	.49 $\pm$.19	.8 $\pm$.3
695.3	16 $\pm$ 5	(37)	.61 $\pm$.19	.7 $\pm$.3
704.5	64 $\pm$ 28	(37)	2.4 $\pm$ 1.1	1.5 $\pm$.3
712.8	20 $\pm$ 7	(37)	.75 $\pm$.26	<.2
*731.6	60 $\pm$ 19	(37)	2.2 $\pm$.7	.17 $\pm$.09
*746.0	4 $\pm$ 2	(37)	.15 $\pm$.07	1.6 $\pm$ 1.0
*759.7				.17 $\pm$.10
778.6	72 $\pm$ 15	(37)	2.6 $\pm$.54	1.7 $\pm$.2
*790.1	4 $\pm$ 2	(37)	.14 $\pm$.07	1.7 $\pm$ 1.0
797.5	2 $\pm$ 2	(37)	.67 $\pm$.07	>3.7
*802.5	7 $\pm$ 2	(37)	.25 $\pm$.07	3.1 $\pm$ 1.2
815.8	11 $\pm$ 2	(37)	.39 $\pm$.07	3.0 $\pm$.8
823.0	28 $\pm$ 7	(37)	.98 $\pm$.24	9.3 $\pm$ 1.9
846.3	6 $\pm$ 4	(37)	.21 $\pm$.14	1.7 $\pm$ 1.2
857.9	33 $\pm$ 14	(37)	1.3 $\pm$.5	1.4 $\pm$.4
865.6	15 $\pm$ 9	(37)	.51 $\pm$.31	4.1 $\pm$ 2.0
872.0	23 $\pm$ 9	(37)	.78 $\pm$.31	1.0 $\pm$.4
884.9	62 $\pm$ 29	(37)	2.1 $\pm$ 1.0	.2 $\pm$.1
899.7	128 $\pm$ 62	(37)	4.27 $\pm$ 2.07	.14 $\pm$.09
*914.0				.6 $\pm$.2
926.3	19 $\pm$ 7	(37)	.62 $\pm$.23	<.5
946.9	34 $\pm$ 11	(37)	1.1 $\pm$.4	.4 $\pm$.3
*971.5		(37)		.35 $\pm$.11

* Resonance with large scattering widths.

* Probably unresolved doublet.

* Fission resonances probably attributed to Pu-240.

Note - Single-level Breit-Wigner parameters.

$^{245}_{96}\text{Cm}$
[8.5 × 10³ yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 345 \pm 20 \text{ b} \\ \sigma_f &= 2020 \pm 40 \text{ b} \\ \sigma_t &= 2375 \pm 100 \text{ b} \\ \nu_p &= 3.832 \pm 0.034\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 101 \pm 8 \text{ b} \\ I_f &= 750 \pm 150 \text{ b} \\ \langle D \rangle &= 1.8 \pm 0.3 \text{ eV} \\ S_0 &= 1.2 \pm .3\end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 1/2^{\circ}$$

$$S_n = 6450.7 \pm 3.9 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
1.95 ± .02	.313 ± .035	(40)	.224 ± .025	-285 ± 45
4.67 ± .02	2.08 ± .03	(40)	.961 ± .015	375 ± 45
9.17 ± .05	.67 ± .12	(40)	.22 ± .04	-150 ± 30
11.34 ± .06	.71 ± .10	(40)	.21 ± .03	130 ± 25
13.88 ± .06	.335 ± .075	(40)	.09 ± .02	-170 ± 30
16.0 ± 0.1	1.20 ± .40	(40)	.3 ± .1	400 ± 100
21.38 ± .05	2.68 ± .60	(40)	.58 ± .13	-490 ± 90
24.82 ± .06	3.0 ± .5	(40)	.6 ± 0.1	223 ± 40
25.84 ± .06	.036	(40)	.007	549
26.83 ± .06	.76	(40)	.147	131
27.55 ± .07	.73 ± .16	(40)	.14 ± .03	200 ± 30
29.40 ± .07	3.58 ± .22	(40)	.66 ± .04	350 ± 40
31.71	.50	(40)	.088	
32.99	.37	(40)	.064	4
34.59	.23	(40)	.039	61
35.31	7.58	(40)	1.28	4195
36.32	1.54	(40)	.26	189
39.45	.65	(40)	.10	102
40.44	4.48	(40)	.71	585
42.45	5.37	(40)	.82	10
43.10	1.73	(40)	.26	537
44.57	2.61	(40)	.39	694
45.74	.59	(40)	.087	901
47.51	3.56	(40)	.52	28
49.20	5.04	(40)	.72	1399
50.48	1.79	(40)	.25	751
51.64	.63	(40)	.087	207
53.63	12.4	(40)	1.69	896
54.63	.33	(40)	.045	1057
56.32	1.40	(40)	.19	505
58.54	13.9	(40)	1.81	393
59.99	.61	(40)	.079	518

Note - Multilevel Reich-Moore parameters.

$^{246}_{96}\text{Cm}$
[4.76 × 10³ yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 1.3 \pm 0.3 \text{ b} \\ \sigma_f &= 0.17 \pm 0.10 \text{ b} \\ \nu_{sp} &= 2.96 \pm 0.03\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 121 \pm 7 \text{ b} \\ I_f &= 10.0 \pm 0.4 \text{ b}\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$S_n = 5157 \pm 7 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_{γ} (meV)	$g\Gamma_n^0$ (meV)	Γ_f (meV)
4.31 ± .02	.35 ± .04	35 ± 2	.17 ± 0.01	
15.29 ± .08	.55 ± .08	35 ± 3	.14 ± .02	
84.43	22 ± 5	(37)	2.39 ± .54	.70 ± .10
91.84	18.0 ± 1.5	(37)	1.88 ± .16	.17 ± .03
158.4	30 ± 3	(37)	2.39 ± .24	
250.7	9 ± 6	(37)	.57 ± .38	.38 ± .30
278.3	7 ± 6	(37)	.42 ± .36	1.3 ± 1.2
288.2	59 ± 38	(37)	3.5 ± 2.2	.31 ± .14
313.4	25 ± 8	(37)	1.4 ± .5	
*361.0		(37)		*2.3 ± 0.5
381.1	118 ± 57	(37)	6.0 ± 6.9	.18 ± .09

* Probably unresolved doublet.

* $\sigma_0 \Gamma_f$ (b-eV)

Note - Single-level Breit-Wigner parameters.

$^{247}_{96}\text{Cm}$
 $[1.54 \times 10^7 \text{ yr}]$

THERMAL CROSS SECTIONS

$$\sigma_T = 60 \pm 30 \text{ b}$$

$$\sigma_f = 90 \pm 10 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 800 \pm 400 \text{ b}$$

$$I_f = 880 \pm 100 \text{ b}$$

$$\langle Q \rangle = 1.4 \pm 0.3 \text{ eV}$$

$$S_0 = 0.84 \pm 0.23$$

RESONANCE PARAMETERS

$$I'' = 9/2^-$$

$$S_n = 6210 \pm 7 \text{ keV}$$

$E_0 (\text{eV})$	$2g\Gamma_n (\text{meV})$	$\Gamma_T (\text{meV})$	$2g\Gamma_n^0 (\text{meV})$	$\Gamma_f (\text{meV})$
21.30	.13	(40)	0.027	404
24.03	.044	(40)	0.009	134
25.35	.010	(40)	0.002	26
26.19	.15	(40)	0.003	220
28.04	.058	(40)	0.011	53
30.25	3.45	(40)	0.627	4
30.62	.19	(40)	0.034	52
32.23	.51	(40)	0.089	26
36.36	1.63	(40)	0.270	61
37.74	.025	(40)	0.004	555
37.76	1.33	(40)	0.217	13
39.52	.006	(40)	0.001	705
39.95	.095	(40)	0.015	167
40.61	.032	(40)	0.005	48
41.25	.66	(40)	0.103	20
41.76	.052	(40)	0.008	546
43.39	.19	(40)	0.029	4
44.87	2.10	(40)	0.313	32
45.21	.58	(40)	0.086	60
47.92	1.17	(40)	0.169	164
48.85	6.80	(40)	0.973	82
50.08	2.36	(40)	0.334	55
50.69	3.18	(40)	0.447	52
51.78	1.66	(40)	0.231	14
52.19	1.26	(40)	0.175	4
53.63	.45	(40)	0.062	324
55.10	.53	(40)	0.072	38
56.18	.66	(40)	0.088	69
59.66	15.7	(40)	2.037	114

Note - Measurements below 21.3 eV are not yet carried out.

^{248}Cm
[35x10³ yr]

THERMAL CROSS SECTIONS

$\sigma_f = 4 \pm 1 \text{ b}$
 $\sigma_f = 0.34 \pm 0.07 \text{ b}$
 $\nu_{sp} = 3.157 \pm 0.015$

RESONANCE PROPERTIES

$I_f = 275 \pm 75 \text{ b}$
 $I_f = 13.2 \pm 0.8 \text{ b}$

RESONANCE PARAMETERS

$I^0 = 0^\circ$

$S_n = 4713 \pm 6 \text{ keV}$

$E_0 \text{ (eV)}$	$g_n^0 \text{ (meV)}$	$\Gamma_f \text{ (meV)}$	$g_n^0 \text{ (meV)}$	$\Gamma_f \text{ (meV)}$
7.26	1.6	(34)	*.6	
26.85 ± .05	19.6 ± 1.5	40 ± 5	3.8 ± 0.3	.09 ± .01
35.00 ± .06	11.2	(34)	*1.9	
76.15 ± .10	105	53 ± 6	*12	4.7 ± 0.6
98.95 ± .15	160	53 ± 6	*16	.67 ± .07
140.2 ± 0.2	1.5		*.13	
186.2 ± 0.2	4.2		*.31	
237.4 ± 0.3	16.9		*1.1	
258.7	71		*4.4	
321.9	29		*1.6	
380.2	96		*4.9	
415.6				
457.9				
485.0				
541.9	14		*0.60	
605.3				
647.0				
692.7				
694.5				
721				
769				
866				
887				
959				
994				
1024				
1104				
1193				
1210				
1263				
1277				
1288				
1388				
1508				
1620				
1813				
1906				

²⁴⁸₉₆Cm

E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)	Γ _f (meV)
2042				
2070				
2137				
2215				
2291				
2370				
2391				
2585				

* Preliminary data.

²⁴⁹₉₆Cm
[64 min]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 1.6 \pm 0.8 \text{ b}$$

$$\nu = 3.31 \pm 0.08$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cm^{242}	I_γ	BAP, 14, 497(69)	Schuman
Cm^{242}	σ_a	68WASH, 2, 1285(68)	Smith
Cm^{242}	ν_{sp}	PR, 101, 1804(56)	Crane
Cm^{242}	ν_{sp}	PR, 101, 1016(56)	Hicks
Cm^{242}	σ_f	PR, 81, 893(51)	Hanna
Cm^{243}	I_f	JIN, 33, 1553(71)	Thompson
Cm^{243}	ν_p	NP/A, 145, 1(70)	Jaffey
Cm^{243}	$\sigma_a \sigma_f$	68WASH, 2, 1285(68)	Smith
Cm^{243}	σ_f	PR, 107, 125(57)	Hulet
Cm^{244}	σ_f	YF, 17, 24(73)	Fomushkin
Cm^{244}	$\sigma_f I_f$	NSE, 47, 203(72)	Benjamin
Cm^{244}	σ_t	NSE, 49, 145(72)	Berreth
Cm^{244}	ν_{sp}	AE, 33, 767(72)	Prokhorova
Cm^{244}	$\sigma_f \sigma_\gamma I_\gamma I_f$	JIN, 33, 1553(71)	Thompson
Cm^{244}	ν_{sp}	NP/A, 145, 1(70)	Jaffey
Cm^{244}	$\nu_{sp} \sigma_f$	AE, 29, 95(70)	Kroshkin
Cm^{244}	ν_{sp}	70HELSINKI, 2, 182(70)	Zamyatnin
Cm^{244}	σ_t	IN-1317, 17(69)	Berreth
Cm^{244}	I_γ	BAP, 14, 497(69)	Schuman
Cm^{244}	$\sigma_\gamma I_\gamma$	68WASH, 2, 1279(68)	Folger
Cm^{244}	$\sigma_a \sigma_f I_a$	68WASH, 2, 1285(68)	Smith
Cm^{244}	σ_a production rate	DP-MS-66-69(66)	Ice
Cm^{244}	ν_{sp}	AE, 17, 28(64)	Bol'shov
Cm^{244}	ν_{sp}	PR, 101, 1012(56)	Diven
Cm^{244}	ν_{sp}	PR, 101, 1804(56)	Crane
Cm^{244}	σ_f	PR, 102, 180(56)	Fields
Cm^{244}	ν_{sp}	PR, 101, 1016(56)	Hicks
Cm^{244}	ν_{sp}	PR, 98, 1521(55)	Hicks
Cm^{244}	σ_γ mass spectrometry	PR, 94, 974(54)	Stevens
Cm^{244}	σ_a	PRIVATE COMM. (51)	Thompson
Cm^{245}	σ_f	YF, 17, 24(73)	Fomushkin
Cm^{245}	$\sigma_f I_f$	NSE, 47, 203(72)	Benjamin
Cm^{245}	σ_t	NSE, 49, 145(72)	Berreth
Cm^{245}	$\sigma_f \sigma_\gamma I_\gamma I_f$	JIN, 33, 1553(71)	Thompson
Cm^{245}	$\sigma_f I_f$	ORNL-4581, 37(70)	Halperin
Cm^{245}	ν_p	NP/A, 145, 1(70)	Jaffey
Cm^{245}	ν_p	AE, 29, 95(70)	Kroshkin
Cm^{245}	ν_p	70HELSINKI, 2, 182(70)	Zamyatnin
Cm^{245}	σ_t	IN-1317, 17(69)	Berreth
Cm^{245}	σ_γ mass spectrometry	ORNL-4437, 20(69)	Halperin
Cm^{245}	$\sigma_f I_f$	JIN, 33, 1553(69)-	Macmurdo
Cm^{245}	I_γ	BAP, 15, 497(69)	Schuman
Cm^{245}	σ_f	JIN, 30, 2553(68)	Diamond
Cm^{245}	I_γ	68WASH, 2, 1279(68)	Folger
Cm^{245}	$\sigma_a \sigma_f$	68WASH, 2, 1285(68)	Smith
Cm^{245}	σ_a production rate	DP-MS-66-69(66)	Ice

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cm ²⁴⁵	σ_f	PR,107,1294(57)	Hulet
Cm ²⁴⁵	σ_γ mass spectrometry	PR,94,974(54)	Stevens
Cm ²⁴⁶	ν_{sp}	JINR-P-15,7119(73)	Dakovski
Cm ²⁴⁶	σ_f	YF,17,24(73)	Fomushkin
Cm ²⁴⁶	ν_{sp}	ORNL-4844,109(73)	Stoughton
Cm ²⁴⁶	$\sigma_f l_f$	NSE,47,203(72)	Benjamin
Cm ²⁴⁶	ν_{sp}	AE,33,767(72)	Prokhorova
Cm ²⁴⁶	$\sigma_f \sigma_\gamma l_\gamma$	JIN,33,1553(71)	Thompson
Cm ²⁴⁶	ν_{sp}	PR/C,2,763(70)	Thompson
Cm ²⁴⁶	σ_γ mass spectrometry	ORNL-4437,20(69)	Halperin
Cm ²⁴⁶	l_γ	BAP,15,497(69)	Schuman
Cm ²⁴⁶	$\sigma_\gamma l_\gamma$	68WASH,2,1279(68)	Folger
Cm ²⁴⁶	$\sigma_a l_a$	68WASH,2,1285(68)	Smith
Cm ²⁴⁶	σ_γ mass spectrometry	PR,94,974(54)	Stevens
Cm ²⁴⁷	σ_f	YF,17,24(73)	Fomushkin
Cm ²⁴⁷	$\sigma_f l_f$	NSE,47,203(72)	Benjamin
Cm ²⁴⁷	$\sigma_f \sigma_\gamma l_\gamma l_f$	JIN,33,1553(71)	Thompson
Cm ²⁴⁷	$\sigma_f l_f$	ORNL-4581,37(70)	Halperin
Cm ²⁴⁷	$\sigma_f l_f$	JIN,33,1553(69)	Macmurdo
Cm ²⁴⁷	σ_f	JIN,30,2553(68)	Diamond
Cm ²⁴⁷	$\sigma_a \sigma_f$	68WASH,2,1285(68)	Smith
Cm ²⁴⁷	σ_a production rate	DP-M5-66-69(66)	Ice
Cm ²⁴⁷	σ_γ growth rate	55GENEVA,7,261(55)	Bentley
Cm ²⁴⁸	σ_f	YF,17,24(73)	Fomushkin
Cm ²⁴⁸	ν_{sp}	ORNL-4844,109(73)	Stoughton
Cm ²⁴⁸	$\sigma_f l_f$	NSE,47,203(72)	Benjamin
Cm ²⁴⁸	ν_{sp}	AE,33,767(72)	Prokhorova
Cm ²⁴⁸	ν_{sp}	NSE,43,54(71)	Orth
Cm ²⁴⁸	$\sigma_f \sigma_\gamma l_\gamma$	JIN,33,1553(71)	Thompson
Cm ²⁴⁸	σ_a	68WASH,2,1285(68)	Smith
Cm ²⁴⁸	σ_γ	JIN,6,261(58)	Eastwood
Cm ²⁴⁹	$\sigma_\gamma \sigma_f$	AE,28,388(70)	Bol'shov
Cm ²⁴⁹	σ_γ mass spectrometry	ANL-7330(67)	Diamond
Cm ²⁵⁰	ν_{sp}	NSE,43,54(71)	Orth

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Cm^{243}	σ_t	1.49-25.84	NSE, 49, 145(72)	Berreth
Cm^{243}	σ_t	1.49-25.84	ANCR-1016, 3(71)	Berreth
Cm^{243}	σ_t	2.263-6.005	ANS, 12, 280(69)	Berreth
Cm^{243}	σ_t	2.263-6.005	IN-1317, 17(69)	Berreth
Cm^{244}	σ_t	7.66-85.4	NSE, 49, 145(72)	Berreth
Cm^{244}	σ_t	-1.48-520.6	PRIVATE COMM. (72)	Simpson
Cm^{244}	$\sigma_f \sigma_\gamma$	22.85-971.5	PR/C, 3, 1656(71)+	Moore
Cm^{244}	σ_t	7.66-195.0	ANCR-1016, 3(71)	Berreth
Cm^{244}	σ_t	7.678-196.9	IN-1407, 80(70)	Berreth
Cm^{244}	$\sigma_f \sigma_\gamma$	22.8-273	70HEL5INK1, 1, 527(70)	Moore
Cm^{244}	σ_t	7.678	IN-1317, 17(69)	Berreth
Cm^{244}	σ_t	7.73-768	PR/B, 134, 1281(64)	Cote
Cm^{245}	σ_t	1.95-29.3	NSE, 49, 145(72)	Berreth
Cm^{245}	σ_t	1.955-58.28	ANCR-1016, 3(71)	Berreth
Cm^{245}	σ_f	21.36-59.99	PR/C, 3, 1656(71)	Moore
Cm^{245}	σ_t	1.969-9.168	ANS, 12, 280(69)	Berreth
Cm^{245}	σ_t	1.969-9.168	IN-1317, 17(69)	Berreth
Cm^{246}	σ_t	4.31-15.29	NSE, 49, 145(72)	Berreth
Cm^{246}	$\sigma_f \sigma_\gamma$	84.43-381.1	PR/C, 3, 1656(71)	Moore
Cm^{246}	σ_t	4.308-158.00	ANCR-1016, 3(71)	Berreth
Cm^{246}	σ_t	4.316-159.4	IN-1407, 80(70)	Berreth
Cm^{246}	$\sigma_f \sigma_\gamma$	84.3-287.0	70HEL5INK1, 1, 527(70)	Moore
Cm^{246}	σ_t	4.316	IN-1317, 17(69)	Berreth
Cm^{246}	σ_t	4.316	ANS, 12, 280(69)	Berreth
Cm^{246}	σ_t	4.33-84.5	PR/B, 134, 1281(64)	Cote
Cm^{247}	σ_f	21.30-59.66	PR/C, 3, 1656(71)	Moore
Cm^{248}	σ_t	7.26-2985	BAP, 18, 539(73)+	Benjamin
Cm^{248}	σ_f	26.84-415.2	PR/C, 3, 1656(71)	Moore
Cm^{248}	σ_f	26.8-237.0	70HEL5INK1, 1, 527(70)	Moore

²⁴⁹Bk
[311 day]

THERMAL CROSS SECTIONS

$$\sigma_a = 1300 \pm 300 \text{ b}$$

$$\nu_{sp} = 3.39 \pm 0.03$$

RESONANCE PROPERTIES

$$I_a = 1240 \text{ b}$$

²⁵⁰Bk
[3.22 hr]

THERMAL CROSS SECTIONS

$$\sigma_f = 960 \pm 150 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Bk ²⁴⁹	ν	AE, 33, 788(72)	Kosyakov
Bk ²⁴⁹	$\sigma_a I_a$	ANS, 14, 344(71)	Rusche
Bk ²⁴⁹	σ_γ	AE, 28, 388(70)	Bol'shov
Bk ²⁴⁹	σ_a	68WASH, 2, 1279(68)	Folger
Bk ²⁴⁹	σ_a	DP-M5-66-69(66)	Ice
Bk ²⁴⁹	ν_{sp}	58GENEVA, 15, 353(58)	Pyle
Bk ²⁴⁹	σ_γ	PR, 95, 581(54)	Harvey
Bk ²⁴⁹	σ_γ	PR, 96, 1576(54)	Magnusson
Bk ²⁵⁰	σ_γ	AE, 28, 388(70)	Bol'shov
Bk ²⁵⁰	σ_f	JIN, 30, 2553(68)	Diamond

²⁴⁶
₉₈ Cf
[36 hr]

THERMAL CROSS SECTIONS

$$\nu_{sp} = 3.14 \pm 0.09$$

²⁴⁹
₉₈ Cf
[350.6 yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 465 \pm 25 \text{ b}$$

$$\sigma_f = 1660 \pm 50 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 765 \pm 35 \text{ b}$$

$$I_f = 2114 \pm 70 \text{ b}$$

$$\langle \Delta \rangle = 1.07 \pm 0.14 \text{ eV}$$

$$S_0 = 1.5 \pm 0.3$$

RESONANCE PARAMETERS

$$I^{\pi} = 9/2^{-}$$

$$S_n = 6619 \pm 4 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
.702			^a 8000
3.89			
5.07			
7.51			
8.66			
9.52			
10.35			
11.90			
13.63			
16.0	.40 $\pm$.04	0.10 $\pm$.01	190 $\pm$ 19
16.7	1.6 $\pm$.2	0.38 $\pm$.04	170 $\pm$ 17
^a 17.7	.017	0.004	400
19.8	.18 $\pm$.05	0.04 $\pm$.01	110 $\pm$ 75
21.3	7.98 $\pm$.80	1.73 $\pm$.17	150 $\pm$ 15
21.7	1.8 $\pm$.2	0.39 $\pm$.04	140 $\pm$ 14
22.8	.96 $\pm$.48	0.20 $\pm$.10	2.4 $\pm$ 1.2
23.4	.63 $\pm$.06	0.13 $\pm$.01	106 $\pm$ 11
26.0	1.6 $\pm$.2	0.31 $\pm$.03	320 $\pm$ 32
27.6	.79 $\pm$.08	0.15 $\pm$.02	75 $\pm$ 26
28.1	4.1 $\pm$ 1.2	0.77 $\pm$.23	15 $\pm$ 5
^a 28.9	.05	0.01	500
30.3	.83 $\pm$.25	0.15 $\pm$.05	28 $\pm$ 14
31.0	2.3 $\pm$.4	0.42 $\pm$.08	480 $\pm$ 96
31.5	.84 $\pm$.17	0.15 $\pm$.03	200 $\pm$ 40
33.3	1.7 $\pm$.02	0.29 $\pm$.03	300 $\pm$ 30
34.9	.89 $\pm$.27	0.15 $\pm$.05	40 $\pm$ 20
36.3	6.0 $\pm$ 2.4	1.0 $\pm$.4	50 $\pm$ 30
37.0	3.95 $\pm$.79	0.65 $\pm$.13	130 $\pm$ 91

E_0 (eV)	$2g\Gamma_n$ (meV)	$2g\Gamma_n^0$ (meV)	Γ_f (meV)
^a 37.4	.6	0.1	20
^a 38.1	.49	0.08	400
39.7	2.6 ± .52	0.41 ± .08	220 ± 110
40.3	3.3 ± .7	0.52 ± .10	110 ± 33
42.7	.28 ± .06	0.043 ± .009	130 ± 65
43.1	.37 ± .07	0.056 ± .011	100 ± 50
45.6	3.9 ± 2.3	0.58 ± .35	55 ± 33
46.6	.49 ± .10	0.072 ± .014	150 ± 90
47.5	2.2 ± 1.1	0.32 ± .16	70 ± 53
48.4	3.1 ± .3	0.44 ± .04	170 ± 17
51.2	1.7 ± .7	0.24 ± .10	300 ± 225
52.1	8.3 ± 1.2	1.15 ± .17	87 ± 17
53.9	4.8 ± .5	0.65 ± .07	490 ± 49
56.0	3.1 ± .6	0.41 ± .08	230 ± 172
56.4	3.7 ± .7	0.49 ± .10	45 ± 34
57.6	4.6 ± .5	0.60 ± .06	450 ± 45
58.7	3.9 ± 1.0	0.51 ± .13	10 ± 3
59.4	3.7 ± 1.1	0.048 ± .014	260 ± 78
^a 60.2	.093	0.012	2100
^a 60.8	.39	0.05	1000
61.7	.24 ± .04	0.030 ± .005	500 ± 45
65.7	6.7 ± .7	0.83 ± .08	440 ± 44
^a 67.1	.82	0.10	50
69.3	.56 ± .08	0.067 ± .010	210 ± 32

^a Resonance values are those required by the multilevel fit but are only approximately determined.

^a σ_{of} (b-eV)

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 2030 \pm 200 \text{ b} \\ \sigma_f &< 350 \text{ b} \\ \nu_{sp} &= 3.50 \pm 0.09\end{aligned}$$

RESONANCE PROPERTIES

$$I_a = 11600 \pm 500 \text{ b}$$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_a &= 7150 \pm 350 \text{ b} \\ \sigma_\gamma &= 2850 \pm 150 \text{ b} \\ \sigma_f &= 4300 \pm 300 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 1600 \pm 30 \text{ b} \\ I_f &= 5900 \pm 1000 \text{ b}\end{aligned}$$

²⁵⁰
⁹⁸Cf
[13.1 yr]

²⁵¹
⁹⁸Cf
[900 yr]

²⁵²
⁹⁸Cf
[2.63 yr]

THERMAL CROSS SECTIONS

$\sigma_g = 20.4 \pm 1.5$ b
 $\sigma_f = 32 \pm 4$ b
 $\nu = 3.74 \pm 0.01$

RESONANCE PROPERTIES

$I_g = 43.5 \pm 3.0$ b
 $I_f = 110 \pm 30$ b
 $\langle D \rangle = 27 \pm 4$ eV

RESONANCE PARAMETERS

$I^0 = 0^*$

$S_n = 4793 \pm 8$ keV

E_0 (eV)	Γ_n (meV)	Γ_f (meV)	$\sigma_0 \Gamma_f$ (meV)
24.55			12.9 ± .3
36.35			398 ± 31
68.37	^a 53.5 ± 3.0	^a 180 ± 9	1360 ± 42
79.16			62 ± 5
88.25			3.7 ± 1.0
138.1			15.8 ± 2.7
190.1			12.0 ± 3.0
217.7			293 ± 24
246.2			21 ± 5
307.1			15.7 ± 2.3
338.0			9.4 ± 2.4
387.4			64 ± 7
393.6			9.2 ± 2.4
404.8			73 ± 8
417.0			14.4 ± 3.2
426.7			45 ± 6
445.4			41 ± 7
490.8			37 ± 7
520.2			12 ± 3
557.2	^a <370	^a >42.5	164 ± 17
561.9			50 ± 7
606.4			75 ± 10
626.4			7 ± 5
643.7			8 ± 6
674.2			20 ± 7
706.2			20 ± 5
726.1	^a <1250	^a >82	257 ± 26
754.1			26 ± 7
771.1			37 ± 7
813.5			6 ± 4
833.1	^a <1300	^a >44	118 ± 18
841.0			12 ± 5
877.6			20 ± 7
931.8			10 ± 5
983.5			7 ± 6

* Since these values are determined from the product and the sum of the neutron and fission widths, it is possible that the entries in the table could be reversed.

$^{253}_{98}\text{Cf}$
[17.8 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 17.6 \pm 1.8 \text{ b} \\ \sigma_f &= 1300 \pm 240 \text{ b}\end{aligned}$$

$^{254}_{98}\text{Cf}$
[60.5 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_a &= 90 \pm 30 \text{ b} \\ \nu_{sp} &= 3.93 \pm 0.05\end{aligned}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cf ²⁴⁶	ν_{sp}	JINR-P15,6730(72)	Dakowski
Cf ²⁴⁶	ν_{sp}	NSE,43,54(71)-	Pyle
Cf ²⁴⁹	half life	JIN-35,3369(73)	Stokely
Cf ²⁴⁹	$\sigma_f I_f$	NSE,47,203(72)	Benjamin
Cf ²⁴⁹	$\sigma_f \sigma_f$	KFK-1338(71)-	Eberle
Cf ²⁴⁹	σ_f	YF,14,73(71)	Fomushkin
Cf ²⁴⁹	$\sigma_f I_f$	ORNL-4706,47(71)	Halperin
Cf ²⁴⁹	$\sigma_a \sigma_f I_a I_f$	ANS,14,344(71)	Rusche
Cf ²⁴⁹	$\sigma_f I_f$	ORNL-4581,37(70)	Halperin
Cf ²⁴⁹	σ_f	JIN,27,33(65)	Metta
Cf ²⁴⁹	σ_f fission chamber	PRIVATE COMM.(64)	Metta
Cf ²⁴⁹	σ_f	PR,95,581(54)	Harvey
Cf ²⁴⁹	σ_f activation	PR,95,581(54)	Harvey
Cf ²⁴⁹	σ_f Cf-250 fission	PR,95,581(54)	Harvey
Cf ²⁵⁰	$\sigma_f I_f$	ORNL-4706,47(71)	Halperin
Cf ²⁵⁰	ν_{sp}	NSE,43,54(71)	Orth
Cf ²⁵⁰	$\sigma_a I_a$	ANS,14,344(71)	Rusche
Cf ²⁵⁰	$\sigma_a I_a$	68WASH,2,1279(68)	Folger
Cf ²⁵⁰	σ_a	68WASH,2,1285(68)	Smith
Cf ²⁵⁰	σ_f	JIN,27,33(65)-	Diamond
Cf ²⁵⁰	σ_f	PRIVATE COMM.(64)	Diamond
Cf ²⁵⁰	σ_f	ANL-6252(61)	Vandenbosch
Cf ²⁵⁰	σ_f	PR,96,1576(54)	Magnusson
Cf ²⁵¹	σ_f	PRIVATE COMM.(73)	Ragaini
Cf ²⁵¹	$\sigma_f \sigma_f I_f I_f$	RCA,15,180(71)	Eberle
Cf ²⁵¹	$\sigma_f \sigma_f$	KFK-1338(71)-	Eberle
Cf ²⁵¹	$\sigma_f I_f$	ORNL-4706,47(71)	Halperin
Cf ²⁵¹	$\sigma_a \sigma_f I_a I_f$	ANS,14,344(71)	Rusche
Cf ²⁵¹	$\sigma_a I_a$	68WASH,2,1279(68)	Folger
Cf ²⁵¹	$\sigma_a \sigma_f$	68WASH,2,1285(68)	Smith
Cf ²⁵¹	σ_f	JIN,27,33(65)	Metta
Cf ²⁵¹	σ_f	PRIVATE COMM.(64)	Metta
Cf ²⁵¹	σ_f	ANL-6252(61)	Vandenbosch
Cf ²⁵¹	σ_f	PR,96,1576(54)	Magnusson
Cf ²⁵²	σ_a	AE,32,493(72)	Anufriev
Cf ²⁵²	ν_{sp}	PRIVATE COMM.(72)	DeVolpi
Cf ²⁵²	$\sigma_f I_f$	KFK-1456,47(71)	Eberle
Cf ²⁵²	$\sigma_f I_f$	KFK-1338(71)	Eberle
Cf ²⁵²	$\sigma_f I_f$	ORNL-4706,53(71)	Halperin
Cf ²⁵²	$\sigma_a \sigma_f I_a I_f$	ANS,14,344(71)	Rusche
Cf ²⁵²	ν_{sp}	PR/C,1,683(70)	DeVolpi
Cf ²⁵²	ν_{sp}	AE,29,95(70)	Kroshkin
Cf ²⁵²	ν_{sp}	70HELSINKI,2,182(70)	Zamyatnin

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cf ²⁵²	$\sigma_{\gamma} I_{\gamma}$	NSE, 37, 228(69)	Halperin
Cf ²⁵²	$\sigma_a I_a$	68WASH, 2, 1279(68)	Folger
Cf ²⁵²	ν_{sp}	JNE, 22, 73(68)	White
Cf ²⁵²	ν_{sp}	66PARIS, 2, 57(66)	Baron
Cf ²⁵²	ν	PRIVATE COMM.(66)	Caldwell
Cf ²⁵²	ν_{sp}	ANL-7210, 21(66)	DeVolpi
Cf ²⁵²	ν_{sp}	JNE, 20, 549(66)	Fieldhouse
Cf ²⁵²	ν_{sp}	65SALZBURG, 2, 25(65)	Colvin
Cf ²⁵²	ν_{sp}	NSE, 16, 124(63)	Asplund- Nilsson
Cf ²⁵²	ν_{sp}	NP, 48, 433(63)	Hopkins
Cf ²⁵²	ν_{sp}	PR, 126, 197(62)	Meadows
Cf ²⁵²	ν_{sp}	JNE, 15, 102(61)	Moat
Cf ²⁵²	σ_{γ}	ANL-6252(61)	Vandenbosch
Cf ²⁵²	ν	58GENEVA, 15, 212(58)	Bowman
Cf ²⁵²	ν_{sp}	PR, 101, 1804(56)	Crane
Cf ²⁵²	delayed neutrons	PR, 112, 960(58)	Cox
Cf ²⁵²	ν_{sp}	PR, 101, 1012(56)	Diven
Cf ²⁵²	ν_{sp}	PR, 101, 1016(56)	Hicks
Cf ²⁵²	ν_{sp}	PR, 97, 242(55)	Crane
Cf ²⁵²	σ_{γ}	PR, 95, 581(54)	Harvey
Cf ²⁵²	σ_{γ}	PR, 96, 1576(54)	Magnusson
Cf ²⁵³	$\sigma_a \sigma_f I_a I_f$	ANS, 14, 344(71)	Rusche
Cf ²⁵³	σ_f	JIN, 35, 1063(73)	Wild
Cf ²⁵³	σ_a	AE, 32, 493(72)	Anufriev
Cf ²⁵³	σ_a	NSE, 41, 146(70)-	Bigelow
Cf ²⁵³	$\sigma_{\gamma} \sigma_f$	NSE, 41, 146(70)	Bemis
Cf ²⁵³	σ_a	68WASH, 2, 1285(68)	Smith
Cf ²⁵⁴	ν_{sp}	NSE, 43, 54(71)	Orth
Cf ²⁵⁴	$\sigma_a I_a$	ANS, 14, 344(71)	Rusche
Cf ²⁵⁴	σ_{γ}	PR, 95, 581(54)	Harvey

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Cf ²⁴⁹	σ_f	0.702-18.87	ORNL-4844, 100(73)+	Dabbs
Cf ²⁴⁹	σ_f	16.0-69.3	NSE, 51, 376(73)+	Silbert
Cf ²⁴⁹	σ_f	0.72	PRIVATE COMM.(72)	Bemis
Cf ²⁵²	σ_f	24.55-983.5	PR/C, 4, 273(71)	Moore
Cf ²⁵²	σ_f	24.72-243	70HELSINKI, 1, 527(70)	Moore
Cf ²⁵²	ν_{sp}		66PARIS, 1, 307(66)	Colvin

$^{253}_{99}\text{Es}$
[20.47 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 155 \pm 20 \text{ b } [39.3 \text{ hr } ^{254}\text{Es}^{\text{m}}] \\ \sigma_{\gamma} &< 3 \text{ b } [276 \text{ day } ^{254}\text{Es}^{\text{g}}]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 3000 \pm 170 \text{ b } [39.3 \text{ hr } ^{254}\text{Es}^{\text{m}}] \\ I_{\gamma} &= 4300 \pm 220 \text{ b } [276 \text{ day } ^{254}\text{Es}^{\text{g}}]\end{aligned}$$

$^{254}_{99}\text{Es}^{\text{m}}$
[39.3 hr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &\cong 1.3 \text{ b } [39.3 \text{ hr } ^{254}\text{Es}^{\text{m}}] \\ \sigma_{\text{f}} &= 1840 \pm 80 \text{ b}\end{aligned}$$

$^{254}_{99}\text{Es}^{\text{g}}$
[276 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &< 40 \text{ b } [39 \text{ day } ^{255}\text{Es}] \\ \sigma_{\text{f}} &= 2900 \pm 110 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\text{f}} = 2190 \pm 90 \text{ b}$$

$^{255}_{99}\text{Es}$
[39 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 43 \pm 10 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Es ²⁵³	$\sigma_{\gamma} I_{\gamma}$	JIN, 35, 1821(73)	Harbour
Es ²⁵³	$\sigma_a I_a$	68WASH, 2, 1279(68)	Folger
Es ²⁵³	σ_{γ}	NP/A, 96, 440(67)	Fields
Es ²⁵³	σ_{γ}	PR, 102, 203(56)	Jones
Es ²⁵³	σ_{γ}	PR, 94, 209(54)	Fields
Es ^{254M}	σ_{γ} transmutation	ORNL-4884(73)+	Bigelow
Es ²⁵⁴	σ_{γ}	JIN, 6, 1(58)	Schuman
Es ²⁵⁴	σ_f	JIN, 30, 2553(68)	Diamond
Es ^{254M}	σ_f	JIN, 30, 2553(68)	Diamond
Es ^{254G}	$\sigma_f I_f$	JIN, 34, 449(72)	MacMurdo
Es ²⁵⁵	σ_{γ}	PR, 98, 1519(55)	Choppin

²⁵⁴₁₀₀Fm
[3.24 hr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &\approx 76 \text{ b} \\ \nu_{sp} &= 3.96 \pm 0.19\end{aligned}$$

²⁵⁵₁₀₀Fm
[20.1 hr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 26 \pm 3 \text{ b} \\ \sigma_f &= 3400 \pm 170 \text{ b}\end{aligned}$$

²⁵⁶₁₀₀Fm
[2.63 hr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &\approx 45 \text{ b} \\ \nu_{sp} &= 3.73 \pm 0.18\end{aligned}$$

²⁵⁷₁₀₀Fm
[100.5 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_f &= 2950 \pm 160 \text{ b} \\ \sigma_a &= 6100 \pm 600 \text{ b} \\ \nu_{sp} &= 3.77 \pm 0.02\end{aligned}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Fm^{254}	σ_f transmutation	ORNL-4884(73)+	Bigelow
Fm^{254}	ν_{sp}	PR,102,766(56)	Choppin
Fm^{255}	σ_f	PRIVATE COMM.(73)	Ragaini
Fm^{255}	σ_f	PRIVATE COMM.(66)	Hulet
Fm^{255}	σ_f	PR,98,1519(55)	Choppin
Fm^{256}	ν_{sp}	YF,16,1167(73)	Dakowski
Fm^{256}	σ_f	ORNL-4884(73)-	Hoffman
Fm^{256}	ν	PR/C,5,1725(72)	Flynn
Fm^{257}	ν_{sp}	LA-UR-1010(73)	Balagna
Fm^{257}	ν	3ROCHESTER(73)	Balagna
Fm^{257}	ν	ANS,16,315(73)	Veaser
Fm^{257}	ν	PRIVATE COMM.(73)	Veaser
Fm^{257}	σ_f	JIN,35,1063(73)	Wild
Fm^{257}	ν_{sp}	PR/C,3,2017(71)	Cheifetz
Fm^{257}	σ_a	ORNL-4581,43(70)	Bemis

ENERGY ORDERED RESONANCES

E_{Res}
(eV)

E ₀ (eV)	Isotope	E ₀ (eV)	Isotope	E ₀ (eV)	Isotope
0.0268	64Gd ¹⁵⁵	2.047	62Sm ¹⁵¹	5.48	68Er ¹⁶²
0.0314	64Gd ¹⁵⁷	2.09	95Am ²⁴²	5.77	93Np ²³⁷
0.084	54Xe ¹³⁵	2.15	66Dy ¹⁵⁶	5.80	66Dy ¹⁶²
0.0976	62Sm ¹⁴⁹	2.156	75Re ¹⁸⁵	5.96	96Cm ²⁴³
0.1413	71Lu ¹⁷⁶	2.27	96Cm ²⁴³	5.97	94Pu ²⁴¹
0.147	73Ta ¹⁸²	2.334	52Te ¹²³	5.98	92U ²³²
0.169	61Pm ¹⁴⁸	2.36	95Am ²⁴¹	5.98	68Er ¹⁶⁷
0.173	95Am ²⁴²	2.457	63Eu ¹⁵³	5.98	73Ta ¹⁸²
0.1776	48Cd ¹¹³	2.568	64Gd ¹⁵⁵	6.16	71Lu ¹⁷⁶
0.257	94Pu ²⁴¹	2.583	71Lu ¹⁷⁵	6.24	51Sb ¹²¹
0.296	94Pu ²³⁹	2.60	95Am ²⁴¹	6.30	64Gd ¹⁵⁵
0.308	95Am ²⁴¹	2.67	94Pu ²⁴²	6.42	92U ²³³
0.396	91Pa ²³¹	2.72	66Dy ¹⁶¹	6.44	62Sm ¹⁵¹
0.433	73Ta ¹⁸⁰	2.830	91Pa ²³³	6.554	95Am ²⁴³
0.461	63Eu ¹⁵¹	2.96	46Pd ¹⁰⁸	6.57	61Pm ¹⁴⁷
0.460	68Er ¹⁶⁷	2.99	57La ¹³⁸	6.71	76Os ¹⁸⁹
0.539	88Ra ²²⁶	3.18	90Th ²²⁹	6.78	95Am ²⁴¹
0.576	95Am ²⁴¹	3.25	95Am ²⁴²	6.92	61Pm ¹⁴⁷
0.609	90Th ²²⁹	3.293	63Eu ¹⁵³	6.93	94Pu ²⁴¹
0.61	95Am ²⁴²	3.31	64Gd ¹⁵²	7.181	91Pa ²³³
0.6551	77Ir ¹⁹¹	3.35	65Tb ¹⁵⁹	7.24	75Re ¹⁸⁵
0.872	62Sm ¹⁴⁹	3.366	63Eu ¹⁵¹	7.29	63Eu ¹⁵¹
1.02	95Am ²⁴²	3.49	92U ²³³	7.55	90Th ²²⁸
1.056	94Pu ²⁴⁰	3.68	66Dy ¹⁶¹	7.60	68Er ¹⁶²
1.098	72Hf ¹⁷⁷	3.90	69Tm ¹⁶⁹	7.69	96Cm ²⁴⁴
1.103	62Sm ¹⁵¹	3.92	67Ho ¹⁶⁵	7.69	96Cm ²⁴⁴
1.26	90Th ²²⁹	3.942	63Eu ¹⁵³	7.78	72Hf ¹⁷⁸
1.257	45Rh ¹⁰³	3.99	95Am ²⁴¹	7.863	95Am ²⁴³
1.27	95Am ²⁴¹	4.10	62Sm ¹⁵¹	7.91	70Yb ¹⁷¹
1.303	77Ir ¹⁹³	4.28	73Ta ¹⁸¹	8.00	64Gd ¹⁵²
1.341	91Pa ²³³	4.28	94Pu ²⁴¹	8.047	62Sm ¹⁵²
1.356	95Am ²⁴³	4.288	91Pa ²³³	8.13	70Yb ¹⁷⁰
1.427	90Th ²³⁰	4.31	96Cm ²⁴⁶	8.60	94Pu ²⁴¹
1.44	90Th ²²⁹	4.34	66Dy ¹⁶¹	8.73	91Pa ²³¹
1.457	49In ¹¹⁵	4.37	71Lu ¹⁷⁶	8.78	92U ²³⁵
1.48	93Np ²³⁷	4.416	75Re ¹⁸⁷	8.86	63Eu ¹⁵³
1.55	92U ²³³	4.67	96Cm ²⁴⁵	8.95	62Sm ¹⁴⁹
1.568	71Lu ¹⁷⁶	4.75	71Lu ¹⁷⁵	8.96	76Os ¹⁸⁹
1.644	91Pa ²³³	4.75	90Th ²²⁹	8.97	91Pa ²³³
1.65	95Am ²⁴²	4.906	79Au ¹⁹⁷	9.07	77Ir ¹⁹¹
1.711	62Sm ¹⁵¹	5.03	95Am ²⁴¹	9.07	77Ir ¹⁹³
1.713	61Dy ¹⁶³	5.06	91Pa ²³¹	9.12	49In ¹¹⁵
1.72	90Th ²²⁹	5.152	91Pa ²³³	9.37	68Er ¹⁶⁷
1.744	95Am ²⁴³	5.19	92U ²³⁴	9.37	91Pa ²³³
1.82	73Ta ¹⁸²	5.25	71Lu ¹⁷⁵	9.8	71Lu ¹⁷⁶
1.88	66Dy ¹⁶⁰	5.33	62Sm ¹⁵¹	10.06	94Pu ²⁴¹
1.896	90Th ²²⁸	5.36	77Ir ¹⁹¹	10.30	76Os ¹⁸⁹
1.93	95Am ²⁴¹	5.36	61Pm ¹⁴⁷	10.34	73Ta ¹⁸¹
1.95	96Cm ²⁴⁵	5.45	92U ²³⁶	10.37	92U ²³³
1.96	90Th ²²⁹	5.45	66Dy ¹⁶²	10.8	71Lu ¹⁷⁶

E_{Res}
(eV)

E_0 (eV)	Isotope	E_0 (eV)	Isotope	E_0 (eV)	Isotope
10.84	$^{237}\text{Np}_{93}$	19.5	$^{147}\text{Pm}_{61}$	28.1	$^{249}\text{Cf}_{98}$
10.93	$^{239}\text{Pu}_{94}$	19.92	$^{155}\text{Gd}_{64}$	28.89	$^{241}\text{Pu}_{94}$
11.07	$^{243}\text{Cm}_{96}$	20.02	$^{153}\text{Eu}_{63}$	29.2	$^{147}\text{Pm}_{61}$
11.09	$^{237}\text{Np}_{93}$	20.3	$^{99}\text{Te}_{43}$	29.4	$^{182}\text{Ta}_{73}$
11.14	$^{187}\text{Re}_{75}$	20.3	$^{162}\text{Er}_{68}$	29.62	$^{231}\text{Pa}_{91}$
11.20	$^{175}\text{Lu}_{71}$	20.50	$^{175}\text{Lu}_{71}$	29.65	$^{121}\text{Sb}_{51}$
11.62	$^{153}\text{Eu}_{63}$	20.54	$^{233}\text{U}_{92}$	29.65	$^{232}\text{U}_{92}$
11.63	$^{94}\text{Nb}_{41}$	20.56	$^{157}\text{Gd}_{64}$	29.9	$^{191}\text{Ir}_{77}$
11.67	$^{231}\text{Pa}_{91}$	20.6	$^{231}\text{Pa}_{91}$	30.2	$^{105}\text{Pd}_{46}$
11.80	$^{105}\text{Pd}_{46}$	20.7	$^{150}\text{Sm}_{62}$	30.25	$^{247}\text{Cm}_{96}$
12.15	$^{233}\text{Pa}_{91}$	20.90	$^{238}\text{U}_{92}$	30.42	$^{237}\text{Np}_{93}$
12.35	$^{152}\text{Gd}_{64}$	21.0	$^{138}\text{La}_{57}$	30.5	$^{164}\text{Er}_{68}$
12.39	$^{235}\text{U}_{92}$	21.00	$^{232}\text{U}_{92}$	31.04	$^{175}\text{Lu}_{71}$
12.70	$^{232}\text{U}_{92}$	21.03	$^{155}\text{Gd}_{64}$	31.21	$^{234}\text{U}_{92}$
12.75	$^{165}\text{Ho}_{67}$	21.07	$^{235}\text{U}_{92}$	31.39	$^{173}\text{Yb}_{70}$
12.877	$^{243}\text{Am}_{95}$	21.2	$^{159}\text{Tb}_{65}$	31.71	$^{245}\text{Cm}_{96}$
12.93	$^{182}\text{Ta}_{73}$	21.2	$^{152}\text{Gd}_{64}$	32.06	$^{233}\text{U}_{92}$
13.04	$^{171}\text{Yb}_{70}$	21.3	$^{249}\text{Cf}_{98}$	32.07	$^{235}\text{U}_{92}$
13.152	$^{243}\text{Am}_{95}$	21.3	$^{185}\text{Re}_{75}$	32.1	$^{147}\text{Sm}_{62}$
13.2	$^{105}\text{Pd}_{46}$	21.5	$^{182}\text{Ta}_{73}$	32.24	$^{113}\text{In}_{49}$
13.26	$^{231}\text{Pa}_{91}$	21.55	$^{113}\text{In}_{49}$	32.97	$^{182}\text{Ta}_{73}$
13.38	$^{231}\text{Pa}_{91}$	21.7	$^{249}\text{Cf}_{98}$	32.99	$^{245}\text{Cm}_{96}$
14.32	$^{161}\text{Dy}_{66}$	22.63	$^{94}\text{Nb}_{41}$	33.14	$^{233}\text{U}_{92}$
14.6	$^{229}\text{Th}_{90}$	23.06	$^{198}\text{Hg}_{80}$	33.23	$^{156}\text{Gd}_{64}$
14.7	$^{162}\text{Er}_{68}$	23.80	$^{232}\text{U}_{92}$	33.24	$^{108}\text{Pd}_{46}$
14.74	$^{241}\text{Pu}_{94}$	23.84	$^{230}\text{Th}_{90}$	33.50	$^{199}\text{Hg}_{80}$
14.75	$^{241}\text{Am}_{95}$	23.9	$^{181}\text{Ta}_{73}$	33.53	$^{235}\text{U}_{92}$
15.11	$^{147}\text{Pm}_{61}$	24.4	$^{135}\text{Ba}_{56}$	33.6	$^{176}\text{Lu}_{71}$
15.29	$^{246}\text{Cm}_{96}$	24.5	$^{156}\text{Dy}_{66}$	33.9	$^{159}\text{Tb}_{65}$
15.35	$^{175}\text{Lu}_{71}$	24.5	$^{159}\text{Tb}_{65}$	34.39	$^{235}\text{U}_{92}$
15.404	$^{243}\text{Am}_{95}$	24.51	$^{193}\text{Ir}_{77}$	34.8	$^{169}\text{Tm}_{69}$
15.41	$^{121}\text{Sb}_{51}$	24.58	$^{151}\text{Eu}_{63}$	34.8	$^{162}\text{Er}_{68}$
15.9	$^{101}\text{Ru}_{44}$	24.7	$^{176}\text{Lu}_{71}$	35.31	$^{245}\text{Cm}_{96}$
15.96	$^{233}\text{Pa}_{91}$	24.97	$^{237}\text{Np}_{93}$	36.36	$^{247}\text{Cm}_{96}$
16.07	$^{187}\text{Re}_{75}$	24.99	$^{113}\text{In}_{49}$	36.52	$^{175}\text{Lu}_{71}$
16.23	$^{163}\text{Dy}_{66}$	25.04	$^{193}\text{Ir}_{77}$	36.80	$^{238}\text{U}_{92}$
16.29	$^{233}\text{U}_{92}$	25.2	$^{191}\text{Ir}_{77}$	36.86	$^{152}\text{Gd}_{64}$
16.7	$^{249}\text{Cf}_{98}$	25.28	$^{233}\text{U}_{92}$	37.0	$^{249}\text{Cf}_{98}$
16.8	$^{161}\text{Dy}_{66}$	25.3	$^{105}\text{Pd}_{46}$	37.0	$^{176}\text{Lu}_{71}$
17.27	$^{230}\text{Th}_{90}$	26.39	$^{241}\text{Pu}_{94}$	37.64	$^{161}\text{Dy}_{66}$
17.4	$^{156}\text{Dy}_{66}$	26.56	$^{237}\text{Np}_{93}$	37.76	$^{247}\text{Cm}_{96}$
17.56	$^{187}\text{Re}_{75}$	26.64	$^{167}\text{Er}_{68}$	37.93	$^{203}\text{Tl}_{81}$
17.65	$^{179}\text{Hf}_{72}$	26.7	$^{182}\text{Ta}_{73}$	38.34	$^{240}\text{Pu}_{94}$
17.83	$^{241}\text{Pu}_{94}$	26.83	$^{245}\text{Cm}_{96}$	38.38	$^{161}\text{Dy}_{66}$
18.01	$^{153}\text{Eu}_{63}$	27.05	$^{183}\text{W}_{74}$	38.4	$^{105}\text{Pd}_{46}$
18.29	$^{231}\text{Pa}_{91}$	27.1	$^{74}\text{Se}_{34}$	38.7	$^{188}\text{Os}_{76}$
18.30	$^{147}\text{Sm}_{62}$	27.4	$^{189}\text{Os}_{76}$	38.8	$^{117}\text{Sn}_{50}$
18.5	$^{161}\text{Dy}_{66}$	27.42	$^{167}\text{Er}_{68}$	39.13	$^{181}\text{Ta}_{73}$
18.6	$^{238}\text{Pu}_{94}$	27.53	$^{111}\text{Cd}_{48}$	39.5	$^{187}\text{Re}_{75}$
18.84	$^{185}\text{W}_{74}$	27.70	$^{232}\text{U}_{92}$	39.60	$^{115}\text{In}_{49}$
18.98	$^{233}\text{U}_{92}$	27.8	$^{175}\text{Lu}_{71}$	39.6	$^{226}\text{Ra}_{88}$
19.30	$^{235}\text{U}_{92}$	27.92		39.65	$^{165}\text{Ho}_{67}$

E_{Res}
(eV)

E ₀ (eV)	Isotope	E ₀ (eV)	Isotope	E ₀ (eV)	Isotope
39.7	⁶² Sm ¹⁴⁷	50.58	⁶³ Eu ¹⁵¹	66.62	⁹⁴ Pu ²⁴⁰
39.8	⁵⁰ Th ²³⁰	50.69	⁹⁶ Cm ²⁴⁷	66.75	⁷² Hf ¹⁷⁷
39.9	⁴³ Te ⁹⁹	51.0	⁷⁷ Lu ¹⁹¹	67.1	⁷⁰ Pt ¹⁹⁵
39.93	⁷⁰ Pb ¹⁷⁰	51.27	⁹² U ²³⁵	67.91	⁶³ Eu ¹⁵¹
40.3	⁹⁸ Cf ²⁴⁹	51.38	⁶⁴ Gd ¹⁵⁵	68.37	⁹⁸ Cf ²⁵²
41.3	⁶² Sm ¹⁴⁹	51.4	⁶⁸ Er ¹⁶²	68.8	⁹⁶ Gd ¹⁰⁵
41.35	⁶³ Eu ¹⁵¹	51.5	⁷⁵ Re ¹⁸⁵	69.07	⁹⁰ Th ²³²
41.6	⁷⁵ Re ¹⁸⁵	51.60	⁶⁷ Ho ¹⁶⁵	69.3	⁷⁷ Lu ¹⁹³
41.64	⁹⁴ Pu ²⁴⁰	51.64	⁹⁶ Cm ²⁴⁵	69.5	⁷¹ Re ¹⁸⁷
42.28	⁴⁴ Pu ¹⁰¹	51.78	⁹⁶ Cm ²⁴⁷	70.55	⁸⁶ Dy ¹⁶²
42.3	⁵⁵ Cs ¹³⁶	52.1	⁹⁸ Cf ²⁴⁹	70.7	⁶² Sm ¹⁴⁹
42.51	⁶⁰ Nd ¹⁴⁵	52.13	⁶⁴ Gd ¹⁵⁵	70.7	⁷⁵ Re ¹⁸⁵
42.7	⁶⁴ Gd ¹⁵²	52.3	⁶¹ Pm ¹⁴⁷	70.9	⁸⁰ Hg ²⁰¹
42.8	⁴⁸ Pd	52.60	⁹⁴ Pu ²³⁹	70.93	⁴² Hc ⁹⁷
43.0	⁸⁰ Ag ²⁰¹	53.3	⁷² Hf ¹⁷⁶	71.1	⁹² U ²³⁶
43.02	⁶⁶ Dy ¹⁶¹	53.46	⁹⁴ Pu ²⁴²	72.10	⁶⁶ Dy ¹⁶²
43.2	⁶⁸ Er ¹⁶²	53.47	⁷⁰ Yb ¹⁷³	72.26	⁵⁰ Sn ¹¹²
43.3	⁷⁷ Ir ¹⁹³	53.5	⁷⁵ Re ¹⁸⁷	72.26	⁵² Te ¹²²
43.7	⁹² U ²³⁶	53.60	⁶⁸ Er ¹⁶⁷	72.80	⁹⁴ Pu ²⁴⁰
43.7	⁶⁵ Tb ¹⁵⁹	53.63	⁹⁶ Cm ²⁴⁵	73.0	⁶² Sm ¹⁴⁹
43.92	⁶⁴ Gd ¹⁵⁵	53.74	⁷⁸ Pt ¹⁹²	73.8	⁵¹ Sb ¹²¹
44.22	⁶⁴ Gd ¹⁵⁷	53.9	⁹⁸ Cf ²⁴⁹	74.0	⁶⁵ Tb ¹⁵⁹
44.3	⁶⁴ Gd ¹⁴⁹	53.9	⁷⁷ Lu ¹⁹³	74.7	⁷⁵ Re ¹⁸⁵
44.48	⁶² Sm ¹⁴⁹	54.18	⁷⁰ Yb ¹⁷¹	74.76	⁵⁰ Sn ¹¹⁹
44.55	⁹⁴ Pu ²³⁹	54.79	⁷² Hf ¹⁷⁹	74.95	⁹⁴ Pu ²³⁹
44.7	⁴² Mo ⁹⁵	55.08	⁹² U ²³⁵	76.7	⁵¹ Sb ¹³¹
44.85	⁶⁸ Dy ¹⁶¹	55.20	⁹¹ Pa ²³¹	78.8	⁷⁷ Lu ¹⁹¹
45.6	⁹⁸ Cf ²⁴⁹	55.7	⁴⁶ Pd ¹⁰⁵	78.9	⁷⁶ Os ¹⁸⁸
45.74	⁹⁶ Cm ²⁴⁵	57.04	⁸⁸ Ra ²²⁶	81.0	⁷⁵ Re ¹⁸⁵
45.75	⁵⁰ Sn ¹¹⁸	57.36	⁷¹ Lu ¹⁷⁵	81.08	⁶³ Eu ¹⁵¹
46.0	⁶⁸ Er ¹⁶²	57.4	⁶⁸ Er ¹⁶²	81.62	⁶⁴ Gd ¹⁵⁷
46.2	⁶⁵ Tb ¹⁵⁹	57.9	⁵⁶ Ba ¹³⁰	82.0	⁴⁴ Ru ¹³⁵
46.24	⁷⁴ Lu ¹⁸³	58.54	⁹⁶ Cm ²⁴⁵	83.1	⁹⁴ Pu ²³⁸
46.3	⁵⁶ Ba ¹³⁰	58.97	⁶⁶ Dy ¹⁶³	83.3	⁹⁰ Th ²³⁰
46.55	⁷⁸ Pt ¹⁹²	59.2	⁶⁹ Tm ¹⁶⁹	84.43	⁹⁶ Cm ²⁴⁶
47.04	⁷¹ Lu ¹⁷⁶	59.66	⁹⁶ Cm ²⁴⁷	84.82	⁴⁸ Cd ¹¹³
47.07	⁶³ Eu ¹⁵⁴	60.32	⁷⁹ Au ¹⁹⁷	85.1	⁷⁵ Re ¹⁸⁷
47.5	⁶⁴ Gd ¹⁵⁴	60.92	⁶³ Eu ¹⁵³	85.32	⁶⁴ Gd ¹⁵²
47.70	⁷⁵ Re ¹⁸⁷	61.81	⁴⁴ Ru ¹⁰¹	85.96	⁹⁴ Pu ²³⁹
47.92	⁶⁷ Ho ¹⁶⁵	62.0	⁵⁰ Sn ¹²⁴	85.96	⁹⁶ Cm ²⁴⁴
48.1	⁹⁶ Cm ²⁴⁷	62.7	⁷⁴ Lu ¹⁸⁰	85.96	⁹⁶ Cm ²⁴⁴
48.3	⁶² Sm ¹⁵⁰	63.45	⁷² Hf ¹⁷⁷	86.2	⁹² U ²³⁶
48.75	⁷² Hf ¹⁷⁶	63.46	⁴⁶ Pd	87.4	⁷⁴ Lu ¹⁸⁰
48.80	⁹² U ²³⁴	64.66	⁵⁰ Sn ¹¹²	87.6	⁷⁵ Re ¹⁸⁷
48.85	⁷² Hf ¹⁷⁷	64.8	⁶² Sm ¹⁴⁹	87.70	⁶² Sm ¹⁵²
49.3	⁹⁶ Cm ²⁴⁷	64.9	⁶⁵ Tb ¹⁵⁹	88.4	⁸⁶ Ra ²²⁶
49.34	⁷⁴ Lu ¹⁸⁰	65.06	⁶⁴ Gd ¹⁵⁴	89.27	⁴⁸ Cd ¹¹⁰
50.08	⁹³ Np ²³⁷	65.7	⁹⁸ Cf ²⁴⁹	89.6	⁵¹ Sb ¹²¹
50.37	⁹⁶ Cm ²⁴⁷	65.71	⁹⁴ Pu ²³⁹	89.81	⁹⁰ Th ¹⁹⁸
50.4	⁹³ Np ²³⁷	65.9	⁶⁹ Tm ¹⁶⁹	90.42	⁹² U ²³⁵
	⁷⁵ Re ¹⁸⁵	66.15	⁹² U ²³⁶	90.5	⁶² Sm ¹⁴⁹

E_{Res} (eV)

E_0 (eV)	Isotope	E_0 (eV)	Isotope	E_0 (eV)	Isotope
91.59	$^{99}\text{In}^{113}$	115.5	$^{69}\text{Tm}^{169}$	158.0	$^{35}\text{Cr}^{246}$
91.6	$^{96}\text{Pd}^{108}$	116.1	$^{80}\text{Th}^{230}$	158.4	$^{96}\text{Te}^{123}$
91.84	$^{98}\text{Cm}^{246}$	118.6	$^{84}\text{Pu}^{239}$	158.6	$^{52}\text{Te}^{123}$
92.3	$^{99}\text{Xe}^{129}$	118.83	$^{84}\text{Pu}^{239}$	158.9	$^{60}\text{Nd}^{143}$
92.4	$^{60}\text{Gd}^{152}$	120.10	$^{48}\text{Cd}^{114}$	159.5	$^{42}\text{Ho}^{95}$
93.01	$^{62}\text{Sm}^{154}$	120.4	$^{50}\text{Sn}^{117}$	160.4	$^{70}\text{Yb}^{171}$
93.26	$^{63}\text{Eu}^{153}$	120.5	$^{78}\text{Pt}^{195}$	160.64	$^{95}\text{Am}^{243}$
93.5	$^{80}\text{Hg}^{196}$	120.5	$^{92}\text{U}^{236}$	160.73	$^{88}\text{Er}^{164}$
94.75	$^{92}\text{U}^{234}$	120.77	$^{90}\text{Th}^{232}$	162.81	$^{54}\text{Xe}^{128}$
95.07	$^{68}\text{Er}^{170}$	121.0	$^{64}\text{Gd}^{157}$	163.5	$^{77}\text{Ir}^{193}$
95.6	$^{62}\text{Sm}^{149}$	122.4	$^{94}\text{Pu}^{238}$	164.54	$^{94}\text{Pu}^{239}$
95.8	$^{31}\text{Ga}^{71}$	122.9	$^{81}\text{Tl}^{204}$	164.67	$^{49}\text{In}^{115}$
95.82	$^{70}\text{Pt}^{198}$	123.37	$^{95}\text{Am}^{243}$	165.29	$^{44}\text{Ru}^{102}$
97.0	$^{53}\text{I}^{129}$	123.9	$^{62}\text{Sm}^{147}$	167	$^{23}\text{V}^{90}$
97.10	$^{63}\text{Eu}^{153}$	124.0	$^{64}\text{Gd}^{154}$	167.1	$^{51}\text{Sb}^{121}$
97.5	$^{65}\text{Tb}^{159}$	125.84	$^{54}\text{Xe}^{129}$	168.8	$^{70}\text{Yb}^{173}$
97.6	$^{77}\text{Ir}^{191}$	126.29	$^{46}\text{Pd}^{105}$	170.3	$^{80}\text{Th}^{232}$
98.6	$^{75}\text{Re}^{185}$	126.9	$^{56}\text{Ba}^{137}$	171.1	$^{94}\text{Pu}^{238}$
98.8	$^{50}\text{Sn}^{112}$	127.4	$^{60}\text{Nd}^{143}$	171.4	$^{64}\text{Gd}^{157}$
99.32	$^{73}\text{La}^{181}$	129.7	$^{78}\text{Pt}^{192}$	173.2	$^{61}\text{Pa}^{147}$
99.41	$^{48}\text{Cd}^{111}$	129.7	$^{80}\text{Hg}^{199}$	173.5	$^{64}\text{Gd}^{155}$
99.5	$^{62}\text{Sm}^{147}$	130.8	$^{64}\text{Gd}^{155}$	175.1	$^{80}\text{Hg}^{199}$
101.0	$^{35}\text{Br}^{81}$	130.86	$^{68}\text{Er}^{164}$	176.9	$^{72}\text{Hf}^{177}$
101.2	$^{77}\text{Hf}^{179}$	131.1	$^{61}\text{Pm}^{147}$	177.1	$^{78}\text{Pt}^{192}$
101.8	$^{56}\text{Ba}^{134}$	131.4	$^{42}\text{No}^{96}$	179.5	$^{60}\text{Nd}^{143}$
102.0	$^{32}\text{Ge}^{72}$	131.9	$^{51}\text{Sb}^{121}$	180.3	$^{70}\text{Yb}^{172}$
102.47	$^{92}\text{U}^{236}$	132.0	$^{27}\text{Co}^{59}$	181.0	$^{58}\text{Ce}^{136}$
103.08	$^{72}\text{Hf}^{177}$	135.7	$^{58}\text{Ce}^{136}$	181.0	$^{55}\text{Cs}^{136}$
103.1	$^{62}\text{Sm}^{147}$	135.7	$^{55}\text{Cs}^{136}$	181.8	$^{40}\text{Zr}^{91}$
103.6	$^{77}\text{Ir}^{181}$	136.1	$^{69}\text{Tm}^{169}$	182.7	$^{94}\text{Pu}^{238}$
103.7	$^{77}\text{Hf}^{179}$	136.2	$^{56}\text{Ba}^{130}$	184.2	$^{74}\text{Yb}^{184}$
104.3	$^{58}\text{Ba}^{135}$	139.2	$^{64}\text{Gd}^{154}$	184.5	$^{56}\text{Ba}^{130}$
104.7	$^{50}\text{Sn}^{112}$	139.9	$^{62}\text{Sm}^{150}$	185.0	$^{62}\text{Sm}^{147}$
104.8	$^{77}\text{Ir}^{191}$	139.9	$^{70}\text{Yb}^{172}$	186	$^{46}\text{Pd}^{104}$
105.0	$^{51}\text{Sb}^{123}$	140	$^{64}\text{Gd}^{152}$	186	$^{48}\text{Pd}^{104}$
105.05	$^{94}\text{Ru}^{124}$	140.9	$^{50}\text{Sn}^{119}$	186.6	$^{60}\text{Nd}^{143}$
105.88	$^{68}\text{Dy}^{163}$	141.18	$^{46}\text{Pd}^{105}$	187.0	$^{58}\text{Ce}^{136}$
106.9	$^{50}\text{Sn}^{122}$	143.7	$^{64}\text{Gd}^{157}$	187	$^{55}\text{Cs}^{136}$
107.1	$^{72}\text{Hf}^{174}$	144.9	$^{78}\text{Pt}^{192}$	186.96	$^{92}\text{U}^{234}$
108.59	$^{68}\text{Er}^{164}$	145.4	$^{66}\text{Dy}^{164}$	188.3	$^{78}\text{Pt}^{195}$
108.8	$^{42}\text{No}^{94}$	145.7	$^{50}\text{Sn}^{119}$	188.5	$^{92}\text{U}^{234}$
110.5	$^{64}\text{Gd}^{157}$	147.9	$^{50}\text{Sn}^{116}$	189.70	$^{92}\text{U}^{238}$
111.0	$^{31}\text{Ga}^{69}$	149.9	$^{51}\text{Sb}^{121}$	191.8	$^{51}\text{Sb}^{123}$
111.2	$^{50}\text{Sn}^{116}$	150.4	$^{78}\text{Pt}^{195}$	192.82	$^{46}\text{Cd}^{113}$
111.4	$^{62}\text{Sm}^{150}$	152.81	$^{92}\text{U}^{234}$	193.35	$^{92}\text{U}^{236}$
111.49	$^{92}\text{U}^{234}$	154.1	$^{62}\text{Sm}^{152}$	194.53	$^{68}\text{Er}^{164}$
112.51	$^{44}\text{Ru}^{101}$	154.3	$^{45}\text{Rh}^{103}$	195	$^{90}\text{Th}^{230}$
113.19	$^{95}\text{Cm}^{243}$	154.4	$^{74}\text{Yb}^{183}$	196.57	$^{93}\text{Mo}^{237}$
113.3	$^{65}\text{Tb}^{159}$	154.7	$^{78}\text{Pt}^{195}$	198.1	$^{64}\text{Gd}^{156}$
113.4	$^{42}\text{No}^{96}$	155.02	$^{66}\text{Dy}^{163}$	200.5	$^{52}\text{Te}^{126}$
114.4	$^{74}\text{U}^{182}$	155.4	$^{60}\text{Nd}^{148}$	201.6	$^{64}\text{Gd}^{154}$
114.8	$^{50}\text{Sn}^{119}$	157.04	$^{44}\text{Ru}^{101}$	202.1	$^{64}\text{Gd}^{156}$

E_{res}
(eV)

E_0 (eV)	Isotope	E_0 (eV)	Isotope	E_0 (eV)	Isotope
202.2	^{73}Pc	262.70	$^{44}\text{Ru}^{89}$	320	$^{84}\text{Pu}^{238}$
203.0	$^{74}\text{U}^{1e3}$	262.6	$^{52}\text{Te}^{125}$	323	$^{30}\text{Zr}^{66}$
203.10	$^{26}\text{H}^{159}$	263	$^{56}\text{Ba}^{134}$	323.08	$^{66}\text{Dy}^{163}$
203.36	$^{49}\text{In}^{113}$	267	$^{66}\text{Dy}^{162}$	323.7	$^{51}\text{Sb}^{123}$
204.8	$^{94}\text{Pu}^{242}$	268.1	$^{42}\text{Mo}^{97}$	324.4	$^{60}\text{Nd}^{143}$
205.60	$^{49}\text{In}^{115}$	270.0	$^{70}\text{Yb}^{170}$	324.55	$^{66}\text{Dy}^{163}$
206.0	$^{62}\text{Sm}^{147}$	270.7	$^{80}\text{Hg}^{74}$	326.7	$^{33}\text{Ru}^{75}$
208.9	$^{64}\text{Gd}^{157}$	271.5	$^{34}\text{Se}^{74}$	327.2	$^{62}\text{Sm}^{152}$
209	$^{90}\text{Th}^{230}$	272.2	$^{45}\text{Rh}^{103}$	328.9	$^{90}\text{Th}^{232}$
210.3	$^{80}\text{Hg}^{201}$	275.7	$^{72}\text{Hf}^{178}$	329	$^{56}\text{Ba}^{134}$
210.4	$^{70}\text{Yb}^{171}$	278.3	$^{96}\text{Cm}^{246}$	330.0	$^{50}\text{Sn}^{119}$
211	$^{72}\text{Hf}^{174}$	279.6	$^{74}\text{U}^{183}$	332.0	$^{32}\text{Ge}^{73}$
211.6	$^{34}\text{Se}^{77}$	280.0	$^{78}\text{Pt}^{155}$	332.4	$^{94}\text{Pu}^{242}$
212.8	$^{70}\text{Yb}^{170}$	281.8	$^{30}\text{Zr}^{64}$	332.6	$^{52}\text{Te}^{122}$
212.99	$^{92}\text{U}^{236}$	282.5	$^{68}\text{Er}^{167}$	334.0	$^{31}\text{Ga}^{69}$
217.5	$^{74}\text{U}^{186}$	283	$^{56}\text{Ba}^{135}$	336	$^{56}\text{Ba}^{130}$
219	$^{56}\text{Ba}^{135}$	283.1	$^{50}\text{Sn}^{119}$	337	$^{25}\text{Mn}^{55}$
221	$^{84}\text{Pu}^{238}$	283.49	$^{54}\text{Xe}^{131}$	339.6	$^{25}\text{Mn}^{55}$
222.6	$^{50}\text{Sn}^{119}$	284.0	$^{68}\text{Er}^{170}$	342.70	$^{67}\text{Ho}^{165}$
223	$^{30}\text{Zr}^{67}$	284.9	$^{72}\text{Hf}^{177}$	342.7	$^{70}\text{Yb}^{174}$
223.4	$^{77}\text{Ir}^{193}$	285.9	$^{42}\text{Mo}^{97}$	344.0	$^{70}\text{Yb}^{174}$
224.03	$^{49}\text{In}^{115}$	286.0	$^{72}\text{Hf}^{176}$	347.2	$^{80}\text{Hg}^{198}$
224.15	$^{64}\text{Gd}^{154}$	287.5	$^{94}\text{Pu}^{240}$	347.3	$^{72}\text{Hf}^{176}$
224.7	$^{66}\text{Dy}^{163}$	287.5	$^{60}\text{Nd}^{148}$	348.32	$^{74}\text{U}^{183}$
224.8	$^{32}\text{Ge}^{73}$	287.5	$^{31}\text{Ga}^{71}$	353.1	$^{66}\text{Dy}^{163}$
224.9	$^{72}\text{Hf}^{177}$	288.0	$^{69}\text{Im}^{169}$	353.1	$^{72}\text{Hf}^{178}$
225.43	$^{68}\text{Er}^{164}$	288.2	$^{96}\text{Cm}^{246}$	353.1	$^{96}\text{Cm}^{244}$
228.50	$^{49}\text{In}^{113}$	289.7	$^{52}\text{Te}^{125}$	354.4	$^{96}\text{Cm}^{244}$
229.0	$^{77}\text{Ir}^{193}$	292.0	$^{40}\text{Zr}^{91}$	358.5	$^{70}\text{Yb}^{171}$
230.5	$^{44}\text{Ru}^{100}$	293	$^{88}\text{Ra}^{226}$	358.9	$^{42}\text{Mo}^{95}$
233.41	$^{46}\text{Cd}^{111}$	293.0	$^{79}\text{Au}^{197}$	360	^{78}Pt
237.69	$^{54}\text{Xe}^{128}$	294	$^{90}\text{Th}^{230}$	363.4	$^{50}\text{Sn}^{118}$
238	$^{86}\text{Ra}^{226}$	297.0	$^{67}\text{Ho}^{165}$	363.8	$^{52}\text{Te}^{123}$
238.8	$^{81}\text{Tl}^{203}$	299.3	$^{51}\text{Sb}^{123}$	364.6	$^{42}\text{Mo}^{100}$
239.1	$^{81}\text{Pm}^{147}$	300	$^{94}\text{Pu}^{238}$	367.1	$^{38}\text{Sr}^{84}$
240.0	$^{40}\text{Zr}^{91}$	301.15	$^{68}\text{Er}^{166}$	370.78	$^{32}\text{Ge}^{72}$
240.6	$^{51}\text{Sb}^{123}$	302.5	$^{80}\text{Hg}^{198}$	373.6	$^{54}\text{Xe}^{128}$
240.9	$^{64}\text{Gd}^{157}$	303.68	$^{92}\text{U}^{236}$	374.50	$^{60}\text{Nd}^{144}$
243	$^{56}\text{Ba}^{135}$	306.2	$^{60}\text{Nd}^{143}$	374.74	$^{53}\text{I}^{127}$
243.9	$^{50}\text{Sn}^{118}$	307.1	$^{70}\text{Yb}^{173}$	375.0	$^{54}\text{Xe}^{129}$
244.4	$^{66}\text{Er}^{168}$	311.38	$^{46}\text{Cd}^{111}$	376.0	^{52}Te
248.0	$^{74}\text{U}^{182}$	312.7	$^{80}\text{Hg}^{201}$	376.3	$^{31}\text{Ga}^{71}$
248.7	$^{90}\text{Th}^{230}$	313.2	$^{73}\text{I}^{181}$	377	$^{72}\text{Hf}^{177}$
251.1	$^{96}\text{Cm}^{246}$	313.61	$^{94}\text{Pu}^{240}$	377.0	$^{64}\text{Gd}^{156}$
251.6	$^{50}\text{Sn}^{112}$	314.5	$^{44}\text{Ru}^{101}$	378.0	$^{78}\text{Pt}^{194}$
254.5	$^{54}\text{Xe}^{124}$	315.97	$^{80}\text{Hg}^{199}$	378.3	$^{37}\text{Rb}^{87}$
255.5	$^{67}\text{Ho}^{165}$	317	$^{68}\text{Er}^{166}$	380	$^{44}\text{Ru}^{101}$
259.9	$^{72}\text{Hf}^{178}$	319.5	$^{68}\text{Er}^{164}$	380.42	$^{56}\text{Ba}^{130}$
261.03	$^{50}\text{Sn}^{122}$	319.5	$^{35}\text{Br}^{79}$	380.4	$^{92}\text{U}^{236}$
261.6	$^{46}\text{Cd}^{113}$	319.6	$^{45}\text{Rh}^{103}$	381.1	$^{62}\text{Sm}^{147}$
262	$^{50}\text{Sn}^{119}$	319.9	^{78}Pt	381.7	$^{96}\text{Cm}^{246}$
	$^{86}\text{Ra}^{226}$		$^{94}\text{Pu}^{242}$	385.63	$^{72}\text{Hf}^{179}$
					$^{53}\text{I}^{127}$

E_{Res}
(eV)

E_0 (eV)	Isotope	E_0 (eV)	Isotope	E_0 (eV)	Isotope
387.2	^{171}Yb	496.7	^{170}Er	594.84	^{166}Er
388.7	^{192}Pt	503.9	^{242}Pu	596.6	^{181}Ta
390.6	^{179}Hf	505.2	^{97}Te	603.3	^{194}Pt
392.24	^{114}Cd	505.4	^{97}Mo	611.57	^{164}Er
398	^{135}Cl	505.4	^{145}Nd	612.4	^{122}Te
401.3	^{143}Nd	513	^{112}Hg	612.5	^{98}Mo
401.6	^{99}Ru	514	^{112}Sn	616.8	^{123}Te
405.1	^{135}Ba	514	^{112}Ru	617.8	^{154}Sm
406	^{135}Ba	514	^{112}Ru	622.63	^{111}Cd
406.1	^{135}Ba	514	^{112}Ru	625	^{162}Dy
408.9	^{169}Tm	515.0	^{156}Gd	627.5	^{176}Hf
411.08	^{163}Dy	517	^{84}Sr	630.0	^{95}Mo
414.03	^{113}Cd	525.40	^{239}Pu	632	^{116}Sn
415.2	^{102}Ru	527.4	^{168}Er	634.89	^{113}Cd
417.4	^{198}Hg	529.3	^{195}Pt	635	^{84}Sr
418.2	^{95}Mo	530.0	^{85}Rb	635.8	^{141}Pr
419.0	^{96}Mo	533.4	^{75}As	636.80	^{129}Xe
419.95	^{164}Er	536.6	^{242}Pu	638.7	^{197}Au
420	^{137}Ba	538.9	^{171}Yb	640.60	^{132}Xe
420.6	^{244}Cm	540	^{101}Ru	641.9	^{152}Sm
420.6	^{244}Cm	541.9	^{248}Cm	643.3	^{132}Xe
424.0	^{128}Te	546	^{179}Hf	644.2	^{165}Ho
426.84	^{131}Xe	550	^{76}Ge	645.0	^{183}U
426.93	^{127}I	551.59	^{113}Cd	646.2	^{87}Br
429.3	^{98}Mo	554.54	^{128}Xe	648.3	^{87}Sr
430.3	^{165}Ho	556	^{147}Sm	650	^{98}Hg
431.7	^{125}Te	556	^{150}Sm	657.5	^{176}Hf
432.8	^{101}Ru	557.2	^{252}Cf	660.81	^{113}In
435	^{103}Rh	558.3	^{97}Mo	661.6	^{95}Mo
435.6	^{176}Hf	560.1	^{137}Ba	665.1	^{240}Pu
444.8	^{176}Hf	564.0	^{201}Hg	666	^{114}Sn
445.0	^{201}Hg	565.6	^{196}Pt	668.8	^{101}Br
446.3	^{143}Nd	565.80	^{127}I	670	^{101}Ru
448	^{67}Zn	568.6	^{145}Nd	670.68	^{114}Cd
448.0	^{91}Zr	576.91	^{236}U	675.2	^{232}Th
449	^{136}Ba	577	^{112}Sn	676.1	^{97}Mo
450.38	^{131}Xe	577	^{137}Ba	676.1	^{169}Tm
456.55	^{154}Cd	577.1	^{176}Hf	680.0	^{91}Zr
457.3	^{154}Sm	578	^{114}Sn	680.7	^{95}Mo
459.64	^{126}Xe	578	^{114}Sn	683	^{162}Dy
465	^{238}Pu	578.6	^{137}Ba	685.0	^{201}Hg
467.4	^{98}Mo	579	^{124}Ba	686	^{199}Hg
469.7	^{95}Mo	579.1	^{197}Au	689	^{179}Hf
470.9	^{244}Cm	579.4	^{125}Te	589.0	^{183}U
477.0	^{197}Au	580.1	^{178}Hf	690.0	^{77}Se
486.0	^{150}Nd	580.19	^{115}In	692	^{69}Ga
488	^{84}Sr	580.82	^{129}Xe	692.9	^{158}Gd
488.3	^{176}Yb	580.8	^{117}Sn	698.3	^{194}Pt
490.0	^{195}Pt	583	^{179}Hf	699.0	^{197}Au
490.3	^{73}Ge	585	^{130}Ba	701	^{103}Rh
491.5	^{199}Hg	585.52	^{133}Cs	704.7	^{154}Sm
492.3	^{154}Pt	588.4	^{86}Sr	705	^{71}Ga

E_{Res}
(eV)

E_0 (eV)	Isotope	E_0 (eV)	Isotope	E_0 (eV)	Isotope
707	64Gd156	785	72Hf178	880	55Cs133
708.50	53I127	786.4	42Mo97	880.23	70Yb174
709.3	78Pt195	792	72Hf180	882	56Ba135
709.4	70Yb171	795.72	55Cs133	885	50Sn119
711	66Dy162	796.2	81Tl204	885.2	51Sb123
712	38Sr84	798.87	81Xe129	889	72Hf178
714	64Gd156	799.3	74U104	897.4	72Gd154
714.59	49In113	799.76	48Cd110	900	64Gd156
714.9	60Nd148	800	83Bi209	901.28	48Cd
715.1	69Tm169	804.1	90Th232	904.9	64Gd160
716.04	54Xe128	808	80Hg199	905.0	68Er166
716.4	78Pt	809	72Hf177	912.01	49In113
717.94	48Cd	814.5	78Pt	914	72Hf180
720.0	74U186	814.5	50Sn117	916.9	64Gd154
721.0	74U183	817.6	92U234	918.0	52Te123
723	72Hf178	818.1	42Mo98	922.4	52Te122
723.20	54Xe131	825.0	79Au197	925.8	70Yb173
726.0	70Yb176	825.2	78Pt195	934.7	41Nb93
726.1	98Cf252	828.7	62Sm154	935.6	68Er170
732	64Gd156	830.4	68Er168	947.3	74U182
733.3	33As75	833.1	98Cf252	948	50Sn119
736.07	54Xe131	836.3	64Gd154	950	50Sn124
737.28	48Cd112	837	56Ba130	952.3	62Sm152
740.9	90Th232	845	64Gd156	952.6	70Yb170
741.8	38Sr87	845	45Rh103	956.8	59Pr141
744	56Ba130	845.2	59Pr141	957.3	74U184
744.13	53I127	845.3	64Gd154	963.4	74U186
744.6	78Pt	847.3	64Gd158	971	44Ru
750.22	68Er164	848.4	60Nd145	971	72Hf179
752.19	48Cd114	849.0	68Er166	975.51	48Cd
753.9	70Yb172	850	56Ba130	981	50Sn116
762.30	53I127	851.43	48Cd113	984	50Sn114
764	66Dy162	852.9	62Sm152	991.1	70Yb171
768.7	62Sm152	861	66Dy162	991.8	92U238
769.8	42Mo95	862	34Se76	993.0	50Sn117
770.0	92U234	864.0	34Se77	997.0	34Se77
772	50Sn118	877	50Sn112	997.4	52Te123
776.4	68Er167	880	80Hg199	998.0	70Yb173

E_{Res}
(keV)

ENERGY ORDERED RESONANCES

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
1.0090	$^{91}\text{Nb}^{93}$	1.2773	$^{60}\text{Nd}^{144}$	1.5418	$^{42}\text{Mo}^{94}$
1.0220	$^{69}\text{Er}^{167}$	1.2829	$^{62}\text{Sm}^{154}$	1.5465	^{35}Br
1.0290	$^{34}\text{Se}^{74}$	1.2845	$^{68}\text{Er}^{167}$	1.548	$^{30}\text{Zr}^{67}$
1.031	$^{56}\text{Ba}^{135}$	1.290	$^{58}\text{Ce}^{142}$	1.553	$^{50}\text{Sn}^{116}$
1.0323	$^{52}\text{Te}^{125}$	1.296	$^{44}\text{Ru}^{102}$	1.5550	$^{52}\text{Te}^{124}$
1.0354	$^{73}\text{Ta}^{181}$	1.2962	$^{70}\text{Yb}^{170}$	1.5715	$^{70}\text{Yb}^{176}$
1.046	$^{56}\text{Ba}^{135}$	1.3075	$^{51}\text{Sb}^{121}$	1.5817	$^{48}\text{Cd}^{111}$
1.0483	$^{48}\text{Cd}^{116}$	1.321	$^{50}\text{Sn}^{112}$	1.582	$^{31}\text{Ga}^{69}$
1.0517	$^{42}\text{Mo}^{94}$	1.325	$^{80}\text{Hg}^{200}$	1.584	$^{50}\text{Sn}^{118}$
1.053	$^{56}\text{Ba}^{137}$	1.3281	$^{94}\text{Pu}^{240}$	1.5866	$^{54}\text{Xe}^{131}$
1.0541	$^{60}\text{Nd}^{148}$	1.335	$^{38}\text{Sr}^{87}$	1.5895	$^{90}\text{Th}^{232}$
1.055	$^{56}\text{Ba}^{135}$	1.338	$^{50}\text{Sn}^{116}$	1.5942	$^{55}\text{Cs}^{133}$
1.0691	$^{42}\text{Mo}^{100}$	1.3467	$^{48}\text{Cd}^{110}$	1.600	$^{38}\text{Sr}^{84}$
1.0735	$^{52}\text{Te}^{123}$	1.350	$^{58}\text{Ba}^{137}$	1.6099	$^{54}\text{Xe}^{128}$
1.07830	$^{53}\text{I}^{127}$	1.3610	$^{50}\text{Sn}^{117}$	1.6176	$^{70}\text{Yb}^{173}$
1.0860	$^{74}\text{Lu}^{184}$	1.3640	$^{48}\text{Cd}^{113}$	1.6193	$^{49}\text{In}^{115}$
1.0939	$^{74}\text{Er}^{168}$	1.3650	$^{54}\text{Xe}^{128}$	1.630	$^{34}\text{Se}^{74}$
1.0950	$^{74}\text{Lu}^{182}$	1.3649	$^{51}\text{Sb}^{121}$	1.6309	$^{48}\text{Cd}^{111}$
1.096	$^{72}\text{Hf}^{178}$	1.367	$^{50}\text{Sn}^{114}$	1.6309	$^{90}\text{Th}^{232}$
1.1154	$^{48}\text{Cd}^{112}$	1.3673	$^{68}\text{Er}^{166}$	1.638	$^{31}\text{Ga}^{69}$
1.115	$^{32}\text{Ge}^{70}$	1.386	$^{34}\text{Se}^{74}$	1.640	$^{58}\text{Ce}^{142}$
1.141	$^{74}\text{Lu}^{183}$	1.3311	$^{68}\text{Er}^{170}$	1.6504	$^{42}\text{Mo}^{94}$
1.148	$^{94}\text{Pu}^{242}$	1.4000	$^{74}\text{Lu}^{184}$	1.6886	$^{70}\text{Yb}^{174}$
1.163	$^{72}\text{Hf}^{178}$	1.4084	$^{54}\text{Xe}^{128}$	1.674	$^{56}\text{Ba}^{204}$
1.1650	$^{51}\text{Sb}^{123}$	1.414	$^{37}\text{Rb}^{85}$	1.68	$^{82}\text{Pb}^{204}$
1.1680	$^{60}\text{Nd}^{146}$	1.416	$^{50}\text{Sn}^{112}$	1.6825	$^{55}\text{Cs}^{133}$
1.1767	$^{42}\text{Mo}^{97}$	1.4190	$^{42}\text{Mo}^{95}$	1.6884	$^{49}\text{In}^{115}$
1.1779	$^{42}\text{Mo}^{181}$	1.42	$^{23}\text{V}^{50}$	1.6870	$^{42}\text{Mo}^{100}$
1.1798	$^{73}\text{Ta}^{181}$	1.4233	$^{48}\text{Cd}^{112}$	1.6988	$^{51}\text{Sb}^{123}$
1.1837	$^{68}\text{Er}^{166}$	1.4257	$^{48}\text{Cd}^{114}$	1.700	$^{56}\text{Ba}^{118}$
1.1853	$^{70}\text{Yb}^{173}$	1.4381	$^{51}\text{Sb}^{125}$	1.710	$^{50}\text{Sn}^{118}$
1.1860	$^{54}\text{Xe}^{129}$	1.443	$^{37}\text{Rb}^{85}$	1.710	$^{80}\text{Hg}^{202}$
1.1916	$^{73}\text{Ta}^{181}$	1.4520	$^{41}\text{Nb}^{93}$	1.7271	$^{52}\text{Te}^{123}$
1.199	$^{56}\text{Ba}^{137}$	1.4588	$^{64}\text{Gd}^{158}$	1.737	$^{56}\text{Ba}^{137}$
1.2000	^{35}Br	1.461	$^{44}\text{Ru}^{104}$	1.7423	$^{48}\text{Cd}^{111}$
1.2085	^{35}Br	1.4721	$^{62}\text{Sm}^{154}$	1.746	$^{34}\text{Se}^{74}$
1.2199	$^{64}\text{Gd}^{158}$	1.48	$^{26}\text{Ca}^{43}$	1.7480	$^{52}\text{Te}^{125}$
1.2258	$^{52}\text{Te}^{123}$	1.4840	$^{59}\text{Pr}^{141}$	1.751	$^{56}\text{Ba}^{122}$
1.226	$^{56}\text{Ba}^{134}$	1.4841	$^{54}\text{Xe}^{130}$	1.756	$^{50}\text{Sn}^{114}$
1.2395	$^{62}\text{Sm}^{152}$	1.4904	$^{75}\text{Lu}^{197}$	1.7688	$^{62}\text{Sm}^{134}$
1.2409	$^{64}\text{Gd}^{160}$	1.4930	$^{50}\text{Sn}^{117}$	1.7720	$^{74}\text{Lu}^{182}$
1.2500	$^{42}\text{Mo}^{97}$	1.4983	$^{70}\text{Yb}^{173}$	1.7790	$^{94}\text{Pu}^{240}$
1.2521	$^{48}\text{Cd}^{111}$	1.5044	$^{60}\text{Nd}^{146}$	1.7826	$^{92}\text{U}^{238}$
1.2607	$^{42}\text{Mo}^{100}$	1.5140	$^{74}\text{Lu}^{184}$	1.7870	$^{48}\text{Cd}^{111}$
1.2630	$^{60}\text{Nd}^{143}$	1.5183	$^{70}\text{Yb}^{173}$	1.7974	$^{60}\text{Nd}^{145}$
1.265	$^{34}\text{Se}^{77}$	1.525	$^{31}\text{Ga}^{71}$	1.802	$^{50}\text{Sn}^{116}$
1.2673	$^{48}\text{Cd}^{113}$	1.5265	$^{42}\text{Mo}^{98}$	1.8084	$^{64}\text{Gd}^{160}$
1.2676	$^{55}\text{Cs}^{133}$	1.530	$^{40}\text{Zr}^{91}$	1.820	$^{45}\text{Rh}^{103}$
1.270	$^{45}\text{Rh}^{103}$	1.5335	$^{60}\text{Nd}^{148}$	1.8266	$^{70}\text{Yb}^{172}$
1.2750	^{35}Br	1.5347	$^{42}\text{Mo}^{97}$	1.828	^{35}Br

E_{Res}
(keV)

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
1.832	$^{93}\text{Nb}_{41}$	2.310	$^{209}\text{Bi}_{83}$	2.6783	$^{114}\text{Cd}_{48}$
1.837	$^{128}\text{Te}_{52}$	2.321	$^{77}\text{Se}_{34}$	2.6827	$^{168}\text{Er}_{68}$
1.8407	$^{52}\text{Te}_{52}$	2.3365	$^{112}\text{Cd}_{48}$	2.6848	$^{112}\text{Cd}_{48}$
1.866	$^{68}\text{Ba}_{56}$	2.3615	$^{116}\text{Cd}_{48}$	2.686	$^{15}\text{Sb}_{51}$
1.870	$^{69}\text{Ga}_{31}$	2.3632	$^{96}\text{Mo}_{42}$	2.710	$^{200}\text{Hg}_{80}$
1.8711	$^{131}\text{Xe}_{54}$	2.375	$^{55}\text{Mn}_{25}$	2.718	$^{91}\text{Zr}_{40}$
1.8725	$^{35}\text{Br}_{35}$	2.3760	$^{133}\text{Cs}_{55}$	2.725	$^{92}\text{Zr}_{40}$
1.9136	$^{197}\text{Au}_{79}$	2.3760	$^{110}\text{Cd}_{48}$	2.7302	$^{150}\text{Nd}_{60}$
1.9211	$^{114}\text{Cd}_{48}$	2.3780	$^{122}\text{Te}_{52}$	2.740	$^{142}\text{Ce}_{58}$
1.9373	$^{168}\text{Er}_{68}$	2.380	$^{124}\text{Sn}_{50}$	2.7558	$^{128}\text{Xe}_{54}$
1.9372	$^{100}\text{Mo}_{42}$	2.3963	$^{160}\text{Gd}_{64}$	2.7614	$^{145}\text{Nd}_{60}$
1.954	$^{68}\text{Ba}_{56}$	2.400	$^{71}\text{Ga}_{31}$	2.784	$^{71}\text{Ga}_{31}$
1.9685	$^{116}\text{Cd}_{48}$	2.420	$^{85}\text{Rb}_{37}$	2.790	$^{182}\text{Hf}_{74}$
1.9686	$^{238}\text{U}_{92}$	2.4200	$^{100}\text{Mo}_{42}$	2.794	$^{205}\text{Ti}_{81}$
1.970	$^{80}\text{Se}_{34}$	2.4315	$^{130}\text{Xe}_{54}$	2.8306	$^{170}\text{Er}_{68}$
1.9750	$^{144}\text{Nd}_{60}$	2.4470	$^{130}\text{Te}_{52}$	2.8408	$^{145}\text{Nd}_{60}$
1.977	$^{56}\text{Ba}_{56}$	2.4522	$^{154}\text{Sm}_{62}$	2.846	$^{74}\text{Ge}_{32}$
1.980	$^{114}\text{Sn}_{50}$	2.458	$^{69}\text{Ga}_{31}$	2.850	$^{23}\text{Na}_{11}$
1.980	$^{84}\text{Sr}_{38}$	2.48	$^{204}\text{Pb}_{82}$	2.850	$^{15}\text{Sb}_{51}$
1.986	$^{68}\text{Ba}_{56}$	2.4842	$^{96}\text{Mo}_{42}$	2.8688	$^{158}\text{Gd}_{64}$
1.9890	$^{124}\text{Te}_{52}$	2.5044	$^{160}\text{Gd}_{64}$	2.8930	$^{127}\text{I}_{53}$
1.9980	$^{123}\text{Te}_{52}$	2.5169	$^{160}\text{Gd}_{64}$	2.915	$^{15}\text{Sb}_{51}$
2.0000	$^{123}\text{Sb}_{51}$	2.5210	$^{126}\text{Te}_{52}$	2.9291	$^{176}\text{Yb}_{70}$
2.0041	$^{113}\text{In}_{49}$	2.5285	$^{142}\text{Nd}_{60}$	2.9306	$^{145}\text{Nd}_{60}$
2.005	$^{91}\text{Zr}_{40}$	2.528	$^{65}\text{Cu}_{29}$	2.9380	$^{126}\text{Te}_{52}$
2.011	$^{73}\text{Ge}_{32}$	2.5396	$^{130}\text{Te}_{52}$	2.971	$^{128}\text{Te}_{52}$
2.0130	$^{117}\text{Sn}_{50}$	2.540	$^{77}\text{Se}_{34}$	2.976	$^{118}\text{Sn}_{50}$
2.021	$^{93}\text{Nb}_{41}$	2.5473	$^{130}\text{Te}_{52}$	2.9780	$^{117}\text{Sn}_{50}$
2.0320	$^{146}\text{Nd}_{60}$	2.5490	$^{98}\text{Mo}_{42}$	2.9804	$^{130}\text{Xe}_{54}$
2.0355	$^{112}\text{Cd}_{48}$	2.5533	$^{131}\text{Xe}_{54}$	2.996	$^{15}\text{Sb}_{51}$
2.038	$^{63}\text{Cu}_{29}$	2.5623	$^{148}\text{Nd}_{60}$	2.9980	$^{141}\text{Pr}_{59}$
2.0450	$^{184}\text{Hf}_{74}$	2.5659	$^{129}\text{Xe}_{54}$	2.9975	$^{139}\text{La}_{57}$
2.0600	$^{133}\text{Cs}_{55}$	2.5737	$^{112}\text{Cd}_{48}$	3.000	$^{84}\text{Sr}_{38}$
2.0657	$^{110}\text{Cd}_{48}$	2.5748	$^{172}\text{Yb}_{70}$	3.0032	$^{130}\text{Xe}_{54}$
2.0790	$^{126}\text{Te}_{52}$	2.575	$^{76}\text{Se}_{34}$	3.0060	$^{100}\text{Mo}_{42}$
2.0920	$^{184}\text{Hf}_{74}$	2.5775	$^{130}\text{Xe}_{54}$	3.0307	$^{132}\text{Xe}_{54}$
2.0965	$^{141}\text{Pr}_{59}$	2.58070	$^{160}\text{Gd}_{64}$	3.035	$^{74}\text{Ge}_{32}$
2.115	$^{15}\text{Sb}_{51}$	2.5817	$^{130}\text{Te}_{52}$	3.039	$^{186}\text{Hf}_{74}$
2.1160	$^{139}\text{La}_{57}$	2.5870	$^{117}\text{Sn}_{50}$	3.042	$^{205}\text{Ti}_{81}$
2.1215	$^{152}\text{Sm}_{62}$	2.5965	$^{238}\text{U}_{92}$	3.0422	$^{110}\text{Cd}_{48}$
2.1291	$^{143}\text{Nd}_{60}$	2.5990	$^{146}\text{Nd}_{60}$	3.0650	$^{100}\text{Mo}_{42}$
2.1312	$^{131}\text{Xe}_{54}$	2.6020	$^{124}\text{Te}_{52}$	3.074	$^{137}\text{Ti}_{22}$
2.1494	$^{131}\text{Xe}_{54}$	2.6080	$^{89}\text{Y}_{39}$	3.144	$^{75}\text{As}_{33}$
2.1777	$^{148}\text{Nd}_{60}$	2.6149	$^{130}\text{Xe}_{54}$	3.158	$^{91}\text{Zr}_{40}$
2.1784	$^{94}\text{Mo}_{42}$	2.6298	$^{125}\text{Te}_{52}$	3.1690	$^{92}\text{Zr}_{40}$
2.1860	$^{238}\text{U}_{92}$	2.6305	$^{100}\text{Mo}_{42}$	3.1780	$^{114}\text{Cd}_{48}$
2.222	$^{15}\text{Sb}_{51}$	2.637	$^{64}\text{Zn}_{30}$	3.1900	$^{133}\text{Cs}_{55}$
2.246	$^{67}\text{Zn}_{30}$	2.6402	$^{160}\text{Gd}_{64}$	3.197	$^{77}\text{Se}_{34}$
2.2493	$^{170}\text{Er}_{68}$	2.6456	$^{130}\text{Xe}_{54}$	3.227	$^{78}\text{Se}_{34}$
2.250	$^{84}\text{Sr}_{38}$	2.6516	$^{116}\text{Cd}_{48}$	3.247	$^{86}\text{Sr}_{38}$
2.255	$^{15}\text{Sb}_{51}$	2.6564	$^{166}\text{Er}_{68}$	3.2573	$^{130}\text{Xe}_{54}$
2.303	$^{74}\text{Se}_{34}$	2.659	$^{186}\text{Hf}_{74}$	3.2615	$^{100}\text{Mo}_{42}$

E_{Res}
(keV)

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
3.2823	$^{96}\text{Mo}_{42}$	3.9810	$^{145}\text{Nd}_{60}$	4.9300	$^{42}\text{Mo}_{42}$
3.2820	$^{96}\text{Mo}_{42}$	3.9827	$^{158}\text{Gd}_{64}$	4.949	$^{72}\text{Ge}_{32}$
3.293	$^{98}\text{Mo}_{42}$	3.991	$^{91}\text{Zr}_{40}$	4.9690	$^{125}\text{Te}_{52}$
3.3041	$^{168}\text{Er}_{68}$	4.000	$^{146}\text{Nd}_{60}$	4.977	$^{87}\text{Sr}_{38}$
3.311	$^{71}\text{Ga}_{31}$	4.0030	$^{127}\text{I}_{53}$	4.990	$^{74}\text{Ge}_{32}$
3.350	$^{84}\text{Sr}_{38}$	4.037	$^{87}\text{Sr}_{38}$	5.0074	$^{122}\text{Te}_{52}$
3.3574	$^{76}\text{Xe}_{54}$	4.040	$^{73}\text{Ge}_{32}$	5.015	$^{59}\text{Co}_{27}$
3.363	$^{76}\text{Se}_{34}$	4.060	$^{85}\text{Rb}_{37}$	5.054	$^{71}\text{Ga}_{31}$
3.380	$^{116}\text{Sn}_{50}$	4.0770	$^{148}\text{Nd}_{60}$	5.060	$^{200}\text{Hg}_{80}$
3.390	$^{124}\text{Sn}_{50}$	4.105	$^{202}\text{Hg}_{80}$	5.0725	$^{116}\text{Cd}_{48}$
3.4413	$^{128}\text{Xe}_{54}$	4.120	$^{96}\text{Zr}_{40}$	5.0750	$^{154}\text{Sm}_{62}$
3.450	$^{122}\text{Sn}_{50}$	4.1403	$^{103}\text{Rh}_{45}$	5.100	$^{80}\text{Se}_{34}$
3.460	$^{116}\text{Sn}_{50}$	4.1546	$^{168}\text{Er}_{68}$	5.120	$^{87}\text{Rb}_{37}$
3.460	$^{118}\text{Sn}_{50}$	4.163	$^{51}\text{V}_{23}$	5.1440	$^{124}\text{Te}_{52}$
3.4793	$^{158}\text{Gd}_{64}$	4.170	$^{74}\text{Ge}_{32}$	5.1500	$^{93}\text{Nb}_{41}$
3.4800	$^{133}\text{Cs}_{55}$	4.18	$^{64}\text{Zn}_{30}$	5.199	$^{182}\text{W}_{74}$
3.4818	$^{139}\text{La}_{57}$	4.185	$^{53}\text{Cr}_{24}$	5.23	$^{43}\text{Ca}_{20}$
3.497	$^{69}\text{Ga}_{31}$	4.250	$^{85}\text{Rb}_{37}$	5.2735	$^{172}\text{Yb}_{70}$
3.505	$^{75}\text{As}_{33}$	4.2580	$^{114}\text{Cd}_{48}$	5.3005	$^{116}\text{Cd}_{48}$
3.5095	$^{76}\text{Xe}_{54}$	4.270	$^{80}\text{Se}_{34}$	5.357	$^{73}\text{Ge}_{32}$
3.5381	$^{144}\text{Nd}_{60}$	4.313	$^{76}\text{Se}_{34}$	5.360	$^{124}\text{Sn}_{50}$
3.554	$^{77}\text{Se}_{34}$	4.3198	$^{96}\text{Mo}_{42}$	5.3830	$^{94}\text{Mo}_{42}$
3.5639	$^{130}\text{Xe}_{54}$	4.322	$^{59}\text{Co}_{27}$	5.387	$^{76}\text{Se}_{34}$
3.5722	$^{96}\text{Mo}_{42}$	4.3568	$^{139}\text{La}_{57}$	5.397	$^{63}\text{Cu}_{29}$
3.5990	$^{94}\text{Mo}_{42}$	4.36	$^{43}\text{Ca}_{20}$	5.400	$^{122}\text{Sn}_{50}$
3.6025	$^{141}\text{Pr}_{59}$	4.361	$^{69}\text{Ga}_{31}$	5.435	$^{182}\text{W}_{74}$
3.6526	$^{116}\text{Cd}_{48}$	4.3627	$^{94}\text{Mo}_{42}$	5.4495	$^{170}\text{Er}_{68}$
3.656	$^{146}\text{Nd}_{60}$	4.5178	$^{160}\text{Gd}_{64}$	5.4748	$^{126}\text{Te}_{52}$
3.6904	$^{76}\text{Xe}_{54}$	4.532	$^{142}\text{Nd}_{60}$	5.4775	$^{122}\text{Te}_{52}$
3.721	$^{242}\text{Pu}_{94}$	4.54	$^{62}\text{Ni}_{28}$	5.500	$^{96}\text{Zr}_{40}$
3.7260	$^{96}\text{Mo}_{42}$	4.5570	$^{126}\text{Te}_{52}$	5.536	$^{41}\text{K}_{19}$
3.7495	$^{139}\text{La}_{57}$	4.5583	$^{112}\text{Cd}_{48}$	5.570	$^{70}\text{Ge}_{32}$
3.7577	$^{96}\text{Mo}_{42}$	4.5585	$^{96}\text{Mo}_{42}$	5.573	$^{75}\text{As}_{33}$
3.7681	$^{158}\text{Gd}_{64}$	4.560	$^{72}\text{Ge}_{32}$	5.5880	$^{124}\text{Te}_{52}$
3.7800	$^{141}\text{Pr}_{59}$	4.574	$^{98}\text{Mo}_{42}$	5.5960	$^{141}\text{Pr}_{59}$
3.8185	$^{129}\text{Xe}_{54}$	4.5950	$^{93}\text{Nb}_{41}$	5.6112	$^{158}\text{Gd}_{64}$
3.8200	$^{150}\text{Nd}_{60}$	4.6164	$^{94}\text{Mo}_{42}$	5.64	$^{50}\text{Cr}_{24}$
3.835	$^{49}\text{Ti}_{22}$	4.640	$^{116}\text{Sn}_{50}$	5.6532	$^{174}\text{Yb}_{70}$
3.836	$^{242}\text{Pu}_{94}$	4.6460	$^{139}\text{La}_{57}$	5.6547	$^{172}\text{Yb}_{70}$
3.840	$^{87}\text{Rb}_{37}$	4.725	$^{118}\text{Sn}_{50}$	5.656	$^{182}\text{W}_{74}$
3.846	$^{182}\text{W}_{74}$	4.760	$^{92}\text{Zr}_{40}$	5.660	$^{80}\text{Se}_{34}$
3.848	$^{90}\text{Zr}_{40}$	4.760	$^{76}\text{Ge}_{32}$	5.67	$^{53}\text{Cr}_{24}$
3.8500	$^{123}\text{Te}_{52}$	4.766	$^{87}\text{Sr}_{38}$	5.6870	$^{93}\text{Nb}_{41}$
3.8539	$^{132}\text{Xe}_{54}$	4.805	$^{186}\text{W}_{74}$	5.709	$^{75}\text{As}_{33}$
3.8730	$^{145}\text{Nd}_{60}$	4.810	$^{69}\text{Ga}_{31}$	5.7163	$^{176}\text{Yb}_{70}$
3.8920	$^{148}\text{Nd}_{60}$	4.810	$^{71}\text{Ga}_{31}$	5.777	$^{87}\text{Sr}_{38}$
3.9060	$^{232}\text{Th}_{90}$	4.843	$^{98}\text{Mo}_{42}$	5.800	$^{94}\text{Zr}_{40}$
3.913	$^{65}\text{Cu}_{29}$	4.8738	$^{115}\text{Cd}_{48}$	5.856	$^{150}\text{Nd}_{60}$
3.919	$^{77}\text{Se}_{34}$	4.8776	$^{172}\text{Yb}_{70}$	5.903	$^{127}\text{I}_{53}$
3.9453	$^{131}\text{Xe}_{54}$	4.9167	$^{94}\text{Mo}_{42}$	5.9464	$^{170}\text{Er}_{68}$
3.9535	$^{110}\text{Cd}_{48}$	4.929	$^{144}\text{Nd}_{60}$	5.9611	$^{126}\text{Te}_{52}$
3.960	$^{118}\text{Sn}_{50}$	4.930	$^{85}\text{Rb}_{37}$	5.9837	$^{110}\text{Cd}_{48}$

E_{Res}
(keV)

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
5.998	$^{75}\text{As}_{33}$	7.930	$^{63}\text{Cu}_{29}$	10.345	$^{86}\text{Sr}_{38}$
5.9990	$^{93}\text{Nb}_{41}$	8.0	$^{45}\text{Sc}_{21}$	10.389	$^{150}\text{Nd}_{60}$
6.060	$^{87}\text{Sr}_{38}$	8.047	$^{130}\text{Te}_{52}$	10.43	$^{66}\text{Zn}_{30}$
6.123	$^{150}\text{Nd}_{60}$	8.18	$^{53}\text{Cr}_{24}$	10.450	$^{124}\text{Te}_{52}$
6.127	$^{184}\text{W}_{74}$	8.25	$^{50}\text{V}_{23}$	10.656	$^{128}\text{Te}_{52}$
6.150	$^{87}\text{Sr}_{38}$	8.34	$^{47}\text{Ti}_{22}$	10.712	$^{144}\text{Nd}_{60}$
6.171	$^{78}\text{Se}_{34}$	8.35	$^{204}\text{Pb}_{82}$	10.757	$^{146}\text{Nd}_{60}$
6.1880	$^{125}\text{Te}_{52}$	8.370	$^{87}\text{Rb}_{37}$	10.790	$^{64}\text{Zn}_{30}$
6.2	$^{50}\text{V}_{23}$	8.4051	$^{170}\text{Er}_{68}$	10.830	$^{128}\text{Te}_{52}$
6.21	$^{57}\text{Fe}_{26}$	8.430	$^{85}\text{Rb}_{37}$	10.840	$^{63}\text{Cu}_{29}$
6.2493	$^{168}\text{Er}_{68}$	8.4581	$^{166}\text{Er}_{68}$	10.850	$^{186}\text{W}_{74}$
6.4060	$^{93}\text{Nb}_{41}$	8.5143	$^{139}\text{La}_{57}$	10.869	$^{86}\text{Sr}_{38}$
6.437	$^{76}\text{Se}_{34}$	8.530	$^{73}\text{Ge}_{32}$	10.961	$^{142}\text{Nd}_{60}$
6.448	$^{85}\text{Cu}_{29}$	8.635	$^{70}\text{Ge}_{32}$	11.0	$^{46}\text{Ti}_{22}$
6.4555	$^{139}\text{La}_{57}$	8.646	$^{148}\text{Nd}_{60}$	11.060	$^{78}\text{Se}_{34}$
6.5042	$^{160}\text{Gd}_{64}$	8.70	$^{43}\text{Ca}_{20}$	11.150	$^{87}\text{Rb}_{37}$
6.5770	$^{112}\text{Cd}_{48}$	8.790	$^{87}\text{Rb}_{37}$	11.170	$^{72}\text{Ge}_{32}$
6.580	$^{82}\text{Se}_{34}$	8.8222	$^{110}\text{Cd}_{48}$	11.475	$^{86}\text{Sr}_{38}$
6.631	$^{146}\text{Nd}_{60}$	8.8222	$^{116}\text{Cd}_{48}$	11.494	$^{92}\text{Mo}_{42}$
6.74	$^{53}\text{Cr}_{24}$	8.8350	$^{166}\text{Er}_{68}$	11.570	$^{89}\text{Y}_{39}$
6.788	$^{144}\text{Nd}_{60}$	8.87	$^{55}\text{Mn}_{25}$	11.62	$^{51}\text{V}_{23}$
6.7921	$^{160}\text{Gd}_{64}$	8.9036	$^{139}\text{La}_{57}$	11.7	$^{45}\text{Sc}_{21}$
6.797	$^{51}\text{V}_{23}$	8.943	$^{120}\text{Sn}_{50}$	11.751	$^{126}\text{Te}_{52}$
6.815	$^{87}\text{Sr}_{38}$	8.953	$^{150}\text{Nd}_{60}$	11.8	$^{50}\text{V}_{23}$
6.865	$^{122}\text{Sn}_{50}$	8.980	$^{72}\text{Ge}_{32}$	12.030	$^{74}\text{Ge}_{32}$
6.890	$^{92}\text{Zr}_{40}$	9.030	$^{75}\text{As}_{33}$	12.070	$^{72}\text{Ge}_{32}$
6.9755	$^{112}\text{Cd}_{48}$	9.052	$^{98}\text{Mo}_{42}$	12.14	$^{209}\text{Bi}_{83}$
7.015	$^{130}\text{Te}_{52}$	9.2	$^{45}\text{Sc}_{21}$	12.479	$^{126}\text{Te}_{52}$
7.027	$^{122}\text{Te}_{52}$	9.2231	$^{172}\text{Yb}_{70}$	12.5	$^{60}\text{Ni}_{28}$
7.065	$^{94}\text{Zr}_{40}$	9.250	$^{78}\text{Se}_{34}$	12.632	$^{80}\text{Se}_{34}$
7.1020	$^{125}\text{Te}_{52}$	9.2624	$^{114}\text{Cd}_{48}$	12.64	$^{61}\text{Ni}_{28}$
7.148	$^{76}\text{Se}_{34}$	9.310	$^{85}\text{Rb}_{37}$	12.761	$^{176}\text{Yb}_{70}$
7.15	$^{61}\text{Ni}_{28}$	9.372	$^{144}\text{Nd}_{60}$	12.880	$^{85}\text{Rb}_{37}$
7.17	$^{55}\text{Mn}_{25}$	9.410	$^{89}\text{Y}_{39}$	12.893	$^{128}\text{Te}_{52}$
7.216	$^{74}\text{Se}_{34}$	9.4957	$^{176}\text{Yb}_{70}$	12.90	$^{204}\text{Pb}_{82}$
7.2671	$^{172}\text{Yb}_{70}$	9.587	$^{186}\text{W}_{74}$	12.990	$^{89}\text{Y}_{39}$
7.3	$^{50}\text{V}_{23}$	9.621	$^{141}\text{Pr}_{59}$	13.040	$^{64}\text{Zn}_{30}$
7.310	$^{136}\text{Ba}_{56}$	9.64	$^{204}\text{Pb}_{82}$	13.170	$^{63}\text{Cu}_{29}$
7.3471	$^{116}\text{Cd}_{48}$	9.640	$^{72}\text{Ge}_{32}$	13.192	$^{65}\text{Cu}_{29}$
7.3794	$^{160}\text{Gd}_{64}$	9.735	$^{144}\text{Nd}_{60}$	13.200	$^{184}\text{W}_{74}$
7.533	$^{150}\text{Nd}_{60}$	9.797	$^{122}\text{Te}_{52}$	13.200	$^{70}\text{Ge}_{32}$
7.55	$^{61}\text{Ni}_{28}$	9.868	$^{146}\text{Nd}_{60}$	13.242	$^{144}\text{Nd}_{60}$
7.580	$^{87}\text{Rb}_{37}$	9.885	$^{142}\text{Nd}_{60}$	13.281	$^{76}\text{Se}_{34}$
7.589	$^{150}\text{Nd}_{60}$	9.890	$^{70}\text{Ge}_{32}$	13.310	$^{90}\text{Zr}_{40}$
7.604	$^{65}\text{Cu}_{29}$	9.8960	$^{110}\text{Cd}_{48}$	13.378	$^{150}\text{Nd}_{60}$
7.6763	$^{158}\text{Gd}_{64}$	9.930	$^{63}\text{Cu}_{29}$	13.408	$^{176}\text{Yb}_{70}$
7.7266	$^{174}\text{Yb}_{70}$	9.970	$^{124}\text{Sn}_{50}$	13.450	$^{174}\text{Yb}_{70}$
7.76	$^{54}\text{Fe}_{26}$	10.020	$^{130}\text{Te}_{52}$	13.458	$^{126}\text{Te}_{52}$
7.770	$^{73}\text{Ge}_{32}$	10.161	$^{86}\text{Sr}_{38}$	13.567	$^{146}\text{Nd}_{60}$
7.800	$^{200}\text{Hg}_{80}$	10.210	$^{76}\text{Se}_{34}$	13.601	$^{176}\text{Yb}_{70}$
7.870	$^{122}\text{Te}_{52}$	10.304	$^{174}\text{Yb}_{70}$	13.663	$^{142}\text{Nd}_{60}$
7.879	$^{65}\text{Cu}_{29}$	10.310	$^{70}\text{Ge}_{32}$	13.700	$^{92}\text{Mo}_{42}$

E_{Res}
(keV)

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
13.732	^{176}Yb	19.965	^{124}Te	25.880	^{70}Ge
13.800	^{82}Se	19.98	^{25}Mo	25.905	^{142}Nd
13.80	^{43}Ca	20.200	^{94}Zr	26.200	^{92}Mo
13.940	^{76}Ge	20.270	^{89}Y	26.475	^{124}Te
13.963	^{158}Er	20.300	^{80}Se	26.550	^{82}Se
14.230	^{65}Cu	20.5	^{50}V	26.50	^{34}Se
14.25	^{206}Pb	20.95	^{45}Sc	26.900	^{78}Se
14.3	^{64}Ni	21.00	^{55}Mn	26.9	^{204}Pb
14.406	^{174}Yb	21.040	^{76}Ge	26.9	^{43}Ca
14.500	^{92}Zr	21.100	^{92}Mo	27.00	^{53}Cr
14.600	^{128}Te	21.250	^{142}Nd	27.0	^{55}Mn
14.788	^{35}Cl	21.32	^{66}Zn	27.02	^{19}F
14.980	^{87}Rb	21.359	^{86}Sr	27.17	^{47}Ti
14.980	^{86}Sr	21.5	^{204}Pb	27.600	^{70}Ge
15.030	^{85}Rb	21.540	^{130}Te	27.7	^{56}Fe
15.050	^{76}Ge	21.70	^{51}V	27.760	^{130}Te
15.3	^{66}Zn	21.910	^{74}Ge	28.426	^{50}Cr
15.399	^{86}Sr	21.94	^{59}Co	28.60	^{60}Ni
15.50	^{58}Ni	21.94	^{206}Pb	28.700	^{92}Mo
15.51	^{209}Bi	22	^{44}Ca	29.0	^{57}Fe
15.650	^{186}W	22.460	^{76}Ge	29.11	^{61}Ni
15.707	^{174}Yb	22.5	^{43}Ca	29.2	^{43}Ca
16.140	^{120}Sn	22.51	^{59}Co	29.260	^{89}Y
16.258	^{142}Nd	22.6	^{50}V	29.359	^{63}Cu
16.36	^{47}Ti	22.700	^{82}Se	29.400	^{78}Se
16.45	^{205}Tl	22.7	^{66}Zn	29.400	^{96}Zr
16.500	^{92}Mo	22.77	^{49}Ti	29.400	^{72}Ge
16.70	^{61}Ni	23.000	^{89}Y	29.600	^{80}Se
16.710	^{41}K	23.030	^{120}Sn	29.600	^{76}Ge
16.80	^{207}Pb	23.1	^{54}Cr	29.760	^{130}Te
17.010	^{128}Te	23.100	^{92}Zr	29.800	^{92}Mo
17.080	^{126}Te	23.122	^{80}Se	30.050	^{89}Y
17.170	^{120}Sn	23.350	^{130}Te	30.11	^{59}Co
17.200	^{92}Zr	23.470	^{87}Rb	30.170	^{130}Te
17.230	^{90}Zr	23.5	^{204}Pb	30.200	^{94}Zr
17.520	^{128}Te	23.790	^{124}Te	30.35	532
17.6	^{48}Ti	23.8	^{48}Ti	30.570	^{142}Nd
17.83	^{61}Ni	24.120	^{89}Y	30.8	^{66}Zn
18.300	^{80}Se	24.133	^{65}Cu	31.100	^{92}Mo
18.374	^{86}Sr	24.200	^{76}Ge	31.13	^{61}Ni
18.764	^{130}Te	24.220	^{130}Te	31.200	^{78}Se
18.82	^{68}Zn	24.3	^{66}Zn	31.20	^{205}Tl
18.9	^{43}Ca	24.46	^{59}Co	31.800	^{94}Zr
19.080	^{72}Ge	24.560	^{89}Y	31.9	^{49}Ti
19.100	^{78}Se	24.820	^{120}Sn	32.33	^{47}Ti
19.365	^{142}Nd	24.926	^{41}K	32.40	^{45}Sc
19.420	^{128}Te	25.100	^{74}Ge	32.500	^{138}Ba
19.450	^{74}Ge	25.100	^{94}Zr	32.70	^{61}Ni
19.56	^{66}Zn	25.48	^{206}Pb	32.860	^{120}Sn
19.750	^{94}Zr	25.519	^{39}K	33.000	^{78}Se
19.80	^{206}Pb	25.618	^{63}Cu	33.200	^{72}Ge
19.895	^{65}Cu	25.800	^{92}Mo	33.28	^{209}Bi

E_{Res}
(keV)

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
33.400	^{63}Cu	48.7	^{46}Ti	80	^{25}Mg
33.800	^{94}Zr	48.700	^{76}Ge	81.000	^{138}Ba
33.81	^{64}Ni	49.10	^{19}F	82	^{44}Ca
34.1	^{50}V	50.19	^{52}Cr	83.0	^{24}Mg
34.300	^{92}Zr	51.16	^{45}Sc	83.329	^{41}K
34.500	^{96}Zr	51.27	^{44}Ca	83.6	^{56}Fe
34.700	^{90}Zr	51.8	^{48}Ti	83.8	^{206}Pb
34.70	^{27}Al	52.1	^{54}Fe	84.4	^{55}Mn
36.100	^{70}Ge	53.15	^{23}Na	87.2	^{53}Cr
36.100	^{96}Zr	53.4	^{204}Pb	87.3	^{51}V
36.200	^{63}Cu	53.500	^{138}Ba	87.568	^{39}K
36.40	^{206}Pb	54.200	^{96}Zr	88.35	^{59}Co
36.5	^{43}Ca	54.220	^{120}Sn	88.5	^{27}Al
36.500	^{138}Ba	54.410	^{120}Sn	90.35	^{207}Pb
36.8	^{48}Ti	54.7	^{37}Cl	90.40	^{19}K
37.0	^{50}V	55.15	^{37}Cl	92.78	^{59}Co
37.3	^{50}Cr	55.5	^{50}Ti	93.00	^{137}Cl
38.4	^{49}Ti	55.6	^{28}Si	93.15	^{207}Pb
38.4	^{204}Pb	55.81	^{57}Fe	93.7	^{57}Fe
38.400	^{70}Ge	57.56	^{47}Ti	94.7	^{62}Ni
38.570	^{120}Sn	57.868	^{39}K	94.75	^{50}Cr
38.587	^{41}K	58.300	^{96}Zr	95.50	^{209}Bi
38.900	^{96}Zr	58.4	^{206}Pb	96.23	^{52}Cr
39.0	^{46}Ti	59.000	^{90}Zr	96.582	^{39}K
39.200	^{92}Zr	61.0	^{57}Fe	96.6	^{49}Ti
39.500	^{72}Ge	61.04	^{74}Ge	97.0	^{19}F
39.900	^{80}Se	63.0	^{58}Ni	97.5	^{60}Ni
40.000	^{94}Zr	63.5	^{46}Ti	98.30	^{59}Co
40.0	^{42}Ca	63.5	^{51}V	98.75	^{207}Pb
40.100	^{90}Zr	64.1	^{55}Mn	99.096	^{19}K
40.37	^{47}Ti	65.7	^{53}Cr	99.80	^{45}Sc
40.500	^{78}Se	65.87	^{61}Ni	100.0	^{46}Ti
40.700	^{96}Zr	65.94	^{45}Sc	100.827	^{41}K
41.0	^{57}Fe	66.20	^{206}Pb	101.2	^{44}Ca
41.600	^{94}Zr	66.358	^{17}Cl	102.25	^{207}Pb
41.600	^{90}Zr	68.000	^{88}Sr	102.7	^{209}Bi
41.64	^{207}Pb	68.000	^{90}Zr	102.9	^{32}S
42.08	^{47}Ti	68.6	^{51}V	103.33	^{35}Cl
42.23	^{47}Ti	68.77	^{61}Ni	104.242	^{19}K
42.400	^{90}Zr	68.818	^{39}K	105	^{25}Mg
42.565	^{39}K	68.84	^{209}Bi	105.65	^{62}Ni
42.800	^{74}Ge	70.000	^{138}Ba	106.4	^{49}Ti
43.10	^{65}Cu	70.11	^{45}Sc	108.615	^{39}K
44.100	^{90}Zr	71.8	^{54}Fe	109.6	^{57}Fe
44.580	^{120}Sn	74.0	^{56}Fe	110.9	^{55}Mn
44.700	^{92}Zr	75.384	^{41}K	112.30	^{207}Pb
45.32	^{209}Bi	76.500	^{138}Ba	113.30	^{35}Cl
45.800	^{96}Zr	77.2	^{57}Fe	114.00	^{138}Ba
46.40	^{47}Ti	77.30	^{40}Ar	115.50	^{207}Pb
46.61	^{37}Cl	78.540	^{19}K	115.70	^{40}Ar
47.000	^{92}Zr	79.759	^{41}K	116.0	^{51}V
47.6	^{206}Pb	79.80	^{45}Sc		

E_{Res}
(keV)

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
116.031	$^{19}\text{K}^{41}$	172.8	$^{18}\text{Ar}^{40}$	270	$^9\text{F}^{19}$
117.5	$^{23}\text{V}^{51}$	173.0	$^{26}\text{Fe}^{54}$	270	$^{22}\text{Ti}^{48}$
118.6	$^{22}\text{Ti}^{48}$	173.5	$^9\text{F}^{19}$	270.0	$^{28}\text{Ni}^{58}$
119.8	$^{13}\text{Al}^{27}$	175.0	$^{20}\text{Ca}^{42}$	272.5	$^{16}\text{S}^{32}$
120.1	$^{24}\text{Cr}^{54}$	175.0	$^{20}\text{Ca}^{44}$	273.0	$^{26}\text{Fe}^{56}$
120.944	$^{19}\text{K}^{41}$	177.791	$^{19}\text{K}^{39}$	278.5	$^{20}\text{Ca}^{42}$
121.00	$^{56}\text{Ba}^{138}$	179.0	$^{22}\text{Ti}^{46}$	279.5	$^{24}\text{Cr}^{54}$
121.38	$^{24}\text{Cr}^{52}$	179	$^{17}\text{Cl}^{37}$	280.5	$^{28}\text{Ni}^{62}$
123.6	$^{24}\text{Cr}^{53}$	179.1	$^{24}\text{Cr}^{54}$	282.5	$^{24}\text{Cr}^{54}$
124.2	$^{20}\text{Ca}^{42}$	180	$^{17}\text{Cl}^{37}$	288.7	$^{16}\text{S}^{32}$
126.00	$^{56}\text{Ba}^{138}$	182.82	$^{17}\text{Cl}^{35}$	291.5	$^{22}\text{Ti}^{46}$
127.0	$^{25}\text{Mn}^{55}$	185.0	$^{22}\text{Ti}^{46}$	295.00	$^{38}\text{Sr}^{88}$
127.66	$^{17}\text{Cl}^{37}$	185.21	$^{24}\text{Cr}^{50}$	300	$^{12}\text{Mg}^{26}$
128.2	$^{82}\text{Pb}^{207}$	185.6	$^{22}\text{Ti}^{50}$	305.5	$^{22}\text{Ti}^{46}$
128.5	$^{20}\text{Ca}^{42}$	186.6	$^{28}\text{Ni}^{60}$	305.5	$^{26}\text{Fe}^{54}$
129.32	$^{28}\text{Ni}^{64}$	187.7	$^{22}\text{Ti}^{49}$	307.0	$^{22}\text{Ti}^{50}$
129.5	$^{26}\text{Fe}^{57}$	188.0	$^{26}\text{Fe}^{56}$	315.0	$^{26}\text{Fe}^{56}$
131.87	$^{20}\text{Ca}^{40}$	188.0	$^{14}\text{Si}^{28}$	317.0	$^{26}\text{Fe}^{54}$
133.74	$^{17}\text{Cl}^{37}$	188.07	$^{17}\text{Cl}^{35}$	317.6	$^{16}\text{S}^{34}$
134.5	$^{23}\text{V}^{51}$	188.5	$^{26}\text{Fe}^{54}$	319	$^{10}\text{Ne}^{22}$
134.5	$^{26}\text{Fe}^{57}$	190.0	$^{22}\text{Ti}^{48}$	321.5	$^{20}\text{Ca}^{44}$
134.95	$^{17}\text{Cl}^{37}$	190.32	$^{17}\text{Cl}^{35}$	325.0	$^{24}\text{Cr}^{54}$
135.0	$^{24}\text{Cr}^{53}$	193.0	$^{28}\text{Ni}^{58}$	326.3	$^{28}\text{Ni}^{60}$
135.50	$^{56}\text{Ba}^{138}$	193	$^{17}\text{Cl}^{37}$	327.0	$^{28}\text{Ni}^{62}$
136.22	$^{17}\text{Cl}^{37}$	198.0	$^{28}\text{Ni}^{60}$	327.5	$^{20}\text{Ca}^{40}$
136.20	$^{83}\text{B}^{209}$	198.780	$^{19}\text{K}^{39}$	328.00	$^{38}\text{Sr}^{88}$
139.71	$^{24}\text{Cr}^{52}$	199.0	$^{82}\text{Pb}^{206}$	328.6	$^{24}\text{Cr}^{50}$
139.9	$^{26}\text{Fe}^{56}$	200	$^{17}\text{Cl}^{35}$	330	$^{24}\text{Cr}^{54}$
140.5	$^{28}\text{Ni}^{58}$	202	$^{17}\text{Cl}^{37}$	331.1	$^{24}\text{Cr}^{52}$
140.55	$^{17}\text{Cl}^{37}$	202.2	$^{16}\text{S}^{32}$	339.5	$^{28}\text{Ni}^{60}$
141.3	$^{24}\text{Cr}^{52}$	204.8	$^{13}\text{Al}^{27}$	340.00	$^{38}\text{Sr}^{88}$
142.89	$^{17}\text{Cl}^{35}$	207.0	$^{28}\text{Ni}^{58}$	340.5	$^{22}\text{Ti}^{46}$
145	$^{17}\text{Cl}^{37}$	208.1	$^{13}\text{Al}^{27}$	341	$^{22}\text{Ti}^{48}$
145.0	$^{13}\text{Al}^{27}$	213.2	$^{20}\text{Ca}^{42}$	344.2	$^{28}\text{Ni}^{62}$
146.200	$^{19}\text{K}^{41}$	217.5	$^{20}\text{Ca}^{40}$	352	$^{82}\text{Pb}^{208}$
147.743	$^{19}\text{K}^{41}$	220.0	$^{18}\text{Ar}^{40}$	357.2	$^{16}\text{S}^{34}$
148.995	$^{19}\text{K}^{41}$	221.0	$^{26}\text{Fe}^{56}$	360.5	$^{26}\text{Fe}^{56}$
149.63	$^{17}\text{Cl}^{37}$	221.6	$^{24}\text{Cr}^{53}$	363.5	$^{24}\text{Cr}^{52}$
151.2	$^{22}\text{Ti}^{49}$	229.5	$^{28}\text{Ni}^{62}$	370.0	$^{24}\text{Cr}^{50}$
152.2	$^{22}\text{Ti}^{49}$	231.0	$^{28}\text{Ni}^{58}$	370.0	$^{20}\text{Ca}^{44}$
154.165	$^{19}\text{K}^{39}$	231.95	$^{26}\text{Ni}^{64}$	370	$^5\text{B}^{10}$
154.5	$^{22}\text{Ti}^{48}$	238.5	$^{20}\text{Ca}^{42}$	371.3	$^{18}\text{Ar}^{40}$
155.0	$^{28}\text{Ni}^{64}$	244.5	$^{20}\text{Ca}^{40}$	375.5	$^{28}\text{Ni}^{60}$
158	$^{15}\text{P}^{31}$	247.0	$^{20}\text{Ca}^{44}$	380.3	$^{16}\text{S}^{32}$
159.0	$^{13}\text{Al}^{27}$	247.5	$^{24}\text{Cr}^{54}$	382.0	$^{26}\text{Fe}^{56}$
159.5	$^{28}\text{Ni}^{58}$	249.0	$^{22}\text{Ti}^{48}$	387	$^9\text{F}^{19}$
162.440	$^{19}\text{K}^{39}$	252	$^3\text{Li}^{6}$	387.00	$^{38}\text{Sr}^{88}$
165.35	$^{17}\text{Cl}^{37}$	255.1	$^{18}\text{Ar}^{40}$	388.5	$^{28}\text{Ni}^{62}$
169.38	$^{20}\text{Ca}^{40}$	257.1	$^{82}\text{Pb}^{207}$	389.0	$^{28}\text{Ni}^{64}$
169.8	$^{24}\text{Cr}^{54}$	257.8	$^{28}\text{Ni}^{60}$	393.5	$^{24}\text{Cr}^{54}$
170.3	$^5\text{B}^{10}$	263	$^{12}\text{Mg}^{24}$	393.8	$^{11}\text{Na}^{23}$
172.3	$^{22}\text{Ti}^{49}$	269.7	$^{28}\text{Ni}^{64}$	396.6	$^{16}\text{S}^{34}$

E_{Res}
(keV)

E_0 (keV)	Isotope	E_0 (keV)	Isotope	E_0 (keV)	Isotope
401.0	$^{52}_{24}\text{Cr}$	525	$^{208}_{82}\text{Pb}$	878.7	$^{40}_{20}\text{Ca}$
403.00	$^{88}_{38}\text{Sr}$	530	$^{10}_{5}\text{B}$	911.2	$^{23}_{11}\text{Na}$
416	$^{54}_{26}\text{Fe}$	530.0	$^{52}_{24}\text{Cr}$	920.5	$^{32}_{16}\text{S}$
416.5	$^{50}_{24}\text{Cr}$	532.0	$^{42}_{20}\text{Ca}$	985.1	$^{23}_{11}\text{Na}$
420.8	$^{64}_{28}\text{Ni}$	536.5	$^{64}_{28}\text{Ni}$	997	$^{14}_{7}\text{N}$
426.5	$^{58}_{28}\text{Ni}$	536.50	$^{88}_{38}\text{Sr}$	1116	$^{14}_{7}\text{N}$
430	$^{24}_{12}\text{Mg}$	536.6	$^{23}_{11}\text{Na}$	1163.9	$^{28}_{14}\text{Si}$
431.0	$^{54}_{26}\text{Fe}$	569.3	$^{40}_{18}\text{Ar}$	1186.0	$^{22}_{14}\text{Si}$
433.0	$^{62}_{28}\text{Ni}$	569.50	$^{88}_{38}\text{Sr}$	1211	$^{14}_{7}\text{N}$
433.5	$^{50}_{24}\text{Cr}$	570.5	$^{42}_{20}\text{Ca}$	1252.0	$^{28}_{14}\text{Si}$
435.7	$^{34}_{16}\text{S}$	571.0	$^{58}_{28}\text{Ni}$	1351	$^{14}_{7}\text{N}$
443	$^{40}_{20}\text{Ca}$	583.5	$^{62}_{28}\text{Ni}$	1405	$^{14}_{7}\text{N}$
460.5	$^{52}_{24}\text{Cr}$	587.3	$^{32}_{16}\text{S}$	1598	$^{14}_{7}\text{N}$
467.5	$^{50}_{24}\text{Cr}$	589.50	$^{88}_{38}\text{Sr}$	1783	$^{14}_{7}\text{N}$
469.3	$^{40}_{18}\text{Ar}$	590.0	$^{40}_{20}\text{Ca}$	1830	$^{10}_{5}\text{B}$
470.8	$^{34}_{16}\text{S}$	596	$^{40}_{18}\text{Ar}$	1880	$^{10}_{5}\text{B}$
473	$^{20}_{10}\text{Ne}$	597.8	$^{23}_{11}\text{Na}$	2220	$^{14}_{7}\text{N}$
483.0	$^{64}_{28}\text{Ni}$	628	$^{40}_{18}\text{Ar}$	2351	$^{16}_{8}\text{O}$
483.0	$^{44}_{20}\text{Ca}$	644	$^{14}_{7}\text{N}$	2820	$^{10}_{5}\text{B}$
489.0	$^{54}_{26}\text{Fe}$	665	$^{24}_{12}\text{Mg}$	3500	$^{16}_{3}\text{Li}$
498.0	$^{60}_{28}\text{Ni}$	697.2	$^{23}_{11}\text{Na}$	3800	$^{14}_{7}\text{N}$
505	$^{26}_{12}\text{Mg}$	700.5	$^{32}_{16}\text{S}$	4040	$^{10}_{5}\text{B}$
506.0	$^{44}_{20}\text{Ca}$	726.6	$^{23}_{11}\text{Na}$	4047	$^{16}_{8}\text{O}$
513.5	$^{42}_{20}\text{Ca}$	771.5	$^{40}_{20}\text{Ca}$	4469	$^{16}_{8}\text{O}$
515	$^{208}_{82}\text{Pb}$	780.5	$^{23}_{11}\text{Na}$	4600	$^{16}_{3}\text{Li}$
521.50	$^{88}_{38}\text{Sr}$	850	$^{24}_{12}\text{Mg}$		
522	$^{22}_{10}\text{Ne}$	861.8	$^{40}_{20}\text{Ca}$		

The preceding table is a listing of strong resonances ordered by increasing energy. The ten strongest resonances, if they exist, were included for each isotope. The criterion chosen for defining these resonances is related to peak cross section (Γ_n divided by the resonance energy, E_0).

ADDITIONS AND CORRECTIONS

The relevant references can be found in the section on Recent References.

Page No.	Isotope	Comments
A/16	^{12}C	Second line of "note" should read . . . 13.28-14.46 MeV (neutron energies 13.28-14.46 MeV).
B/36	^{59}Co	Parameters of bound level should read $E_0 = -0.558$ keV, $J=3$, and $2g\Gamma_n^0 = 2.18$ eV for an assumed $\Gamma_\gamma = 0.48$ eV. $a_{\text{coh}} = 2.35 \pm 0.05$ fm
B/44	^{58}Ni	Delete the 600 keV resonance
B/51	^{64}Ni	Neutron separation energy should read $S_n = 6097.6 \pm 0.6$ keV.
B/62	Zn	$a_{\text{coh}} = 5.70 \pm 0.02$ fm
B/74	^{73}Ge	Comment of "spin is 4" should apply to the 0.102 and 0.224 keV resonances.
B/89	Br	$a_{\text{coh}} = 6.77 \pm 0.02$ fm
B/94	Kr	$a_{\text{coh}} = 7.96 \pm 0.15$ fm
B/102	Sr	$a_{\text{coh}} = 7.05 \pm 0.07$ fm
C/30	Ru	$a_{\text{coh}} = 7.21 \pm 0.07$ fm Unassigned resonance at 65.66 eV possibly belongs to ^{104}Ru .
C/31	^{99}Ru	The $2g\Gamma_n$ values of the 25.2 and 342.2 eV resonances should read 11.7 ± 1.0 and 37 ± 2 meV respectively.
C/32	^{101}Ru	Spin of the 52.13 eV resonance is $J=3$. $2g\Gamma_n$ value of the 66.82 eV resonance should read 36 ± 4 meV. Values under the $2g\Gamma_n$ and $2g\Gamma_n^0$ columns for resonances from 141.1 to 485.2 eV correspond to Γ_n and Γ_n^0 respectively.
C/33	^{102}Ru	$S_n = 6232.2 \pm 0.3$ keV
C/33	^{104}Rh	$S_n = 5910.1 \pm 0.7$ keV
C/35	^{103}Rh	$a_{\text{coh}} = 5.88 \pm 0.03$ fm
C/49	^{108}Pd	For the 2.96 eV resonance the values under the Γ_n and Γ_n^0 columns correspond to $g\Gamma_n$ and $g\Gamma_n^0$ respectively.

Page No.	Isotope	Comments
C/67	^{111}Cd	Spin of the 233.4 eV resonance should read $J=1$. Additional spin assignments are: $J=1$ for 102.93, 225.05, 275.56, 331.97, 355.99, 575.92, 790.43 eV resonances, and $J=0$ for 86.11, 311.38, and 389.02 eV resonances. For the 311.38 eV resonance, $\Gamma_\gamma=30\pm 10$ meV.
C/80	^{115}In	Additional spin assignments are: $J=5$ for 22.73, 39.60, 48.14, 83.28, 94.34, 132.81, 150.29, 168.08, 205.60, 224.03, 266.96, 354.13, 370.94, 402.35, 423.00 eV resonances and $J=4$ for the 12.1, 46.36, 63.00, 80.87, 125.89, 164.67, 177.92, 186.96, 288.88, 294.33, 319.49, 362.10, 411.56 eV resonances.
C/119	^{128}Te	For recent, more accurate radiative widths of ^{128}Te , see Browne and Berman.
C/123	^{153}I	$a_{\text{coh}}=5.25\pm 0.02$ fm
C/128	^{130}Te	For recent, more accurate radiative widths of ^{130}Te , see Browne and Berman.
C/132	Xe	$a_{\text{coh}}=4.76\pm 0.07$ fm
C/135	^{129}Xe	$S_0=1.0\pm 0.2$
C/140	^{135}Xe	$I^\pi=3/2^-$
C/141	Xe	Add to thermal cross section references Crouch et al., <i>Phys. Rev.</i> 102 , 1321 (56).
C/142	^{131}Cs	Add $\sigma_\gamma(^{131}\text{Cs})=250\pm 40$ b
C/142	^{133}Cs	$a_{\text{coh}}=5.42\pm 0.02$ fm
C/148	Ba	$a_{\text{coh}}=5.28\pm 0.03$ fm Delete $\sigma_p=4.3+1.0$ b
C/164	^{141}Pr	Delete $\sigma_p=3.0\pm 0.6$ b
C/180	^{146}Nd	$\sigma_\gamma=1.3\pm 0.1$ b $I_\gamma=2.59\pm 0.20$ b
C/181	^{148}Nd	$\sigma_\gamma=2.48\pm 0.14$ b $I_\gamma=13.8\pm 1.0$ b For 155.4 eV resonance $\Gamma_n=1850\pm 200$ meV and $\Gamma_n^0=166.4\pm 16.0$ meV respectively. To achieve consistency between measured and calculated resonance integrals, Γ_γ of the 155.4 eV resonance should be reduced.

Page No.	Isotope	Comments
D/1	^{147}Pm	$a_{\text{coh}} = 12.6 \pm 0.4 \text{ fm}$
D/4	^{147}Sm	Additional spin assignments are: $J=3$ for resonances at 151.7, 180.0, 191.3, (198.3), 221.8, 226.0, (229.0), 264.3, 271.8, 275.1 eV; and $J=4$ for resonances at 49.3, 99.5, 107.2, 140.5, 143.6, 161.0, 193.5, 206.0, 240.9, 248.3, (257.5), (264.3), 284.1 eV.
D/8	^{149}Sm	Additional spin assignments are: $J=3$ for resonances at 87.7, 92.1, 96.3, 101.6, 107.0, 111.2, 117.0, 119.4, 157.5, (158.7), 168.3, 173.5, 179.9, 185.4, 197.4, 203.7 eV; and $J=4$ for resonances at (24.6), 76.9, 83.8, 90.5, 95.6, 98.1, 99.5, 115.3, (121.7), 125.4, 129.9, 134.3, 144.2, 146.9, (149.5), 154.7, 177.8, (188.0), 192.9 eV.
D/25	^{154}Gd	Chemical symbol at top right-hand side should read $^{154}_{64}\text{Gd}$ instead of $^{152}_{64}\text{Gd}$.
D/30	^{157}Gd	Additional spin assignments are: $J=1$ for resonances at 16.24, 23.33, 40.17, (138.7), 191.4 eV; and $J=2$ for resonances at 21.65, 82.30, 107.7, 110.5, 115.4, 156.8, 195.6 eV.
D/38	^{159}Tb	For the 77.5 eV resonance $2g\Gamma_n^0$ value should read $0.83 \pm 0.08 \text{ mV}$.
D/68	^{168}Er	Delete $a_{\text{coh}} = 10.9 \pm 0.5 \text{ fm}$
D/74	^{170}Er	In note, 0.79 eV should read 0.079 eV. To achieve consistency with the measured absorption resonance integral the average radiative width of ^{170}Er should be about half of 0.079 eV.
D/77	^{169}Tm	$R' = 8.5 \pm 0.5 \text{ fm}$. For additional resonance parameters in energy range 3.9 - 1941 eV, see Tellier '72.
D/148		Half-life of $^{191}\text{Os}^{\text{m}}$ should read 13.0 hr.
D/163	^{198}Au	$\sigma_{\gamma} = 25100 \pm 370 \text{ b}$
E/95	^{244}Pu	(D) should read $24 \pm 5 \text{ eV}$.

Recent References

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
F ¹⁹	diffraction	JCP, 59, 453(73)	Peterson
Na ²²	activation	NYO-3417-19, 2(72)	Fischman
Mn ⁵⁴	activation	NYO-3417-19, 3(72)	Fischman
Co ⁵⁷	activation	NYO-3417-19, 2(72)	Fischman
Co ⁵⁹	Christiansen filter	PRIVATE COMM.(73)	Koester
Zn	diffraction	ACR/A, 29, 49(73)	Cooper
Ge	Pendellosung	ZN/A, 28, 657(73)	Shull
Br	Christiansen filter	ZN/A, 27, 901(72)	Koester
Sr	Christiansen filter	PRIVATE COMM.(73)	Koester
Ru	Christiansen filter	PRIVATE COMM.(73)	Koester
Rh ¹⁰³	Christiansen filter	PRIVATE COMM.(73)	Koester
Cd ¹¹⁶	isomeric ratio	JIN-35, 371(73)	Tang
Sb	activation	DA, 32B, 3245(71)	Elgart
Te ^{127m}	activation	NYO-3417-19, 2(72)	Fischman
I	Christiansen filter	ZN/A, 27, 901(72)	Koester
Xe	diffraction	JCP, 59, 453(73)	Peterson
Xe ¹³⁵	depletion	JNE, 27, 409(73)	Santry
Ba	Christiansen filter	PRIVATE COMM.(73)	Koester
Nd ¹⁴⁶	activation	PRIVATE COMM.(68)	Movatt
Nd ^{146, 148, 150}	activation	RCA-17, 191(72)	Kim
Pm ¹⁴⁷	diffraction	PRIVATE COMM.(72)	Koehler
Eu, Eu ^{151, 153}	σ_c	71KIEV, 2, 239(71)	Ver'ebny
Dy	Christiansen filter	PRIVATE COMM.(73)	Koester
Ho ¹⁶⁵	diffraction	JPR, 34, 423(73)	Herpin
Hf ¹⁸⁰	σ_a	NP/A, 205, 614(73)	Alam
Cs	Christiansen filter	ZN/A, 27, 901(72)	Koester
Cs ¹³¹	activation	RAK, 14, 866(72)	Malinin
Cs ¹³³	isomeric ratio	TID-22165(65)	Simons
Au ¹⁹⁸	activation	NAP, 9, 662(70)	Serment
Au ¹⁹⁸	activation	JIN-31, 1229(69)	Cabell
Tl	Christiansen filter	ZN/A, 27, 901(72)	Koester
Tl ²⁰³	σ_a	NP/A, 205, 614(73)	Alam
Pb ²⁰⁸	σ_a	NP/A, 205, 614(73)	Alam
Bi ²⁰⁹	σ_a	NP/A, 205, 614(73)	Alam

Recent References

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Fe ⁵⁴	σ_t	7813-98820	ORNL-4844(4)(73)	Good
Fe ⁵⁴	σ_t	7.67-245.7	KFK-1516(72)	Beer
Fe ⁵⁷	σ_t	1628-118832	ORNL-4844,47(73)	Good
Nb ⁹³	σ_γ (spectra)	35.8-94.3	PR/C,8,336(73)	Chrien
Mo ⁹²	σ_γ (spectra)	300-23900	PR/C,8,297(73)	Hasson
Ru, Ru ⁹⁹	σ_t	10.0-1453	AKE,19,111(72)	Priesmeyer
Ru ¹⁰⁰		228.5	AKE,19,111(72)	Priesmeyer
Ru ¹⁰¹		15.7-666	AKE,19,111(72)	Priesmeyer
Ru ¹⁰²		165-1291	AKE,19,111(72)	Priesmeyer
Ru ¹⁰⁴		224.6-1050	AKE,19,111(72)	Priesmeyer
Cd ¹¹¹	multiplicity	27.5-390.1	JINR-P3-6948(73)	Karzhavina
Cd ¹¹³	multiplicity	18.3-430.8	JINR-P3-6948(73)	Karzhavina
Cd ¹⁵⁷	multiplicity	16.17-339	JINR-P3-6948(73)	Karzhavina
In ¹¹⁵	σ_γ (spectra)	1.45-422.9	72BUDAPEST,74(72)	Stefanon
Te ¹²⁸	σ_γ	350-7071	UCRL-74840(73)	Browne
Te ¹³⁰	σ_γ	1143-7016	UCRL-74840(73)	Browne
Sm ¹⁴⁷	multiplicity	3.4-283.3	72BUDAPEST,20(72)	Karzhavina
Sm ¹⁴⁹	multiplicity	4.98-203.7	72BUDAPEST,20(72)	Karzhavina
Dy ¹⁶¹	multiplicity	7.72-65.9	JINR-P3-6948(73)	Karzhavina
Dy ¹⁶³	multiplicity	16.2-65.9	JINR-P3-6948(73)	Karzhavina
Tm ¹⁶⁹	σ_t	3.92-1941	CEA-N-1563(72)	Tellier
Yb ¹⁶⁸	σ_t	0.66-289	71KIEV,1,181(71)	Vertebny
Os ¹⁸⁶	σ_t	22.37-274	71KIEV,1,181(71)	Vertebny
Os ¹⁸⁷	σ_t	9.46-386	71KIEV,1,181(71)	Vertebny
Os ¹⁸⁸	σ_t	38.4-332	71KIEV,1,181(71)	Vertebny
Os ¹⁸⁹	σ_t	6.75-103	71KIEV,1,181(71)	Vertebny
Os ¹⁹⁰	σ_t	11.14-563	71KIEV,1,181(71)	Vertebny
Os ¹⁹²	σ_t	20.33-717	71KIEV,1,181(71)	Vertebny
Ti ²⁰³	σ_t	37.9	NP/A,193,643(72)	Thomas
Ti ²⁰⁵	σ_t	44.6	NP/A,193,643(72)	Thomas

REFERENCE CODE MNEMONICS

- + following a reference indicates the reference has been supplemented by private communication.
- indicates quoted reference cited other authors.

AAEC/E-	Australian AEC Report Series		
AAEC/TM-	Australian AEC Technical Memos		
AC	(Anal.Chem.) Analytical Chemistry		
ACJ	(Acta Chem.Scand.) Acta Chemica Scandinavica		
ACR	(Acta Crystallogr.) Acta Crystallographica		
	Continued 1970 In Parts A and B		
ACR/A	(Acta Crystallogr.,Part A) Acta Crystallographica, Part A, Started With Vol.26 In 1970		
ACR/B	(Acta Crystallogr.,Part B) Acta Crystallographica, Part B, Started With Vol.26 In 1970		
ACRH	Argonne Cancer Research Hospital,Argonne Ill.		
ACS	(J.Amer.Chem.Soc.) Journal of the American Chemical Society		
ACT.EL	(Actinide Elements) the Actinide Elements.		
	National Nuclear Energy Series, Div IV, Vol 1		
	Mcgraw 1954. Editors G.T. Seaborg and J.J. Katz		
AD-	Dept.of Defence Reports		
ADP	(Ann.Phys) Annalen Der Physik		
AE	(Atomnaja Energija)		
	Translations in English see SJA, in French see EAF, Selected Articles and Abstracts From Vol.1 (1956) To Vol.20 (1966) translated Into English See JNE Vol.3 (1956) To Vol.21 (1967).		
AE-	Aktiebolaget Atomenergi Repts.Stockholm/Studsvil		
AEC-TR-	Div.of Tech.Inf.USAEC Translations		
AECO-	DTIE Rept.Series. Succeeded MDDC-, Extinct 1960		
AECU-	Atomic Energy of Canada Ltd. Reports		
AECU-	USAEC Reports, Div.Tech.Inf., Extinct		
AEEW-R-	AEEW-Winfrith Reports		
AERE-M-	AERE-Harwell Reports		
AERE-N/R-	AERE-Harwell Reports	AERE-R-	AERE-Harwell Reports
AERE-NP/M-	AERE-Harwell Reports	AERE-R/M-	AERE-Harwell Reports
AERE-NP/R-	AERE-Harwell Reports	AERE-R/R-	AERE-Harwell Reports
AERE-PR/NP-	AERE-Harwell Reports	AERE-RP/R-	AERE-Harwell Reports
CAGP-	AECL-Reports. Use AECL- Numbers, Extinct 1970 Replaced By Physica Scripta		
AFSUC-TDR-	Air Force Spec.Weap.Centre Kirtland Reports		
AKE	(Atomkernenergie)		
AMA	Archiv Mat. Astron. Fysik		
ANCR-	Aerojet Nucl.Corp. Reports		
ANL-	Argonne National Laboratory Report Series		
ANS	(Trans.Amer.Nucl.Soc.) Transactions of the American Nuclear Society		
AP	(Ann.Phys.(N. York)) Annals of Physics (New York)		
APA	(Acta Phys.Austr.) Acta Physica Austriaca		
APP	(Acta Phys.Pol.) Acta Physica Polonica		
	Until Vol.36 (1969).		
ARI	(Int.J.Appl.Radiat.Isotop.) International Journal of Applied Radiation and Isotopes		
ARN	(Annu.Rev.Nucl.Sci.) Annual Review of Nuclear Science		
AUJ	(Aust.J.Phys.) Australian Journal of Physics		
BAP	(Bull.Amer.Phys.Soc.) Bulletin of the American Physical Society		
BAS	(Bull.Acad.Sci.USSR,Phys.Ser.) Bulletin of the Academy of Sciences of the USSR,Physical Series, English translation of IZV.		
BIS	(Bull.Inform.Scient.Tech.) Bulletin D Informations Scientifiques Et Techniques Commissariat A L Energie Atomique		

BMI- Battelle Memorial Inst. Reports
 BNL- Brookhaven National Laboratory Report Series
 BOS (Trans.Bose Res.Inst.,Calcutta) Transactions of The
 BTI Bulletin of Tokyo Institute of Technology,Japan
 Bose Research Institute,Calcutta
 CC- Chicago University Metallurgical Labs
 CEA- Centre D Etudes Nucleaires Report Series
 CEA-N- Centre D Etudes Nucleaires, Saclay, Note
 Internal Report With Limited Distribution
 CEA-R- Centre D Etudes Nucleaires,Saclay,Reports
 CF- Chicago University Metallurgical Labs
 CHP (Chin.J.Phys.(Taipei)) Chinese Journal of Physics,
 Taipei.
 CJC (Can.J.Chem.) Canadian Journal of Chemistry
 CJP (Can.J.Phys.) Canadian Journal of Physics
 Formerly, Can.J.Res.,Sect.A.
 CJR/A (Can.J.Res.) Canadian Journal of Research (Part A)
 CL-RWS- Clinton Laboratory Report,Tennessee
 CNAEM- Cernmece Nucl Res and Training Centre Reports
 CNI Centro Nazionale Per Le Ricerche Nucleari Di Ispra,Ita
 COO- Chicago Operations Office,AEC,Contract Reports
 CP- Chicago University Metallurgical Labs
 Some Reports From Argonne National Lab
 CR (C.R.Acad.Sci.) Comptes Rendus Hebdomadaires Des
 Seances De L Academie Des Sciences.
 CRB (C.R.Acad.Bulg.Sci.) Comptes Rendus De L Academie
 Bulgare Des Sciences.
 CRC- National Research Council Reports, Extinct
 CRAP- Chalk River Reports
 CS- Chicago University Metallurgical Labs
 CU-PNPL- Columbia University Reports-Pegram Nuc.Phys.Lab.
 CU- Columbia University Reports
 CUD- Columbia University, New York
 CZJ/A (Cesk.Cas.Fys.= Czech.J.Phys.,Part A)Ceskoslovensky
 Casopys Pro Fysiku,(In Czech)
 CZJ/B (Czech.J.Phys.,Part B) International Issue.
 Note=part B is not a translation of Part A, but
 has different articles.
 DA/B (Diss.Abstr.B) Dissertation Abstracts B (Sciences)
 From No.27 1966/67. From Vol.30(July 1969) the
 Journal Is Called Dissertation Abstracts
 International.B
 DOK (Dokl.Akad.Nauk SSSR) Doklady Akademii Nauk SSSR
 See SPD For English Translation.
 DP- Du Pont,Savannah River Reports
 EIR- Eidg.Inst.Reaktorforsch.Wuerenlingen Reports
 EN (Energ.Nucl.(Milan)) Energia Nucleare (Milan)
 EON (Euronuclear) Euronuclear (Extinct May 1966)
 EUR- Euratom Reports
 GA- General Atomic Div.Reports
 HPA (Helv.Phys.Acta) Helvetica Physica Acta
 HW- Hanford Reports, Nov BNWL- Extinct 1965
 ICD- Bull.Centr Po Jadernym Dannym, Obninsk
 Last Issue ICD-6 (1970) Continued as YK-/ (1971)
 IDO- Philips Petroleum Co.,Idaho Falls,Idaho,Reports
 IJP (Indian J.Phys.) Indian Journal of Physics
 IN- Idaho Nuclear Corp.,Reports.
 IZV (Izv.Mkad.Nauk SSSR,Ser.Fiz.) Izvestiya Akademii
 Nauk Sssr,Seriya Fizicheskaya
 See Bas For English Translation
 JAERI- Atomic Energy Res.Inst.Tokyo, Reports
 JAP (J.Appl.Phys.) Journal of Applied Physics
 JCP (J.Chem.Phys.) Journal of Chemical Physics
 JEA Electro Chemical,U.S.

JET (Sov.Phys.JETP) Soviet Physics-JETP
 English translation of ZET USSR
 JIN (J.Inorg.Nucl.Chem.) Journal of Inorganic and Nuclear Chemistry
 JINR- Joint Inst.For Nucl.Res.,Dubna,Reports
 Note= the 4-Digits Report-Number Is Unique, the Symbols Between JINR and Number Can Be Omitted They Mean P=Russian, E=English, D=Engl+Russian.
 JINR-P- Joint Inst.For Nucl.Res.,Dubna,Report-Series P
 JINP-P15- Joint Inst.For Nucl.Res.,Dubna,Report-Series P15
 JINR-P3- Joint Inst.For Nucl.Res.,Dubna,Report-Series P3
 JMS Journal of Mass Spectroscopy and Ion Physics,U.S.
 JNE (J.Nucl.Energy) Journal of Nuclear Energy.
 Until Vol.9(59) and From Vol.21(67)
 Note= JNE Part C Started With Vol.(59) Under the Name Plasma Physics Which,From Vol.9(67) Became An Independent Journal.
 JNE/A (Reactor Science = J.Nucl.Energy,Part A)
 From Vol.10(1959) To Vol.13(1961)
 JP/C (J.of Physics,Pt.C= Solid State Physics)
 JPJ (J.Phys.Soc.Jap.) Journal of the Physical Society of Japan
 JPR (J.Phys.(Paris)) Journal De Physique (Paris)
 Formerly J.Phys.Rad (Vol 1-23)
 KAPL- Knolls Atomic Power Lab.Report Series
 KE (Kernenergie) Kernenergie
 KFI (KFKI(Kozp.Fiz.Kut.Intez.)Kozlem.) KFKI(Kozponti Fizikai Kutato Intezet) Kozlemenyek
 KFK- Kernforschungszentrum Karlsruhe Report Series
 KRI (Kristallografiya) Kristallografiya
 (For English Translation See SPC)
 LA- Los Alamos Scientific Lab.Report Series
 LAMS- Los Alamos Reports, Extinct Sept. 1954
 MC- Nat L Res.Council of Canada, Montreal Labs
 MET (Metrologia) Metrologia
 MLM- Mound Lab. Miamisburg, Reports
 MON-P- Monsanto Report,U.S.
 NAP (Nucl.Appl.) Nuclear Applications
 NAT (Nature(London)) Nature
 NB Noble Gas Compounds
 NC (Nuovo Cimento) Nuovo Cimento
 Until Vol.39 No.4 Oct(1965)
 NCS (Nuovo Cimento Suppl.) Nuovo Cimento,Supplemento
 NCSAC- Usaec Nucl.Cross-Sections Advisory Committee
 NEUTOF METH Neutron Time-Of-Flight Method,Euratom Brussels
 NEU DIFF Neutron Diffraction,U.K.
 NII Proceeding National Institute of Science,India
 NIM (Nucl.Instrum.Methods) Nuclear Instruments and Methods (Formerly Nucl.Inst.)
 NKA (Nukleonika) Nukleonika
 NP (Nucl.Phys.) Nuclear Physics.Until Vol.89,Dec(66).
 NP/A (Nucl.Phys.A) Nuclear Physics,Section A.
 From Vol.90,Jan(67).
 NROC- AERE-Harwell Report Series
 NS I.E.E.E. Translation-Nuclear Science,U.S.
 NSA (Nucl.Sci.Abstr.) Nuclear Science Abstract
 NSE (Nucl.Sci.Eng.) Nuclear Science and Engineering
 NST (Nucl.Sci.Technol.)Journal of Nuclear Science and Technology
 NUC (Nucleonics) Nucleonics
 NUK (Nukleonik) Nukleonik
 NWS (Naturwissenschaften) Naturwissenschaften
 NYO-72- New York Operations Office Reports. Series 72
 NYO-GEN72- New York Operations Office Reports

ORNL- Oak Ridge National Lab. Report Series
 ORNL-CF- Oak Ridge National Lab., Central File Memos
 ORNL-TM- Oak Ridge National Lab., Technical Memos
 PCH Journal of Physical Chemistry, U.S.
 PHY (Physica (Utrecht)) Physica
 PL (Phys. Lett.) Physics Letters. Until Vol. 23, Dec (66).
 PL/A (Phys. Lett. A) Physics Letters, Section A.
 From Vol. 24, Jan (67).
 PL/B (Phys. Lett. B) Physics Letters, Section B.
 From Vol. 24, Jan (67)
 PM (Phil. Mag.) Philosophical Magazine
 PR.NUC.EN. (Progress In Nucl. Energy)
 Progress In Nuclear Energy, Series 1, Physics and Maths
 Hughes, Sanders and Morowitz, 1958
 PPS (Proc. Phys. Soc. (London)) Proceedings of the
 Physical Society, London
 PPS/A (Proc. Phys. Soc. (London)) Proceedings of the
 Physical Society, London (Part A)
 PR (Phys. Rev.) Physical Review.
 Until Vol. 132 (63) and From Vol. 141 (66)
 PR/CE (Phys. Rev.) Physical Review.
 PR/CM (Phys. Rev.) Physical Review.
 PR-CMA (Phys. Rev.) Physical Review.
 PR-P- AECL-Reports. Use AECL- Numbers, Extinct
 PR/A (Phys. Rev., Part A) Physical Review, Part A
 Existing Vol. 133 Jan. 1964 - Vol. 140 Dec. 1965
 PR/B (Phys. Rev., Part B) Physical Review, Part B
 Existing Vol. 133 Jan. 1964 - Vol. 140 Dec. 1965
 PR/C (Phys. Rev., Part C) Physical Review, Part C, Nuclear
 Physics. - Started With Vol. 1 (1970)
 PRL (Phys. Rev. Lett.) Physical Review Letters
 PRS (Proc. Roy. Soc. (London)) Proceedings of the Royal
 Society, London
 PRS/A (Proc. Roy. Soc. (London)) Proceedings of the Royal
 Society, London (Part A)
 PS (Physica Scripta) Started 1970
 RANCHM.ST Radiochemical Studies. The Fission Products. McGraw-Hill, 1951
 RCA (Radiochim. Acta) Radiochimica Acta
 RCN Reactor Cent. Nederland, Petten, Report Series, Netherlands
 RMP (Rev. Mod. Phys.) Review of Modern Physics.
 RPI- Rensselaer Polytechnic Inst. Reports
 RRP (Rev. Roum. Phys.)
 Vol. 1 (1956) - Vol. 8 (1963) = Revue De Physique
 Vol. 9 (1964) Onwards = Revue Roumaine De Physique
 Vol. 6 (1961) Supplement is coded 61BUCHAR
 RSI (Rev. Sci. Instrum.) Review of Scientific Instruments
 SCI (Science) Science
 SCP (Sci. Pap. Inst. Phys. Chem. Res., Tokyo) Scientific
 Papers of the Institute of Physical and Chemical
 Research.
 SNP (Sov. J. Nucl. Phys.) Soviet Journal of Nuclear
 Physics (English Translation of YF)
 SPD (Sov. Phys.-Dokl.) Soviet Physics-Doklady (English
 Translation of Dokl)
 TID- Div. of Techn. Inf., USAEC Reports
 TNCC(UK)- Tripartite Nucl. Cross-Sectns. Comm. Repts. Extinct
 TRANS'.EL. (Transuranium Elements)
 the Transuranium Elements
 National Nuclear Energy Series, Div. IV, Vol. 14B 19
 UCRL- Lawrence Rad. Lab. (Both Berkeley and Livermore)
 UFZ (Ukr. Fiz. Zh.) Ukrain'skii Fizicheskii Zhurnal (See
 UPJ for English Translation)
 UJV- Ustav Jad. Vyzkumu (Inst Nucl Res), Reports
 WAPD-TM- Westinghouse Atomic Power Div. (Bettis) Reports
 YF (Yad. Fiz.) Yadernaya Fizika (See SNP for Eng. Trans.)

ZAP (Z.Angew.Phys.) Zeitschrift Fuer Angewandte Physik
 ZET (Zh.Eksp.Teor.Fiz.) Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki (For Eng.Trans.see JET)
 ZFK- Zentral Inst.Kernphysik Rossendorf, Reports
 ZFK-RN- Zentral Inst.Kernphysik Rossendorf, Reports
 ZK (Z.Kristallogr.,Kristallgeometrie,Kristallphys., Kristallchem.) Zeitschrift Fuer Kristallographie, Kristallgeometrie,Kristallphysik,Kristallchemie.
 ZMP (Z.Angew.Math.Phys.) Zeitschrift Fuer Angewandte Mathematik Und Physik
 ZN (Z.Naturforsch.) Zeitschrift Fuer Naturforschung Vol.1 (1946)
 ZN/A (Z.Naturforsch. A) Zeitschrift Fuer Naturforschung, Section A From Vol.2 (1947)
 ZP (Z.Phys.) Zeitschrift Fuer Physik
 55GENEVA (First Internat. At.En. Conf., Geneva 1955)
 First UN Conference on the Peaceful Uses of Atomic Energy. Geneva 8-20 Aug.1955.
 55MOSCOW (Peaceful Uses of At.En. Conf., Moscow 1955)
 Conference of the USSR Academy of Sciences On the Peaceful Uses of Atomic Energy. Moscow, USSR, July
 57COLUMBIA (Columbia Conference, New York, 1957)
 58GENEVA (Second Internat. At.En. Conf., Geneva 1958)
 Second UN Conference on the Peaceful Uses of Atomic Energy. Geneva, 1-13 Sep.1958.
 60KINGSTON (Nuclear Structure Conf., Kingston 1960)
 United Nations Conference On Nuclear Structure. Kingston, Canada, 29 Aug - 3 Sep 1960.
 60VIENNA (Pile Neutron Research Symp., Vienna 1960)
 IAEA Symposium On Pile Neutron Research In Physics IAEA, Vienna, 17-21 Oct 1960
 61BUCHAR (Research Reactors Conf., Bucuresti,1961)
 International Conference On Physics and Technique of Research Reactors
 Bucuresti, Romania, 10-17 Nov. 1961
 Proceedings Published As Supplement To Revue De Physique Vol.6 (1961)
 61OUBNA (Slow Neutron Physics Conf., Dubna 1961)
 Conference On Slow Neutron Physics.
 Dubna, USSR, 7-12 Dec 1961.
 61SACLAY (Time of Flight Methods Conf., Saclay 1961)
 EANDC Conference On Time of Flight Methods.
 Saclay, France, 24-27 Jul 1961.
 62WIEN (Light Water Lattices Panel, Vienna 1962)
 Panel On Light Water Lattices. Vienna, Austria. May-June 1962. Published by IAEA in Vienna Nov 1962.
 63ANL (Nucl.Physics With Reactor Neutrons Conf.,Argonne 1963)
 International Conference On Nuclear Physics With Reactor Neutrons. Argonne, 15-17 Oct 1963.
 Published as ANL-6797.
 63MANCHST (Nuclear Physics Conference, Manchester 1963)
 Conference On Low and Medium Energy Nuclear Physics Manchester,U.K., September 1963.
 64GENEVA (Third Internat. At.En. Conf., Geneva 1964)
 Third UN Conference on The Peaceful Uses of Atomic Energy. Geneva, 31 Aug - 9 Sep 1964.
 64PARIS (Nuclear Physics Congress, Paris 1964)
 Congres International De Physique Nucleaire. Paris, 2-8 Jul 1964.
 65ANTWERP (Nuclear Structure Conf., Antwerp 1965)
 International Conference On the Study of Nuclear Structure. Antwerp, Belgium, 19-23 Jul 1965.
 Proceedings Give For Some Papers Abstract Only.
 For full papers see EANDC-50.
 For technical minutes see EANDC-44.

- 65KRLSRH (Pulsed Neutron Symp., Karlsruhe 1965) 1, 14 May 1965.
IAEA Symposium on Pulsed Neutron Research, Karlsruhe.
Proceedings publ. by IAEA, Vienna, Aug. 1965.
- 65SALZBURG (Physics and Chemistry of Fission Conf., Salzburg 1965)
IAEA Conference on The Physics and Chemistry of Fission
Salzburg, Austria, 22-26 Mar 1965.
Proceedings publ. by IAEA, Vienna July 1965.
- 66BERKELEY (Radiation Measurements Conf., Berkeley 1966)
CEGB Conference On Radiation Measurements In Nuclear
Power, Berkeley, UK, 12-16 Sept 1966.
- 66PARIS (Nuclear Data For Reactors Conf., Paris 1966)
IAEA Conference On Nuclear Data For Reactors.
Paris, France, 17 - 21 Oct 1966.
Published by IAEA in Vienna 1967.
- 66WASH (Neutron Cross-Section Techn. Conf., Washington
Conference On Neutron Cross-Section and Technology.
Washington D.C., 22-24 March 1966.
Published as AEC Report Conf-660303.
- 67JUELICH (Neutron Physics At Reactors Conf., Juelich 1967)
Neutron Physics At Research Reactors.
Juelich, Germany, 25-28 April 1967.
- 68WASH (Nuclear Cross-Sections Techn. Conf., Washington 1968)
2nd Conference On Nuclear Cross-Sections and Technology
Washington D.C., 4-7 March 1968.
Published as NBS Special Publication 299
- 69MONTREAL (Nucl. Structure Conf., Montreal 1969)
International Conference On Nuclear Structure
Montreal, Canada, 1969
- 69STUDSVIK (Neutron Capture Gamma-Ray Spectroscopy, Studsvik, 1969)
International Symposium On Neutron Capture Gamma-Ray
Spectroscopy, Studsvik, Sweden, 11-15 Aug 1969.
Published by IAEA.
- 69VIENNA (Physics and Chemistry of Fission Symp., Vienna
Second IAEA Symposium On the Physics and Chemistry of
Fission, Vienna, 28 July - 1 Aug 1969
Proceedings published by IAEA.
- 70ANL (Neutron Standards Symp., Argonne 1970)
EANDC Symposium on Neutron Standards and Flux
Normalization, Argonne Nat'l Lab, 21-23 Oct 1970
Published by USAEC-DTIC in August 1971 as
AEC Symposium Series 23 (Conf-701002).
- 70HELSINKI (Nuclear Data For Reactors Conf., Helsinki 1970)
Second IAEA Conference on Nuclear Data For Reactors,
Helsinki, Finland, 15-19 June 1970.
- 71ALBANY (Radiation Voids Conf., Albany 1971)
International Conference On Radiation Induced Voids In
Metals, Albany, New York, USA, 9-11 June 1971.
Proceedings Published by USAEC in April 1972 as
AEC Symposium Series 26 (Conf-710601)
- 71CANT (Chemical Nucl. Data Conf., Canterbury 1971)
Conference on Chemical Nuclear Data.
Univ. of Kent at Canterbury, UK, 20 Sept. 1971
- 71KIEV (Neutron Physics Conf., Kiev 1971)
Conference on neutron-physics, Kiev, USSR, 21 May 1971
- 71KNOX (3rd Conf. Neutron Cross-Sections+tech., Knoxville 1971)
3rd Conference On Neutron Cross-Sections and Technology
University of Tennessee, Knoxville, 15-17 March
- 72BUO (Nucl. Structure Conf., Budapest 1972)
Conference On Nuclear Structure and Study With Neutrons
Budapest, Hungary, 31 July - 5 August 1972
- 73ASILOMAR International Conf. On Photonuclear Reactions
and Applications, 26-30 March 1973.
Asilomar Conf. Grounds, Pacific Grove, Calif. USA
- 73ROCH (3. Physics + Chemistry of fission symp., Rochester 1973)
3. IAEA symposium on the physics and chemistry of
fission, Rochester, NY, USA, 13 August 1973

Neutron Cross Section Data is collected, stored, and disseminated according to an International agreement involving 4 centers.
Requests for Neutron Data should be directed to the center responsible for your geographical area.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
C	σ_t (130 ev)	ZN/A,26,442(71)	Dilg
C	σ_t	PR/C,3,1886(71)	Houk
C	gravity ref.	PR/L,27,956(71)	Koester
C	diffraction	ACR/A,26,543(70)	Pryor
C	$\bar{\sigma}_s$	70HEL5INK1,1,651(70)	Vertebnyi
C	σ_t	BAP,12,989(67)	Houk
C	refractometry	ZP,198,187(67)	Koester
C	σ_t (1.44 ev)	NP,61,381(65)	Rayburn
C ¹²	σ_γ (spectra)	ANL-6797,236(63)	Jurney
C ¹³	σ_γ (spectra)	PRIVATE COMM.(63)	Motz
C	pulsed n	JNE,17,347(63)	Sagot
C	neutron lifetime	BNL-719,3,1034(62)	Starr
C ¹³	σ_γ (spectra)	ARN,11,259(61)	Bartholomew
C	reactivity	NSE,7,395(60)	Nichols
C	diffusion length	58GENEVA,12,695(58)	Hendrie
C	review	58GENEVA,16,8(58)	Hughes
C	pile osci.	AERE-R/R-2516(58)	Jovitt
C	pile osci.	PRIVATE COMM.(58)	Muehlhaue
C	neutron lifetime	PRIVATE COMM.(58)	Wirtz
C ¹³	σ_γ (spectra)	PR-P-36,37(57)	Bartholomew
C ^{12,13}	mass spectrometry	BNL-489,19(57)	Hennig
C	pile osci.	BNL-489,97(57)	Koechlin
C ¹³	mass spectrometry	PR,95,92(54)	Hennig
C,C ¹³	diffraction	PR,91,597(53)	Koehler
C	diffraction	PR,81,527(51)	Shull
C ^{12,13}		ANL-4410(50)	Hennig
C ¹⁴	activation	PR,79,893(50)	Yaffe
C,C ¹⁴	compilation	AECD-2274(48)	Way
C	reflection	PR,71,666(47)	Fermi
C	σ_t	PR,70,815(46)	Anderson
C	σ_t	PR,59,489(41)	Hanstein
C	σ_t	PR,60,155(41)	Whitaker
C	$\bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber
C	σ_t	PR,49,453(36)	Mitchell
C	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
C ¹²	(d,p)	6293-7758	PR/C,7,663(73)	Goss
C ¹³	σ_t	153	BAP,18,96(73)+	Schrack
C ¹²	polarization	1860-4200	PRIVATE COMM.(72)	Firk
C ¹³	σ_y	152	PR/C,3,1737(71)	Allen
C ^{12,13}	compilation		NP/A,152,1(70)	Ajzenberg-Selove
C,C ¹²	σ_t	2091-3035	NIM,78,300(70)	Knowlen
C,C ¹²	σ_t	2820	BAP,15,567(70)	Schwartz
C ¹²	σ_t	100-1500	NSE,41,351(70)	Meadows
C ¹²	$\bar{\sigma}_s$	2000-6000	KFK-1189(70)	Nebe
C ¹²	σ_t	0.07-1500	70HELSINKI,1,191(70)	Uttley
C	σ_t	4935-7759	NP/A,134,361(69)	Davis
C ¹²	σ_t	2000-12000	68WASH,2,743(68)+	Cierjacks
C ¹²	σ_t	700-4000	68WASH,2,771(68)	Schwartz
C ¹²	$\bar{\sigma}_s$	3600-4250	PR,143,745(66)	Lister
C ¹³	$\sigma(\alpha,n)$	4070-5100	PR/B,140,616(65)	Barnes
C ¹²	analysis	2084	NCS,1,386(63)	Pisent
C ¹²	$\bar{\sigma}_s$	2080	NC,28,600(63)	Pisent
C ¹²	σ_t	3-660	NP,47,137(63)	Seth
C ¹³	σ_t	153-2454	PR,122,534(61)	Cohn
C ¹²	σ_t	3500-12100	PR,123,209(61)	Fossan
C ¹²	$\bar{\sigma}_s$	2080	AP,12,135(61)	Lane
C ¹³	diffraction	9800	ARN,11,303(61)	Wilkinson
C ¹²	inelastic sc	5000-10000	NP,14,295(60)	Hall
Be ⁹	$\sigma(\alpha,n)$	8120-12040	PR,114,571(59)	Gibbons
C ¹³	σ_t	1750-2450	BAP,3,18(58)	Millard
C ¹²	σ_t	2080-3670	PR,109,891(58)	Mills
C ¹²	σ_t	0.014-10	PR,104,1054(56)	Brugger
C ¹³	$\sigma(\alpha,n)$	3200-5110	PR,107,1065(57)	Walton
C,C ¹²	$\bar{\sigma}_s$	2080-3600	HPA,27,512(54)	Huber
C ¹²	$\bar{\sigma}_s$	2400-3650	HPA,27,577(54)	Meier
C ¹²	$\bar{\sigma}_s$	2080	NC,10,1607(53)	Ricamo
C ¹²	σ_t	2080-2950	PR,84,69(51)	Bockelman

${}^7\text{N}$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_a &= 1.85 \pm 0.05 \text{ b} \\ \sigma_s &= 10.6 \pm 0.5 \text{ b} \\ \sigma_t &= 12.5 \pm 0.5 \text{ b} \\ a_{\text{coh}} &= 9.38 \pm 0.03 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_a = 0.90 \pm 0.05 \text{ b}$$

${}^{14}_7\text{N}$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 0.0750 \pm 0.0075 \text{ b} \\ \sigma_s &= 10.6 \pm 0.5 \text{ b} \\ \sigma_p &= 1.81 \pm 0.05 \text{ b} \\ a_{\text{coh}} &= 9.38 \pm 0.03 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma^c} = 0.90 \pm 0.05 \text{ b}$$

RESONANCE PARAMETERS

$I^a = 1^a$		$\chi^2/\text{dof} = 99.635$		$S_n = 10833.7 \pm 0.4 \text{ keV}$		
$E_0 \text{ (keV)}$	$\Gamma \text{ (keV)}$	$\Gamma_n \text{ (keV)}$	J	ℓ	$\Gamma_p \text{ (keV)}$	$\Gamma_a \text{ (keV)}$
-144 ± 1			3/2	0		
432 ± 5	3.5 ± 0.4		1/2	>0		
492.7 ± 0.7	7.8 ± 0.5	<3	1/2	1	6 ± 2	
644 ± 3	43 ± 5	34 ± 4	1/2	0	9 ± 3	
997 ± 3	46 ± 5	45 ± 5	3/2	0	.8 ± .3	
1116 ± 3	19 ± 3	19 ± 3	3/2	1	.20 ± .12	
1184 ± 2	<2	<2	1/2		<.1	
1211 ± 3	14 ± 2	14 ± 2	1/2	1	.1 ± .2	.26
1351 ± 3	20 ± 4	19 ± 4	5/2	2	.8 ± .2	.4 ± .1
1405 ± 3	55 ± 8	42 ± 4	3/2	1	11 ± 4	1.8 ± .6
1598 ± 3	22 ± 3	22 ± 3	5/2	1	.3 ± .1	<.1
1783 ± 4	40 ± 4	32 ± 5	5/2	2	.5 ± .2	7 ± 2
2230 ± 4	65 ± 5	39 ± 10	3/2	1	8 ± 2	18 ± 6
2470 ± 4	<3					
2523 ± 4	7 ± 2					
2710 ± 6	30 ± 10		3/2	1		
2749 ± 8	80 ± 20		5/2	2		
2958 ± 4	15 ± 4	11 ± 4	5/2	2	1.1 ± .4	3 ± 1
3095 ± 5	50 ± 10					
3213 ± 5	60 ± 5		3/2	*		
3510 ± 7	100					
3575 ± 7	30 ± 5		3/2	*		
3800	~2000	~1000			200	1000
4080 ± 10	40 ± 10					

¹⁴₇N

E ₀ (keV)	Γ (keV)	Γ _n (keV)	J	ℓ	Γ _p (keV)	Γ _α (keV)
4100 ± 10	~300					
4380	40					
4600						
5030						
^a 5060						
5600	100					
5940						
^a 5950						
6160	75					
6260	110					
6550	170					
6940						
7160						
7340	120					
7480	180					
7920	170					
8000	120					

^a Complex.

^a Even parity.

¹⁵₇N

THERMAL CROSS SECTIONS

$$\sigma_T = 0.024 \pm 0.008 \text{ mb}$$

$$a_{coh} = 6.5 \pm 0.2 \text{ fm}$$

RESONANCE PARAMETERS

I ^π = 1/2 ⁻				XAbn = 0.365				S _n = 2490.0 ± 2.2 keV			
E ₀ (keV)	Γ (keV)	J	ℓ	E ₀ (keV)	Γ (keV)	J	ℓ	E ₀ (keV)	Γ (keV)	J	ℓ
921 ± 2	20 ± 5	1	1	4126	804 ± 20	3	2				
1095 ± 2	3 ± 2	1	1	4270 ± 10	110 ± 20	[2]					
1563 ± 2	<2	1	[2]	4640 ± 10	>150	>1					
1944 ± 4	22 ± 7	1	1	4800 ± 10	30 ± 5	1					
2039 ± 5	60 ± 10	1	0	5055 ± 8	25 ± 5	3					
2370 ± 7	350 ± 50	1	2	5430 ± 8	25 ± 5	>3					
2399 ± 5	100 ± 10	2	1	5534 ± 10	<7	>0					
2650 ± 100	1100 ± 200	1	2	^a 5730 ± 10	160 ± 20	4					
2730 ± 5	40 ± 10	1	2	5910 ± 10	70 ± 20	>1					
2830 ± 7	12	3		6280 ± 10	20	>0					
2840 ± 70	714 ± 100	2	2	6420 ± 15	<53	>0					
2915 ± 10	<4			6550	45	>0					
2930 ± 10	260 ± 30	1	3	6760							
3225 ± 10	<7			7100	110	>1					
3454 ± 10	24 ± 12	1	1	7310							
3750 ± 10	290 ± 30	1		7440	105	>1					
3987	66	[1]		7710	150	>1					

$^{15}_7\text{N}$

E_0 (keV)	Γ (keV)	J	ℓ	E_0 (keV)	Γ (keV)	J	ℓ
8070	30	>2		10250			
8300	175	>1		10640			
8770	130	>1		11090			
9610		>2		11410			
9770		>2		12100			

Note-Inelastic channel opens.

* Higher limit for the width of 5730 keV level implies spin less than 5.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
N	refractrometer	PRIVATE COMM.(73)	Koester
N ¹⁵	diffraction	ACR/A,28,655(72)	Kuznietz
N	reflection	BAP,8,477(63)+	Bartolini
N	pile osci.	KE,6,335(63)	Huttel
N ¹⁴	σ_y (spectra)	ANL-6797,236(63)	Jurney
N ¹⁴	σ_p	CJP,39,1784(61)	Hanna
N ¹⁴	σ_y (spectra)	CJP,35,1347(57)	Bartholomew
N ¹⁵	activation	PR,87,215(52)	Ferguson
N	diffraction	PR,87,462(52)	Peterson
N ¹⁴	σ_p	JPR,12,65(51)	Cuer
N	diffraction	PR,83,88(51)	Goldschmidt
N ¹⁴	σ_y (spectra)	CJP,29,1(51)	Kinsey
N	reflection	PR,84,969(51)	McReynolds
N	pile osci.	PR,83,641(51)	Powernance
N	diffraction	PR,81,527(51)	Shull
N	pile osci.	PPS/A,63,1175(50)	Colmer
N ¹⁴	σ_p	AERE-N/R-370(49)	Batchelor
N ¹⁴	σ_p	PR,75,1358(49)	Coon
N	σ_c	PR,76,1750(49)	Melkonian
N	compilation	AEC-D-2274(48)	May
N	σ_c	PR,60,702(41)	Carroll
N	water bath	PR,58,554(40)	Lapointe
N	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
N	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
N ¹⁵	(d,p)	2400-2910	PL/B,39,323(72)	Lipperheide
N ¹⁵	σ_t	921-12100	NP/A,166,461(71)	Dover
N ¹⁵	$\bar{\sigma}_s$	800-3100	NP/A,166,461(71)	Dover
N ¹⁵	(d,p)	2400-2930	PL/B,37,285(71)	Fuchs
N ¹⁵	σ_t	921-12100	NP/A,166,443(71)	Zeitnitz
N ¹⁵	$\bar{\sigma}_s$	800-3100	NP/A,156,443(71)	Zeitnitz
N ¹⁴	compilation		NP/A,152,1(70)	Ajzenberg- Selove
N ¹⁴	σ_t	500-9000	NSE,42,28(70)+	Carlson
N ¹⁴	σ_t	2230-3570	68WASH,2,851(68)	Johnson
N ¹⁵	σ_t	3480-6250	PR,152,980(66)	Fossan
N ¹⁴	$\bar{\sigma}_s$	1682-3207	66WASH,2,653(66)	Fowler
N ¹⁵	(d,p)		NP,88,561(66)	Hewka
N ¹⁴	σ_t	2230-3570	BAP,11,808(66)+	Martin
N ¹⁴	σ_a	4000-6400	ZP,197,124(66)	Scobel
N ¹⁵	$\bar{\sigma}_s$	940	NP,54,49(64)	Donoghue
N ¹⁵	σ_t	930-2020	PR/B,135,1347(64)	Fossan
N ¹⁴	σ_p	493	PR,129,324(63)	Engelke
N ¹⁵	$\sigma_t \bar{\sigma}_s$	1960-3010	NP,32,470(62)	Sikkema
C ¹³	(p,n)	4740-11350	PR,119,1948(60)	Bair
N ¹⁴	$\bar{\sigma}_s$		NP,14,295(60)	Hall
N ¹⁴	inelastic	6260-8000	NP,14,295(60)	Hall
N ¹⁵	σ_t	1960-2950	PHY,26,379(60)	Sikkema
N ¹⁴	$\sigma_a \sigma_p$	1350-4610	NP,14,277(59)	Gabbard
N ¹⁵	σ_t	2960	HFA,32,357(59)	Schellenberg
B ¹¹	$\sigma(\alpha,n)$	1784-4097	PR,102,1348(56)	Bonner
C ¹⁴	(p,n)	489-2250	PR,104,1434(56)	Sanders
N ¹⁴	$\bar{\sigma}_s$	1120-2250	PR,98,728(55)	Fowler
N,N ¹⁴	$\bar{\sigma}_s$	1110-2250	ORNL-1798,3(54)	Johnson
N ¹⁴	σ_t	1930-2700	HFA,26,451(53)	Meier
N ¹⁴	σ_t	430-1595	PR,86,483(52)	Hinchey
N,N ¹⁴	σ_t	433-1450	PR,84,775(51)	Johnson
C ¹⁴	(p,n)	434-1780	PR,83,1133(51)	Roseborough
N ¹⁴	σ_a	499-1415	PR,80,818(50)	Johnson
N ¹⁴	σ_p	1415-1800	PR,80,818(50)	Johnson

⁸0

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.270 \pm 0.025 \text{ mb} \\ \sigma_a &= 3.76 \pm 0.02 \text{ b} \\ a_{coh} &= 5.804 \pm 0.007 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 0.31 \pm 0.04 \text{ mb}$$

¹⁶₈0

THERMAL CROSS SECTIONS

$$\sigma_T = 0.178 \pm 0.025 \text{ mb}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 0.27 \pm 0.03 \text{ mb} \\ S_1 &= 0.9 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$I'' = 0^+$		$\%Abn = 99.756$		$S_n = 4142.4 \pm 0.9 \text{ keV}$		
$E_0 \text{ (keV)}$	$\Gamma \text{ (keV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$ $g\Gamma_n^1 \text{ (eV)}$ $\Gamma_a \text{ (keV)}$	
440 ± 4	45 ± 5	3/2	1	2.7±0.5	335	
1000 ± 5	96 ±10	3/2	2			
1312 ± 3	41.5± 3.0	3/2	1		110	
1651 ± 2	3.4± 0.3	7/2	3			
1689 ± 2	<1					
1833 ± 2	6.6± .7	3/2	2			
1907 ± 2	31.5± 2.0	1/2	1		31	
*2351 ± 5	130 ± 5	1/2	0		8.74± .33	
2888 ± 2	<1					
3006 ± 2	<1					
3211.1± 1.5	1.5± 0.2	5/2	3			.0027
3350 ±15	450 ±50	3/2	2			
3439.0± 1.5	.6± 0.2	5/2	2			.0032
3442.1± 1.5	0.9± 0.2	5/2	3			
3630 ±20	470 ±70	3/2	1		580	.08
3768 ± 3	18 ± 3	7/2	3			.01
4047 ± 8	81 ± 5	1/2	0	42.2 ±2.5		6.7
4090	264 ±30	1/2	1		151	14
4183 ± 5	73 ± 7	3/2	2			15
4289 ± 5	68	1/2	1		37	0.8
4319 ± 5	65 ± 5	3/2	1		71	4
4469 ± 3	13 ± 2	1/2	0	7.1 ±1.0		2.2
4530 ± 3	5.7± 0.7	5/2	2			.54
4600 ± 3	8 ± 3	7/2	4			7.6
4636 ± 3	5.3± 1.0	5/2	3			1.9
4835 ± 5	47 ± 4	3/2	1		48	1.8
5052 ± 5	90 ±10	3/2	2			9.7

$^{16}_8\text{O}$

E_0 (keV)	Γ (keV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)	Γ_a (keV)
5128 $\pm$ 4	25 $\pm$ 3	7/2	3				2.3
5314 $\pm$ 4	9 $\pm$ 2						
5371 $\pm$ 4	8 $\pm$ 2						
5630 $\pm$ 4	130 $\pm$ 15	3/2	1			61	
5681 $\pm$ 4	16 $\pm$ 2	5/2	3				
5923 $\pm$ 5	25 $\pm$ 5						
5990 $\pm$ 10	40 $\pm$ 5						
6076 $\pm$ 5	15 $\pm$ 2						
6090 $\pm$ 15	5 $\pm$ 3						
6196 $\pm$ 20	85 $\pm$ 20						
6280 $\pm$ 20	120 $\pm$ 40						
6410 $\pm$ 5	45 $\pm$ 5						
6578 $\pm$ 15	150						
6680 $\pm$ 10	20 $\pm$ 4						
6807 $\pm$ 7	48 $\pm$ 6						
7200 $\pm$ 8	60 $\pm$ 20						

Note-All widths are expressed in the center of mass system.

* The minimum for this s-wave resonance is 0.13 b.

 $^{17}_8\text{O}$

THERMAL CROSS SECTIONS

$$\sigma_a = 0.235 \pm 0.010 \text{ b}$$

$$a_{coh} = 5.78 \pm 0.15 \text{ fm}$$

RESONANCE PROPERTIES

$$I_a^c = 0.105 \pm 0.010 \text{ b}$$

RESONANCE PARAMETERS

$$I^n = 5/2^+$$

$$\%abn = 0.039$$

$$S_n = 8046.8 \pm 0.9 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	ℓ
176 $\pm$ 4	1.0 $\pm$ 0.8	2	0
250 $\pm$ 4	8 $\pm$ 1	3	1

¹⁸
8 0

THERMAL CROSS SECTIONS

$$\sigma_y = 0.16 \pm 0.01 \text{ mb [27 sec } ^{18}\text{O9]}$$

$$a_{coh} = 6.00 \pm 0.13 \text{ fm}$$

RESONANCE PROPERTIES

$$I_y = 0.81 \pm 0.04 \text{ mb}$$

RESONANCE PARAMETERS

$$I'' = 0^+$$

$$\%abn = 0.205$$

$$S_n = 3956.9 \pm 2.5 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	ℓ	$g\Gamma_n^1$ (eV)	E_0 (keV)	Γ (keV)	J	ℓ	$g\Gamma_n^1$ (eV)
663 $\pm$ 5	55 $\pm$ 3	3/2	1	260	2375 $\pm$ 10	130 $\pm$ 20	1/2	1	106
1200 $\pm$ 8	50 $\pm$ 5	1/2	1	83	2445 $\pm$ 10	20.3 $\pm$ 2.5	7/2	3	
1256 $\pm$ 10	3.6 $\pm$ 1.0	3/2			3050	100	3/2	2	
1450 $\pm$ 10	350	3/2	2		3200	250	1/2	1	166
1565 $\pm$ 10	300 $\pm$ 30	5/2	2		3500	100	1/2	1	63
1840 $\pm$ 10	8.2 $\pm$ 1.5	3/2	1	17	4000	65	1/2	1	38
2300 $\pm$ 10	200 $\pm$ 40	3/2	2						

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
¹⁸ O	activation	JIN,33,1221(71)	Blaser
0	σ_t reflection (130 ev)	PL/8,36,208(71)	Dilg
0	reflection	PRIVATE COMM.(69)	Koester
¹⁶ O	σ_t	KFK-1000(68)+	Cierjacks
¹⁶ O	σ_t	68WASH,2,851(68)	Johnson
¹⁷ O	diffraction	AERE-R-5770(68)	Valentine
¹⁸ O	diffraction	HERE-R-5275(66)	O'Conner
0	σ_t	JNE,20,479(66)	Vertebnyi
0	reflection	PR/8,138,1116(65)	Donaldson
0	σ_t (1.44 ev)	NP,61,381(65)	Rayburn
0	reflection	8AP,8,477(63)+	Bartolini
¹⁶ O	σ_y (spectra)	63ANL-6797,236(63)	Jurney
0	diffraction	ACR,15,351(62)	Roof
¹⁷ O	σ_t	CJP,39,1784(61)	Hanna
¹⁷ O	σ_t	PRIVATE COMM.(56)	Seppi
0	reflection	PR,90,497(53)	Hughes
0	diffraction	PR,81,527(51)	Shull
0	σ_t	PR,76,1750(49)	Melkonian
¹⁷ O	activation	CJR/A,25,77(47)	May
²⁰ O	diffusion	CJR/A,25,134(47)	Sargent
¹⁸ O	activation	PR,72,888(47)	Seren
0	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
C ¹³	$\sigma(\alpha, n)$	3211-6680	PR/C, 7, 1356(73)	Bair
O ¹⁸	σ_e	1450-2375	PR/C, 7, 1270(73)	Donoghue
O ¹⁶	analysis	442-5610	PR/C, 7, 561(73)	Johnson
O ¹⁶	(d, p)	1560	PR/C, 7, 1267(73)	Wiza
O ¹⁷	compilation		NP/A, 190, 1(72)	Ajzenberg-Selove
O ¹⁶	σ_t	1651	ORNL-4743, 39(72)	Collaway
O ¹⁶	σ_y	426	PR/C, 3, 1737(71)	Allen
O ¹⁶	σ_t	650-4340	71KNOX, 1179(71)	Fowler
O ¹⁶	$\bar{\sigma}_s$	1833-3441	PR/C, 2, 124(70)	Fowler
O ¹⁶	σ_t	3765-7200	NP/A, 134, 361(69)	Davis
O ¹⁶	σ_t	1651-3444	68WASH, 2, 851(68)	Johnson
O ¹⁶	$\bar{\sigma}_s$	3846-4320	PR, 162, 890(67)	Johnson
O ¹⁶	$\bar{\sigma}_s$	3769-4180	PR, 162, 890(67)	Johnson
O ¹⁶	σ_t	3769	PR, 162, 890(67)	Johnson
C ¹³	$\sigma(\alpha, n)$	4050-6290	PR, 156, 1187(67)	Sekharan
O ¹⁶	$\bar{\sigma}_s$	3290-4175	PR, 143, 745(66)	Lister
O ¹⁸	σ_t	2500-3470	NP, 64, 343(65)	Salisbury
O ¹⁸	σ_t	661-2445	NP, 64, 336(65)	Vaughn
O ¹⁸	$\bar{\sigma}_s$	666-2445	NP, 54, 33(64)	Donoghue
O ¹⁸	σ_y	660	BAP, 9, 20(64)	Vaughn
O ¹⁶	analysis	442-1318	NCS, 1, 386(63)	Pisent
O ¹⁶	$\bar{\sigma}_s$	442-1318	NC, 28, 600(63)	Pisent
O ¹⁶	σ_t	3440-11500	PR, 123, 209(61)	Fossan
O ¹⁶	$\bar{\sigma}_s$	442-1660	AP, 12, 135(61)	Lane
O ¹⁶	inelastic sc	6830-9340	NP, 14, 295(60)	Hall
O ¹⁶	σ_a	5069-8610	BAP, 5, 109(60)	Worley
O ¹⁸	ν_t	3550-4000	HPA, 32, 357(59)	Schellenberg
O ¹⁶	$\bar{\sigma}_s$	1000	PR, 109, 89(58)	Fowler
O ¹⁶	σ_t	442-1312	NP, 6, 188(58)	Striebel
O ¹⁶	σ_t	3200-5110	PR, 107, 1065(57)	Walton
O ¹⁶	(d, p)	437-1910	PR, 108, 1007(57)	Browne
C ¹³	$\sigma(\alpha, n)$	3210-4290	PPS/A, 69, 830(56)	Rusbridge
O ¹⁶	$\sigma_e \bar{\sigma}_s$	442	PR, 99, 55(55)	Okazaki
O ¹⁶	$\bar{\sigma}_s$	435-1311	PR, 92, 1491(53)	Adair
O ¹⁶	$\bar{\sigma}_s$	1900-4400	HPA, 25, 142(52)	Baldinger
O ¹⁶	$\bar{\sigma}_s$	1900-4400	PR, 84, 1058(51)	Baldinger
O ¹⁶	σ_t	440-2370	PR, 84, 68(51)	Bockelman
O ¹⁶	σ_t	440-1300	PR, 80, 1011(50)	Bockelman
O ¹⁶	σ_t	440	PR, 75, 1124(49)	Adair

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 9.5 \pm 0.7 \text{ mb} \\ \sigma_s &= 4.0 \pm 0.1 \text{ b} \\ \sigma_t &= 4.0 \pm 0.1 \text{ b} \\ \lambda_{coh} &= 5.64 \pm 0.04 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 17.6 \pm 3.0 \text{ mb} \\ R_\gamma &= 6.0 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$$J^\pi = 1/2^+$$

$$\lambda_{abn} = 100$$

$$S_n = 6601.1 \pm 0.3 \text{ keV}$$

E_0 (keV)	Γ (keV)	$2g\Gamma_n$ (keV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
27.02 ± 0.07	0.37 ± 0.04	.925 ± .100	2	1	1.3 ± 0.2		157
49.10 ± 0.17	1.4 ± 0.2	2.100 ± .300	1	1	1.6 ± 0.2		150
97.0 ± 0.5	13 ± 3	19.500 ± 4.500	1	1	4.2 ± 1.8		512
^b 173.5 ± 1.0		0.70 ± 0.20					
269 ± 1	10 ± 2		(2)	(1)	3.5 ± .8		
^a 270 ± 1	25 ± 10	37.5 ± 15.0	1	0	4.2 ± 1.0	72.2 ± 20.9	
311 ± 1			(0)		2.6 ± 1.3		
349							
357							
368							
387 ± 1	7 ± 2	16.5 ± 3.0	(1)		2.4 ± 0.8		
423 ± 2	25 ± 15		0		2.4 ± 0.8		
491 ± 2	25 ± 15		(1)		3.3 ± 1.0		
595 ± 2	11 ± 2		2		6.3 ± 1.2		
747 ± 3	35 ± 7		1		2.4 ± 0.8		
794	20 ± 4		1				
852 ± 4	15 ± 5		(2)		1.5 ± 0.5		
932 ± 5	50 ± 15		(1)		1.7 ± 0.5		
1107 ± 6	60 ± 20		2		2.2 ± 0.7		
1255 ± 12	70 ± 20		(1)		8.6		
1640 ± 15	190 ± 20		1		11 ± 3		
^a 1645	15						
^a 1916	28						
^a 2240	45						
^a 2465	75						
^a 3075	120						

E_0 (keV)	Γ (keV)	$2g\Gamma_n$ (keV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
*3215	80						
*3400	35						
*3475	<30						
*3620	120						
*4240	90						
*4620	200						
*4900	<50						

Note-There is no recent evidence for the previously reported peak at 15.3 keV.

Note-The resonance at 270 keV accounts for the thermal absorption cross section.

- * Possibly doublet.
- * Prominent inelastic peaks.
- * Inelastic channel opens at 110 keV.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
F19	reflection	PRIVATE COMM.(71)	Koester
F19	reflection	PR,174,313(68)	Bartolini
F19	reflection	BAP,8,477(63)+	Bartolini
F19	activation	PR,129,1281(63)	Glickstein
F19	activation	PR,130,2599(63)	Glickstein
F19	diffraction	PR,81,527(51)	Shull
F19	σ_t (100,300 ev)	PR,76,100(49)	Hibdon
F19	activation	PR,72,888(47)	Seren
F19	activation	PR,59,102(41)	O'Neal
F19	water bath	PR,58,554(40)	Lapointe
F19	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
F19	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
F19	σ_y	27.07-4900	PR/C,7,1766(73)+	Macklin
F19	σ_y	23-1460	BAP,17,900(72)	Macklin
F19	σ_y	27-48	PS,4,95(71)	Nystroem
F19	σ_t	27-97	71ALBANY,81(71)	Singh
F19	Inelast. Sc	140-3140	70HELSINKI,2,295(70)	Broder
F19	σ_y	26.5-92	BAP,12,512(67)+	Block
F19	σ_y (spectra)	27-50	PR,158,1049(67)	Bergqvist
F19	σ_t	497-1107	CEA-R-3279(67)	Cabe
F19	polarization	thermal	YF,6,657(67)	Gul'ko
F19	σ_y (spectra)	27-49	PR/B,138,20(65)	Bird
F19	σ_t	27.03-528.0	65ANTWERP,74(65)	Garg
F19	σ_t	15-268	PR/B,133,353(64)	Hibdon
F19	σ_y	15-40	NP,43,353(63)	Macklin
F19	σ_a	3850-7800	NP,27,448(61)	Davis
F19	σ_t	27.5-425	AP,14,365(61)	Newson
F19	σ_a	3750-5900	PR,117,514(60)	Smith
F19	σ_y	27-1635	PR,114,201(59)	Gabbard
F19	σ_t	27-49	AP,8,194(59)	Merzbacher
F19	$\bar{\sigma}_s$	27-99	PR,109,1620(58)	Block
F19	σ_t	510-3610	PR,109,891(58)+	Wills
F19	(d,p)	30-630	PPS/A,69,221(56)	El Bedewi
F19	Inelast. Sc	100-1000	PR,99,1446(55)	Freeman
F19	σ_a	3400-5900	PR,100,69(55)	Marion
F19	σ_t	10-700	PR,80,1011(50)	Bockelman

¹⁰Ne

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.038 \pm 0.006 \text{ b} \\ \bar{\sigma}_s &= 2.42 \pm 0.01 \text{ b} \\ a_{coh} &= 4.5 \pm 0.1 \text{ fm}\end{aligned}$$

²⁰₁₀Ne

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 37 \pm 4 \text{ nb}$$

RESONANCE PROPERTIES

$$\begin{aligned}\langle D \rangle &= 100 \pm 15 \text{ keV} \\ S_1 &= 0.7 \pm 0.4\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\chi_{Abn} = 90.5$		$S_n = 6761.2 \pm 1.0 \text{ keV}$	
$E_0 \text{ (keV)}$	$\Gamma \text{ (keV)}$	J	ℓ	$\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$
473 ± 3	107 ± 6	1/2	0	156 ± 9	
910 ± 10	14 ± 4	3/2	1		68
1280 ± 10	6 ± 2	3/2	1		20
1310 ± 10	32 ± 6	1/2	1		53
1370 ± 10	8 ± 3	3/2	2		
1620 ± 10	27 ± 5	3/2	1		74
1680 ± 10	10 ± 3	3/2	2		
1849 ± 2	6				
1930 ± 10	38 ± 7	3/2	2		
2009 ± 10	54 ± 6	3/2	1		120
2121 ± 5	50 ± 6	3/2	1		106
^a 2139 ± 5	<5				
^a 2189 ± 5	10				
^a 2206 ± 5	7				
^a 2274 ± 5	5				
^a 2338 ± 5	2.5				
2455 ± 10	100				
2570 ± 5	10				
^a 2631 ± 5	15				
^a 2665 ± 5	10				
2737 ± 5	30				
^a 2831 ± 10	35				
2885 ± 5	45 ± 5				
^a 2893 ± 5	20				
^a 3030 ± 10	30				
^a 3057 ± 20	~5				
^a 3082 ± 10	10				
^a 3111 ± 10	10				
3187 ± 3	10				
^a 3227 ± 10	50				
3290 ± 10	48 ± 6				

²⁰₁₀Ne

E_0 (keV)	Γ (keV)	J	ℓ	Γ_{α}^0 (eV)	g_{α}^0 (eV)
*3329 ±10	15				
*3481 ±10	<5				
3518 ±10	40 ± 5				
3598 ±10	20 ±10				
3710 ±10	73 ±10				
*3762 ±20	<5				
3804 ±10	45				
3870 ±10	55				
*4051 ±10	65				
4155 ±10	40 ±10				
*4287 ±10	20				
4322 ±10	30 ±10				
*4377 ±10	35				
*4513 ±10	<5				
*4537 ±10	<5				
*4543 ±20	(100)				
4628 ±10	30 ± 5				
*4671 ±15	25				
*4757 ±10	30				
*4867 ±10	55				
*4870 ±20	15				
*5002 ±15	55				
*5095 ±15	30				

* Data from charged particle reactions.

²¹
₁₀Ne

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_f &= 0.692 \pm 0.114 \text{ b} \\ \sigma_a &= 5.1 \pm 0.3 \text{ b} \\ \sigma_s &= 1.5 \text{ b}\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 3/2^{+}$$

$$\Gamma_{\text{th}} = 0.27$$

$$S_n = 10365.6 \pm 1.0 \text{ keV}$$

E_0 (keV)	Γ (keV)	J	Γ_n (eV)	E_0 (keV)	Γ (keV)	J	Γ_n (eV)
*261 ±3	6			*1630	30 ±15	(1)	710
*402 ±3	6			*1755	70	(1)	5000
*511 ±3	6			*1770	10	(1)	500
*580 ±3	24			*2010	80	(1)	8700
*865 ±3	7			*2110	80	(1)	8900
*942 ±5	12			*2205	15	(1)	~440
*1119 ±8	40			*2310	~20	(1)	~1700
*1150 ±3	43			*2350	30	(1)	3700
*1269 ±5	18			*2560	45	(1)	5900
*1382 ±5	9	(1)	540	*2625	45	(1)	~6000
*1459	14	(1)	2200	*2780	50	(1)	10000
*1592	13	(1)	2400				

* Data from charged particle reactions.

²²₁₀Ne

THERMAL CROSS SECTIONS

$$\sigma_T = 0.048 \pm 0.005 \text{ b}$$

$$\sigma_a = 1.705 \pm 0.009 \text{ b}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$					$\chi^2/\text{b} = 9.2$					$S_n = 5200.2 \pm 2.0 \text{ keV}$				
E_0 (keV)	Γ (keV)	J	δ	Γ_n^0 (eV)	E_0 (keV)	Γ (keV)	J	δ	Γ_n^0 (eV)	E_0 (keV)	Γ (keV)	J	δ	Γ_n^0 (eV)
519	50	1/2	0	86.5	2190									
522	125	1/2	0	172	2320	160	3/2	1						
685					2320	160	3/2	2						
1195					2530	<30								
1310					2720	90								
1715					2870									
1855					3100									
2010	<20				3200									
2140					3443									

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ne ^{20,21,22}	σ_y (spectra)	AKE,17,145(71)	Bellman
Ne ^{20,22}	σ_y (spectra)	PS,2,169(70)	Selin
Ne	σ_t	NP/A,133,410(69)	Rorer
Ne ^{20,22}	σ_y (spectra) ratio	AF,35,423(68)	Jonsson
Ne ²¹	σ_a	NAL-7310,19(67)	Bennett
Ne,Ne ^{21,22}	σ_a	PR,148,1303(65)	Krohn
Ne	σ_t	JPR,24,21(63)	Genin
Ne ²⁰	σ_y (spectra)	PRIVATE COMM.(63)	Motz
Ne ²⁰	σ_y (spectra)	BMP,6,335(63)*	Motz
Ne	σ_t	GOVIENNA,219(62)	Genin
Ne ²¹	σ_a	ZET,41,1023(61)	Abramov
Ne	pile osci.	CR,252,3973(61)	Carre
Ne	pile osci.	CR,251,691(60)	Genin
Ne	σ_t	ZN/A,15,828(60)	Springer
Ne	σ_t diffraction	PR,111,1470(58)	Menshaw
Ne ²²	activation	PR,87,215(52)	Ferguson
Ne	σ_a	PR,80,20(50)	Harris
Ne	compilation	AEC0-2274(48)	May

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
O ¹⁷	σ_a	1849-5095	PR/C,7,1356(73)	Bair
O ¹⁸	σ_a	261-1382	PR/C,7,1356(73)	Bair
Ne ²²	σ_t	319-522	PRIVATE COMM.(72)	Fossan
Ne,Ne ²⁰	σ_t	3184-6552	NP/A,134,361(69)	Davis
Ne ²²	σ_t	200-2100	BMP,11,28(66)	Salisbury
O ¹⁸	σ_a	1393-3629	PR,126,299(62)	Bair
Ne	σ_a	6310-10700	NP,31,166(62)	Shamu
Ne,Ne ²⁰	σ_t	500-675	PR,118,683(60)	Vaughn
Ne,Ne ²⁰	σ_a	2890-6930	NP,14,270(59)	Bell
Ne,Ne ²⁰	$\sigma_t \sigma_a$	910-2000	PR,114,194(59)	Cohn
Ne,Ne ²⁰	$\sigma_t \sigma_a$	910-1850	ORNL-2501,20(58)	Cohn
Ne ²²	σ_t	2010-3430	NP,3,351(58)	Sikkema
Ne,Ne ²⁰	σ_t	1940-3370	NP,3,375(57)	Sikkema

²²
¹¹Na
[2.601 yr]

THERMAL CROSS SECTIONS

$$\sigma_g = (2.9 \pm 0.1) \times 10^3 \text{ b}$$

RESONANCE PROPERTIES

$$I_g = (16.0 \pm 2.1) \times 10^3 \text{ b}$$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 400 \pm 30 \text{ mb} \quad (20 \text{ ms } ^{23}\text{Na}^0) \\ \sigma_T &= 530 \pm 5 \text{ mb} \\ \sigma_a &= 3.2 \pm 0.2 \text{ b} \\ \sigma_c &= 3.7 \pm 0.2 \text{ b} \\ \sigma_{\text{coh}} &= 3.63 \pm 0.02 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 311 \pm 10 \text{ mb} \\ R^2 &= 5.7 \pm 0.2 \text{ fm} \\ \langle D \rangle &= 30 \pm 6 \text{ keV}\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 3/2^+$		$XAbn = 100$			$S_n = 6959.3 \pm 0.4 \text{ keV}$		
$E_R \text{ (keV)}$	$\Gamma \text{ (keV)}$	$2g\Gamma_n \text{ (keV)}$	J	ℓ	$\Gamma_T \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$
2.850 ± 0.015	0.911 ± 0.013	0.308 ± 0.010	1	0	0.38 ± 0.04	$5.77 \pm .19$	
7.53 ± 0.020					$^{+0.0098}_{-0.0002}$		
35.4 ± 0.1		$0.07096 \pm .00020$	3	1	$^{+0.788}_{-0.096}$	$^{+0.0051}_{-0.0010}$	0.05
53.15 ± 0.03	1.200 ± 0.065	1.500 ± 0.030	2	1	$^{+1.58}_{-0.31}$	6.51 ± 0.35	45.0
114.7 ± 0.4					$^{+3.0}_{-0.7}$		
129.5 ± 0.5					$^{+0.58}_{-0.14}$		
139.1 ± 0.5					$^{+1.42}_{-0.36}$		
189.0 ± 1.0	4.5 ± 0.5	3.4 ± 0.4	1	0		7.7 ± 0.9	
212.5 ± 1.3	15.0 ± 3.1	3.8 ± 0.8	0	1		8.2 ± 0.2	17.3
238.0 ± 1.5	3.9 ± 0.7	2.9 ± 0.5	1	0		6.0 ± 1.0	
298.5 ± 1.0	1.9 ± 0.4	2.4 ± 0.5	2	0		4.4 ± 0.9	
383.8 ± 1.0	25.8 ± 2.6	19.1 ± 2.0	1	1		30.4 ± 3.2	41.6
431.2 ± 1.0	7.8 ± 0.7	1.9 ± 0.2	0	1		2.9 ± 0.3	3.8
448.4	5.7 ± 1.1	7.1 ± 1.4	2	2			
536.6 ± 1.5	35.3 ± 4.0	26.5 ± 3.0	1	0		36.2 ± 4.1	
597.8 ± 1.5	25.8 ± 2.6	19.4 ± 2.0	1	[1]		25.1 ± 2.6	26.9
697.2	60 ± 5	135 ± 14	[4]	[2]			
726.6	45 ± 5	79 ± 8	[3]	[1]		92.7 ± 9.4	90.0
780.5 ± 2.0	43.6 ± 4.4	98.1 ± 9.8	[4]	[2]			
911.2 ± 2.0	40.1 ± 4.0	70.2 ± 7.0	[3]	[2]			
985.1 ± 2.0	27.2 ± 3.0	20.4 ± 2.2	[2]	[2]			

Note—Previously reported resonances in the energy region 74.2–87.8 keV are due to impurities, probably Fe-56.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Na ²²	activation	NYO-3417-19,2(72)	Fishman
Na ²³	Christiansen filter	ZN/A,27,901(72)	Koester
Na ²²	activation	JNE,26,403(72)	Werner
Na ²³	activation	JNE,24,35(70)	Ryves
Na ²³	activation	JNE,24,419(70)	Ryves
Na ²²	depletion (0.5ev)	JIN,29,593(67)	Sims
Na ²³	activation	DA/8,27,919(66)	Kappe
Na ²³	activation	NUK,8,437(63)	Jozefowicz
Na ²³	activation	ADP,12,225(63)	Alexander
Na ²³	activation	ZN/A,18,1339(63)-	Brezhneva
Na ²²	depletion	PHY,29,1196(63)	Farinelli
Na ²³	activation	ZN/A,18,1339(63)	Koehler
Na ²³	pulsed n	NSE,9,132(61)	Meadows
Na ²³	activation	NUK,2,255(61)	Wolf
Na ²³	activation	NSE,8,378(60)-	Brooksbank
Na ²³	pile osci.	PNE,3,342(59)	Rose
Na ²³	pile osci.	8M1-1262(58)	Anno
Na ²³	pile osci.	AERE-R/R-2516(58)	Jovitt
Na ²³	activation	AE,3,334(57)	Sakharov
Na ²³	activation	JNE,3,70(56)	Cocking
Na ²³	activation	AERE-NP/R-1894(56)	Cocking
Na ²³	activation	JNE,1,231(55)	Grimeland
Na ²³	activation	SSGENEVA,2,39(55)	Groshev
Na ²³	σ_t	PR,99,610(55)	Joki
Na ²³	activation	CJC,31,204(53)	Bartholomev
Na ²³	pile osci.	ANL-5031,68(53)	Harris
Na ²³	pile osci.	AERE-R/R-961(52)	Littler
Na ²³	local osci.	PR,83,641(51)	Prmerance
Na ²³	diffraction	PR,81,527(51)	Snell
Na ²³	pile osci.	PPS/A,63,1175(50)	Colmer
Na ²³	pile osci.	PR,80,342(50)	Harris
Na ²³	$\bar{\sigma}_s$	PR,71,666(47)	Fermi
Na ²³	activation	PR,72,888(47)	Seren
Na ²³	water bath	PR,58,554(40)	Lapointe
Na ²³	$\bar{\sigma}_s$	SCP,36,153(39)	Kimura
Na ²³	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Na ²³	σ_c	2.85-298.1	PRIVATE COMM.(73)	Rahn
Na ²³	σ_t	53.15-298.5	NSE,51,119(73)	Wynchank
Na ²³	σ_y	thermal	RCN-175(72)	Kopecky
Na ²³	$\sigma_y(\text{spectra})$	THERM.-2.85	BAP,16,15(71)	Chrien
Na ²³	σ_T	2.85	NSE,41,445(70)	Yamamuro
Na ²³	σ_c	298.4-985.1	70HELSEINKI,2,745(70)	Nebe
Na ²³	σ_t	299.5-778.0	PL/B,29,417(69)	Cierjacks
Na ²³	σ_y	2.85-139.1	PR,178,1746(69)	Hockenbury
Na ²³	σ_T	2.85	68WASH,2,695(68)	Friesenhahn
Na ²³	$\sigma_y(\text{spectra})$	thermal	68WASH,2,675(68)	Wasson
Na ²³	$\sigma_y(\text{spectra})$	35-55	PR,158,1049(67)	Bergqvist
Na ²³	$\sigma_c \sigma_T$	2.86-54	66PARIS,1,129(66)	Moxon
Na ²³	σ_c	35-117	66PARIS,1,119(66)	Ribon
Na ²³	σ_T	35-55	JNE,20,67(66)	Rigoleur
Na ²³	σ_t	2.85-450	65ANTWERP,74(65)	Garg
Na ²³	σ_c	629.8-857.5	PR,124,500(61)	Hibdon
Na ²³	σ_t	350-630	PR,122,1235(61)	Hibdon
Na ²³	σ_c	2.95-346	PR,118,514(60)	Hibdon
Na ²³	σ_c	53	AP,8,194(59)	Merzbacher
Na ²³	$\bar{\sigma}_s$	2.80	PR,109,1217(58)	Block
Na ²³	$\bar{\sigma}_s$	53	PR,109,1620(58)	Block
Na ²³	σ_t	2.80	PR,109,926(58)	Good
Na ²³	σ_c	2.85	NP,5,603(58)	Lynn
Na ²³	σ_t	2.80-55	PR,85,595(52)	Hibdon
Na ²³	σ_c	3.5	PPS/A,65,992(52)	Hodgson
Na ²³	σ_c	120-1000	PR,88,1354(52)	Stelson
Na ²³	σ_t	3.0	PR,27,730(50)	Hibdon
Na ²³	σ_c	60-920	PR,75,1124(49)	Adair

¹²Mg

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.063 \pm 0.003 \text{ b} \\ \bar{\sigma}_s &= 3.416 \pm 0.006 \text{ b} \\ \sigma_t &= 3.40 \pm 0.03 \text{ b} \\ a_{coh} &= 5.33 \pm 0.02 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 0.038 \pm 0.004 \text{ b} \\ R' &= 5.4 \pm 0.3 \text{ fm}\end{aligned}$$

²⁴₁₂Mg

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.052 \pm 0.007 \text{ b} \\ \bar{\sigma}_s^c &= 3.8 \pm 0.4 \text{ b} \\ \sigma_t^c &= 3.8 \pm 0.4 \text{ b} \\ a_{coh} &= 5.49 \pm 0.18 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 0.030 \pm 0.004 \text{ b} \\ R' &= 5.5 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\%Abn = 78.99$		$S_p = 7332.8 \pm 0.4 \text{ keV}$	
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (keV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (eV)}$	$g\Gamma_n^{\dagger} \text{ (eV)}$
47 ± 1			2	*0.93 ± 0.13 5.0 ± 1.0	
83.0 ± 0.4	15.000 ± 1.000	3/2	1		860
263 ± 2	78.000 ± 5.000	1/2	1		870
430 ± 4	40.000 ± 5.000	[1/2]	1		240
*471 ± 2		5/2	[2]		
665	26	1/2	0		
850	16	3/2	2		

* $g\Gamma_n\Gamma_{\gamma}/\Gamma$

* Resonance with isotopic spin = 3/2 observed in photoneutron and (d,p) reactions. e.g. Dehnhard and Yntema, Phys. Rev. 160, 964, 67.

²⁵₁₂Mg

THERMAL CROSS SECTIONS

$$\sigma_T = 0.180 \pm 0.032 \text{ b}$$
$$a_{coh} = 3.62 \pm 0.14 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T^c = 0.111 \pm 0.020 \text{ b}$$
$$R_T^c = 5.2 \pm 0.3 \text{ fm}$$

RESONANCE PARAMETERS

$$I^n = 5/2^+$$

$$\%Abn = 10.00$$

$$S_n = 11096.0 \pm 0.5 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (keV)	J	ℓ	Γ_T (eV)	$2g\Gamma_n^0$ (eV)
19.98 ± 0.05	1.925 ± .200	3	0	2.1 ± 0.4	13.6 ± 1.4
80 ± 1	10.000 ± 2.500	2	0		35.3 ± 8.8
105 ± 2	8.335 ± 1.670	2	0		25.7 ± 5.1

* Calculated.

²⁶₁₂Mg

THERMAL CROSS SECTIONS

$$\sigma_T = 0.0382 \pm 0.0008 \text{ b}$$
$$\sigma_s^c = 3.0 \pm 0.3 \text{ b}$$
$$\sigma_t^c = 3.0 \pm 0.3 \text{ b}$$
$$a_{coh} = 4.85 \pm 0.15 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 0.025 \pm 0.001 \text{ b}$$
$$R_T = 5.0 \pm 0.2 \text{ fm}$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\%Abn = 11.01$$

$$S_n = 6446.3 \pm 0.9 \text{ keV}$$

E_0 (keV)	$g\Gamma_n$ (keV)	J	ℓ	$g\Gamma_n^1$ (eV)
300 ± 4	>75.000	1/2	1	>510
505 ± 5	68.000		1	170

²⁷₁₂Mg

[9.45 min]

THERMAL CROSS SECTIONS

$$\sigma_T < 0.04 \text{ b [21.3 hr } ^{28}\text{Mg]}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Mg	refractrometer	PRIVATE COMM.(73)	Koester
Mg	σ_t (1.25,5.2 ev)	PRIVATE COMM.(73)	Koester
Mg ^{24,25,26}	diffraction	ACR/A,28,473(72)	Abul Khail
Mg ²⁶	activation	JNE,24,35(70)	Ryves
Mg ^{24,25}	σ_y (spectra)	NP/A,150,305(70)	Selin
Mg ^{24,25,26}	σ_y (spectra)	NP/A,102,209(67)	Spilling
Mg	pile osci.	66PARIS,1,479(66)	Carre
Mg	pile osci.	CEA-R-2485(64)	Carre
Mg	pile osci.	KE,6,336(63)	Huttel
Mg	diffraction	63ANL-6797,393(63)	Mueller
Mg	diffraction	ACR,16,834(63)	Sabine
Mg	pile osci.	61BUCHAR,553(61)	Stefanescu
Mg	pile osci.	JNE,12,32(60)	Tattersall
Mg	pile osci.	58GENEVA,16,34(58)	Rose
Mg ²⁷	double capture	PRIVATE COMM.(58)	Schuman
Mg	$\bar{\sigma}_s$	AERE-N/R-1165(57)	Egelstaff
Mg ²⁷	double capture	CJC,35,176(57)	Roy
Mg ²⁶	activation	PR,101,1524(56)	Lyon
Mg	diffraction	ACR,5,684(52)	Bacon
Mg ^{24,25,26}	pile osci.	PR,88,412(52)	Pomerance
Mg	σ_t	PRS,212,192(52)	Squires
Mg	mirror reflections	CU-97,11(51)	Heindl
Mg	pile osci.	PR,83,641(51)	Pomerance
Mg	diffraction	PR,81,527(51)	Shull
Mg	pile osci.	PPS/A,63,1175(50)	Colmer
Mg ²⁶	activation	PR,72,888(47)	Seren
Mg ²⁶	activation	PR,59,102(41)	O'Neal
Mg	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
Mg	$\bar{\sigma}_s$	PR,50,133(36)	Mitchell

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Mg ²⁴	$\sigma_t \bar{\sigma}_s$	665-880	PRIVATE COMM.(73)	Cox
Mg ²⁴	analysis	85	73ASILOMAR,2E6(73)	Mughabghab
Mg ²⁵	$\sigma(\gamma,n)$	471	PR/C,6,2295(72)	Berman
Mg ^{24,25,26}	$\sigma(\gamma,n)$	489-2168	PR/C,3,672(71)	Baglan
Mg,Mg ²⁴	σ_γ	20-84	PS,4,95(71)	Nystroem
Mg,Mg ^{24,25,26}	σ_t	19-505	PRIVATE COMM.(71)	Singh
Mg	σ_γ	47	69STUDSVIK,667(69)	Lundberg
Mg	σ_γ	46-82	BAP,12,512(67)+	Block
Mg	σ_γ (spectra)	50-84	PR,158,1049(67)	Bergqvist
Mg	σ_γ	20-450	PRIVATE COMM.(67)	Block
Mg	$\sigma_t \bar{\sigma}_s$	665-850	BAP,12,1186(67)	Cox
Mg	$\bar{\sigma}_s$	665-850	ANL-7210,5(66)	Cox
Mg,Mg ²⁴	σ_p (spectra)	84	PL,18,323(65)	Bergqvist
Mg	σ_t	20-505	65ANTWERP,74(65)	Garg
Mg ²⁴	(d,p)	40-85	NP,34,404(62)	Middleton
Mg ²⁴	σ_t	83-260	AP,8,211(59)	Newson
Mg ²⁵	σ_t	21-105	AP,8,211(59)	Newson
Mg ²⁶	σ_t	300	AP,8,211(59)	Newson
Mg	$\bar{\sigma}_s$	85	PR,109,1620(58)	Block
Mg,Mg ²⁴	σ_t	85-430	PR,83,479(51)	Fields

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 230 \pm 3 \text{ mb} \\ \sigma_0 &= 1.49 \pm 0.03 \text{ b} \\ \sigma_s &= 1.72 \pm 0.03 \text{ b} \\ \sigma_{\text{coh}} &= 3.448 \pm 0.009 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 0.17 \pm 0.01 \text{ b} \\ R^2 &= 4.0 \pm 0.4 \text{ fm} \\ \langle D \rangle &= 24 \pm 3 \text{ keV}\end{aligned}$$

RESONANCE PARAMETERS

$$I^0 = 1/2^0$$

$$XAl_{\text{Al}} = 100$$

$$S_0 = 7725.4 \pm 0.5 \text{ keV}$$

E_0 (keV)	Γ (keV)	$2g^2_{\alpha}$ (keV)	J	ℓ	Γ_T (eV)	$2g^2_{\beta}$ (eV)	$2g^2_{\gamma}$ (eV)
Bound level				0			
5.903 $\pm$ 0.008		.005 $\pm$.001	1	1	0.95 $\pm$ 0.15		13
34.70 $\pm$ 0.10	3.24 $\pm$ 0.32	2.70 $\pm$ 0.27	2	0	2.0 $\pm$ 0.3	14.5 $\pm$ 1.5	
36.5 $\pm$ 0.4	11.3 $\pm$ 1.1	13.2 $\pm$ 1.3	3	1			640
118.8 $\pm$ 0.6	3.48 $\pm$ 0.35	2.81 $\pm$ 0.29	2	1			22
143.0 $\pm$ 0.8	15.14 $\pm$ 1.51	17.66 $\pm$ 1.76	3	1			430
158.0 $\pm$ 0.9	2.84 $\pm$ 0.43	4.26 $\pm$ 0.65	4	1			80
204.8 $\pm$ 1.3	4.26 $\pm$ 0.65	3.55 $\pm$ 0.54	2	1			53
208.1 $\pm$ 1.4	4.35 $\pm$ 0.65	3.62 $\pm$ 0.54	2	1			53
222.9 $\pm$ 0.4							
240.5 $\pm$ 1.6							
257.5 $\pm$ 1.8							
282.4 $\pm$ 2.1							
289 $\pm$ 2							
317 $\pm$ 2							
338 $\pm$ 3							
368 $\pm$ 3							
387 $\pm$ 3							
*432 $\pm$ 5							
500 $\pm$ 5							
*528.9 $\pm$.8	9.5						
*547.1 $\pm$.8							
*572.2 $\pm$.8	14.5						
*588.1 $\pm$.8	5.5						
*593.1 $\pm$.8	1.1						

A/45

E_γ (keV)	Γ (keV)	$2g_{\gamma\alpha}$ (keV)	J	ℓ	Γ_γ (eV)	$2g_{\gamma\alpha}^2$ (eV)	$2g_{\gamma\alpha}^1$ (eV)
*603.1 ± .8							
*608.1 ± .8							
*625.0							
*648.3							
*652.7							
*707.5 ± .9	3.4						
*717.6 ± .9							
*727.5 ± .9							
*760.4 ± 0.9	8						
*767.8 ± .9							
*777.0 ± .9	9						
*787.7 ± 1.0							
*799.6 ± 1.0							
*829.0 ± 1.0							
*851.2 ± 1.2	5.5						
*859.2 ± 1.2	5.5						
*865.1							
*877.3	6.8						
*919.7	5.5						
*930.5	5.5						
*947.2							
*970.9							
*979.2							

* Doublet.

* Widths are estimates.

13-2

²⁷Al
13

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Al ²⁷	σ_t	ZP,250,166(72)	Stayerl
Al ²⁷	Maxon Rae	NP/A,169,95(71)	Cranston
Al ²⁷	Christiansen Filters	ZN/A,26,391(71)	Koester
Al ²⁷	Maxon Rae	NIM,86,83(70)	Malik
Al ²⁷	activation	JNE,24,35(70)	Ryves
Al ²⁷	activation	JNE,24,419(70)	Ryves
Al ²⁷	reactivity	NECL-3073(68)	Okazaki
Al ²⁷	σ_t	NP,61,381(65)	Rayburn
Al ²⁷	pile osci.	CEA-R-2485(64)	Carre
Al ²⁷	pile osci.	PRIVATE COMM.(63)	Tattersall
Al ²⁷	activation	PRIVATE COMM.(62)	Sher
Al ²⁷	absorption	NUK,2,139(60)	Brose
Al ²⁷	pile osci.	JNERI-1009(60)	Fuketa
Al ²⁷	pile osci.	SOGENEVA,16,34(58)	Rose
Al ²⁷	pile osci.	PRIVATE COMM.(56)	Grimeland
Al ²⁷	pile osci.	JPR,12,584(51)	Benoist
Al ²⁷	pile osci.	PR,83,641(51)	Pomerance
Al ²⁷	diffraction	PR,81,527(51)	Shull
Al ²⁷	pile osci.	PPS/A,63,1175(50)	Collear
Al ²⁷	pile osci.	PR,80,342(50)	Harris
Al ²⁷	$\bar{\sigma}_a$	PR,71,915(47)	Ferai
Al ²⁷	activation	PR,72,888(47)	Seren
Al ²⁷	activation	PR,59,102(41)	O'Neal

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Al ²⁷	σ_t	5.907-646.9	NSE,51,119(73)	Hynchank
Al ²⁷	σ_T	35	PS,4,95(71)	Nystroem
Al ²⁷	σ_t	5.9-208	71ALBANY,81(71)	Singh
Al ²⁷	σ_T	5.88-35.0	PR,178,1746(69)	Hockenbury
Al ²⁷	σ_T (spectra)	35-120	PR,158,1049(67)	Bergqvist
Al ²⁷	σ_t	660-1174	CEA-R-3279(67)	Cabe
Al ²⁷	σ_t	300-1500	NSE,26,500(66)	Chien
Al ²⁷	σ_T (spectra)	35	PL,18,323(65)	Bergqvist
Al ²⁷	σ_t	5.9-387	CR-1860(64)	Garg
Al ²⁷	σ_t	5.91-387	PRIVATE COMM.(64)	Garg
Al ²⁷	σ_t	5.6-445	PR,114,179(59)	Hibdon
Al ²⁷	σ_t	36	AP,8,194(59)	Merzbacher
Al ²⁷	$\bar{\sigma}_a$	68	PR,109,1620(58)	Block
Al ²⁷	σ_t	5.6	PR,109,926(58)	Good
Al ²⁷	σ_t	35-90	PR,99,1625(55)	Toller
Al ²⁷	σ_T	6.4	PR,95,302(54)	Rohrer
Al ²⁷	σ_T	40-500	PR,80,145(50)	Henkel
Al ²⁷	σ_t	295-795	PR,72,439(47)	Seagondollar

¹⁴Si

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.16 \pm 0.02 \text{ b} \\ \sigma_{\alpha} &= 2.2 \pm 0.1 \text{ b} \\ \sigma_t &= 2.4 \pm 0.1 \text{ b} \\ \sigma_{coh} &= 4.1491 \pm 0.0010 \text{ fm}\end{aligned}$$

THERMAL CROSS SECTIONS

$$\sigma_T = 0.17 \pm 0.03 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 0.078 \pm 0.005 \text{ b}$$

$$R_{1c}^2 = 4.2 \pm 0.2 \text{ fm}$$

$$S_1 = 1.6 \pm 0.4$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\Sigma A_{\text{bn}} = 92.2$			$S_n = 8474.2 \pm 0.5 \text{ keV}$		
$E_0 \text{ (keV)}$	$\Gamma \text{ (keV)}$	$g_{\text{p}}^2 \text{ (keV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (eV)}$	$g_{\text{p}}^2 \text{ (eV)}$	$g_{\text{n}}^2 \text{ (eV)}$
Bound level			1/2	0			
*4.980					*.006		
15.14					*.004		
15.29					*.052		
38.82					*.23		
*55.6 ± 0.2		1.5 ± 0.3	1/2	0	*.45	.64 $\pm .04$	
*67.73				1	*1.64		
70.84					*.03		
*86.98					*.30		
*188.0 ± 2.0		56 ± 7	1/2	0	13.8	12.9 ± 1.6	
*298.7					*1.2		
*354.6					*1.04		
*400 ± 1			3/2	1	*.45		
*533.2 $\pm .5$	.53 $\pm .12$		5/2	2	.8		
*566.2 $\pm .5$	10.4 $\pm .7$		3/2	1	4.0		86.1
*587.0 $\pm .5$	.8 ± 0.3		1/2	1	3.3		3.2
*592.7 $\pm .5$	0.4 ± 0.2		1/2	1			1.6
601.7					*4.1		
711.0					*1.39		
772.2					*4.0		
804.5					*8.9		
816.2 $\pm .5$	27 ± 2		3/2	1	20.8		150.0
844.2 $\pm .5$	2.5 ± 0.8		(5/2)	(2)	*7		
871.4 ± 1.0	<3.8				*17		
910.5 $\pm .5$	3.0 $\pm .5$		3/2	1	2.3 $\pm .5$		15.1
966.7 ± 1.0	90 ± 10		1/2	1	4.8 ± 1.0		207.7
983 ± 2			3/2	1			
1016.0 $\pm .5$	<1.0						

E_0 (keV)	Γ (keV)	g_n^2 (keV)	J	ℓ	Γ_γ (eV)	g_n^2 (eV)	g_n^2 (eV)
1041.7 $\pm$.5	1.4 $\pm$.4		(1/2)	1			3.0
1163.9 $\pm$.9	3.3 $\pm$.4		1/2	0		3.1 $\pm$.4	
1186.0	1.8		1/2	0		1.6	
1203.7 $\pm$.6	12 $\pm$ 3		3/2	1			44.3
1227 $\pm$ 5	<5.7						
1252.0 $\pm$ 2.0	7.0 $\pm$ 1.0		1/2	0		6.3 $\pm$.9	
1264.0 $\pm$.7	6 $\pm$ 4		(1/2)	1			10.5
1408.3 $\pm$.8	8 $\pm$ 2		3/2	1			25.2
^a 1477.7 $\pm$.9	5.5 $\pm$.5						
^a 1510.4 $\pm$ 2.0							
^a 1527.5 $\pm$ 1.0	3.5 $\pm$ 0.7						
^a 1578.9 $\pm$ 1.0	2 $\pm$ 1						
1595.4 $\pm$ 1.0	17 $\pm$ 2		3/2	2			
1628.0 $\pm$ 4.0	20 $\pm$ 5		1/2	1			27.5
1636.0 $\pm$ 1.0	3.5 $\pm$ 1.5		5/2	2			
1650.0 $\pm$ 1.1	15 $\pm$ 2		5/2	2			
^a 1782.6 $\pm$ 2.4							
1803.5 $\pm$ 1.2	2.2 $\pm$ 1.0						
1850 $\pm$ 4	45 $\pm$ 10		3/2	1			110
1858 $\pm$ 4	16 $\pm$ 5		5/2	(2)			
1926.4 $\pm$ 1.3							
1972.0 $\pm$ 1.4							

^a $g_n^2 \Gamma_\gamma / \Gamma$

^a Levels also observed in (d,p) reaction.

^a P or D resonance.

²⁹₁₄Si

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.28 \pm 0.09 \text{ b}$$

RESONANCE PARAMETERS

$$I^{\pi} = 1/2^{+}$$

$$\% \text{Abn} = 4.7$$

$$S_n = 10609.7 \pm 0.6 \text{ keV}$$

E_0 (keV)
^a 15.29
^a 38.79
^a 159.6
^a 184.5
^a 336.7
^a 385.4
^a 553.2
^a 650.3

^a Preliminary data.

³⁰₁₄Si

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.107 \pm 0.002 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 0.106 \pm 0.012 \text{ b}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{Abn} = 3.1$$

$$S_n = 6589.1 \pm 0.7 \text{ keV}$$

E_0 (keV)
^a 2.235
^a 4.98
^a 63.43
^a 185.8
^a 235.1
^a 302.7
^a 413.5
^a 644.4
^a 747.6
^a 849.9

^a Preliminary data.

³¹₁₄Si

[2.62 hr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.48 \pm 0.09 \text{ b [286 yr } ^{32}\text{Si]}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Si	pendellosung	PRL,29,871(72)	Shull
Si	σ_t (130 ev)	ZN/A,26,442(71)	Dilg
Si	Christiansen filters	ZN/A,26,391(71)	Koester
Si ³⁰	activation	JNE,24,35(70)	Ryves
Si ³²	half-life	KE,10,89(67)	Jantsch
Si ³⁰	activation	ZN/A,21,829(66)	Koehler
Si	σ_t (1.44 ev)	NP,61,381(65)	Rayburn
Si ³⁰	activation	PRIVATE COMM.(62)	Sjoesstrand
Si ³⁰	activation	JEA,108,171(61)	Tannenbaum
Si ³¹	2N capture	CJC,35,176(57)	Roy
Si ³⁰	activation	PR,93,501(54)	Lyon
Si ³¹	2N capture	PR,94,364(54)	Turkevich
Si ^{28,29,30}	pile osci.	PR,88,412(52)	Pomerance
Si	local osci.	PR,83,641(51)	Pomerance
Si	$\bar{\sigma}_s$	PR,83,379(51)	Weiss
Si	pile osci.	PPS/A,63,1175(50)	Colmer
Si	pile osci.	PR,80,1014(50)	Harris
Si ³⁰	activation	PR,72,888(47)	Seren
Si ³⁰	activation	PR,59,102(41)	O'Neal
Si	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Si, Si ^{28,29}	σ_γ	4.98-1404	73AS1LOMAR,2E2(73)	Allen
Si ²⁹	σ_t	15.29-650.3	ORNL-4844,47(73)+	Good
Si ³⁰	σ_t	2.235-849.9	ORNL-4844,47(73)+	Good
Si, Si ²⁸	σ_t	1594-1854	72BUDAPEST,198(72)	Choi
Si ²⁹	$\sigma(\gamma,n)$	404-1409	PRL,29,379(72)+	Jackson
Si	analysis	190-1854	71ALBANY,309(71)	Newson
Si, Si ²⁸	σ_γ	38-68	PS,4,95(71)	Nystroem
Si	σ_t	190-1594	PRIVATE COMM.(71)	Pineo
Si	σ_t	533.2-566.2	BAP,16,495(71)+	Schwartz
Si, Si ²⁸	σ_γ	68	69STUDSVIK,667(69)	Lundberg
Si	σ_γ	5.05-191	AERE-PR/NP-16,10(69)	Moxon
Si, Si ²⁸	σ_t	536-804	PRIVATE COMM.(68)	Bardolle
Si, Si ²⁸	σ_t	500-1971	KFK-1000(68)+	Cierjacks
Si, Si ²⁸	σ_t	500-1200	CEA-R-3279(67)	Cabe
Si, Si ²⁸	polarization	830-1045	BAP,12,1186(67)	Cox
Si ²⁸	compilation	5	NP/A,105,1(67)	Endt
Si, Si ²⁸	$\bar{\sigma}_s$	570-2280	EUR-2798E(66)	Copolla
Si, Si ²⁸	$\bar{\sigma}_s$	840-2280	65ANTWERP,146(65)	Copolla
Si, Si ²⁸	$\bar{\sigma}_s$	537-2050	AP,12,135(61)	Lane
Si ²⁸	(d,p)	5-804	NP,19,164(60)	Browne
Si, Si ²⁸	σ_t	55-188	AP,8,211(59)	Newson
Si, Si ²⁸	σ_t	195-570	PR,83,479(51)	Fields

³¹
¹⁵P

THERMAL CROSS SECTIONS

$$\sigma_y = 0.180 \pm 0.007 \text{ b}$$

$$a_{coh} = 5.11 \pm 0.01 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 0.08 \pm 0.02 \text{ b}$$

RESONANCE PARAMETERS

$$J^\pi = 1/2^+$$

$$\lambda_{Abn} = 100$$

$$S_n = 7936.3 \pm 0.7 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (keV)
27 ± 1	
158 ± 2	1.1 ± 0.2

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
p31	activation	DA/B,27,919(66)	Kappe
p31	activation	NKA,8,437(63)	Jozefowicz
p31	diffraction	ARN,11,303(61)	Wilkinson
p31	activation	JNE,1,231(55)	Grimeland
p31	diffraction	PRS/A,220,397(53)	Bacon
p31	diffraction	AECU-2277(52)	Levy
p31	pile osci.	PR,83,641(51)	Pomerance
p31	pile osci.	PPS/A,63,1175(50)	Colmer
p31	activation	PR,72,888(47)	Seren
p31	activation	PR,59,102(41)	O'Neal
p31	$\bar{\sigma}_s$	SCP,36,153(39)	Kimura
p31	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
p31	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
p31	σ_y (spectra)	26.5	PS,4,95(71)	Nystroem
p31	σ_y (spectra)	27	69STUDSVIK,667(69)	Lundberg
p31	σ_t	158	PRIVATE COMM.(57)	Patterson
p31	σ_t	147	PR,99,1625(55)	Patterson

16S

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.520 \pm 0.030 \text{ b} \\ \sigma_s &= 0.975 \pm 0.006 \text{ b} \\ a_{coh} &= 2.850 \pm 0.001 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$R' = 4.1 \pm 0.2 \text{ fm}$$

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.53 \pm 0.04 \text{ b}$$

$$\sigma_a = 0.004 \pm 0.001 \text{ b}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^+$ $\Sigma A_{\text{br}} = 95.0$ $S_n = 8646 \pm 1 \text{ keV}$

E_0 (keV)	Γ (keV)	$g\Gamma_n$ (keV)	J	ℓ	Γ_{γ} (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
30.35 $\pm$ 0.09	0.040 $\pm$.003	0.080 $\pm$ 0.006	3/2	1	0.4 $\pm$ 0.1		9.5
42.0							
*96.6 $\pm$.5							
102.9 $\pm$ 0.6	16.98 $\pm$ 1.70	16.98 $\pm$ 1.70	1/2	0	4.7 $\pm$ 0.5	52.9 $\pm$ 5.3	
*111.4 $\pm$.5							
202.2 $\pm$ 1.5	1.30 $\pm$ 0.20	1.30 $\pm$.20	1/2	1			20.5
272.5 $\pm$ 2.5	1.17 $\pm$ 0.18	1.17 $\pm$.18	1/2	1			124
288.7 $\pm$ 2.8	1.14 $\pm$ 0.17	1.14 $\pm$.17	1/2	1			13.4
380.3 $\pm$ 3.0	4.82 $\pm$ 0.72	4.82 $\pm$ 0.72	1/2	0		7.81 $\pm$ 1.17	
587.3 $\pm$.4	1.4 $\pm$ 0.5	4.2 $\pm$ 1.5	5/2	2			
649.2 $\pm$.4	<1.2						
675.5 $\pm$.5	<1.4						
700.5 $\pm$.6	10 $\pm$ 2		1/2	0		12.0 $\pm$ 2.4	
725.8 $\pm$.6	6 $\pm$ 1						
741.6 $\pm$.6	2 $\pm$ 1						
779.0 $\pm$.7	2 $\pm$ 1						
783.3 $\pm$.7							
819.0 $\pm$.7	<1.3						
920.5 $\pm$.8	3 $\pm$ 1	3 $\pm$ 1	1/2	0		3 $\pm$ 1	
947.1 $\pm$.8	1.9 $\pm$.4						

* Narrow resonance.

³³
¹⁶S

THEMAL CROSS SECTIONS

$$\sigma_p = 0.002 \pm 0.001 \text{ b}$$
$$\sigma_a = 0.140 \pm 0.030 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 3/2^+$$

$$\chi_{\text{fbr}} = 0.75$$

$$S_n = 11414.9 \pm 1.9 \text{ keV}$$

E_0 (keV)	E_0 (keV)	E_0 (keV)
^a 13.44	^a 59.06	^a 168.7
^a 17.63	^a 77.84	^a 178.3
^a 23.93	^a 81.46	^a 197.3
^a 30.37	^a 87.50	^a 221.7
^a 52.17	^a 101.2	^a 228.8
^a 53.54	^a 151.6	^a 238.4

^a Preliminary values.

³⁴₁₆S

THERMAL CROSS SECTIONS

$$\sigma_T = 0.240 \pm 0.010 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+ \quad \lambda \text{Abn} = 4.2 \quad S_n = 6988.1 \pm 1.5 \text{ keV}$$

E_0 (keV)	Γ (keV)	g_n^2 (keV)	J	ℓ	g_n^2 (eV)
118.5	0.5			>1	
301.3	8.0			>1	
317.6	1.5	1.5	1/2	1	
357.2	4.0	4.0	1/2	0	15
396.6	7.0	7.0	1/2	1	
435.7	0.8	1.6	3/2	1	
464.0 $\pm$ 5	0.5			>1	
470.8 $\pm$ 5	1.0	1.0	1/2	0	1.5
*510.2					
*642.5					
*800.6					
*814.5					
*839.5					
*851.0					
*893.7					
*935.8					
*1019					
*1089					
*1125					
*1193					
*1313					
*1352					
*1391					
*1450					

* Preliminary values.

³⁶₁₆S

THERMAL CROSS SECTIONS

$$\sigma_T = 0.15 \pm 0.03 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
S	σ_t (1.25,5.2 ev)	PRIVATE COMM.(73)	Koester
S	σ_t diffraction	ZN/A,26,400(71)	Truestedt
S	mirror reflections	PRIVATE COMM.(70)	Koester
S	ratio	BAP,13,1421(68)	DeVolpi
S ³⁴	activation	NUK,10,278(67)	Koehler
S	$\sigma_t \bar{\sigma}_s$	AKE,13,152(67)	Maayouf
S ^{32,33}	alpha emission	DA/B,27,2077(66)	Harris
S ³⁴	activation	DA/B,27,919(66)	Kappe
S ^{32,33}	alpha emission	APP,28,763(65)	Benisz
S	pile osci.	61BUCHAR,623(61)	Bouzyk
S ³⁴	activation	NCS,19,4(61)	Durham
S ^{32,33}	alpha emission	ZP,153,106(58)	Munnich
S ^{32,33}	$\sigma_p \sigma_e$	THESIS(56)	Seppi
S ³³	σ_p	PR,88,573(52)	Westermark
S	pile osci.	PR,83,641(51)	Pomerance
S	diffraction	PR,81,527(51)	Shull
S	pile osci.	PPS/A,63,1175(50)	Colmer
S	pile osci.	PR,80,342(50)	Harris
S ³⁴	activation	PR,72,888(47)	Seren
S ³⁶	activation	CP-3574,32(46)	Hughes
S	$\bar{\sigma}_s$	SCP,36,153(39)	Kimura
S	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
S ³⁴	σ_t	30.37-1450	ORNL-4844,47(73)+	Good
S ³³	σ_t	13.44-238.4	ORNL-4844,47(73)+	Good
S, S ³²	σ_t	202.2-591.7	NSE,51,119(73)	Wynchank
S ³⁴	σ_t	120-466	PRIVATE COMM.(71)	Bilpuch
S, S ³²	σ_γ (spectra)	30-42	PS,4,95(71)	Nystroem
S, S ³²	σ_t	30-377	PRIVATE COMM.(71)	Singh
S	σ_t	96.6-111.4	ORNL-4513,33(70)	Macklin
S, S ³²	σ_γ (spectra)	30-42	69STUDSVIK,667(69)	Lundberg
S, S ³²	σ_t	500-947	68WASH,2,743(68)+	Cierjacks
S	σ_γ	30-127	BAP,12,512(67)+	Block
S, S ³²	σ_γ (spectra)	30-111	PR,158,1049(67)	Bergqvist
S, S ³²	σ_γ (spectra)	30-111	PL,18,323(65)	Bergqvist
S, S ³²	σ_t	30-465	65ANTWERP,74(65)	Garg
S, S ³²	σ_γ	30	PR/B,136,695(64)	Macklin
S, S ³²	$\bar{\sigma}_s$	590	AP,12,135(61)	Lane
S, S ³²	σ_t	100-800	PR,79,593(50)	Peterson
S, S ³²	σ_t	108-205	PR,76,308(49)	Adair

¹⁷Cl

THERMAL CROSS SECTIONS

$$\sigma_T = 33.2 \pm 0.5 \text{ b}$$

$$a_{coh} = 9.605 \pm 0.003 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 12 \pm 2 \text{ b}$$

UNASSIGNED RESONANCES

E_0 (keV)	$2ag\Gamma_n$ (keV)
66.358	34 ± 10
66.500	$.0174 \pm .006$
$90.25 \pm .15$	$.012 \pm .006$
$133.74 \pm .27$	$.400 \pm .130$
$134.95 \pm .28$	$.100 \pm .020$
$140.55 \pm .29$	$.090 \pm .020$
$149.63 \pm .32$	$.100 \pm .020$
$165.35 \pm .38$	$.096 \pm .020$
$179 \pm .5$	$.300 \pm .100$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 43 \pm 2 \text{ b} \\ \sigma_p &= 0.490 \pm 0.020 \text{ b} \\ \sigma_a &= 0.08 \pm 0.04 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_p &= 0.369 \pm 0.015 \text{ b} \\ I_{\gamma} &= 17 \pm 2 \text{ b} \\ \langle D \rangle &= 13 \pm 4 \text{ keV}\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 3/2^{+}$		$\chi A_{\text{bn}} = 75.77$			$S_n = 8580.5 \pm 0.9 \text{ keV}$		
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (keV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$	$\Gamma_p \text{ (eV)}$
$-18 \pm .03$		2	0	$.50 \pm .02$	$1.4 \pm .3$		$.0024 \pm .0008$
0.398 ± 0.001	$.074 \pm .004 + 3$	2	1	0.420 ± 0.057		5.0	$.07 \pm .03$
1.1 ± 0.1	.000001						
4.249 ± 0.002	$.0005 \pm .00005$		1			.97	$.04 \pm .02$
14.788 ± 0.015	0.038 ± 0.002	1	0		$.312 \pm .016$		
17.124 ± 0.018	0.021 ± 0.001		1			5.1	
26.60 ± 0.03	0.130 ± 0.010		[0]		$.798 \pm .006$		
44.12 ± 0.05	0.0276 ± 0.008		[1]			1.7	
57.70 ± 0.08	0.117 ± 0.006	2	1			4.8	
$68.17 \pm .10$	$.156 \pm .008$	1	0		$.596 \pm .046$		
103.33 ± 0.19	0.264 ± 0.014						
113.30 ± 0.21	0.600 ± 0.080	2	1			9.3	
142.89 ± 0.31	$0.950 \pm .132$		1				
182.82 ± 0.44	2.380 ± 0.528		1			15.0	
188.07 ± 0.45	$1.188 \pm .132$	2					
190.32 ± 0.46	0.792 ± 0.106	1					
200 ± 1	2.8 ± 0.5						

* Isotopic assignment uncertain.

³⁶₁₇Cl
[3.0 × 10⁵ yr]

THERMAL CROSS SECTIONS

$$\sigma_T < 10 \text{ b}$$

³⁷₁₇Cl

THERMAL CROSS SECTIONS

$$\sigma_T = 0.428 \pm 0.005 \text{ b [37 min } ^{38}\text{Cl}^{m+g}]$$

$$\sigma_T = 0.005 \pm 0.003 \text{ b [1 sec } ^{38}\text{Cl}^{m}]$$

RESONANCE PROPERTIES

$$I_T = 0.310 \pm 0.060 \text{ b}$$

$$\langle D \rangle = 9 \pm 3 \text{ keV}$$

RESONANCE PARAMETERS

$$I'' = 3/2^*$$

$$\%Abn = 24.23$$

$$S_n = 6110.4 \pm 3.9 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (keV)	J	ℓ	$2g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
8.314 ± 0.005	0.088 ± 0.014		0	.96 ± .15	
*16.34 ± .01	.0200 ± .002		1		4.1
25.30 ± 0.06	0.105 ± 0.030	1	0	.66 ± .19	
46.61 ± 0.06	0.455 ± 0.017	2	0	2.110 ± .079	
54.7 ± 0.09	.131 ± .013	2	0	.560 ± .056	
55.15 ± 0.09	.141 ± .014	2	0	.600 ± .060	
*93.00 ± .16	.809 ± .066				
125 ± 2	.230 ± .100				
*127.66 ± .26	.413 ± .080				
*136.22 ± .28	1.240 ± .250				
145 ± 2	1.450 ± .400				
159 ± 3	.340 ± .340				
180 ± 4	1.100 ± .350				
193 ± 4	.925 ± .350				
202 ± 4	2.2				

* Isotopic assignment uncertain.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cl	mirror reflections	PRL,27,956(71)	Koester
Cl ³⁷	activation	JNE,24,35(70)	Ryves
Cl ³⁷	activation	JNE,24,419(70)	Ryves
Cl ³⁵	$\sigma_y \sigma_p$	JIN,31,3721(69)	Sims
Cl ³⁵	σ_p	PR,165,1184(68)	Schroeder
Cl	diffraction	ZP,198,187(67)	Koester
Cl ^{35,37}	activation	DA/B,27,919(66)	Kappe
Cl ³⁵	σ_p	PRIVATE COMM.(66)	Koehler
Cl ^{35,36}	σ_p	ORNL-4013(65)	Gillette
Cl	σ_y	PRIVATE COMM.(64)	Kay
Cl	σ_y	NKA,8,443(63)	Bouzyk
Cl ^{35,37}	$\sigma_p \sigma_n$ activation	NCS,19,4(61)	Durham
Cl	σ_y	BOS,24,7(61)	Ghose
Cl	σ_y	NSE,9,132(61)	Meadows
Cl ³⁵	σ_c	PR,104,1054(56)	Brugger
Cl ³⁵	alpha emission	THESIS(56)	Seppi
Cl ^{35,36}	σ_y	CJP,33,35(55)	Boyd
Cl ³⁵	proton emission	HPA,27,159(54)	Berthet
Cl ³⁷	activation	PR,95,613(54)	Scharff- Goldhaber
Cl	σ_y	CR,232,2089(51)	Grimeland
Cl	σ_y	PR,83,641(51)	Pomerance
Cl	diffraction	PR,81,527(51)	Shull
Cl	σ_y	PPS/A,63,1175(50)	Colmer
Cl	σ_y	PR,80,342(50)	Harris
Cl ³⁵	σ_p	ZN/A,4,150(49)	Maurer
Cl ^{35,37}	σ_p activation	PR,72,888(47)	Seren
Cl ³⁵	proton emission	CP-2984(45)	Hughes
Cl ³⁵	proton emission	HPA,17,97(44)	Gibert
Cl ³⁵	σ_p	CP-2638(44)	Langsdorf
Cl	σ_y	JPJ,24,569(42)	Kimura
Cl ³⁷	activation	PR,59,102(41)	O'Neal
Cl	σ_y	PR,58,554(40)	Lapointe
Cl	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Cl, Cl ^{35,37}	σ_t	0.4-190.7	BAP, 18,96(73)+	Singh
Cl	σ_t	14.81-113.8	NSE, 51,119(73)	Wynchank
Cl, Cl ^{35,37}	σ_t	0.4-190.8	71ALBANY, 81(71)	Singh
Cl, Cl ³⁵	$\sigma_\gamma(\text{spectra})$	0.4-500	NP/A, 135,241(69)	Alves
Cl, Cl ^{35,37}	σ_t	0.404-113.0	NP/A, 134,118(69)	Alves
Cl, Cl ^{35,37}	σ_t	0.404-113.0	NP/A, 123,561(69)	Morgenstern
Cl, Cl ³⁵	$\sigma_\gamma(\text{spectra})$	0.4	UJV-1705(66)	Becvar
Cl, Cl ³⁵	$\sigma_\gamma(\text{spectra})$	thermal	NP, 77,267(66)	Middelkoop
Cl	σ_t	0.398-406	65ANTWERP, 74(65)	Garg
Cl, Cl ³⁵	σ_t	0.405	65ANTWERP, 192(65)	Karzavina
Cl	σ_γ	thermal	YF, 1,229(65)	Romanov
Cl, Cl ³⁵	σ_γ	0.020-4.3	JNE, 14,76(61)	Kashukeev
Cl, Cl ³⁵	σ_p	THERM.-4.3	ZET, 40,1610(61)	Popov
Cl ³⁵	σ_t	15-184	PRIVATE COMM.(59)	Bilpuch
Cl ³⁷	σ_t	8.5-193	PRIVATE COMM.(59)	Bilpuch
Cl ³⁵	σ_t	15-202	PRIVATE COMM.(57)	Patterson
Cl ³⁷	σ_t	8-202	PRIVATE COMM.(57)	Patterson
Cl, Cl ^{35,37}	σ_t	0.03-8.7	PR, 104,1054(56)	Brugger
Cl ³⁵	σ_t	26.5-190	PR, 99,620(55)	Toller
Cl ³⁷	σ_t	8.8-190	PR, 99,620(55)	Toller
Cl, Cl ³⁵	σ_t	thermal	PR, 79,44(50)	Hibdon

³⁶Ar

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.678 \pm 0.009 \text{ b} \\ \bar{\sigma}_s &= 0.644 \pm 0.004 \text{ b} \\ \sigma_t &= 1.32 \pm 0.01 \text{ b} \\ a_{coh} &= 2.0 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 0.42 \pm 0.05 \text{ b}$$

³⁸Ar

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 5 \pm 1 \text{ b} \\ \bar{\sigma}_s &= 73.7 \pm 0.4 \text{ b} \\ \sigma_a &= 0.0055 \pm 0.0001 \text{ b} \\ \sigma_t &= 82.7 \pm 1.0 \text{ b} \\ a_{coh} &= 24.3 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 2.5 \pm 0.5 \text{ b}$$

RESONANCE PARAMETERS

$I^a = 0^+$	$\%Abn = 0.34$	$S_n = 8791.1 \pm 0.4 \text{ keV}$
$E_0 \text{ (keV)}$	$\Gamma_{\gamma} \text{ (eV)}$	$\Gamma_n^0 \text{ (eV)}$
-9.8 ± 1.0	1.85 ± 0.22	82 ± 10

³⁹Ar

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.8 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 0.4 \pm 0.1 \text{ b}$$

³⁹Ar
[269 yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 600 \pm 300 \text{ b}$$

⁴⁰
¹⁸Ar

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.660 \pm 0.010 \text{ b} \\ \sigma_s &= 0.40 \pm 0.02 \text{ b} \\ a_{coh} &= 1.83 \pm 0.05 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 0.41 \pm 0.03 \text{ b} \\ \langle D \rangle &= 24 \pm 3 \text{ keV} \\ S_1 &= 0.47 \pm 0.16\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\%Abn = 99.59$			$S_n = 6098.0 \pm 0.6 \text{ keV}$		
E_0 (keV)	Γ (keV)	$g\Gamma_n$ (keV)	J	ℓ	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)	
11.17 ± .01		.00015 ± .00003		1			0.13
17.95 ± .02		.00043 ± .00007		1			.17
59.25 ± .05		.0059 ± .0009		1			.42
77.30 ± .22	5.0 ± .5	5.0 ± .5	1/2	0	18.0 ± 1.8		
115.70 ± .14		.530 ± .060	[1/2]	1			14.7
172.8 ± .5	4.9 ± .5	4.9 ± .5	1/2	0	11.8 ± 1.2		
180.4 ± .3	.260 ± .080	.260 ± .080	[1/2]	1			3.9
192.8 ± .3		.110 ± .030		1			1.5
220.0 ± .4	2.0 ± .3	2.0 ± .3	1/2	0	4.2 ± .6		
255.1 ± .5	3.8 ± .5	3.8 ± .5	1/2	0	6.9 ± .9		
268.4 ± .5	0.40 ± .12	.40 ± .12	1/2	0	.77 ± .23		
274.7 ± .5		.360 ± .120		1			3.2
296.9 ± .6	.335 ± .100	.335 ± .100	[1/2]	1			2.7
301.1 ± .6	.140 ± .050	.140 ± .050	[1/2]	1			1.1
340.8 ± .7	.460 ± .125	.920 ± .250	3/2	1			6.1
363.0 ± .8		.120 ± .050		1			0.7
371.3 ± .8	.540 ± .100	1.080 ± .200	3/2	1			6.5
390.6 ± .9	1.0 ± 0.2	1.0 ± 0.2	1/2	0	1.6 ± 0.3		
401.7 ± .9	.480 ± .110	.480 ± .110	[1/2]	1			2.6
455.4 ± 1.1	.860 ± .170	.860 ± .170	1/2	1			4.0
469.3 ± 1.1	1.200 ± .285	2.400 ± .570	3/2	1			10.9
531.6 ± 1.4	.850 ± .200	.850 ± .200	1/2	1			3.3
552.8 ± 1.4	.255 ± .075	.510 ± .150	[3/2]	1			1.8
569.3 ± 1.5	2.125 ± .600	4.250 ± 1.200	[3/2]	1			15.3
593	0.8		1/2	1			2.8
596	4.0		1/2	0	5.2		
605	0.4			1			1.3
628	1.5	3.2	3/2	1			4.8

⁴¹
¹⁸Ar

[1.83 hr]

THERMAL CROSS SECTIONS

$$\sigma_T = 0.5 \pm 0.1 \text{ b}$$

THERMAL CROSS SECTIONS

isotope	Measurement	Reference	Author
Ar ³⁶	$\bar{\sigma}_s$	PL/A,28,642(69)	Andriess
Ar ⁴⁰	activation	NP/A,128,333(69)	Ranakumar
Ar ³⁶	σ_t	NP/A,133,410(69)	Rorer
Ar ³⁶	activation	AKE,13,383(68)	Wille
Ar ³⁹	mass analysis	PRIVATE COMM.(66)	Cohen
Ar ³⁶ , Ar ³⁶	$\bar{\sigma}_s$	PR,148,1303(66)	Krohn
Ar ⁴¹	evaluation	SCI,148,1325(66)	Stoerner
Ar ³⁹	mass analysis	PRIVATE COMM.(66)	Zoch
Ar ⁴⁰	activation	NP,65,225(65)	French
Ar ⁴⁰	$\sigma_t \sigma_\gamma \bar{\sigma}_s$	JPR,24,21(63)	Genin
Ar ⁴⁰	activation	ZN/A,18,1339(63)	Koehler
Ar ³⁶	σ_t	PR,125,275(62)	Chrien
Ar ³⁶	alpha emission	CJP,39,1784(61)	Hanna
Ar ³⁶	σ_t	ZN/A,15,828(60)	Springer
Ar ³⁶ , 40	$\sigma_t \bar{\sigma}_s$	PR,105,976(57)	Henshaw
Ar ³⁸ , 40, 41	activation	PR,87,886(52)	Katcoff
Ar ³⁶	reflection	PR,84,969(51)	McReynolds
Ar ³⁶	pile osci.	PPS/A,63,1175(50)	Colmer
Ar ³⁶	$\bar{\sigma}_s$	PR,80,20(50)	Harris
Ar ³⁶	activation	PR,77,840(50)	McMurtrie
Ar ³⁶	σ_t	PR,76,1750(49)	Melkonian

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Ar ³⁶	σ_t	11.2-569.3	PRIVATE COMM.(72)	Liou
Ar ³⁶ , Ar ⁴⁰	σ_t	77-628	PRIVATE COMM.(71)	Bilpuch
Ar ³⁶	σ_t	0-6	PR,125,275(62)	Chrien

¹⁹K

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 2.10 \pm 0.10 \text{ b} \\ \bar{\sigma}_s &= 1.5 \pm 0.2 \text{ b} \\ a_{coh} &= 3.71 \pm 0.02 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_y &= 1.0 \pm 0.1 \text{ b} \\ S_1 &= 2.0 \pm 0.4\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (keV)	$ag\Gamma_n$ (keV)	ℓ	$ag\Gamma_n^1$ (eV)
16.453±.014	.00008±.00003	1	.038
78.540±.120	.020 ±.012	1	0.97
90.40 ±.15	.012 ±.007	1	0.42
99.096±.175	.074 ±.030		
104.242±.189	.007 ±.004	1	0.23
126.915±.253	.024 ±.012	1	.60
138.554±.290	.018 ±.009	1	.39
146.200±.310	.082 ±.025	1	1.67
147.743±.317	.057 ±.017	1	1.14
148.995±.321	.045 ±.025	1	.89
184.547±.440	.037 ±.018	1	.55
198.780±.492	.130 ±.060	1	1.75

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 1.96 \pm 0.15 \text{ b} \\ \sigma_a &= 0.0043 \pm 0.0005 \text{ b} \\ a_{coh} &= 3.7 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 0.9 \pm 0.1 \text{ b} \\ \langle D \rangle &= 4.3 \pm 0.5 \text{ keV} \\ S_1 &= 2.0 \pm 0.6\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 3/2^+$$

$$\% \text{Abn} = 93.3$$

$$S_n = 7800.53 \pm .21 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (keV)	J	ℓ	$2g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
-1.0		1	0	1.08	
1.111 ± .0006	.000015 ± 1.00-6		1		.20
3.277 ± .002	.000100 ± 1.50-6		1		2.5
9.373 ± .005	.054 ± .006		0	.56 ± .06	
12.610 ± .009	.00131 ± .00026	1	1		.45
*14.279 ± .011	.00081 ± .00017		1		.23
*15.934 ± .013	.00169 ± .0003		1		.42
25.519 ± .024	.105 ± .017	1	0	.657 ± .106	
32.170 ± .034	.0036 ± .0009	1	1		.30
33.305 ± .035	.0202 ± .0043	[1]	1		1.6
37.490 ± .042	.0116 ± .0024	0	1		.80
42.565 ± .051	.643 ± .107	2	0	3.11 ± .52	
45.980 ± .057	.052 ± .015	1	1		2.6
52.090 ± .068	.0159 ± .0043		1		.67
54.585 ± .073	.0204 ± .0054	0	1		.80
57.868 ± .079	.922 ± .172	2	0	3.83 ± .72	
59.903 ± .083	.062 ± .015		1		2.1
68.818 ± .102	1.050 ± .215	1	1		29.4
*81.007 ± .130	.030 ± .011	[1]	1		.66
87.568 ± .146	.354 ± .086	1	1		7.0
92.909 ± .159	.036 ± .011		1		.65
96.582 ± .168	.450 ± .064	1	0	1.45 ± .21	
*102.065 ± .183	.045 ± .013		1		.70
*108.613 ± .201	1.500 ± .320	1	1		23.0
*118.450 ± .223	.077 ± .021		1		1.0
122.573 ± .240	.034 ± .011		1		.43
*132.279 ± .269	.279 ± .086		1		3.12
134.954 ± .277	.165 ± .049		1		1.78
136.322 ± .281	.090 ± .026		1		.97
143.782 ± .304	.215 ± .065	2	1		2.24
154.165 ± .337	1.500 ± .540	[3]	[1]		13.60
162.440 ± .365	.940 ± .320		[1]		7.93
177.791 ± .417	.835 ± .280	1	[1]		6.25
188.517 ± .455	.210 ± .065		1		1.50
193.081 ± .471	.665 ± .260		0	1.51 ± .59	

Note-Isotopic assignments for resonances below 100 keV from data of Good(73).

* Isotopic assignment on basis of peak cross-section.

* Isotopic assignment uncertain.

^b K-41 has a resonance about this energy.

⁴⁰
¹⁹K

[1.28 × 10⁹ yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 30 \pm 8 \text{ b} \\ \sigma_p &= 4.4 \pm 0.3 \text{ b} \\ \sigma_a &= 0.39 \pm 0.03 \text{ b}\end{aligned}$$

⁴¹
¹⁹K

THERMAL CROSS SECTIONS

$$\sigma_T = 1.46 \pm 0.03 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 1.42 \pm 0.06 \text{ b} \\ \langle D \rangle &= 4.8 \pm 1.2 \text{ keV} \\ S_1 &= 1.9 \pm 0.6\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 3/2^+$		$\%Abn = 6.7$		$S_n = 7534.8 \pm 1.4 \text{ keV}$	
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (keV)}$	J	ℓ	$2g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$
2.028 ± .0009	.0032 ± .0006	2	0	.071 ± .013	0.65
3.205 ± .002	.00023 ± .00003		1		
5.536 ± .003	.075 ± .009		[0]		
*12.135 ± .009	.0024 ± .0004		1		
13.330 ± .010	.0058 ± .0011		1		
15.007 ± .012	.0046 ± .0012	[3]	1	1.35 ± .27	1.2
16.710 ± .014	.174 ± .035		[0]		
20.285 ± .018	.029 ± .009				
24.926 ± .024	.107 ± .020				
27.083 ± .026	.018 ± .004		1		
38.587 ± .044	.810 ± .020	2	0	4.12 ± .10	2.0
55.720 ± .075	.078 ± .023		1		
75.384 ± .117	.405 ± .115		1		
79.759 ± .127	.695 ± .230		1		
83.329 ± .135	.347 ± .116		1		
91.076 ± .154	.130 ± .072	1	1		1.8
100.827 ± .179	.434 ± .145		1		
116.031 ± .221	.839 ± .260		1		
120.944 ± .235	.405 ± .145		1		
			1		

* Isotopic assignment on the basis of the peak cross-section.

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
K ⁴¹	activation	RCA,17,191(72)	Kim
K	Christiansen filters	ZN/A,27,901(72)	Koester
K ⁴⁰	σ_{γ} (spectra)	PR/C,3,208(71)	Beckstrand
K ⁴¹	activation	JNE,24,35(70)	Ryves
K ⁴⁰	$\sigma_p \sigma_a$	PR,165,1184(68)	Schroeder
K ⁴¹	activation	NUK,9,270(67)	Koehler
K	diffraction	ACR,20,220(66)	Brown
K ⁴¹	activation	DA/B,27,919(66)	Kappe
K ^{39,40}	mass spectrometry	ORNL-4013(65)	Gillette
K ³⁹	σ_a	APP,28,763(65)	Benisz
K, K ³⁹	diffraction	63ANL-6797,393(63)	Mueller
K	pile osci.	61BUCHAR,623(61)	Bouzyk
K ⁴¹	activation	NSE,8,378(60)	Lyon
K ⁴⁰	σ_p	HPA,31,727(58)	Rossel
K	σ_t	PR,99,610(55)+	Joki
K ^{39,40,41}	pile osci.	PR,88,412(52)	Pomerance
K	pile osci.	PR,83,641(51)	Pomerance
K	diffraction	PR,81,527(51)	Shull
K	pile osci.	PPS/A,63,1175(50)	Colmer
K	pile osci.	PR,80,342(50)	Harris
K	$\bar{\sigma}_s$ (120 ev)	PR,79,747(50)	Hibdon
K ³⁹	activation	PR,76,577(49)	Hansen
K ⁴¹	activation	PR,72,888(47)	Seren
K ⁴¹	activation	PR,59,102(41)	O'Neal
K ⁴¹	activation	PR,59,102(41)	O'Neal
K	water bath	PR,58,554(40)	Lapointe
K	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
K	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
K ³⁹	σ_t	1.108-109.05	PRIVATE COMM.(73)	Good
K ⁴¹	σ_t	0.896-121.12	PRIVATE COMM.(73)	Good
K, K ^{39,41}	σ_t	1.1-198.8	PRIVATE COMM.(73)	Singh
K, K ^{39,41}	σ_t	1.1-199.5	71ALBANY,81(71)	Singh
K, K ³⁹	σ_t	445-447.8	PL/B,29,417(69)	Cierjacks
K	σ_t	1.114-142	65ANTWERP,74(65)	Garg
K ³⁹	σ_t	3.4-9.2	PR,109,926(58)	Good
K ⁴¹	σ_t	5.4-16.2	PR,109,926(58)	Good
K ³⁹	σ_t	43-68	PR,99,620(55)	Toller
K ⁴¹	σ_t	39	PR,99,620(55)	Toller

²⁰Ca

THERMAL CROSS SECTIONS

$$\sigma_T = 0.43 \pm 0.02 \text{ b}$$

$$a_{coh} = 4.83 \pm 0.07 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 0.20 \pm 0.02 \text{ b}$$

$$R_T = 3.6 \pm 0.3 \text{ fm}$$

$$S_0 = 2.6 \pm 0.4$$

⁴⁰Ca

THERMAL CROSS SECTIONS

$$\sigma_T = 0.40 \pm 0.05 \text{ b}$$

$$\sigma_a = 2.5 \pm 1.1 \text{ mb}$$

$$a_{coh} = 4.9 \pm 0.2 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T^c = 0.18 \pm 0.03 \text{ b}$$

$$R_T = 3.6 \pm 0.3 \text{ fm}$$

$$\langle D \rangle = 14 \pm 1 \text{ keV}$$

$$S_0 = 2.6 \pm 0.6$$

$$S_1 = 0.12 \pm 0.04$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		%Abn = 96.94		$S_n = 8363.1 \pm 0.5 \text{ keV}$			
$E_0 \text{ (keV)}$	$\Gamma \text{ (keV)}$	$g\Gamma_n \text{ (keV)}$	J	ℓ	$g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$	
-1.0			1/2	0	0.11		
10.824 ± .007		.00064 ± .00021					
20.43 ± 0.02		0.006 ± 0.002	1/2	0	.042 ± .014		
42.041 ± .050		.00092 ± .00031					
*88.84 ± 0.17		0.150 ± 0.008	1/2	1			5.8
131.97 ± 0.31		3.000 ± 0.200	1/2	0	8.26 ± .55		
145.32 ± 0.35		0.160 ± 0.020		1			3.1
169.38 ± 0.44		2.470 ± 0.125	1/2	0	6.00 ± .30		
211.5 ± 0.6		.165 ± .020	[3/2]	1			2.0
217.5 ± 0.6		6.900 ± 0.700	1/2	0	14.80 ± 1.50		
223.0 ± 0.7				>0			
229.8 ± 0.7		0.120 ± 0.020	[3/2]	1			1.3
235.0 ± 0.8				>0			
242.0 ± 0.8				>0			
244.5 ± 0.8		19.00 ± 1.00	1/2	0	38.42 ± 2.02		
269 ± 1				>0			
277 ± 1		.107		>0			
282 ± 1		.175		>0			
290 ± 1		.038		>0			
292.6 ± 1		2.4 ± 0.2	1/2	0	4.44 ± .37		
294 ± 1				>0			

⁴⁰
₂₀Ca

E_0 (keV)	Γ (keV)	$g\Gamma_n$ (keV)	J	ℓ	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
295 ±1				>0		
301 ±1				>0		
303 ±1				>0		
327.5 ±2		14.0 ±1.2	1/2	0	24.4 ±2.1	
343 ±1				>0		
346 ±1				>0		
354 ±1				>0		
357 ±2		2.0 ±0.2	1/2	0	3.34 ±.34	
365 ±2		.058		>0		
372 ±2		.320		>0		
377 ±2				>0		
380 ±2				>0		
386 ±2		.790		>0		
397 ±2		.260		>0		
420 ±2		.235		>0		
438 ±2		.460		>0		
443 ±2		10.0 ±1.0	1/2	0	15.08 ±1.51	
469 ±2				>0		
471 ±2		.390		>0		
479 ±2		.480		>0		
493 ±2		.410		>0		
525.3 ±0.4	<0.9					
537.6 ±0.4	<0.6					
559.0 ±0.4	1.120±0.220	1.120 ±0.220	[1/2]	[0]	1.50 ±.29	
570.1 ±0.4		0.390 ±0.010	3/2	1		1.4
590.0 ±1.5	58.0 ±4.0	58.0 ±4.0	1/2	0	75.52 ±5.21	
594.2 ±0.4	0.148±0.040		5/2	2		
622.0 ±0.4		<0.300	[5/2]	2		
635.5 ±.4	2.0 ±0.6	2.0 ±0.6	1/2	0	2.51 ±.75	
638.4 ±.4		<0.300	5/2	2		
640.9 ±.5	1.300±0.25	1.300 ±0.25	1/2	1		4.0
668.1 ±		<0.300	[5/2]	2		
675.0 ±.5	2.700±0.270	2.700 ±0.270	1/2	0	3.29 ±.33	
694.6 ±.5		0.900 ±0.200	1/2	1		2.5
713.2 ±.6		0.200	3/2	1		.6
728.0 ±.6		<0.200	3/2	1		.5
738.2 ±.6		3.200	1/2	0	3.72	
742.8 ±.6		4.400	1/2	0	5.11	
747.3 ±.6		0.300	1/2	1		0.8
758.0 ±.6		1.200	[3/2]	2		
764.8 ±.6		0.200	3/2	[2]		
771.5 ±1.0		12.000	1/2	0	13.66	
792.5 ±.7		2.400	1/2	0	2.69	
800.2 ±.7		0.300	5/2	2		
823.0 ±.7		3.500	1/2	0	3.86	
826.0 ±.7		0.400	1/2	[1]		0.9
830.0 ±.8		0.300	[5/2]	2		
842.2 ±.8		1.800	3/2	1		
857.2 ±.8		0.600	[3/2]	2		
861.8 ±.8		29.000	1/2	0	31.23	
867.6 ±.8		0.300	[1/2]	1		.7
878.7 ±.8		31.000	1/2	0	33.07	

⁴⁰
²⁰Ca

E ₀ (keV)	Γ (keV)	gΓ _n (keV)	J	l	gΓ _n ⁰ (eV)	gΓ _n ¹ (eV)
884.8 ± .8		0.600	3/2	1		1.3
908.1 ± .8		1.500	1/2	1		3.2
924.6 ± .8		0.600	5/2	2		
940.5 ± .8		0.600	1/2	1		1.2
945.1 ± .8		1.000	[3/2]	2		
958.8 ± .9		0.800	3/2	1		1.6
970.0 ± .9		7.200	1/2	0	7.31	
993.3 ± .9		2.200	[3/2]	[2]		
1003.9 ± .9		11.00	1/2	0	10.98	
1018.7 ± .9		1.000	[3/2]	1		1.9
1025.2 ± .9		0.300	[1/2]	[1]		0.6
1037.4 ± .9		0.700	1/2	1		1.3
1058.0 ± 1.0		0.400	1/2	[1]		.7
1061.5 ± 1.0		0.400	1/2	[1]		0.7
1083.2 ± 1.0		1.400	3/2	[1]		2.5
1094.4 ± 1.0		1.200	[3/2]	2		
1094.9 ± 1.0		1.200	1/2	0	1.15	
1097.7 ± 1.0		0.600	5/2	2		
1126.0 ± 1.0		0.500	1/2	[0]	.47	
1129.2 ± 1.0		1.400	3/2	2		
1160.2 ± 1.2		0.400	3/2	[2]		
1169.0 ± 1.3		1.400	3/2	1		2.3
1189.4 ± 1.3		3.000	1/2	0		
1202.6 ± 1.4		12.00	5/2	[2]		
1210.8 ± 1.4		15.00	1/2	0	13.63	
1214.0 ± 1.4		2.000	3/2	1		3.2
1232.0 ± 1.5		2.000	3/2	2		
1242.9 ± 1.5		1.500	1/2	1		2.4
1250.0 ± 1.5		1.500	[5/2]	2		
1262.0 ± 1.5		1.000	[3/2]	[2]		
1284.0 ± 1.5		15.000	1/2	0	13.24	
1289			[3/2]	2		
1308				[1]		
1318			[1/2]	[0]		
1333						
1337						
1348			3/2	1		
1355						
1375			1/2	0		
1388						
1408			1/2	1		
1424						
1433						
1445			3/2	1		
1457			3/2	1		
1468				1		
1478				1		

▪ Possibly doublet, one component with J=2.5, l=2.

⁴²
20 Ca

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.65 \pm 0.10 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 0.29 \pm 0.05 \text{ b}$$

$$\langle D \rangle = 14 \pm 2 \text{ keV}$$

$$S_0 = 2.4 \pm 0.7$$

RESONANCE PARAMETERS

$$I^n = 0^*$$

$$\% \text{Abn} = 0.65$$

$$S_n = 7932.6 \pm 0.5 \text{ keV}$$

E_0 (keV)	$g\Gamma_n$ (keV)	J	ℓ	$g\Gamma_n^0$ (eV)	E_0 (keV)	$g\Gamma_n$ (keV)	J	ℓ	$g\Gamma_n^0$ (eV)
40.0	5.0	1/2	0	25.0	385.0			>0	
124.2	3.75	1/2	0	10.641	399.5	0.500	1/2	0	0.791
128.5	11.00	1/2	0	30.686	418.0	0.400	1/2	0	0.619
157.7	0.300	1/2	0	0.755	425.0	0.300	1/2	0	0.460
175.0	2.50	1/2	0	5.976	445.0			>0	
189.0	.300		>0		447.0	1.000	3/2	>0	
213.2	1.75			3.790	450.5	1.750	1/2	0	2.607
221.5	0.250		>0		468.5	0.300	1/2	0	0.438
238.5	500	3/2	>0		478.0	0.750	1/2	0	1.085
249.0			>0		491.5	1.000	1/2	0	1.426
254.0	0.800	1/2	1		497.5			>0	
259.5	0.750	1/2	0	1.472	509.0			>0	
274.5	0.750	1/2	0	1.431	513.5	5.500	1/2	0	7.675
275.0			>0		532.0	6.500	1/2	0	8.912
278.5	1.5	1/2	0	2.842	545.5	2.00	1/2	0	2.708
280.5	0.750	1/2	1		555.0	0.300	1/2	0	0.403
297.0	0.238		>0		560.0	0.500	1/2	0	0.668
334.0	0.460		>0		564.5			>0	
338.0	0.550		>0		570.5	10.000	1/2	0	13.240
356.5	1.500	1/2	0	2.512	572.5			>0	
378.5	0.295		>0						

⁴³
²⁰Ca

THERMAL CROSS SECTIONS

$$\sigma_T = 6.2 \pm 0.6 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 5.5 \pm 1.5 \text{ b}$$

$$\langle D \rangle = 3.3 \pm 0.6 \text{ keV}$$

$$S_0 = 1.6 \pm 0.7$$

RESONANCE PARAMETERS

$$I^\pi = 7/2^-$$

$$\%abn = 0.14$$

$$S_n = 11136.3 \pm 2.8 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (keV)	$2g\Gamma_n^0$ (eV)	E_0 (keV)	$2g\Gamma_n$ (keV)	$2g\Gamma_n^0$ (eV)
1.48 ± 0.10	0.150 ± 0.050		21.0	.054	0.37
4.36	.049	0.74	22.5	.109	0.73
5.23	.037	0.51	26.9	.204	1.24
8.70	.157	1.68	29.2	.089	0.52
13.80	.147	1.25	30.6	.060	0.34
18.9	.162	1.18	36.5	.299	1.57

⁴⁴
²⁰Ca

THERMAL CROSS SECTIONS

$$\sigma_T = 1.0 \pm 0.1 \text{ b}$$

$$a_{coh} = 1.8 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 0.56 \pm 0.04 \text{ b}$$

$$\langle D \rangle = 13 \pm 1 \text{ keV}$$

$$S_0 = 2.0 \pm 0.7$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\%abn = 2.08$$

$$S_n = 7414.4 \pm 1.0 \text{ keV}$$

E_0 (keV)	Γ (keV)	$g\Gamma_n$ (keV)	J	ℓ	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
51.27 ± 0.08		2.130 ± 0.700	1/2	0	9.41	
101.2 ± 0.2	5.50	5.50	1/2	0	17.29	
133.0				>0		
137.5				>0		
147.3	9.5 ± 0.5		1/2	0		
158.5	0.300	0.300	1/2	0	0.754	
160.0				>0		
175.0	1.500	1.500	1/2	0	3.586	
213.5		0.440		>0		
221.0	0.605	0.605	[1/2]	1		5.25
247.0	3.00	3.00			6.036	
272.5				>0		

⁴⁴
20 Ca

E_0 (keV)	Γ (keV)	$g\Gamma_n$ (keV)	J	ℓ	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
288.5		0.275		>0		
306.5				>0		
309.0				>0		
316.0				>0		
321.5	9.0			0	15.873	
332.5		0.530		>0		
361.5				>0		
370.0	11.000	11.000	1/2	0	18.084	
379.5				>0		
385.0	0.300	0.300	1/2	0	0.483	
402.0	2.75	2.75			4.337	
438.3	2.960	2.960	[1/2]	1		9.18
443.5	1.500	1.500	1/2	0	2.252	
448.5						
454.0						
461.0						
472.0						
475.5	1.172	1.172	[1/2]	1		3.21
483.0	17.500	17.500	1/2	0	25.181	
490.0	0.835	0.835	[1/2]	1		2.18
495.0		0.680		>0		
503.0		1.370		>0		
506.0	3.500	3.500	1/2	0	4.920	
525.5				>0		
530.0	2.000	2.000	1/2	0	2.747	
538.5	0.500	0.500	1/2	0	0.68	
546.0	0.800	0.800	1/2	0	1.08	
557.0				>0		
560.5	2.500	2.500	1/2	0	3.339	
568.0				>0		
576.0	0.581	0.581	[1/2]	1		1.19

⁴⁶
20 Ca

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.7 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 0.32 \pm 0.12 \text{ b}$$

⁴⁸₂₀Ca

THERMAL CROSS SECTIONS

$$\sigma_T = 1.1 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$\langle D \rangle = 260 \pm 90 \text{ keV}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\chi_{\text{Abn}} = 0.19$		$S_n = 5141.6 \pm 3.5 \text{ keV}$	
$E_0 \text{ (keV)}$	$\Gamma \text{ (keV)}$	J	ℓ	$g\Gamma_n^1 \text{ (eV)}$	
302.25	3.000	1/2	1	22.4	
399.0	3.000	3/2	1	20.7	
412.25	2.000	1/2	1	10.2	
448.0	2.000	1/2	1	9.2	
956.0					
1305.0	10.0	3/2	>0		

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ca	refractometer	PRIVATE COMM.(73)	Koester
Ca ⁴⁰	activation	JIN,34,2699(72)	Steinnes
Ca,Ca ^{40,42,43,44}	σ_{γ} (spectra)	NP/A,169,95(71)	Cranston
Ca ^{46,48}	σ_{γ} (spectra)	NP/A,169,95(71)	Cranston
Ca ^{40,42,43,44}	σ_{γ} (spectra)	NP/A,102,226(71)	Gruppelaar
Ca ⁴⁴	activation	JIN,32,2839(70)	Sias
Ca	diffraction	JCP,35,1950(61)	Atoji
Ca ⁴⁴	activation	NSE,8,378(60)	Lyon
Ca ⁴⁰	alpha emission	ZP,153,106(58)	Munnich
Ca ⁴⁶	activation	PR,90,1121(53)	Cook
Ca ⁴⁸	activation	PR,91,1423(53)	Hughes
Ca ^{40,42}	pile osci.	PR,88,412(52)	Pomerance
Ca	pile osci.	PR,83,641(51)	Pomerance
Ca,Ca ^{40,44}	diffraction	PR,81,527(51)	Shull
Ca	pile osci.	PP5/A,63,1175(50)	Colmer
Ca	pile osci.	PR,80,342(50)	Harris
Ca ⁴⁴	activation	PR,72,888(47)	Seren
Ca	absorption	PR,69,411(46)	Coltman

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Ca,Ca ⁴⁰		212-596	ORNL-4844,67(73)	Johnson
Ca,Ca ⁴⁰	σ_t	20.47-738.0	NSE,51,119(73)	Mynchank
Ca ⁴⁸	σ_t	302-1355	AP,69,451(72)+	Seibel
Ca ⁴⁸	σ_t	302-445	PRIVATE COMM.(71)	Bilpuch
Ca ⁴⁰	σ_{γ} (spectra)	10-89	AUJ,24,671(71)	Chan
Ca,Ca ^{40,44}	σ_t	10.83-292.6	PRIVATE COMM.(71)	Singh
Ca ⁴⁰	σ_s	558-1530	NP/A,154,36(70)	Kirouac
Ca,Ca ⁴⁰	σ_t	570-1284	70HEL51NK1,2,745(70)	Nebe
Ca ⁴²	σ_t	124.2-572.5	AP,37,367(66)	Farrell
Ca ⁴⁴	σ_t	103-576	AP,37,367(66)	Farrell
Ca ⁴³	σ_t	4.36-36.5	PR,151,912(66)	Good
Ca,Ca ⁴³	σ_t	4.36-36.5	65ANTWERP,99(65)+	Wagner
Ca ⁴³	σ_t	1.47	PRIVATE COMM.(63)	Cote
Ca,Ca ⁴⁰	σ_t	148-676	AP,17,319(62)	Bowman
Ca ⁴⁰	σ_t	88-250	AP,14,387(61)	Bilpuch
Ca ⁴⁴	σ_t	22-247	AP,14,387(61)	Bilpuch
Ca,Ca ⁴⁰	σ_t	132-250	AP,14,365(61)	Newson
Ca,Ca ⁴⁰	σ_t	254-595	PR,121,1150(61)	Wilenzick
Ca ⁴³	σ_t	1.49	PRIVATE COMM.(59)	Chrien
Ca,Ca ⁴⁰	σ_t	83-252	BAP,3,164(58)	Bilpuch
Ca ⁴⁴	σ_t	150-248	BAP,3,164(58)	Bilpuch
Ca	σ_t	150-505	PR,75,1124(49)	Adair

B/1

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 26.5 \pm 1.0 \text{ b} \\ \sigma_T &= 9.6 \pm 1.0 \text{ b (20 sec } ^{85}\text{Sc}^{\text{m}}) \\ \sigma_T &= 16.9 \pm 1.0 \text{ b (83.8 day } ^{85}\text{Sc}^{\text{g}}) \\ \sigma_s &= 24 \pm 2 \text{ b} \\ \sigma_c &= 50.5 \pm 2.3 \text{ b} \\ \lambda_{\text{coh}} &= 11.8 \pm 0.5 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 11.3 \pm 1.0 \text{ b} \\ \langle D \rangle &= 1.1 \pm 0.2 \text{ keV} \\ S_0 &= 5.1 \pm 0.9\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 7/2^{-} \quad \lambda_{\text{fwhm}} = 100 \quad S_n = 8766.9 \pm 1.0 \text{ keV}$$

E_0 (keV)	Γ (eV)	$2\sigma_n^{\text{p}}$ (eV)	J	ℓ	Γ_T (eV)	$2\sigma_n^{\text{p}}$ (eV)
-0.140			[3]	0	0.29 ± 0.06	0.94 ± 0.17
0.455 ± 0.020		.0076 ± 0.0112		[1]		0.00036 ± .00053
1.01 ± 0.05		.022 ± .006		[1]		.00069 ± .00019
3.24 ± 0.02		70 ± 15				1.2 ± 0.2
4.27 ± 0.05		250 ± 50			0.35 ± 0.11	3.8 ± 0.8
6.59 ± 0.05		73 ± 15				0.90 ± 0.18
8.0 ± 0.1		160 ± 30				1.79 ± .34
9.2 ± 0.1		260 ± 50				2.71 ± .52
11.7 ± 0.1		140 ± 30				1.29 ± .28
19.17 ± .06	60	67.5 ± 6.8	4			.487 ± 0.049
20.80 ± .06	60	67.5 ± 6.8	4			.468 ± 0.047
20.95 ± .06	800	700 ± 70	3			.484 ± 0.48
24.18 ± .07	60	52.5 ± 5.3	3			.338 ± 0.034
24.48 ± .07	60	67.5 ± 6.8	4			.431 ± 0.043
27.12 ± .08	90	101.2 ± 10.1	4			.6145 ± 0.0615
28.12 ± .08	110	96.3 ± 9.6	3			.574 ± 0.057
29.85 ± .09	100	112.5 ± 11.3	4			0.6511 ± 0.0651
32.40 ± 0.10	570	498.7 ± 49.9	3			2.770 ± 0.277
34.00 ± 0.10	190	166 ± 17	3			.900 ± .090
35.3 ± 0.11	280	315 ± 32	4			1.67 ± .17
40.37 ± 0.12	130	146 ± 15	4			.727 ± 0.073
40.77 ± 0.12	100	87.5 ± 8.8	3			.433 ± 0.043
41.15 ± .12	110	124 ± 12	4			.611 ± .061

⁴⁵
₂₁Sc

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E ₀ (keV)	Γ (eV)	2g _n ⁰ (eV)	J	ℓ	Γ _γ (eV)	2g _n ⁰ (eV)
43.35 ± .13	170	190 ± 19	4		.912 ± .091	
46.15 ± .14	480	420 ± 42	3		1.95 ± 0.20	
47.60 ± .14	180	157.5 ± 15.8	3		.722 ± .072	
49.17 ± .15	160	180 ± 18	4		.812 ± .081	
51.16 ± .16	840	952 ± 95	4		4.20 ± .42	
52.18 ± .16	100	91 ± 9	3		.39 ± .04	
54.83 ± .16	220	193 ± 19	3		.824 ± .082	
57.68 ± .17	220	169 ± 19	3		.787 ± .079	
58.77 ± .18	164	144 ± 14	3		.593 ± .059	
61.84 ± .18	520	589 ± 59	4		2.36 ± .24	
62.54 ± .19	570	494 ± 49	4		1.98 ± .20	
65.94 ± .20	1040	1170 ± 117	4		4.56 ± .46	
70.11 ± .21	1690	1480 ± 148	3		5.59 ± .56	
71.76 ± .22	410	460 ± 46	4		1.72 ± .17	
73.18 ± .22	350	307 ± 31	3		1.14 ± .11	
74.90 ± .22	150	131 ± 13	3		.479 ± .048	
77.15 ± .23	250	280 ± 28	3		1.00 ± 0.10	
77.55 ± .23	600	525 ± 53	3		1.89 ± .19	
77.85 ± .23	150	168 ± 17	4		.602 ± .060	
79.00 ± .24	200	175 ± 18	3		.623 ± .062	
79.80 ± .24	2800	2450 ± 245	3		6.67 ± .87	
81.10 ± .24	600	675 ± 68	4		2.37 ± .24	
83.00 ± .25	150	169 ± 17	4		.587 ± .059	
85.60 ± .26	850	956 ± 96	4		3.27 ± .33	
86.00 ± .26	650	569 ± 57	3		1.94 ± .19	
88.60 ± .27	550	481 ± 48	3		1.62 ± .16	
90.20 ± .27	120	135 ± 14	4		.450 ± .045	
91.70 ± .28	550	481 ± 48	3		1.59 ± .16	
94.40 ± .28	800	700 ± 70	3		2.28 ± .23	
99.80 ± .30	2000	1750 ± 175	3		5.54 ± .55	
100.7 ± .3	300	337 ± 34	4		1.06 ± .11	
101.0 ± 0.3	400	350 ± 35	3		1.10 ± .11	
102.1 ± .3	300	337 ± 34	4		1.06 ± .11	
102.3 ± .3	350	366 ± 31	3		.957 ± .096	
104.0 ± .3	150	169 ± 17	4		.524 ± .052	
105.7 ± .3	150	169 ± 17	4		.520 ± .052	

THERMAL CROSS SECTIONS

$$\sigma_T = 8.0 \pm 1.0 \text{ b}$$

⁴⁶₂₁Sc
[83.8 day]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Sc ⁴⁵	activation	JIN,34,2699(72)	Steinnes
Sc ⁴⁶	activation	ARI,19,593(68)	Bak
Sc ⁴⁶	Sc-47 build-up	AE,24,533(68)	Kondurov
Sc ⁴⁵	σ_t	PRIVATE COMM.(67)	Wilson
Sc ⁴⁵	isom. ratio	TID-22165(62)	Simons
Sc ⁴⁵	activation	NSE,8,378(60)	Lyon
Sc ⁴⁵	activation	60VIENNA,63(60)	Maier-Leibnitz
Sc ⁴⁵	activation	NUK,2,255(60)	Wolf
Sc ⁴⁵	activation	ZP,149,215(57)	Houtermans
Sc ⁴⁵	σ_t	PP5/A,68,104(55)	Pattenden
Sc	pile osci.	PR,89,657(53)	Lockett
Sc ⁴⁵	activation	PR,89,1307(53)	Lyqn
Sc ⁴⁵	σ_t diffraction	PCH,57,535(53)	Milligan
Sc	pile osci.	PR,89,657(53)-	Pomerance
Sc	pile osci.	PR,80,342(50)	Harris
Sc	activation	PR,74,1877(48)	Goldhaber
Sc	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Sc ⁴⁵	σ_t	19.2-106	70HELSINKI,1,619(70)	Cho
Sc ⁴⁵	σ_T	0-4.3	YF,1,229(65)	Romanov
Sc ⁴⁵	σ_T (spectra)	0-1.0	8AP,8,120(63)+	Wasson
Sc ⁴⁵	σ_t	4-40	ORNL-2718,22(59)+	Miller
Sc ⁴⁵	σ_t	3.0-6.8	PR,111,288(58)	Cote
Sc ⁴⁵	σ_t	4.0	PR,106,110(57)	Marshak
Sc ⁴⁵	σ_t	0-3.6	PP5/A,68,104(55)	Pattenden

²²Ti

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 6.1 \pm 0.2 \text{ b} \\ \bar{\sigma}_s &= 4.0 \pm 0.3 \text{ b} \\ \sigma_t &= 10.1 \pm 0.3 \text{ b} \\ a_{\text{coh}} &= -3.4 \pm 0.2 \text{ fm}\end{aligned}$$

⁴⁶₂₂Ti

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.6 \pm 0.1 \text{ b} \\ \bar{\sigma}_s &= 3.2 \pm 0.3 \text{ b} \\ \sigma_t &= 3.8 \pm 0.3 \text{ b} \\ a_{\text{coh}} &= 4.8 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 0.4 \pm 0.2 \text{ b} \\ S_0 &= 2.3 \pm 1.2\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\% \text{Abn} = 8.0$		$S_n = 8875.1 \pm 1.5 \text{ keV}$	
$E_0 \text{ (keV)}$	$\Gamma \text{ (eV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$g\Gamma_n^0 \text{ (eV)}$
Bound level					
11.0 ± 0.1	230 ± 50	230 ± 50	1/2	0	2.19 ± .48
39.0 ± 0.4	550 ± 80	550 ± 80	1/2	0	2.79 ± .41
48.7 ± 0.2	1500 ± 200	1500 ± 200	1/2	0	6.80 ± .91
63.5 ± 0.2	3500 ± 400	3500 ± 400	1/2	0	13.89 ± 1.56
100.0 ± 0.4	4800 ± 500	4800 ± 500	1/2	0	15.18 ± 1.58
105 ± 1		70		>0	
111 ± 1		166		>0	
114 ± 1		106		>0	
117 ± 1		93		>0	
120 ± 1		48		>0	
126 ± 1		30		>0	
129 ± 1		84		>0	
131 ± 1		120		>0	
134 ± 1		334		>0	
144 ± 1		179		>0	
146 ± 1		153		>0	
153 ± 1		192		>0	
156 ± 1		212		>0	
158 ± 1		160		>0	
160 ± 1		376		>0	
166 ± 1		175		>0	
172 ± 1		213		>0	
175 ± 1		72		>0	
179.0 ± 1.0	1300 ± 260	1300 ± 260	1/2	0	3.07 ± .61
185.0 ± 1.0	3500 ± 500	3500 ± 500	1/2	0	8.14 ± 1.16
207 ± 1.5		448		>0	

$^{46}_{22}\text{Ti}$

E_0 (keV)	Γ (eV)	$g\Gamma_n$ (eV)	J	ℓ	$g\Gamma_n^0$ (eV)
210 ± 1.5		144		>0	
213 ± 1.5		182		>0	
216 ± 1.5		270		>0	
223 ± 1.5		138		>0	
216 ± 1.5		270		>0	
223 ± 1.5		138		>0	
226 ± 1.5		333		>0	
230 ± 1.5		460		>0	
233 ± 1.5		645		>0	
236 ± 1.5		420		>0	
241 ± 1.5		100		>0	
243 ± 1.5		200		>0	
246 ± 1.5		660		>0	
250 ± 1.5		290		>0	
252 ± 1.5		125		>0	
259.0 ± 1.5	500 ± 100	500 ± 100	1/2	0	.98 $\pm$.20
263 ± 1.5		190		>0	
267 ± 1.5		232		>0	
271 ± 1.5		170		>0	
276 ± 1.5		665		>0	
281 ± 1.5		113		>0	
287 ± 1.5		314		>0	
291.5 ± 1.5	1000 ± 150	1000 ± 150	1/2	0	1.85 $\pm$.28
299 ± 1.5		372		>0	
302 ± 1.5		240		>0	
305.5 ± 2.0	2000 ± 300	2000 ± 300	1/2	0	3.62 $\pm$.54
320 ± 1.5		268		>0	
328.0 ± 2.0	3000 ± 400	3000 ± 400	1/2	0	.52 $\pm$.70
333 ± 1.5		580		>0	
337 ± 1.5		180		>0	
340.5 ± 2.0	900 ± 150	900 ± 150	1/2	0	1.54 $\pm$.26
347 ± 1.5		243		>0	
360 ± 1.5		515		>0	
363 ± 1.5		550		>0	

⁴⁷
₂₂Ti

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 1.7 \pm 0.2 \text{ b} \\ \sigma_a &= 3.0 \pm 0.3 \text{ b} \\ \sigma_t &= 4.7 \pm 0.3 \text{ b} \\ a_{coh} &= 3.3 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 1.8 \pm 0.4 \text{ b} \\ R' &= 4.9 \pm 0.4 \text{ fm} \\ \langle D \rangle &= 1.6 \pm 0.4 \text{ keV} \\ S_0 &= 3.5 \pm 0.7\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^-$$

$$\chi_{abn} = 7.5$$

$$S_n = 11628.1 \pm 1.0 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
3.074±0.004	140 ± 15	3	2.0±0.2	2.53±.27
*4.180±0.004	3.3± 1.6	3		.51±.03
8.13 ±0.01	55 ± 6	2	1.4±0.3	.61±.07
8.34 ±0.02	117 ± 15	2	2.0±0.4	1.28±.16
10.53 ±0.03	65 ± 7	3		.63±.07
12.13 ±0.03	130 ± 15	3		1.18±.14
12.16 ±0.04	18 ± 3	2	2.1±0.5	.16±.03
12.81 ±0.04	130 ± 15	2	2.5±0.5	1.15±.13
16.33 ±0.05	462 ± 50	3	2.0±0.4	3.61±.39
17.39 ±0.05	42 ± 7	3	2.0±0.3	.32±.05
19.08 ±0.05	23 ± 3	3	2.5±0.5	.17±.02
21.26 ±0.06	52 ± 5	2	1.7±0.3	.36±.03
27.12 ±0.06	100 ± 10	2		.61±.06
27.17 ±0.06	1000 ±100	3		6.07±.61
30.18 ±0.06	62 ± 6	2		.36±.04
32.33 ±0.07	498 ± 50	2		2.77±.28
38.11 ±0.11	100 ± 10	3		.51±.05
40.37 ±0.13	750 ±100	3		3.73±.50
41.03 ±0.13	48 ± 5	2		.24±.03
42.08 ±0.13	900 ±150	3		4.39±.73
42.23 ±0.13	500 ± 50	2		2.43±.24
46.40 ±0.14	750 ± 80	3		3.48±.37
49.27 ±0.14	330 ± 50	3		1.49±.23
51.34 ±0.15	230 ± 30	3		1.02±.13
55.37 ±0.17	300 ± 40	3		1.27±.17
57.56 ±0.17	800 ±100	3		3.33±.42
60.29 ±0.18	74 ± 10	2		.30±.04
61.78 ±0.19	177 ± 20	2		.71±.08
63.37 ±0.19	113 ± 15	3		.45±.06
63.80 ±0.19	62 ± 10	3		.25±.04
71.68 ±0.21	571 ± 70	3		2.13±.26
74.55 ±0.22	107 ± 15	2		.39±.06

* Isotopic assignment is uncertain

⁴⁸
₂₂Ti

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 7.8 \pm 0.3 \text{ b} \\ \sigma_s &= 4.2 \pm 0.2 \text{ b} \\ \sigma_t &= 12.0 \pm 0.4 \text{ b} \\ a_{coh} &= -5.8 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 3.7 \pm 0.3 \text{ b} \\ R_\gamma^c &= 5.0 \pm 0.6 \text{ fm} \\ \langle D \rangle &= 18 \pm 3 \text{ keV} \\ S_0 &= 4.9 \pm 2.2\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^\circ$$

$$\%Abn = 73.7$$

$$S_n = 8143.4 \pm 0.8 \text{ keV}$$

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)
17.6±0.1	8710 ±200	1/2	0	8.5	65.65±1.51
23.8±0.1	650 ±100	1/2	0		4.21± .65
36.8±0.1	1250 ±150	1/2	0		6.52± .78
39.1±0.1		[5/2]	>0		
51.8±0.2	2360 ±200	1/2	0		10.37± .88
74.2±0.3	250 ±200		[1]		.92± .73
83.2±0.4	130 ±100	1/2	0		.45± .35
118.6±0.6	700 ±200	1/2	0		2.03± .58
127 ±1	114		>0		
131.5±1.0	1690		0		4.7
134 ±1	170		>0		
136.5±1	296		0		0.8
154.5±0.9	600 ±200	1/2	0		1.53± .51
157 ±1	135		>0		
161 ±1	49		>0		
164 ±1	136		>0		
175 ±1	269		>0		
185.6±1.0	650 ±100	1/2	0		1.51± .23
190.0±1.5	3000 ±300	1/2	0		6.88± .69
201 ±1.5	242		>0		
207 ±1.5	292		>0		
210 ±1.5	164		>0		
240 ±1.5	96		>0		
249.0±2.0	8500 ±850	1/2	0		17.03±1.70
257 ±2	152		>0		
262 ±2	154		>0		
270 ±2	4000 ±400	1/2	0		7.70± .77
288 ±2	366		>0		
292 ±2	250		>0		
295 ±2	193		>0		
298 ±2	122		>0		
303 ±2	310		>0		
307 ±2	255		>0		
312 ±2	2780		>0		
318 ±2	535		>0		

⁴⁸₂₂Ti

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^c$ (eV)
322 ± 2	280		>0		
325 ± 2	1040		>0		
333 ± 2	760		>0		
336 ± 2	175		>0		
338 ± 2	365		>0		
341 ± 2	4000 ± 600	1/2	0		6.85 $\pm$.103
351 ± 2	272		>0		
354 ± 2	218		>0		
362 ± 2	600 ± 150	1/2	0		1.00 $\pm$.25
367 ± 2	236		>0		

* Positive energy resonances so account for the sign and magnitude of the coherent scattering amplitude that no bound levels are required to account for the absorption cross sections.

Thermal Cross Sections

$$\begin{aligned} \sigma_T &= 2.2 \pm 0.3 \text{ b} \\ \sigma_S &= 3.2 \pm 0.4 \text{ b} \\ \sigma_C &= 5.4 \pm 0.4 \text{ b} \\ \lambda_{coh} &= 0.8 \pm 0.2 \text{ fm} \end{aligned}$$

Resonance Properties

$$\begin{aligned} I_\gamma &= 1.5 \pm 0.3 \text{ b} \\ \langle D \rangle &= 6.0 \pm 1.5 \text{ keV} \\ S_0 &= 3.2 \pm 0.7 \end{aligned}$$

Resonance Parameters

$$I^\pi = 7/2^-$$

$$\chi_{Rb n} = 5.5$$

$$S_n = 10946.0 \pm 2.4 \text{ keV}$$

E_0 (keV)	$2g_n^T$ (eV)	J	$2g_n^0$ (eV)
3.835 $\pm$ 0.005	225 $\pm$ 25		3.63 $\pm$.40
8.095 $\pm$ 0.01	100 $\pm$ 20		1.11 $\pm$.22
18.76 $\pm$ 0.05	120 $\pm$ 20	4	.86 $\pm$.15
21.54 $\pm$ 0.05	130 $\pm$ 15	3	.89 $\pm$.10
22.77 $\pm$ 0.06	550 $\pm$ 100	3	3.64 $\pm$.66
27.25 $\pm$ 0.06	420 $\pm$ 60	4	2.54 $\pm$.36
31.9 $\pm$ 0.1	2000 $\pm$ 400	4	11.20 $\pm$ 2.24
38.4 $\pm$ 0.1	1700 $\pm$ 200	4	8.63 $\pm$ 1.02
56.1 $\pm$ 0.2	506 $\pm$ 113	4	2.14 $\pm$.48
59.4 $\pm$ 0.2	390 $\pm$ 90	3	1.60 $\pm$.37
66.8 $\pm$ 0.2	700 $\pm$ 90	3	2.71 $\pm$.35
76.6 $\pm$ 0.2	1000 $\pm$ 225	4	3.61 $\pm$.81
96.6 $\pm$ 0.3	2625 $\pm$ 440	3	8.45 $\pm$ 1.42
106.4 $\pm$ 0.3	2900 $\pm$ 450	3	8.89 $\pm$ 1.38
138.8 $\pm$ 0.4	1800 $\pm$ 225	4	4.83 $\pm$.60
145.7 $\pm$ 0.4	1700 $\pm$ 260	3	4.45 $\pm$.68
151.2 $\pm$ 0.5	2900 $\pm$ 900	3	7.46 $\pm$ 2.31
152.2 $\pm$ 0.5	3100 $\pm$ 1125	4	7.95 $\pm$ 2.88
170.5 $\pm$ 0.5	900 $\pm$ 225	4	2.18 $\pm$.55
172.3 $\pm$ 0.5	3900 $\pm$ 800	4	9.40 $\pm$ 1.93
176.2 $\pm$ 0.5	2000 $\pm$ 560	4	4.77 $\pm$ 1.33
184.7 $\pm$ 0.5	2600 $\pm$ 525	3	6.05 $\pm$ 1.22
185.8 $\pm$ 0.6	2800 $\pm$ 560	4	6.50 $\pm$ 1.30
187.7 $\pm$ 0.6	3500 $\pm$ 875	3	8.08 $\pm$ 2.02
197.0 $\pm$ 0.6	3400 $\pm$ 675	4	7.66 $\pm$ 1.52
208.5 $\pm$ 0.6	1300 $\pm$ 260	3	2.85 $\pm$.57
216 $\pm$ 0.6	2500 $\pm$ 450	4	5.38 $\pm$.97
224.5 $\pm$ 0.7	1800 $\pm$ 350	3	3.80 $\pm$.74
239.0 $\pm$ 0.7	2300 $\pm$ 560	4	4.71 $\pm$ 1.15

⁵⁰
²²Ti

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.179 \pm 0.003 \text{ b} \\ \sigma_{sc} &= 3.80 \pm 0.27 \text{ b} \\ \sigma_t &= 3.98 \pm 0.27 \text{ b} \\ a_{coh} &= 5.5 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma = 0.118 \pm 0.011 \text{ b}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\chi A_{bn} = 5.3$		$S_n = 6372.4 \pm 1.4 \text{ keV}$	
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$g\Gamma_n^0 \text{ (eV)}$	
55.5 ± 0.2	870 ± 90	1/2	0	3.69 ± .38	
77.0 ± 0.4	77		>0		
85.0 ± 0.4	108		>0		
92.0 ± 0.5	134		>0		
100.0 ± 0.5	116		>0		
121.0 ± 0.7	139	1/2	>0	3.48 ± .35	
135.5 ± 0.7	119		>0		
185.6 ± 1.0	1500 ± 150		0		
194.0 ± 1.0	265		>0		
224 ± 1.5	253		>0		
227 ± 1.5	274		>0		
233 ± 1.5	190		>0		
245 ± 1.5	236		>0		
248 ± 1.5	172		>0		
251 ± 1.5	221		>0		
254 ± 1.5	136	1/2	>0	36.10 ± 5.41	
258 ± 1.5	174		>0		
288 ± 1.5	82		>0		
307.0 ± 2.0	20000 ± 3000		0		
331 ± 2	170		>0		
342 ± 2	410		>0		
346 ± 2	332		>0		
470 ± 2	967		>0		
506 ± 2.5	2980		>0		
586 ± 2.5	905		>0		

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ti ⁵⁰	activation	JNE,24,35(70)	Ryves
Ti ^{46,47,48,49}	σ_t	AE,27,144(69)	Doil'nitsyn
Ti	σ_t	NSE,11,298(61)	Joki
Ti	σ_t	NSE,7,193(60)	Schmunk
Ti ^{46,47,48,49,50}	diffraction	PR,118,797(60)	Shull
Ti ⁴⁸	diffraction	JAP,30,1323(59)	Sidhu
Ti	σ_t	CU-179(58)	Gould
Ti, Ti ⁴⁶⁻⁵⁰	$\bar{\sigma}_s$	ANL-5031,63(53)	Hibdon
Ti ^{46,47,48,49,50}	pile osci.	PR,88,412(52)	Pomerance
Ti	local osci.	PR,83,641(51)	Pomerance
Ti	diffraction	PR,81,527(51)	Shull
Ti	$\bar{\sigma}_s$	PR,83,379(51)	Weiss
Ti	pile osci.	PPS/A,63,1175(50)	Colmer
Ti	pile osci.	PR,80,342(50)	Harris
Ti	σ_t	PR,75,975(49)	Winsberg
Ti ⁵⁰	activation	PR,72,888(47)	Seren
Ti	capture	PR,69,411(46)	Coltman
Ti	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
Ti	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Ti ⁴⁷	σ_f (spectra)	12-64	AUJ,25,9(72)	Broomhall
Ti ⁴⁸	σ_f (spectra)	14-76	AUJ,25,9(72)	Broomhall
Ti ⁴⁷	σ_t	0.584-77.5	PRIVATE COMM.(72)	Good
Ti ⁴⁹	σ_t	1.5-148	PRIVATE COMM.(72)	Good
Ti, Ti ⁴⁶⁻⁵⁰	σ_t	1-220	PR/C,3,2447(71)	Gang
Ti ⁴⁸	σ_t	17-192	NP/A,164,97(71)	Mueller
Ti ⁴⁹	σ_t	18.7-239	NP/A,164,97(71)	Mueller
Ti	σ_f		BAP,15,1667(70)	Allen
Ti ⁴⁷	σ_t	8.1-74.6	70HELSINKI,1,619(70)	Cho
Ti ⁴⁹	σ_t	18.8-239	70HELSINKI,1,619(70)	Cho
Ti ⁴⁷	σ_f	8.1-21.2	70HELSINKI,1,633(70)	Ernst
Ti ⁴⁶	σ_t	11-341	AP,37,367(66)	Farrell
Ti ⁴⁸	σ_t	17.5-362	AP,37,367(66)	Farrell
Ti ⁵⁰	σ_t	55-307	AP,37,367(66)	Farrell
Ti ⁴⁷	σ_t	2.98-36.2	PR,151,912(66)	Good
Ti ⁴⁹	σ_t	3.72-37.7	PR,151,912(66)	Good
Ti ⁴⁶	σ_t	41-390	AP,17,319(62)	Bowman
Ti ⁴⁸	σ_t	4.0-420	AP,17,319(62)	Bowman
Ti ⁵⁰	σ_t	47-586	AP,17,319(62)	Bowman
Ti ⁴⁸	σ_t	4.0-270	AP,14,387(61)	Bilpuch
Ti ⁴⁸	σ_t	3.0-17.5	PR,109,926(58)	Good

23 V

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 5.04 \pm 0.04 \text{ b} \\ \sigma_s &= 4.93 \pm 0.03 \text{ b} \\ \sigma_t &= 9.97 \pm 0.05 \text{ b} \\ a_{coh} &= -0.48 \pm 0.10 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 2.7 \pm 0.1 \text{ b} \\ R' &= 6.9 \pm 0.2 \text{ fm} \\ S_0 &= 7.7 \pm 2.0\end{aligned}$$

50 V
23

THERMAL CROSS SECTIONS

$$\sigma_T = 70 \pm 33 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 67 \pm 15 \text{ b} \\ S_0 &= 4.4 \pm 2.2\end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 6^\circ$$

$$\chi_{Abn} = 0.25$$

$$S_n = 11052.4 \pm 3.1 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
0.167	2.25	0.60 ± 0.08	0.174
1.42 ± 0.01	100 ± 40		2.64 ± 1.03
6.2 ± 0.1	74		0.94
7.3 ± 0.1	280		3.27
8.25 ± 0.17	125		1.38
11.8 ± 0.2	319		2.92
15.0 ± 0.3	121		1.0
15.3 ± 0.3	156		1.26
17.6 ± 0.4	132		1.00
20.5 ± 0.4	529		3.70
22.6 ± 0.4	660		4.40
25.8 ± 0.5	195		1.22
29.0 ± 0.5	323		1.90
34.1 ± 0.7	752		4.06
37.0 ± 0.7	621		3.23
40.7 ± 0.8	466		2.3

THERMAL CROSS SECTIONS

$$\sigma_T = 4.88 \pm 0.04 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_\gamma &= 2.7 \pm 0.1 \text{ b} \\ R^2 &= 6.9 \pm 0.2 \text{ fm} \\ S_0 &= 7.7 \pm 2.0 \end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 7/2^-$$

$$\% \text{Abn} = 99.75$$

$$S_n = 7311.3 \pm 1.0 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
4.163 ± 0.005	565 ± 6	4	0	1.32 ± 0.20	8.76 ± 0.09
4.39 ± 0.015			1	*0.032 ± 0.006	
6.797 ± 0.007	1120 ± 12	3	0	2.45 ± 0.36	13.56 ± .15
7.03 ± 0.03			1	*0.012 ± 0.002	
10.13 ± 0.03			1	*0.058 ± 0.010	
11.62 ± 0.04	4250 ± 50	3	0	1.87 ± 0.37	39.43 ± .46
11.77 ± 0.04			1	*0.044 ± 0.008	
12.00 ± 0.04			1	*0.046 ± 0.008	
15.7 ± 0.05			1	*0.15 ± 0.03	
16.23 ± 0.02	387 ± 25	4	0	1.5 ± 0.5	3.04 ± .20
16.99 ± 0.03	310 ± 20				2.38 ± .15
18.00 ± 0.07			1	*0.29 ± 0.05	
20.70 ± 0.08			1	*0.40 ± 0.07	
21.70 ± 0.04	635 ± 45	3	0	1.50 ± 0.18	4.31 ± .31
24.20 ± 0.10			1		
28.80 ± 0.12			1		
29.63 ± 0.07	150 ± 20	4	0	0.50 ± 0.06	.671 ± .12
29.90 ± 0.08	3.0 ± 1.0	(3)	1	0.53 ± 0.15	.017 ± .006
32.20 ± 0.14			1		
33.51 ± 0.09	14 ± 4	(2)	1	0.50 ± 0.08	.076 ± .022
37.43 ± 0.10	24 ± 4	[4]	1	0.55 ± 0.10	.12 ± .02
39.44 ± 0.11	470 ± 35	3	0	0.68 ± 0.12	2.37 ± .18
40.90 ± 0.12	6.0 ± 2.0	(5)	1	1.2 ± 0.3	.030 ± .010
42.37 ± 0.12	24 ± 4	(4)	1	0.57 ± 0.11	.12 ± .02
44.45 ± 0.13	8 ± 2		1		.038 ± 0.010
45.90 ± 0.14	10 ± 4	(2)	1	0.56 ± 0.10	.047 ± .018
48.04 ± 0.15	130 ± 20	4	0		0.59 ± .09
48.40 ± 0.15	15 ± 5				.058 ± .023
49.50 ± 0.15	490 ± 35	3	0		2.20 ± .16
51.90 ± 0.16	99 ± 8	4	0		.44 ± .04
52.97 ± 0.17	815 ± 60	3	0		3.54 ± .26
63.5 ± 0.3	3300 ± 300	3	0		13.10 ± 1.19
68.6 ± 0.3	5290 ± 115	4	0		20.20 ± .44
73.5 ± 0.3	42 ± 8		0		.16 ± .03
78.7 ± 0.3	20 ± 6				.071 ± .021
82.6 ± 0.3	1400 ± 100	4	0		4.87 ± .35
93.7 ± 0.3	160 ± 6				.55 ± .02
87.3 ± 0.4	3280 ± 240	4	0		11.10 ± .81
92.9 ± 0.4	70 ± 20				.23 ± .07

$^{51}_{23}\text{V}$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
94.5 $\pm$ 0.4	74 $\pm$ 20				.24 $\pm$.07
95.3 $\pm$ 0.4	50 $\pm$ 16				.16 $\pm$.05
96.8 $\pm$ 0.4	24 $\pm$ 12				.077 $\pm$.039
98.3 $\pm$ 0.4	50 $\pm$ 16				.16 $\pm$.05
103.5 $\pm$ 0.5	24 $\pm$ 10				.075 $\pm$.031
110.3 $\pm$ 0.5	250 $\pm$ 40		[0]		.75 $\pm$.12
114.2 $\pm$ 0.5	70 $\pm$ 10				.21 $\pm$.02
116.0 $\pm$ 0.5	4000 $\pm$ 1000	4	0		11.74 $\pm$ 2.94
117.5 $\pm$ 0.5	18000 $\pm$ 2400	4	0		52.51 $\pm$ 7.00
118.5 $\pm$ 0.6	140 $\pm$ 40				.407 $\pm$.12
127.4 $\pm$ 0.6	70 $\pm$ 30				.20 $\pm$.08
134.5 $\pm$ 0.7	3600 $\pm$ 170	4			9.82 $\pm$.46
140.9 $\pm$ 0.7	3150 $\pm$ 130	3			8.25 $\pm$.34
145.6 $\pm$ 0.7	1310 $\pm$ 100	3			3.43 $\pm$.26
152.7 $\pm$ 0.8	3940 $\pm$ 170	4			10.08 $\pm$.44

$\equiv 2g\Gamma_n\Gamma_\gamma/\Gamma$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
V	σ_t	70HELSINKI,1,461(70)	Ceulemans
V ⁵⁰	activation	JNE,24,419(70)	Ryves
V	σ_t	70HELSINKI,1,651(70)	Vertebnyi
V	σ_t 1.44 ev	NP,61,381(65)	Rayburn
V	σ_t	RSI,36,887(65)	Rustad
V ⁵¹	activation	BAP,8,335(63)	Glickstein
V ⁵¹	activation	PRIVATE COMM.(62)	Sher
V	pile osci.	61BUCHAR,623(61)	Bouzyk
V	σ_t	NSA,15,3471(61)	Denis
V	pile osci.	JNE,12,32(60)	Tattersall
V ⁵⁰	σ_y (spectra)	PR,89,386(53)	Bartholomew
V	$\bar{\sigma}_t$	CJP,31,432(53)	Brockhouse
V	pile osci.	AERE-N/R-1147(53)	Egelstaff
V	σ_t	PRIVATE COMM.(53)	Palevsky
V	diffraction	PR,87,462(52)	Peterson
V	pile osci.	CR,232,2089(51)	Grimeland
V	mirror reflections	PR,83,171(51)	McReynolds
V	pile osci.	PPS/A,63,1175(50)	Colmer
V	mirror reflections	PR,80,342(50)	Harris
V ⁵¹	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
V	$\sigma_t \sigma_y$	4.16-87.6	NP/A,163,592(71)	Stieglitz
V	$\sigma_t \sigma_y$	4.16-16.2	70HELSINKI,2,815(70)	Moxon
V	polarization	0.000115	NCSAC-31,24(70)+	Postma
V	σ_t	41.8-52.9	69MONTREAL,367(69)	Garg
V	σ_t	4.1-130	NP/A,123,561(68)	Morgenstern
V	σ_t	21.7-153	NP/A,104,1(67)	Rohr
V ⁵⁰	σ_t	6.2-40.7	PRIVATE COMM.(68)	Good
V	σ_y	0.167	AE,19,294(65)	Kapchigashev
V	σ_t	29.5-68.6	65ANTWERP,86(65)	Morgenstern
V	σ_t	1.42-202	CR-1860(64)	Garg
V	σ_t	4.1-22.3	PPS,82,477(63)	Firk
V	σ_t	4.1-30.7	NRDC-135,10(61)+	Moxon
V	σ_t	6.3	BAP,4,42(59)	Miller
V, V ⁵⁰	σ_t	0.167-1.43	PR,111,288(58)	Cote
V	σ_t	4.1-87	PR,106,110(57)	Marshak

²⁴Cr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 3.1 \pm 0.2 \text{ b} \\ \sigma_s &= 3.8 \pm 0.3 \text{ b} \\ \sigma_t &= 6.9 \pm 0.3 \text{ b} \\ a_{coh} &= 3.532 \pm 0.010 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_T = 1.7 \pm 0.2 \text{ b}$$

⁵⁰
²⁴Cr

THERMAL CROSS SECTIONS

$$\sigma_T = 15.9 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 7.6 \pm 0.4 \text{ b} \\ R_T &= 5.4 \pm 0.4 \text{ fm} \\ S_0 &= 2.2 \pm 0.8 \\ S_1 &= 0.26 \pm 0.15\end{aligned}$$

RESONANCE PARAMETERS

$I^n = 0^+$		$\chi_{Abn} = 4.35$		$S_n = 9262.0 \pm 1.0 \text{ keV}$			
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$	
Bound level			1/2	0			
5.49 $\pm$ 0.02	1665 $\pm$ 50	50	1/2	0	22.17 $\pm$.67		
5.64 $\pm$ 0.03				1			
9.30 $\pm$ 0.03				1			
18.60 $\pm$ 0.08				1			
19.2 $\pm$ 0.08				1			
24.0 $\pm$ 0.1	415 $\pm$ 6	6	1/2	0	2.46 $\pm$.04		
24.8 $\pm$ 0.1				1			
28.426 $\pm$ 0.006				1			
33.40 $\pm$ 0.12				[3/2]			
35.30 $\pm$ 0.13				[3/2]			
37.3 $\pm$ 0.2	2250 $\pm$ 20	20	1/2	0	11.65 $\pm$.10		
40.6 $\pm$ 0.2				1			
50.1 $\pm$ 0.3				[1/2]			
53.7 $\pm$ 0.3				1			
54.99 $\pm$ 0.01				1			
59.7 $\pm$ 0.3	281 $\pm$ 8	8	1/2	0	1.20 $\pm$.03		
63.4 $\pm$ 0.4				[3/2]			
64.79 $\pm$ 0.03				1			
64.9 $\pm$.4				1			
66.0 $\pm$ 0.43				1			
69.2 $\pm$.5	43 $\pm$ 6	6	1/2	0	.16 $\pm$.02		
70.5 $\pm$.5				1			
73.5 $\pm$.5				1			
				1			

⁵⁰
₂₄Cr

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
77.8 ± .5			1			
79.4 ± .5			1			
88.9 ± .6			1			
90.7 ± .6			1			
94.75 ± 0.03	1800 ± 100	1/2	0		5.85 ± .32	
111.80 ± 0.08	90 ± 20	1/2	0		.27 ± .06	
113.0			>0			
114.78 ± 0.08	120 ± 20	1/2	0		.35 ± .05	
116.5	168 ± 30		>0			
122.0			>0			
129.01 ± 0.07	520 ± 50	1/2	0		1.45 ± .14	
142.0	240 ± 50		>0			
156.63 ± 0.07	1230 ± 70	1/2	0		3.11 ± .18	
162.45 ± 0.07	700 ± 50	1/2	0		1.74 ± .12	
185.21 ± 0.07	3300 ± 200	1/2	0		7.67 ± .46	
218.3 ± 0.3	170 ± 40				.364 ± .09	
231.7 ± 0.3	750 ± 100	1/2	0		1.56 ± .21	
245.6 ± 0.4	200 ± 50	1/2	0		.40 ± .10	
276.8 ± 0.4	1800 ± 100	1/2	0		3.42 ± .19	
283.5			>0			
293.0 ± 3.0	3700 ± 400	1/2	0		6.84 ± .74	
313.5	1060 ± 480	3/2	1			6.2
328.6 ± 3.3	4500 ± 1000	1/2	0		7.85 ± 1.74	
341.0			>0			
348.0			>0			
356.6 ± 3.9	4500 ± 1000	1/2	0		7.54 ± 1.67	
359.5 ± 4.0	1750 ± 350	1/2	0		2.92 ± .58	
370.0 ± 4.0	10000 ± 3000	1/2	0		16.44 ± 4.93	
381.0	684 ± 70		>0			
388.5 ± 4.0	4000 ± 800	1/2	0		6.42 ± 1.28	
395.0	0.250	1/2	0		0.415	
405.0	1110 ± 220	3/2	1			4.8
413.7	1.750	1/2	0		2.841	
416.5	14.000	1/2	0		22.655	
431.5	1090 ± 180	3/2	1			4.4
433.5	10.000	1/2	0		15.889	
442.0			>0			
454.5	.250	1/2	0		0.389	
459.5	733 ± 50	1/2	1			2.8
467.5	5.500	1/2	0		9.980	
472.0	875 ± 125	1/2	1			3.2
478.0	2.500	1/2	0		3.800	
489.0	1.750	1/2	0		2.633	
502.5	4.000	1/2	0		5.945	
509.0			>0			
515.0	2.000	1/2	0		2.940	
523.0	0.500	1/2	0		0.730	
536.0			>0			
538.5	3.000	1/2	0		4.323	
547.0	2.500	1/2	0		3.577	
553.8	6.000	1/2	0		8.538	
560.5	3.000	1/2	0		4.246	
578.0	2.700	1/2	0		3.770	
580.5	7.000	1/2	0		9.755	
590.7	1.500	1/2	0		2.074	

^a $g\Gamma_n\Gamma_\gamma/\Gamma$

THERMAL CROSS SECTIONS

$$\sigma_T = 0.76 \pm 0.06 \text{ b}$$

$$a_{coh} = 4.9 \text{ fm}$$

RESONANCE PROPERTIES

$$I_1 = 0.60 \pm 0.05 \text{ b}$$

$$R_1 = 5.7 \pm 0.3 \text{ fm}$$

$$S_0 = 2.1 \pm 1.1$$

$$S_1 = 0.30 \pm 0.15$$

RESONANCE PARAMETERS

$$\chi_{Abn} = 83.79$$

$$S_n = 7940.5 \pm 0.9 \text{ keV}$$

$$I^n = 0^+$$

E_0 (keV)	g_n^0 (eV)	J	ℓ	Γ_γ (eV)	g_n^0 (eV)	g_n^1 (eV)
Bound level						
1.626 ± 0.005						
22.92 ± 0.01	0.080 ± 0.012		1		.0020 ± .0003	0.84
27.60 ± 0.11	4 ± 1		1	0.55 ± 0.09	.026 ± .007	1.1
31.62 ± 0.01			1	0.46 ± 0.08		
33.90 ± 0.13	15 ± 1		0	0.31 ± 0.05	.084 ± .005	
34.30 ± 0.13			1	0.34 ± 0.06		
48.30 ± 0.21			1	0.26 ± 0.05		
50.19 ± 0.01			1	0.47 ± 0.08		
57.58 ± 0.01	1710 ± 20	[3/2]	1	1.16 ± 0.20	7.63 ± .09	
79.2 ± 0.6	75 ± 10	[3/2]	0	0.36 ± 0.16	.31 ± .04	4.0
96.23 ± 0.03	6800 ± 100		1	0.38 ± 0.07		
106.0 ± 0.1	60 ± 20	1/2	0	4.30 ± 0.80	21.92 ± .32	
111.6 ± 0.1	60 ± 20	3/2	1	0.43 ± 0.07	.18 ± .06	1.3
113.0 ± 0.4	60 ± 20	3/2	1	0.31 ± 0.05	.18 ± .06	1.3
117.6 ± 0.4	30 ± 10	1/2	1	0.7 ± 0.1		
121.38 ± 0.02	610 ± 20	1/2	0		.088 ± .029	
124.0 ± 1.0		[3/2]	1	0.73 ± 0.13	1.75 ± .06	
130.10 ± 0.05	220 ± 20	3/2	1	0.67 ± 0.11		
139.71 ± 0.07	5400 ± 200		1		.61 ± .05	3.8
141.3 ± 0.2	700 ± 200	1/2	0		14.45 ± .54	
155.0 ± 1.2		1/2	0		1.86 ± .532	
168.0 ± 1.3		1/2	1	0.62 ± 0.11		
205.0 ± 1.5	130 ± 60	3/2	1	0.84 ± 0.15		
224 ± 1.5	<100				.29 ± .13	1.4
234.0 ± 0.6	300 ± 100		>0		.62 ± .21	

E_0 (keV)	g_n^0 (eV)	J	ℓ	Γ_γ (eV)	g_n^0 (eV)	g_n^0 (eV)
235.8 ± 0.2	1100 ± 100	1/2	0		2.27 ± .21	
242.6 ± 0.4	220 ± 50				.45 ± .10	
246.3 ± 0.2	1010 ± 60	1/2	>0		2.04 ± .12	7.7
249.3 ± 0.2	550 ± 50				1.10 ± .10	
252.0 ± 1.0	810 ± 70	3/2	1		1.62 ± .14	6.0
256.7 ± 0.3	310 ± 50				.812 ± .10	2.2
281.9 ± 0.3	550 ± 80	1/2	0		1.04 ± .15	
288.0 ± 1.0	<100	3/2	1			
331.1 ± 3.5	6700 ± 1000	1/2	0		11.72 ± 1.75	
349.0 ± 3.5	152		>0			
363.5 ± 3.5	3500 ± 1000	1/2	0		5.81 ± 1.66	
401.0 ± 3.5	18000 ± 4000	1/2	0		28.43 ± 6.32	
418.0 ± 3.5	1000 ± 300	1/2	0		1.55 ± 4.64	
442.0 ± 3.5	813		>0			
460.5 ± 4.0	12000 ± 4000	1/2	0		17.68 ± 5.89	
530.0 ± 5.0	8000 ± 2400	1/2	0		10.98 ± 3.30	

$\bullet g_n^0 \Gamma_\gamma / \Gamma$

$\bullet g_n^0$

⁵³
²⁴Cr

Thermal cross sections

$$\sigma_T = 18.2 \pm 1.5 \text{ b}$$

Resonance properties

$$I_\gamma = 8.85 \pm 1.00 \text{ b}$$

$$R' = 6.9 \pm 0.3 \text{ fm}$$

$$\langle D \rangle = 4.1 \pm 0.7 \text{ keV}$$

$$S_0 = 5.0 \pm 2.1$$

$$S_1 = 0.074 \pm 0.050$$

Resonance parameters

$I^\pi = 3/2^-$		%Abn = 9.50		$S_n = 9720.2 \pm 0.7 \text{ keV}$		
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$	
Bound level		1				
4.185 ± 0.015	1140 ± 60	1	0	3.23 ± 0.45	17.62 ± .93	
5.67 ± 0.025	260 ± 20	2	0	1.33 ± 0.20	3.45 ± .27	
6.74 ± 0.04	900 ± 75	1	0	5.28 ± 0.80	10.96 ± .91	
8.18 ± 0.04	1230 ± 110	2	0	3.25 ± 0.4	13.60 ± 1.22	
12.10 ± 0.04			1	*0.38 ± 0.06		
12.90 ± 0.04			1	*0.22 ± 0.04		
14.60 ± 0.05			1	*0.26 ± 0.05		
19.60 ± 0.06	133 ± 19	2	0		.95 ± .14	
20.20 ± 0.08			1	*0.77 ± 0.14		
22.40 ± 0.10			1	*0.29 ± 0.05		
25.90 ± 0.08	280 ± 25	2	0	0.61 ± 0.07	1.74 ± .16	
27.00 ± 0.09	550 ± 50	1	0	1.57 ± 0.17	3.35 ± .30	
28.80 ± 0.11			1	*0.65 ± 0.12		
29.30 ± 0.12	430 ± 40	2	0	1.21 ± 0.14	2.51 ± .23	
31.50 ± 0.13			1	*0.31 ± 0.06		
32.00 ± 0.14			1	*0.23 ± 0.05		
34.90 ± 0.15			1	*0.32 ± 0.07		
37.70 ± 0.17			1	*0.35 ± 0.07		
42.40 ± 0.19			1	*0.21 ± 0.04		
43.20 ± 0.20			1	*0.20 ± 0.04		
47.1 ± 0.2			1	*0.37 ± 0.07		
49.8 ± 0.2			1			
51.0 ± 0.3			1			
53.5 ± 0.3			1	0.40 ± 0.08		
64.8 ± 0.3			1	0.60 ± 0.08		
65.7 ± 0.3	5700 ± 150	2	0		22.23 ± .59	
69.7 ± 0.3			1	1.25 ± 0.24		
73.1 ± 0.3	800 ± 200	1			2.95 ± .74	
74.1 ± 0.3	1400 ± 100	2	0		5.14 ± .37	
87.2 ± 0.3	5500 ± 750	1	0		18.63 ± 2.54	
94.5 ± 0.4	750 ± 125	[2]	0		2.44 ± .41	
99.7 ± 0.4	300 ± 75	1	0		.95 ± .24	
107.8 ± 0.4	1700 ± 200	2	0		5.18 ± .61	
123.6 ± 0.4	3000 ± 750	1			8.53 ± 2.13	
124.5 ± 0.4	600 ± 250	2			1.70 ± .71	
127.6 ± 0.4	500 ± 250	2			1.40 ± .70	

⁵³
₂₄Cr

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
129.5 $\pm$ 0.5	300 $\pm$ 150	2			.83 $\pm$.42
135.0 $\pm$ 0.5	18000 $\pm$ 3750	1	0		48.99 $\pm$ 10.20
145.9 $\pm$ 0.5	800 $\pm$ 125	2			2.09 $\pm$.33
157.8 $\pm$ 0.5	1100 $\pm$ 125	2			2.77 $\pm$.32
159.5 $\pm$ 0.5	2600 $\pm$ 375	2			6.51 $\pm$.94
172.7 $\pm$ 0.6	1500 $\pm$ 250	2			3.61 $\pm$.60
175.7 $\pm$ 0.6	3000 $\pm$ 600	1	0		7.156 $\pm$ 1.4
183.0 $\pm$ 0.7	2600 $\pm$ 525	1			6.08 $\pm$ 1.22
186.0 $\pm$ 0.7	600 $\pm$ 250	2			1.39 $\pm$.58
195.7 $\pm$ 0.7	800 $\pm$ 125	2			1.80 $\pm$.28
201.7 $\pm$ 0.7	700 $\pm$ 125	2			1.55 $\pm$.28
221.6 $\pm$ 0.7	5200 $\pm$ 1000	2			11.04 $\pm$ 2.12
227.5 $\pm$ 0.7	400 $\pm$ 125	2			.84 $\pm$.26
239.0 $\pm$ 0.8	3750 $\pm$ 750	2			7.67 $\pm$ 1.53
244.5 $\pm$ 0.8	3000 $\pm$ 750	1			6.07 $\pm$ 1.51
246.0 $\pm$ 0.8	600 $\pm$ 375	2			1.20 $\pm$.76

■ Positive energy resonances contribute about 11 b to the thermal absorption cross section. Support for spin 1 assignment is based on ratio of thermal capture of spin 2 state to spin 1 state.

• $2g\Gamma_n\Gamma_\gamma/\Gamma$

⁵⁴
²⁴Cr

THERMAL CROSS SECTIONS

$$\sigma_T = 0.36 \pm 0.04 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 0.18 \pm 0.04 \text{ b}$$

$$R^2 = 4.8 \pm 0.2 \text{ fm}$$

$$S_0 = 1.8 \pm 1.0$$

$$S_1 = 0.042 \pm 0.024$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\% \text{Abr} = 2.36$		$S_n = 6246.3 \pm 0.4 \text{ keV}$	
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$
10.30 ± 0.04			1	^a 0.14 ± 0.02	
14.40 ± 0.05			1	^a 0.28 ± 0.04	
19.10 ± 0.08			1	^a 0.25 ± 0.04	
23.1 ± 0.1	550 ± 35		0	0.19 ± 0.05	3.62 ± .23
51.1 ± 0.3			1	^a 0.34 ± 0.05	
54.9 ± 0.3			1	^a 0.36 ± 0.06	
67.5 ± 0.3		[3/2]	1	^a 0.94 ± 0.18	
76.4 ± 0.5			1		
90.1 ± 0.6			1		
120.1 ± 0.8	5600 ± 400	1/2	0		16.16 ± 1.2
129.0		1/2	0		
169.8	500		>0		.70
179.1 ± 1.4	1900 ± 170	1/2	0		4.49 ± .40
189.3			>0		
228.0	255		>0		
233.0			>0		
247.5	1255	1/2	1		
264.0			>0		
279.5	9000	1/2	0		17.02
282.5		1/2	0		
285.0	300		>0		5.70
290.5	600	1/2	0		1.12
300.5	500	1/2	0		0.92
314.0			>0		
325.0	16000	1/2	0		28.33
330 ± 3	13000 ± 1500	1/2	0		22.63 ± 2.61
332.0			>0		
342.0	200	1/2	0		.34
351.5	500	1/2	0		.84
355.5	300	1/2	0		.50
358.7	400		>0		
362.0	500	1/2	0		.83
387.5	1640		>0		
393.5	4000	1/2	0		6.38

$$^a g\Gamma_n \Gamma_\gamma / \Gamma$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cr ⁵⁴	σ_{γ} (spectra) (thermal)	NP/A,187,12(72)	White
Cr	Christiansen filter	ZN/A,26,391(71)	Koester
Cr ⁵⁰	activation	JIN,30,349(68)	Sims
Cr ⁵³	σ_{γ} (spectra) (thermal)	CJP,43,1128(65)	Bartholomew
Cr ⁵³	σ_{γ} (spectra) (thermal)	PR,131,777(63)	White
Cr ⁵²	diffraction	ARN,11,303(61)	Wilkinson
Cr ⁵⁰	activation	NSE,8,378(60)	Lyon
Cr ⁵⁴	activation	PR,95,781(54)	Bazorgan
Cr	σ_t	PR,92,702(53)	Melkonian
Cr ^{50,52,53,54}	pile osci.	PR,88,412(52)	Pomerance
Cr	pile osci.	CR,232,2089(51)	Grimeland
Cr	pile osci.	PR,83,641(51)	Pomerance
Cr	$\bar{\sigma}_s$ diffraction	PR,81,527(51)	Shull
Cr	pile osci.	PPS/A,63,1175(50)	Colmer
Cr	$\bar{\sigma}_s$ diffraction	PR,80,342(50)	Harris
Cr		PR,69,411(46)	Coltman
Cr	$\bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber
Cr	$\bar{\sigma}_s$	PR,50,133(36)	Mitchell
Cr	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Cr ⁵⁰	σ_t	28.4-290	KFK-1517(72)	Spencer
Cr ⁵²	σ_t	22.9-282	KFK-1517(72)	Spencer
Cr ⁵³	$\sigma(\gamma,n)$	23-543	PR/C,3,672(71)	Baglan
Cr ⁵³	$\sigma(\gamma,n)$	50.2-364	PR/C,4,1314(71)	Jackson
Cr ⁵³	σ_t	19.5-246	NP/A,164,97(71)	Mueller
Cr ⁵⁰	$\sigma_t \sigma_{\gamma}$	5.6-357	NP/A,163,592(71)	Stieglitz
Cr ⁵²	$\sigma_t \sigma_{\gamma}$	1.6-331	NP/A,163,592(71)	Stieglitz
Cr ⁵³	$\sigma_t \sigma_{\gamma}$	4.2-176	NP/A,163,592(71)	Stieglitz
Cr ⁵⁴	$\sigma_t \sigma_{\gamma}$	23.1-355	NP/A,163,592(71)	Stieglitz
Cr, Cr ⁵²	σ_t	755-902	CEA-R-3279(67)	Cabe
Cr ⁵⁰	σ_t	95.5-591	AP,37,367(66)	Farrell
Cr ⁵⁴	σ_t	116-394	AP,37,367(66)	Farrell
Cr ⁵³	σ_t	3.6-28.8	PR,151,912(66)	Good
Cr ⁵⁰	σ_{γ}	5.5	AE,16,256(64)	Kapchigashev
Cr ⁵²	σ_{γ}	1.7	AE,16,256(64)	Kapchigashev
Cr ⁵³	σ_t	19-39	BAP,8,556(63)	Kim
Cr ⁵²	σ_t	51-636	AP,17,319(62)	Bowman
Cr ⁵⁰	σ_t	6.6-95	AP,14,387(61)	Bilpuch
Cr ⁵²	σ_t	51-140	AP,14,387(61)	Bilpuch
Cr ⁵⁴	σ_t	23.5-119	AP,14,387(61)	Bilpuch
Cr, Cr ⁵²	$\bar{\sigma}_s$	30-115	PR,109,1620(58)	Block
Cr ⁵⁰	σ_t	5.5	PR,111,288(58)	Cote
Cr ⁵²	σ_t	51-406	PR,108,414(57)	Hibdon
Cr	σ_t	102-342	ANL-5554,55(56)	Hibdon
Cr ⁵³	σ_t	69.0-396	ANL-5554,55(56)	Hibdon
Cr	σ_t	3.8	PR,92,702(53)	Melkonian

⁵³
²⁵Mn
[3.7 × 10⁴ yr]

Thermal Cross Sections

$$\sigma_T = 33 \pm 9 \text{ b}$$

⁵⁴
²⁵Mn
[312.5 day]

Thermal Cross Sections

$$\sigma_T = 10 \text{ b}$$

⁵⁵
²⁵Mn

Thermal Cross Sections

$$\begin{aligned}\sigma_T &= 13.3 \pm 0.2 \text{ b} \\ \sigma_s &= 2.1 \pm 0.2 \text{ b} \\ \sigma_c &= 15.4 \pm 0.3 \text{ b} \\ \sigma_{\text{can}} &= -3.7 \pm 0.1 \text{ fm}\end{aligned}$$

Resonance Properties

$$\begin{aligned}I_T &= 14.0 \pm 0.4 \text{ b} \\ A_T &= 3.6 \pm 0.4 \text{ fm} \\ S_0 &= 3.3 \pm 0.5\end{aligned}$$

Resonance Parameters

$J^\pi = 5/2^+$		$\Gamma_{\text{th}} = 100$		$S_n = 7270.4 \pm 0.5 \text{ keV}$	
$E_0 \text{ (keV)}$	$2\sigma_{\text{th}}^2 \text{ (eV)}$	J	ℓ	$\Gamma_T \text{ (eV)}$	$2\sigma_{\text{th}}^2 \text{ (eV)}$
-2.830		2		(0.45)	4.21
-0.078		3		(0.45)	0.019
0.337 ± 0.001	18.67 ± 0.017	2	0	0.5 ± 0.1	1.017 ± 0.002
1.098 ± 0.002	17.01 ± 0.02	3	0		0.513 ± 0.025
2.375 ± 0.005	467 ± 11	3	0		9.57 ± 0.23
6.330 ± 0.006			1		
7.17 ± 0.02	354 ± 14	2	0		4.21 ± 0.17
8.87 ± 0.02	471 ± 22	3	0		5.02 ± 0.23
17.80 ± 0.06	12.8 ± 2.3	(3)			0.087 ± 0.015
18.00 ± 0.06	54.1 ± 8.3	(2)			.40 ± .06
21.00 ± 0.08	1000 ± 40	3			6.80 ± .28
23.7 ± 0.1	316 ± 30	2			2.05 ± .19
25.9 ± 0.1	7.0 ± 2.0		(1)		.043 ± .012
26.4 ± 0.1	100 ± 12	2			.62 ± .07
27.0 ± 0.1	442 ± 44	3			2.69 ± .27
30.4 ± 0.1					
35.3 ± 0.1	~1200	(3)	0		~6.4
35.6 ± 0.1	~1400	(2)	0		~7.4
36.4 ± 0.1		(2)			
41.0 ± 0.1	325 ± 32	3			1.61 ± .16

⁵⁵
₂₅Mn

E_0 (keV)	$2g_{\gamma}^0$ (eV)	J	i	Γ_{γ} (eV)	$2g_{\gamma}^0$ (eV)
43.2 ± 0.1	2 ± 1				.010 ± .005
46.8 ± 0.1	10 ± 5				.046 ± .023
47.3 ± 0.2	16 ± 4				.074 ± .019
53.4 ± 0.2	70 ± 8	2			.301 ± .035
54.1 ± 0.2	10 ± 3				.043 ± .013
54.4 ± 0.2	8.4 ± 2.8				.036 ± .012
57.4 ± 0.2	540 ± 100	3			2.25 ± .42
58.1 ± 0.2	500 ± 100	2			2.07 ± .41
59.5 ± 0.2	315 ± 50	3			1.29 ± .20
60.0 ± 0.2	83 ± 10	2			.34 ± .04
64.1 ± 0.2	1050 ± 60	3			4.15 ± .24
65.5 ± 0.2	20 ± 4				.078 ± .016
66.6 ± 0.2	137 ± 16	3			.53 ± .06
69.5 ± 0.2	150 ± 20	2			.55 ± .08
70.0 ± 0.2	300 ± 20	3			1.13 ± .08
72.7 ± 0.2	15 ± 4				.056 ± .015
73.9 ± 0.2	830 ± 45	3			3.05 ± .17
81.5 ± 0.2	370 ± 25	2			1.30 ± .09
84.4 ± 0.2	1530 ± 60	3			5.27 ± .21
96.3 ± 0.2	175 ± 20	2			.55 ± .06
98.5 ± 0.2	525 ± 50	3			1.67 ± .16
104.0 ± 0.3	225 ± 20	2			.70 ± .06
105.2 ± 0.3	1260 ± 50	2			3.69 ± .15
107.5 ± 0.3	340 ± 40	2			1.04 ± .12
109.4 ± 0.3	1100 ± 110	2			3.33 ± .33
110.9 ± 0.3	2135 ± 175	3			6.41 ± .53
116.1 ± 0.3	550 ± 50	3			1.61 ± .15
118.7 ± 0.3	830 ± 60	3			2.41 ± .17
123.5 ± 0.4	425 ± 50	2			1.21 ± .14
127.0 ± 0.4	2370 ± 240	3			6.65 ± .67
128.1 ± 0.4	1260 ± 150	2			3.52 ± .42
129.5 ± 0.4	1010 ± 150	2			2.81 ± .42
131.0 ± 0.4	260 ± 50	3			.72 ± .14
142.1 ± 0.4	640 ± 80	3			1.70 ± .21
151.3 ± 0.4	340 ± 70	2			.87 ± .18
155.8 ± 0.4	850 ± 100	2			2.15 ± .25
158.7 ± 0.4	1070 ± 100	3			2.69 ± .25
166.9 ± 0.4	260 ± 50	2			.64 ± .12
172.2 ± 0.5	2000 ± 200	3			4.82 ± .48
176.9 ± 0.5	370 ± 50	3			.88 ± .12
179.9 ± 0.5	290 ± 50	2			.68 ± .12
181.0 ± 0.5	290 ± 80	3			.68 ± .19
184.4 ± 0.5	830 ± 150	2			1.93 ± .35
186.2 ± 0.6	2570 ± 250	3			5.96 ± .58
188.5 ± 0.6	945 ± 150	3			2.18 ± .35
193.9 ± 0.6	350 ± 50	3			.79 ± .11
197.6 ± 0.6	520 ± 75	2			1.17 ± .17
203.4 ± 0.6	2150 ± 400	3			6.98 ± .69
207.7 ± 0.6	2350 ± 300	2			5.16 ± .66

Thermal Cross Sections

Isotope	Measurement	Reference	Author
Mn^{54}	flux monitor	MNS, 14, 353(71)	Jenkins
Mn^{55}	activation	IN-1317, 53(70)	Hogg
Mn^{55}	σ_{th} bsc	NET, 5, 128(69)	DeVolpi
Mn^{55}	pile osci.	NE-351(69)	Sokolovski
Mn^{55}	σ_{th} bath	JNE, 22, 465(68)	Ryves
Mn^{55}	pile osci.	66PARIS, 1, 479(66)	Carre
Mn^{55}	activation	SCI, 147, 503(65)	Millard
Mn^{55}	burn up	IDO-16977, 41(64)	Hogg
Mn^{55}	pile osci.	NKA, 8, 443(63)	Bouzyk
Mn^{55}	local osci.	KE, 6, 336(63)	Mittel
Mn^{55}	activation	PRIVATE COMM. (62)	Berrath
Mn^{55}	pulsed n	HSE, 9, 132(61)	Hedows
Mn^{55}	diffraction	MM, 11, 303(61)	Wilkinson
Mn^{55}	pile osci.	JNE, 12, 32(60)	Tattersall
Mn^{55}	activation	ZNA, 13, 820(58)	Meister
Mn^{55}	ratio, Mn/H	ZAP, 10, 537(58)	Hunderer
Mn^{55}	pile osci.	NEPE-R/R-100(57)	Cummins
Mn^{55}	activation	PR, 99, 191(55)	DeJuren
Mn^{55}	activation	CJC, 31, 204(53)	Bartholomew
Mn^{55}	ratio, Mn/U	JPR, 13, 412(52)	Barloutaud
Mn^{55}	pile osci.	CR, 232, 2089(51)	Grinland
Mn^{55}	local osci.	PR, 83, 641(51)	Pomerance
Mn^{55}	diffraction	PR, 81, 527(51)	Skull
Mn^{55}	pile osci.	PPS/A, 63, 1175(50)	Colmer
Mn^{55}	pile osci.	PR, 80, 342(50)	Harris
Mn^{55}	ratio	CA, 225, 328(47)	Ballini
Mn^{55}	mirror reflections	PR, 71, 666(47)	Ferni
Mn^{55}	σ_t	PR, 71, 65(47)	Rainwater
Mn^{55}	activation	PR, 72, 888(47)	Seren
Mn^{55}	absorption	PR, 69, 411(46)	Coltman
Mn^{55}	σ_t	PR, 60, 155(41)	Whitaker
Mn^{55}	σ_t	PR, 57, 976(40)	Beyer
Mn^{55}	water bath	PR, 58, 554(40)	Lapointe
Mn^{55}	σ_s	PRS/A, 162, 127(37)	Goldhaber
Mn^{55}	σ_s	PR, 50, 133(36)	Mitchell
Mn^{55}	σ_c	PR, 48, 265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Mn ⁵⁵	σ_y (spectra)	0-2.50	N ^o /A, 135,241(69)	Alves
Mn ⁵⁵	analysis	0.335-73.9	NJE, 32,377(68)	Stephenson
Mn ⁵⁵	σ_t	4.932-119	NP/A, 102,602(67)	Morgenstern
Mn ⁵⁵	σ_c	53.4-207.7	NP/A, 104,1(67)	Rohr
Mn ⁵⁵	σ_a	4.932-119	GSANTWERP, 86(65)	Morgenstern
Mn ⁵⁵	σ_t	0.337-8.86	PRIVATE COMM. (66)	Garg
Mn ⁵⁵	σ_c	0-17.8	PR/B, 134,1047(64)	Cote
Mn ⁵⁵	σ_a	0.337-192.5	CR-1860(64)	Garg
Mn ⁵⁵	σ_t	2.36-27.3	PR, 106,110(57)	Marshak
Mn ⁵⁵	σ_c	0.337-2.36	PR, 100,126(55)	Bollinger
Mn ⁵⁵	σ_t	0.337-2.56	KAPL-1084(54)	Gaerttner
Mn ⁵⁵	σ_t	0.337-1.12	PR, 95,476(54)	Seidl
Mn ⁵⁵	$\sigma_y, \sigma_y(SI)$	0.337	PR, 80,1014(50)	Harris

⁵⁶Fe

THERMAL CROSS SECTIONS

$\sigma_T = 2.55 \pm 0.03$ b
 $\sigma_A = 10.9 \pm 0.2$ b
 $\sigma_{sc} < 5$ mb
 $\sigma_c = 13.5 \pm 0.4$ b
 $\sigma_{coh} = 9.51 \pm 0.05$ fm

RESONANCE PROPERTIES

$I_T = 1.4 \pm 0.2$ b
 $S_0 = 1.9 \pm 0.5$

⁵⁴Fe

THERMAL CROSS SECTIONS

$\sigma_T = 2.25 \pm 0.18$ b
 $\sigma_{coh} = 4.2 \pm 0.1$ fm

RESONANCE PROPERTIES

$I_T = 1.2 \pm 0.2$ b
 $R_T = 5.6 \pm 0.6$ fm
 $\langle D \rangle = 20.0 \pm 3.5$ keV
 $S_0 = 5.6 \pm 1.7$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\chi^2_{\text{Abr}} = 5.8$		$S_n = 9298.4 \pm 1.0$ keV		
E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_T (eV)	$g\Gamma_n^0$ (eV)	
3.10						
7.76 ± 0.01	1000 ± 20	1/2	0	*2.5 ± 0.5	11.35 ± .23	
8.10						
9.48 ± 0.02				*0.51 ± 0.05		
11.2 ± 0.1						
13.5 ± 0.1						
14.4 ± 0.1				*0.53 ± 0.14		
19.2 ± 0.1						
23.0						
28.2						
30.6						
35.1						
38.3						
39.1						
52.1 ± 0.2	2300 ± 200	1/2	0		10.08 ± .88	
71.8 ± 0.3	2000 ± 200	1/2	0		7.46 ± .75	
98.5 ± 0.4	490 ± 100	1/2	0		1.56 ± .32	
102.6 ± 0.5	840 ± 250	1/2	0		2.62 ± .78	
129.3 ± 0.6	1260 ± 300				3.50 ± .83	
146.8 ± 0.8	1950 ± 490	1/2	0		5.09 ± 1.28	
163.0 ± 0.9	200 ± 100				.50 ± .25	

⁵⁴
₂₆Fe

E ₀ (keV)	g _n ⁺ (eV)	J	ℓ	γ _y (eV)	g _n ⁰ (eV)
173.0 ± 1.0	4600 ± 1200	1/2	0		11.54 ± 2.89
188.5 ± 1.0	38000 ± 10000	1/2	0		87.52 ± 23.03
223.0 ± 1.5	1900 ± 380	1/2	0		4.023 ± .80
230.0 ± 1.5	500 ± 100	1/2	0		1.04 ± .21
244.5 ± 2.0	1300 ± 260	1/2	0		2.63 ± .53
245	240		>0		
262	200		>0		
277	265		>0		
280	110		>0		
282	250		>0		
293	450		>0		
305.5 ± 3.0	7000 ± 1400	1/2	0		12.66 ± 2.53
317.0 ± 3.0	14000 ± 2900	1/2	0		24.87 ± 4.97
329.5 ± 3.0	2750 ± 550	1/2	0		4.79 ± .96
369 ± 3.0	3000	1/2	0		4.9
399	250		>0		
403	110		>0		
411	600		>0		
415	120		>0		
416 ± 4	19000 ± 5000	1/2	0		29.46 ± 7.75
419	<100	(1/2)	>0		
431.0 ± 4.0	7500 ± 1800	1/2	0		11.42 ± 2.74
435.5 ± 4.0	1750 ± 350	1/2	0		2.65 ± .53
438	<100	(1/2)	>0		
441	<100	(1/2)	>0		
445	<100	(1/2)	>0		
449	905		>0		
453	2060		>0		
462	<100	(1/2)	>0		
464	<100	(1/2)	>0		
471	<100	(1/2)	>0		
489.0 ± 5.0	10000 ± 2000	1/2	0		14.30 ± 2.66
491	215		>0		
494	680		>0		
496	435		>0		
503	650		>0		
506.5	750	1/2	0		1.1

^a g_n⁺ γ_y/Γ
^b Calculated

⁵⁶
₂₆Fe

THERMAL CROSS SECTIONS

$$\sigma_T = 2.63 \pm 0.21 \text{ b}$$

$$a_{coh} = 10.1 \pm 0.2 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 1.4 \pm 0.2 \text{ b}$$

$$R' = 6.1 \pm 0.7 \text{ fm}$$

$$\langle D \rangle = 25 \pm 4 \text{ keV}$$

$$S_0 = 1.6 \pm 0.5$$

RESONANCE PARAMETERS

$I'' = 0^\circ$		$\% \text{Abrn} = 91.7$			$S_n = 7646.2 \pm 0.5 \text{ keV}$		
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$	
-2.0			1/2	0	0.64	3.96	
1.15 ± 0.01	0.068 ±	0.006	1/2	1	0.6 ± 0.1	.0020 ± .0001	1.1
22.7 ± 0.1					*0.19 ± 0.02		
27.7 ± 0.2	1600 ± 50		1/2	0	1.45 ± 0.15	9.61 ± .30	
34.1 ± 0.3			1/2	1	*0.59 ± 0.04		
36.6 ± 0.3					*0.30 ± 0.03		
38.3 ± 0.4					*0.46 ± 0.05		
51.9 ± 0.5					*0.51 ± 0.05		
53.3 ± 0.5					*0.54 ± 0.06		
55.0 ± 0.6					*0.14 ± 0.04		
59.0 ± 0.6			1/2	1	*0.54 ± 0.06		
63.1							
72.6							
74.0 ± 0.4	540 ± 40		1/2	0		1.99 ± .15	
76.7							
80.4							
83.0							
83.6 ± 0.4	960 ± 80		1/2	0		3.32 ± .28	
90.2	50					0.17	
92.1							
95.9							
104							
112							
123.2 ± 0.6	130 ± 20		1/2	0		.37 ± .06	
129.6 ± 0.6	500 ± 50		1/2	0		1.39 ± .19	
139.9 ± 0.7	2370 ± 200		1/2	0		6.33 ± .27	
169.0 ± 0.8	750 ± 65		1/2	0		1.82 ± .16	
188.0 ± 0.8	3400 ± 230		1/2	0		7.98 ± .53	
221.0 ± 1.0	1400 ± 100		1/2	0		2.98 ± .22	
224			3/2	1			
232			3/2	1			
243.5 ± 1.0	500 ± 100		3/2	1		1.01 ± .20	
265	120			>0			
267	<100			>0			
273.0 ± 1.0	3500 ± 700		1/2	0		6.70 ± 1.34	
280			3/2	1			
288			1/2	1			

⁵⁶Fe
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E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
290	<100		>0			
315.0 ±1.0	5500 ±1100	1/2	0		9.80 ±1.96	
337	130		>0			
350	670		>0			
357	260		>0			
360.5 ±1.0	9300 ±2000	1/2	0		15.48 ±3.33	
382.0 ±1.0	10000 ±3000	1/2	0		16.18 ±4.85	
404	610		>0			
406.0 ±1.0	2500 ± 500	1/2	0		3.92 ± .78	
418	800	[3/2]	>0			
428	<100	(1/2)	>0			
438.0 ±1.0	1500 ± 300	1/2	0		2.27 ± .45	
442	<100	(1/2)	>0			
448	1000	[1/2]	1			3.3
465	115		>0			
469.5 ±1.0	1500 ± 300	1/2	0		2.19 ± .44	
481	385		>0			
491	1300	[1/2]	1			4.1
496	<100	(1/2)	>0			
501.0 ±0.4	2000	1/2	0			
503.5 ±0.2	600					
512.1 ±0.2	770					
513.1 ±0.4	700					
527.2 ±0.4	365		>0			
531.9 ±0.4	395		>0			
536.2 ±0.4	235		>0			
538.7 ±0.4	925		>0			
544.5 ±0.4	600		>0			
545.6 ±0.4	1100		>0			
552.3 ±0.4	450		>0			
558.7 ±0.4	465		>0			
561.5 ±0.4	1230	1/2	0			
562.8 ±0.8	~600					
565.4 ±0.5						
569.3 ±0.5						
577.5 ±0.5	2000	[3/2]	1			5.5
578.8 ±0.5	~700					
590.4 ±0.5						
595.0 ±0.5						
604.2 ±0.6						
615.0 ±0.6	2500	1/2	0		3.19	
623.7 ±0.6						
631.1 ±0.6						
633.3 ±0.6						
637.0 ±0.6	385		>0			
641.0 ±0.6	330					
646.4 ±0.6	2000	[3/2]	>0			

^a $g\Gamma_n\Gamma_\gamma/\Gamma$

⁵⁷₂₆Fe

THERMAL CROSS SECTIONS

$$\sigma_T = 2.48 \pm 0.30 \text{ b}$$

$$a_{coh} = 2.3 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 1.3 \pm 0.2 \text{ b}$$

$$R_\gamma^c = 6.5 \pm 0.7 \text{ fm}$$

$$S_0 = 5.4 \pm 1.6$$

RESONANCE PARAMETERS

$I^\pi = 1/2^-$		$\%Abn = 2.19$		$S_n = 10043.0 \pm 1.0 \text{ keV}$	
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$
1.63 ± 0.01				*0.10 ± 0.02	
3.92 ± 0.05	100 ± 20	0	0	1.14 ± 0.06	1.60 ± .32
4.75 ± 0.06				*0.10 ± 0.02	
6.21 ± 0.07	615 ± 75	1	0	1.32 ± 0.12	7.80 ± .95
7.22 ± 0.08				*0.72 ± 0.18	
7.90 ± 0.08				*0.36 ± 0.06	
12.8 ± 0.1				*0.86 ± 0.20	
13.9 ± 0.1				*1.4 ± 0.4	
17.7 ± 0.3				*1.17 ± 0.32	
21.3 ± 0.4				*2.18 ± 0.56	
*29.0 ± 0.4	4870 ± 400	1	0	4 ± 1	28.60 ± 2.35
41.0 ± 0.5	1350 ± 150	1			6.67 ± .74
45.5 ± 0.5	525 ± 150	1			2.46 ± .70
55.81	5000 ± 750	0			21.16 ± 3.17
61.0	5550 ± 750	1			22.47 ± 3.04
77.2	2925 ± 300	1			10.53 ± 1.08
93.7	300 ± 75	1			9.80 ± .25
109.6	3450 ± 450	1			10.42 ± 1.36
110.15	1800 ± 150	1			5.42 ± .45
125.0	2250 ± 300	1			6.36 ± .85
126.0	1250 ± 250	0			3.52 ± .70
129.5	3300 ± 1050	1			17.51 ± 2.92
134.5	4950 ± 750	1			13.50 ± 2.05
141.0	2250 ± 450	1			5.99 ± 1.20
167.3	1650 ± 150	1			4.03 ± .37
169.0	2550 ± 300	1			6.20 ± .73
176.3	350 ± 50	0			.83 ± .12
185.5	5250 ± 600	1			12.19 ± 1.39
189.5	1600 ± 200	0			3.68 ± .46

* $2g\Gamma_n\Gamma_\gamma/\Gamma$

* Rohr et al reported also inelastic widths in the energy range from 29.15 to 189.5 keV.

⁵⁸
₂₆Fe

THERMAL CROSS SECTIONS

$$\sigma_T = 1.15 \pm 0.02 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 1.19 \pm 0.07 \text{ b}$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\%Abn = 0.31$$

$$S_n = 6586.6 \pm 3.5 \text{ keV}$$

E_0 (keV)	Γ_T (eV)
0.230	^a 0.0065 ± 0.0014
0.359	^a 0.017 ± 0.005
2.82	
6.16	
10.5	
19.2	

$$^a g \Gamma_n \Gamma_T / \Gamma$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Fe ⁵⁸	activation	JIN,34,2699(72)	Steinnes
Fe	activation	JNE,24,35(70)	Ryves
Fe ⁵⁸	activation	PRIVATE COMM.(67)	Fabry
Fe	pile osci.	66PARIS,1,479(66)	Carre
Fe ⁵⁸	activation	66BERKLEY,331(66)	Carter
Fe	σ_t 1.44 ev	NP,61,381(65)	Rayburn
Fe	pile osci.	CEA-2485(64)	Carre
Fe ⁵⁸	activation	AC,36,1588(64)	Girardi
Fe ⁵⁸	activation	PRIVATE COMM.(63)	Girardi
Fe	reflection	RSI,33,916(62)	Bally
Fe	diffraction	JPJ,17,(B111),1(62)	Shull
Fe	pile osci.	61BUCHAR,623(61)	Bouzyk
Fe	pulsed n	ZET,41,1037(61)	Isakov
Fe ⁵⁴	activation	NSE,8,378(60)	Lyon
Fe ⁵⁸	activation	NSE,8,378(60)-	Lyon
Fe	pile osci.	JNE,12,32(60)	Tattersall
Fe	reactivity	DP-207(57)	Wade
Fe ⁵⁸	activation	PRIVATE COMM.(56)	Grimeland
Fe	σ_t	PR,91,451(53)	Goldberg
Fe	σ_a	HPA,25,521(52)	Haenni
Fe ⁵⁶	σ_a	JPR,13,333(52)	Longchamp
Fe ^{54,56,57,58}	pile osci.	PR,88,412(52)	Pomerance
Fe	pile osci.	CR,232,2089(51)	Grimeland
Fe	σ_t	PR,83,1123(51)	Havens
Fe	local osci.	PR,83,641(51)	Pomerance
Fe,Fe ^{54,56,57}	diffraction	PR,81,527(51)	Shull
Fe	pile osci.	PP5/A,63,1175(50)	Colmer
Fe	σ_a	CR,231,1475(50)	Faraggi
Fe	σ_a	HPA,23,513(50)	Haenni
Fe	pile osci.	PR,80,342(50)	Harris
Fe	reflection	PR,71,666(47)	Fermi
Fe ⁵⁸	activation	PR,72,888(47)	Seren
Fe	capture	PR,69,411(46)	Coltman
Fe	$\sigma_t \bar{\sigma}_s$	PR,60,155(41)	Whitaker
Fe	σ_t	PR,57,976(40)	Beyer
Fe	$\bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Fe ⁵⁴	$\sigma_t \sigma_\gamma$	3.1-39.0	PRIVATE COMM.(72)	Block
Fe ⁵⁸	$\sigma_t \sigma_\gamma$	0.23-19.2	PRIVATE COMM.(72)	Block
Fe ⁵⁶	analysis	27.9-435.5	PRIVATE COMM.(72)	Mynchank
Fe ⁵⁶	$\sigma(\gamma, n)$	27-410	PR/C,3,2475(71)	Baglan
Fe, Fe ^{54, 56, 57}	σ_t	0-187	PR/C,3,2447(71)	Garg
Fe ⁵⁷	$\sigma(\gamma, n)$	27.7-269	PR/C,4,1314(71)	Jackson
Fe ⁵⁴	$\sigma_\gamma(\text{spectra})$	7.8-52	AUJ,24,805(71)	Kenny
Fe ⁵⁶	$\sigma_\gamma(\text{spectra})$	11-73	AUJ,24,805(71)	Kenny
Fe	σ_t	500-2500	ISE,42,28(70)	Carlson
Fe, Fe ⁵⁶	$\sigma_\gamma(\text{spectra})$	1.17	PR/C,1,973(70)	Chrien
Fe, Fe ⁵⁶	σ_t	1.15	PL/B,28,656(69)	Asami
Fe, Fe ^{54, 56, 57}	σ_γ	10.2-129	70HEL5INK1,1,633(70)	Ernst
Fe, Fe ^{54, 56, 57, 58}	σ_γ	0.23-102	70HEL5INK1,2,815(70)	Moxon
Fe ⁵⁴	σ_γ	7.82-52	PR,178,1746(69)	Hockenbury
Fe ⁵⁶	σ_γ	1.15-129	PR,178,1746(69)	Hockenbury
Fe ⁵⁷	σ_γ	1.63-40	PR,178,1746(69)	Hockenbury
Fe ⁵⁸	σ_γ	0.23-10.4	PR,178,1746(69)	Hockenbury
Fe, Fe ⁵⁶	σ_t	1.15	NP/A,132,129(69)	Julien
Fe ⁵⁷	σ_t	29.2-189.5	ZP,227,1(69)	Rohr
Fe ⁵⁶	analysis	512-1442	CHP,6,15(68)	Chien
Fe	σ_t	500-646.4	KFK-1000(68)	Cierjaks
Fe ⁵⁷	σ_t	3.9-45.5	PR,151,912(66)	Good
Fe ⁵⁶	σ_t	74-242.7	66PARIS,1,137(66)	Rohr
Fe, Fe ^{54, 56, 57}	σ_γ	1.15-28	65ANTWERP,89(65)	Moxon
Fe, Fe ⁵⁶	σ_t moving sample	1.2	PL,14,123(65)	Muradyan
Fe, Fe ⁵⁶	σ_t	1.15	PL,13,234(64)	Block
Fe ⁵⁶	$\sigma_\gamma(\text{spectra})$	1.15	ORNL-3778,64(64)	Block
Fe, Fe ^{54, 56, 57}	σ_t	1.17-221	CR-1860(64)	Garg
Fe ⁵⁶	$\sigma_t \sigma_\gamma$	22-50	PR/B,136,695(64)	Macklin
Fe ⁵⁷	$\sigma_t \sigma_\gamma$	12.7-27	PR/B,135,695(64)	Macklin
Fe, Fe ⁵⁶	σ_t	0-1.2	PR,132,801(63)	Moore
Fe, Fe ⁵⁶	σ_γ	1.18	AERE-PR/NP-6,15(63)+	Moxon
Fe ⁵⁴	σ_t	8-507	AP,17,319(62)	Bowman
Fe ⁵⁶	σ_t	28-645	AP,17,319(62)	Bowman
Fe	σ_γ	1.15	RPI-(ATR),8(62)	Russell
Fe ⁵⁴	σ_t	7.25-147	AP,14,387(61)	Bilpuch
Fe ⁵⁶	σ_t	28.3-189	AP,14,387(61)	Bilpuch
Fe ⁵⁷	σ_t	6	AP,14,387(61)	Bilpuch
Fe	σ_γ	1.18-10	ZET,38,989(60)	Isakov
Fe ⁵⁷	σ_t	3.9-6.1	ORNL-2610,19(58)	Miller
Fe, Fe ⁵⁶	σ_t	29-406	PR,108,414(57)	Hibdon
Fe ⁵⁶	σ_t	8-85	PR,102,1574(56)	Gibbons
Fe, Fe ⁵⁴	σ_t	92-401	ANL-5554,55(56)	Hibdon
Fe, Fe ⁵⁷	σ_t	143-149	ANL-5554,55(56)	Hibdon

⁵⁸
²⁷Co
[9.1 hr]

THERMAL CROSS SECTIONS

$$\sigma_T = 136000 \pm 10000 \text{ b}$$

⁵⁸
²⁷Co
[71.3 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 1880 \pm 120 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 6890 \text{ b}$$

⁵⁹
²⁷Co

THERMAL CROSS SECTIONS

$$\begin{aligned} \sigma_T &= 37.2 \pm 0.2 \text{ b} \\ \sigma_T &= 17 \pm 2 \text{ b (5.272 yr } ^{59}\text{Co)} \\ \sigma_T &= 20 \pm 2 \text{ b (10.48 min } ^{59}\text{Co}^*) \\ \sigma_0 &= 6.7 \pm 0.3 \text{ b} \\ \sigma_c &= 43.9 \pm 0.4 \text{ b} \\ \sigma_{coh} &= 2.5 \pm 0.3 \text{ fm} \\ \sigma_{coh} &= -5.80 \pm 0.54 \text{ fm (J4)} \\ \sigma_{coh} &= 10.60 \pm 0.70 \text{ fm (J3)} \end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_T &= 75.5 \pm 1.5 \text{ b} \\ R_T^2 &= 5.3 \pm 0.4 \text{ fm} \\ \langle D \rangle &= 1.4 \pm 0.2 \text{ keV} \\ S_0 &= 3.8 \pm 1.6 \end{aligned}$$

RESONANCE PARAMETERS

$I^a = 7/2^+$		$XAbn = 100$		$S_n = 7491.6 \pm 1.4 \text{ keV}$	
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_T \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$
-0.502		3		(0.48)	2.06
0.1320 $\pm$ 0.0005	5.77 $\pm$ 0.04	4	0	0.48 $\pm$ 0.04	0.501 $\pm$ 0.039
1.38 $\pm$ 0.02	0.0049 $\pm$ 0.0010				0.00013 $\pm$.00003
2.85 $\pm$ 0.01	0.118 $\pm$ 0.026			(0.48)	0.0022 $\pm$ 0.0005
3.98 $\pm$ 0.01	0.08 $\pm$ 0.04				0.00013 $\pm$ 0.0006
4.322 $\pm$ 0.006	124 $\pm$ 5	4	0	~0.5	1.89 $\pm$ 0.08
5.015 $\pm$ 0.008	570 $\pm$ 25	3	0	~1.0	8.05 $\pm$ 0.35
5.80 $\pm$ 0.01					
6.38 $\pm$ 0.01	2.3 $\pm$ 0.4			*0.22 $\pm$ 0.03	0.0029 $\pm$ 0.005
8.05 $\pm$ 0.01	32.4 $\pm$ 1.2	3	0	0.30 $\pm$ 0.05	0.36 $\pm$ 0.01
8.75 $\pm$ 0.01	0.92 $\pm$ 0.40			*0.32 $\pm$ 0.05	0.0098 $\pm$ 0.0042

E_β (keV)	$2g_{\beta^-}$ (eV)	J	ℓ	Γ_γ (eV)	$2g_{\beta^0}$ (eV)
9.69 ±0.01	2.4 ± 0.6			0.56±0.06	0.024 ±0.006
10.70 ±0.01	73.0 ± 6.2	4	0	0.63±0.07	0.71 ±0.06
11.65 ±0.02	2.2 ± 0.4			0.25±0.06	0.020 ±0.004
13.20 ±0.02	23.6 ± 3.0	4	0	0.65±0.10	0.21 ±0.03
15.64 ±0.03	64.8 ± 6.0	3	0	0.47±0.08	0.52 ±0.05
16.92 ±0.03	185.6 ± 15.0	4	0	0.52±0.11	1.43 ±0.12
19.75 ±0.04	3.1 ± 0.8				0.022 ±0.006
21.94 ±0.04	652 ± 40	3	0		4.40 ±0.27
22.51 ±0.04	285 ± 30	4	0		1.90 ±0.20
24.46 ±0.05	315 ± 30	3	0		2.01 ±0.19
25.15 ±0.05	207 ± 20	4	0		1.31 ±0.13
25.92 ±0.05	28 ± 5	4	0		0.17 ±0.03
27.35 ±0.06	191 ± 20	4	0		1.16 ±0.12
29.40 ±0.07	14 ± 4	3	0		0.082 ±0.023
30.11 ±0.07	368 ± 40	4	0		2.12 ±0.23
31.36 ±0.08	136 ± 20	3	0		0.770 ±0.113
31.76 ±0.08	9.5 ± 2.4				0.053 ±0.014
32.73 ±0.08	125 ± 12	3	0		0.69 ±0.07
33.05 ±0.08	49.5 ± 8.0	4	0		0.27 ±0.04
34.51 ±0.08	5.0 ± 2.0	4	0		0.027 ±0.011
34.90 ±0.08	277 ± 30	4	0		1.48 ±0.16
35.74 ±0.09	23 ± 4	3	[1]		0.12 ±0.02
39.35 ±0.10					
40.25 ±0.10	24 ± 4	131	0		0.12 ±0.02
40.67 ±0.10	3.6 ± 2.0				0.018 ±0.010
41.48 ±0.11	41 ± 6	4	0		0.20 ±0.03
42.81 ±0.12	3.0 ± 1.0				0.015 ±0.005
43.61 ±0.12	3.0 ± 1.0				0.014 ±0.005
45.23 ±0.13	283 ± 20	3	0		1.33 ±0.09
45.97 ±0.13	338 ± 20	4	0		1.58 ±0.09
47.14 ±0.14	45 ± 8	4	0		0.21 ±0.04
51.26 ±0.15	540 ± 40	4	0		2.39 ±0.18
52.65 ±0.17	58.4 ± 8.0	4	0		0.25 ±0.04
53.83 ±0.18	438 ± 30	3	0		1.89 ±0.13
56.45 ±0.19	15 ± 6				0.063 ±0.025
57.74 ±0.19	20 ± 4			[1]	0.083 ±0.016
58.94 ±0.20	298 ± 32	3	0		1.23 ±0.13
59.76 ±0.20	112 ± 18	4	0		0.458 ±0.074
61.08 ±0.20	80 ± 16				0.32 ±0.07
62.80 ±0.21	44 ± 16				0.18 ±0.06
66.04 ±0.24	76 ± 14				0.30 ±0.05
68.51 ±0.25	22 ± 8				0.083 ±0.030
69.96 ±0.25	236 ± 24	4	0		0.892 ±0.091
71.87 ±0.26	384 ± 40	3	0		1.43 ±0.15
72.31 ±0.27	192 ± 30	3	0		0.714 ±0.112
74.47 ±0.28	4 ± 3				0.015 ±0.011
74.73 ±0.28	40 ± 6				0.15 ±0.02
75.70 ±0.29	10 ± 4				0.036 ±0.015
75.89 ±0.29	10 ± 4				0.036 ±0.015
76.53 ±0.29	18 ± 8				0.065 ±0.029
77.00 ±0.30	350 ± 40	3	0		1.26 ±0.14
77.72 ±0.30	10 ± 6				0.036 ±0.022

⁵⁹Co

E ₀ (keV)	2g _γ (eV)	J	ℓ	Γ _γ (eV)	2g _γ ^a (eV)
78.78 ±0.30	10 ± 6				0.036 ±0.021
79.39 ±0.31	280 ± 50	4	0		0.99 ±0.18
81.46 ±0.32	258 ± 50	4	0		0.90 ±0.175
82.46 ±0.34	50 ± 16				0.17 ±0.06
83.14 ±0.36	192 ± 50	3	0		0.666 ±0.173
84.06 ±0.36	238 ± 50	4	0		0.821 ±0.173
86.29 ±0.36	20 ± 10				0.068 ±0.034
88.35 ±0.36	1300 ±140	4	0		4.37 ±0.47
89.05 ±0.37	30 ± 16				0.10 ±0.05
91.51 ±0.37	30 ± 16				0.099 ±0.053
92.70 ±0.38	380 ± 70	4	0		1.25 ±0.23
92.78 ±0.38	2360 ±180	3	0		7.75 ±0.59
94.80 ±0.38	480 ± 70	4	0		1.56 ±0.23
95.11 ±0.39	74 ± 14	[3]	[0]		0.24 ±0.05
96.94 ±0.39	60 ± 14				0.19 ±0.05
97.63 ±0.40	520 ±180	[3]	[0]		1.66 ±0.58
98.30 ±0.40	3360 ±460	4	0		10.72 ±1.47
100.28 ±0.40	114 ± 20	3	0		0.360 ±0.063
101.64 ±0.40	300 ± 50	3	0		0.941 ±0.157
105.33 ±0.5	220 ± 40	3	0		0.678 ±0.123
106.63 ±0.5	258 ± 50	4	0		0.790 ±0.153
108.83 ±0.5	220 ± 40		0		0.667 ±0.121
110.05 ±0.5	160 ± 30		0		0.482 ±0.090
110.95 ±0.6	80 ± 24				0.24 ±0.07
111.40 ±0.6	20 ± 10				0.060 ±0.030
112.12 ±0.6	124 ± 20		0		0.370 ±0.060
113.21 ±0.6	150 ± 30		0		0.446 ±0.089
114.11 ±0.6	16 ± 10				0.047 ±0.030
114.87 ±0.6	1060 ±140	3	0		3.13 ±0.41
116.44 ±0.6	100 ± 40				0.29 ±0.12
117.26 ±0.6	680 ±140	4	0		1.99 ±0.41
118.63 ±0.6	1220 ±220	[3]	0		3.54 ±0.64
119.40 ±0.6	460 ±100	[4]	0		1.33 ±0.29

^a 2g_γ

⁶⁰Co

[5.272 yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.0 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 4.3 \pm 1.0 \text{ b}$$

THERMAL CROSS SECTIONS

$$\sigma_T = 58 \pm 8 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 230 \pm 50 \text{ b}$$

$^{60}_{27}\text{Co}$
(10.48 min)

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Co ⁵⁹	depletion	JNE,26,403(72)	Werner
Co ⁵⁹	burn up	DA/8,32,3245(71)	Elgart
Co ⁵⁹	pulsed n	JNE,24,43(70)	Silk
Co ⁵⁹	polarization	PR,185,961(69)	Ito
Co ⁵⁹	activation	PCA,9,51(68)	Kia
Co ⁵⁹	activation	NE,24,330(68)	Kondurav
Co ⁵⁹	activation	CJP,4,2325(68)	Herritt
Co ⁵⁹	activation	PRIVATE COMM.(67)	Devorn
Co ⁵⁹		NE,24,27(66)	Cance
Co ⁵⁹	pile osci.	SAFARI,1,479(66)	Carre
Co ⁵⁹	activation	IN-1024(66)	Hogg
Co ⁵⁹		NSE,24,87(66)-	Swiniarski
Co ⁵⁹	activation	NSE,24,87(66)	Vaninbroukx
Co ⁵⁹		ORNL-3679,16(64)	Halperin
Co ⁵⁹	pile osci.	ZFK-RN-23(64)	Muttel
Co ⁵⁹	activation	AERE-R-4111(64)	Taylor
Co ⁶⁰	activation	NNS,6,420(63)	Hogg
Co ⁵⁹	pile osci.	KE,6,336(63)	Muttel
Co ⁵⁹	activation	PR,129,769(63)	Keisch
Co ⁵⁹	polarization	PR,130,1907(63)	Schermer
Co ⁵⁹	activation	IDO-16744(62)	Hogg
Co ⁵⁹	pulsed n	NSE,9,132(61)	Meadows
Co ⁵⁹	activation	60VIENNA,63(60)	Maier-
			Leibnitz
Co ⁵⁹	pile osci.	JNE,12,32(60)	Tattersall
Co ⁵⁹	activation	NUK,2,255(60)	Wolf
Co ⁵⁹	diffraction	PR,110,1333(58)	Roth
Co ⁵⁹	activation	ZP,149,215(57)	Houtermans
Co ⁶⁰	activation	CJP,31,903(53)	Brown
Co ⁵⁹	activation	CJC,31,391(53)	Moss
Co ⁵⁹	pile osci.	JPR,13,171(52)	Ailloud
Co ⁵⁹	σ_c	PR,87,487(52)	Bernstein
Co ⁵⁹	activation	PR,83,1059(51)	Deutsch
Co ⁵⁹	pile osci.	CR,232,2089(51)	Grimeland
Co ⁵⁹	local osci.	PR,83,641(51)	Pomerance
Co ⁵⁹	diffraction	PR,81,527(51)	Shull
Co ⁵⁹	activation	PR,82,553(51)	Yaffe
Co ⁵⁹	pile osci.	PPS/A,63,1175(50)	Colmer
Co ⁵⁹	pile osci.	PR,80,342(50)	Harris
Co ⁵⁹	activation	PR,72,888(47)	Seren
Co ⁵⁹	σ_c	PR,71,174(47)	Wu
Co ⁵⁹	σ_s	PR5/A,162,127(37)	Goldhaber
Co ⁵⁹	σ_c	PR,48,265(35)	Nutting

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Co ⁵⁹	σ_t	.132-130.	PRIVATE COMM.(72)	Garg
Co ⁵⁹	σ_t	0.132	NST,7,7(70)	Nakajima
Co ⁵⁹	activation	0.132	69MONTREAL,365(69)	Stroud
Co ⁵⁹	activation	0.132	AAEC/TM-466(68)	Wall
Co ⁵⁹	σ_t	0.132-119	NP/A,102,602(67)	Morgenstern
Co ⁵⁹	σ_t	4.318-27.3	PRIVATE COMM.(66)	Garg
Co ⁵⁹	σ_t	1.38-76.95	65ANTWERP,86(65)	Morgenstern
Co ⁵⁹	σ_y	1.381-16.8	65ANTWERP,88(65)	Maxon
Co ⁵⁹	σ_t	0.132-100.60	CR-1060(64)	Garg
Co ⁵⁹	σ_t, σ_y (spectra)	0.132	NSE,17,319(63)	Jain
Co ⁵⁹	σ_y	0.132-16.6	NERE-PR/NP-4(62)	Maxon
Co ⁵⁹	σ_y	0.132	BAP,6,274(60)	Block
Co ⁵⁹	σ_t	4.2-5.0	BAP,5,449(60)+	Good
Co ⁵⁹	σ_t	4.9-30.	BAP,4,42(59)	Miller
Co ⁵⁹	σ_t	0.132-30.	PR,111,288(58)	Cote
Co ⁵⁹	σ_t	4.7-28.3	PR,106,110(57)	Marshak
Co ⁵⁹	σ_t	0.132	KAPL-1084(54)	Gaerttner
Co ⁵⁹	σ_t	0.132	PR,95,476(54)	Seidl
Co ⁵⁹	σ_t	0.132	PR5/A,215,278(52)	Harrison
Co ⁵⁹	σ_t	0.132	PR,83,1123(51)	Havens
Co ⁵⁹	σ_t	0.132	PR,75,1508(49)	Seidl

²⁸Ni

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 4.43 \pm 0.16 \text{ b} \\ \sigma_s &= 17.3 \pm 0.5 \text{ b} \\ a_{coh} &= 10.3 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 2.2 \pm 0.2 \text{ b} \\ R_T &= 7.3 \pm 0.4 \text{ fm} \\ S_0 &= 2.9 \pm 0.3\end{aligned}$$

⁵⁸Ni

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 4.6 \pm 0.3 \text{ b} \\ \sigma_s &= 26.0 \pm 0.3 \text{ b} \\ \sigma_a &= 0.68 \pm 0.36 \text{ mb} \\ \sigma_t &= 30.4 \pm 0.4 \text{ b} \\ a_{coh} &= 14.4 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T^c &= 2.2 \pm 0.2 \text{ b} \\ R_T^c &= 7.5 \pm 0.5 \text{ fm} \\ \langle D \rangle &= 3.0 \pm 0.3 \text{ keV} \\ S_0 &= 3.1 \pm 0.8\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$ZAbn = 67.88$			$S_n = 8999.3 \pm 1.0 \text{ keV}$	
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_T \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$
-28.5 $\pm$ 5.0		1/2	0	9.0 $\pm$ 0.6	98.0 $\pm$ 5.4	
6.89			[1]	^a 0.022 $\pm$ 0.003		
13.34 $\pm$ 0.03			[1]	^a 0.39 $\pm$ 0.05		
13.66 $\pm$ 0.04			[1]	^a 0.57 $\pm$ 0.05		
15.50 $\pm$ 0.04	1200 $\pm$ 100	1/2	0	2.1 $\pm$ 0.7	9.64 $\pm$ 0.80	
19.03 $\pm$ 0.05			[1]	^a 0.07 $\pm$ 0.01		
20.04 $\pm$ 0.05			[1]	^a 0.22 $\pm$ 0.03		
21.16 $\pm$ 0.05			[1]	^a 0.56 $\pm$ 0.06		
26.08 $\pm$ 0.07			[1]	^a 0.25 $\pm$ 0.05		
26.67 $\pm$ 0.07			[1]	^a 0.70 $\pm$ 0.07		
32.36 $\pm$ 0.08		[3/2]	[1]	^a 1.38 $\pm$ 0.15		
34.24 $\pm$ 0.08			[1]	^a 0.65 $\pm$ 0.08		
36.12 $\pm$ 0.09			[1]	^a 0.86 $\pm$ 0.10		
39.59 $\pm$ 0.10			[1]	^a 0.66 $\pm$ 0.15		
47.8 $\pm$ 0.2		[3/2]	[1]	^a 1.3 $\pm$ 0.2		
52.0 $\pm$ 0.2		[3/2]	[1]	^a 1.5 $\pm$ 0.3		
54.7 $\pm$ 0.2			[1]	^a 0.30 $\pm$ 0.10		
58.6 $\pm$ 0.2			[1]	^a 0.52 $\pm$ 0.15		
60.1 $\pm$ 0.2			[1]	^a 0.44		

⁵⁸Ni
₂₈

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
61.8 ± 0.2			[1]	0.71 ± 0.15		
63.0 ± 0.2	3600 ± 200	1/2	0	3.2 ± 0.8	14.34 ± 0.80	
66.4 ± 0.2			[1]	0.36		
68.8 ± 0.2			[1]	0.24		
69.8 ± 0.2			[1]	0.46		
78.0 ± 0.2			[1]	0.12 ± 0.03		
81.1 ± 0.2			[1]	0.73		
83.1 ± 0.2	110 ± 40		0	3.5 ± 0.7	0.38 ± 0.14	
89.8 ± 0.2			[1]	0.45		
92.3 ± 0.2			[1]	0.17		
94.5 ± 0.3			[1]	0.9 ± 0.2		
97.0 ± 0.3			[1]	0.5 ± 0.1		
101.1 ± 0.3			[1]	1.0 ± 0.2		
105.3 ± 0.3			[1]	1.8 ± 0.4		
107.7 ± 0.5	1400 ± 200	1/2	0	3.5 ± 0.8	4.27 ± 0.61	
110.7 ± 0.3			[1]	1.3 ± 0.3		
117.5 ± 0.3			[1]	0.8 ± 0.3		
120.3 ± 0.3		1/2	0	3.3 ± 0.6		
125.0 ± 0.5	700 ± 200	1/2	0	3.2 ± 0.6	1.98 ± 0.57	
137.5 ± 0.7	1760 ± 200	1/2	0		4.75 ± 0.54	
140.5 ± 0.8	3460 ± 500	1/2	0		9.23 ± 1.33	
147.5 ± 0.8	175		>0			
159.5 ± 0.9	6000 ± 1000	1/2	0		15.02 ± 2.50	
169.0 ± 1.0	750 ± 220	1/2	0		1.82 ± 0.54	
183.5 ± 1.1	250		>0			
193.0 ± 1.2	3500 ± 500	1/2	0		7.97 ± 1.14	
207.0 ± 1.5	6800 ± 1200	1/2	0		14.95 ± 2.64	
215.0 ± 1.5	260		>0			
231.0 ± 1.9	6000	1/2	0		12.48	
243.0 ± 1.8	250	1/2	0		0.51	
247.5 ± 1.8	360		>0			
270.0 ± 2.0	6000	1/2	0		11.55	
278.0 ± 2.0	2000	1/2	0		3.79	
286.5 ± 2.0	215		>0			
303.0 ± 2.0	750	1/2	0		1.36	
325.0 ± 2.0	2000	1/2	0		3.51	
334.5 ± 2.5	624		>0			
343.5 ± 2.5	585		>0			
349.0	1500	1/2	0		2.54	
357.5	443		>0			
367.0	250	1/2	0		0.41	
378.5	443		>0			
387.5	500		>0			
394.0	750	1/2	0		1.20	
417.0	5000	1/2	0		7.74	
426.0	1830 ± 400	3/2	1			5.2
426.5	8000	1/2	0		12.25	
454.5	3000	1/2	0		4.45	
461.5	750	1/2	0		1.10	
492.5	2000		>0			
495.5	2000	1/2	0		2.84	
507.0	2000	1/2	0		2.81	

⁵⁸
²⁸Ni

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
522.5	750	1/2	0		1.04	
530.0	430		>0			
544.0	640		>0			
554.5	1490 ± 300	1/2	1			3.3
559.5	1260		>0			
571.0	10000	1/2	0		13.23	
588.5	2500	1/2	0		3.26	
600.0	6000	1/2	0		7.75	

^a $g\Gamma_n\Gamma_\gamma/\Gamma$

⁵⁹
²⁸Ni

[8 × 10⁴ yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 92 \pm 4 \text{ b} \\ \sigma_n &= 12 \pm 2 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma = 138 \pm 8 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi \approx 3/2^-$$

$$S_n = 11387.5 \pm 1.7 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_n (eV)	$2g\Gamma_n^0$ (eV)
.20310 ± .00005	7.88 ± 0.231	1	0	3.4 ± 1.0	0.548 ± 0.015

⁶⁰Ni
₂₈

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 2.8 \pm 0.2 \text{ b} \\ \sigma_s &= 1.0 \pm 0.1 \text{ b} \\ \sigma_c &= 3.8 \pm 0.2 \text{ b} \\ a_{coh} &= 2.8 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 1.5 \pm 0.2 \text{ b} \\ R' &= 6.7 \pm 0.3 \text{ fm} \\ \langle D \rangle &= 3.8 \pm 0.6 \text{ keV} \\ S_0 &= 2.4 \pm 0.6\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\chi Abn = 26.23$			$S_n = 7819.5 \pm 1.0 \text{ keV}$	
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_T \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$
1.293 ± 0.009				^a 0.0003 ± 0.0001		
2.257 ± 0.009			[1]	^a 0.065 ± 0.007		
5.53 ± 0.02			[1]	^a 0.056 ± 0.009		
12.23 ± 0.03			[1]	^a 0.11 ± 0.02		
12.5 ± 0.1	2660 ± 100		0	3.3 ± 0.3	23.79 ± 0.89	
13.62 ± 0.03			[1]	^a 0.11 ± 0.03		
23.88 ± 0.06		3/2	1	^a 0.78 ± 0.10		
28.47 ± 0.07			[1]	^a 0.15 ± 0.05		
28.60 ± 0.10	850 ± 100	1/2	0	1.1 ± 0.1	5.02 ± 0.59	
29.47 ± 0.08			[1]	^a 0.09 ± 0.02		
30.24 ± 0.08			[1]	^a 0.35 ± 0.06		
33.03 ± 0.08		3/2	1	^a 0.34 ± 0.06		
33.3 ± 0.1			[1]	^a 0.20 ± 0.03		
39.5 ± 0.1				^a 0.49 ± 0.08		
43.0 ± 0.1	90 ± 30	1/2	0	1.3 ± 0.3	0.43 ± 0.15	
47.6 ± 0.1	~10	1/2	1	0.9 ± 0.2		~0.49
49.8 ± 0.1			[1]	^a 0.26 ± 0.04		
50.9 ± 0.2			1	^a 0.11 ± 0.02		
51.5 ± 0.2		3/2	1			
56.0 ± 0.2			[1]	0.20 ± 0.06		
56.7 ± 0.2			[1]	^a 0.44 ± 0.09		
65.42 ± 0.16	500 ± 150	1/2	0	2.1 ± 0.3	1.96 ± 0.59	
71.5 ± 0.2			[1]	^a 0.36 ± 0.07		
73.3 ± 0.2			[1]	^a 0.48 ± 0.09		
78.3 ± 0.2			[1]	^a 0.23 ± 0.04		
80.0 ± 0.2			[1]	^a 0.33 ± 0.07		
82.0 ± 0.2	110 ± 40	[1/2]	1	^a 0.22 ± 0.05		
84.9 ± 0.2	80 ± 40	[3/2]	1	0.20 ± 0.04		1.61
86.3 ± 0.2	330 ± 25	1/2	0		1.12 ± 0.09	
87.9 ± 0.2			[1]	^a 0.64 ± 0.13		
89.9 ± 0.3			[1]	^a 0.17 ± 0.04		
91.6 ± 0.3			[1]	^a 0.25 ± 0.05		
93.9 ± 0.3			[1]	^a 0.48 ± 0.10		
97.5 ± 0.3	1000 ± 200	1/2	0	1.0 ± 0.2	3.20 ± 0.64	
99.2 ± 0.3			[1]	^a 0.92 ± 0.20		

⁶⁰Ni
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E ₀ (keV)	g _n ⁰ (eV)	J	L	γ _y (eV)	g _n ⁰ (eV)	g _n ¹ (eV)
101.9 ±0.3			(1)	0.10 ±0.05		
109.3 ±0.3	700 ± 100	1/2	0	1.1 ±0.3		2.13±0.31
111.6 ±0.3		1/2	1	2.7 ±0.6		
120.6 ±1.1		3/2	1	1.3 ±0.3		
123.8 ±1.2			1			
129.7 ±1.3			1			
136.5 ±1.4		1/2	1	4.3 ±0.9		1.11±0.13
139.6 ±1.4		1/2	1	4.0 ±0.9		3.48±0.50
156.4 ±1.2	440 ± 50	1/2	0	2.2 ±0.5		13.43±1.85
162.0 ±0.4	1400 ± 200	1/2	0			6.97±0.79
186.6 ±1.5	5800 ± 800	1/2	0			
198.0 ±1.8	3100 ± 350	1/2	0			
206.0 ±1.8	120		>0			
214.0 ±1.8	74		>0			
220.0 ±1.8	106		>0			
229.0 ±1.8	224		>0			
252.0 ±2.0	910		>0			
257.8 ±2.1	3500 ± 600	1/2	0			6.89±1.18
279.6 ±2.3	750 ± 160	1/2	0			1.42±0.30
282.5 ±2.4	647		>0			
292.5 ±2.4	378		>0			
306	525		>0			
316.0 ±2.5	3200 ± 600	1/2	0			5.69±1.07
326.3 ±2.5	7000 ±1100	1/2	0			12.25±1.93
339.5 ±2.5	6500 ±1500	1/2	0			11.16±2.57
357.2 ±2.6	1000	1/2	0			1.67
358.5 ±2.6	1113		>0			
375.5	4000	1/2	0			
379.5	226		>0			
387.5	290		>0			
392.0	225		>0			
397.0	321		>0			
401.5	400		>0			
412.3	750	1/2	0			1.17
421.0	2000	1/2	0			3.08
426.5	500	1/2	0			0.77
431.5	230		>0			
446.0	3000	1/2	0			4.49
453.0	1500	1/2	0			2.23
462.0	1000	1/2	0			1.47
473.0	500	1/2	0			0.73
484.6	3750	1/2	0			5.39
497.5	578		>0			
498.0	5000					7.63
502.5	333		>0			
511.5	2420	3/2	1			3.14±6.3
513.5	2250	1/2	0			6.93
520.3	5000	1/2	0			4.14
525.5	3000	1/2	0			0.66
533.0	500	1/2	0			
552.5	710		>0			
556.5	500	1/2	0			0.67

⁶⁰Ni
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E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
566.0	260		>0			
580.3	250	1/2	0		0.33	
588.5	500	1/2	0		0.65	
594.8	2500	1/2	0		3.24	

* $g\Gamma_n\Gamma_\gamma/\Gamma$

⁶¹Ni
28

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 2.5 \pm 0.8 \text{ b} \\ \bar{\sigma}_a &= 9.6 \pm 2.0 \text{ b} \\ \sigma_a &= 0.047 \pm 0.021 \text{ b} \\ \sigma_t &= 12.1 \pm 0.8 \text{ b} \\ a_{coh} &= 7.60 \pm 0.06 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}1_\gamma^c &= 1.6 \pm 0.4 \text{ b} \\ R_1^f &= 6.4 \pm 0.3 \text{ fm} \\ \langle D \rangle &= 0.79 \pm 0.10 \text{ keV} \\ S_0 &= 3.0 \pm 0.8\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 3/2^-$$

$$\lambda_{Abn} = 1.19$$

$$S_n = 10596.6 \pm 1.4 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
1.35±0.01				*0.48±0.060	
2.35±0.01					
3.14±0.01				*0.17±0.04	
3.30±0.01				*0.96±0.12	
6.36±0.01					
6.47±0.01				*0.70±0.20	
7.15±0.02	50 ± 6	1	0	2.5 ± 0.4	0.59 ± 0.07
7.55±0.02	225 ± 20	2	0	2.3 ± 0.6	2.59 ± 0.23
8.73±0.02	7.5 ± 2.5	2	0	2.6 ± 0.8	0.080 ± 0.027
9.91±0.02			[1]	*0.18±0.06	
10.20±0.03			[1]	*0.38±0.10	
10.90±0.03					
11.4 ± 0.03					
11.8 ± 0.03					
12.64±0.03	90 ± 10	2	0	1.7 ± 0.4	0.80 ± 0.09
13.60±0.03	76 ± 5	2	0	1.6 ± 0.4	0.65 ± 0.04
14.02±0.03	13 ± 3	1	0	3.1 ± 0.5	0.11 ± 0.03
14.45±0.04			[1]	*0.60±0.06	
15.38±0.04			[1]	*0.34±0.08	
16.70±0.05	600 ± 20	1	0	2.2 ± 0.4	4.64 ± 0.15
16.80±0.05			[1]	*0.28±0.08	
17.83±0.05	140 ± 10	1	0	1.6 ± 0.5	1.05 ± 0.08

⁶¹
²⁸ Ni

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
18.83±0.05	90 ± 10	2	0	0.9 ±0.3	0.66 ±0.07
20.25±0.05			[1]	*0.18±0.06	
20.50±0.05			[1]	*0.22±0.06	
21.35±0.05			[0]	*1.76±0.40	
24.12±0.05			[1]	*0.72±0.18	
24.62±0.06	97 ± 8	1	0	1.4 ±0.3	0.62 ±0.05
25.12±0.06			[1]	*0.50±0.12	
25.96±0.06			[1]	*0.48±0.12	
26.45±0.06			[1]	*0.36±0.10	
27.10±0.07			[1]	*0.40±0.10	
27.65±0.07	6.3± 5.0	2	[1]	*0.80±0.20	0.038±0.030
28.21±0.07			0	3.0 ±1.0	
29.11±0.07			0	2.4 ±0.4	
30.64±0.08			0		
31.13±0.08			0		
31.83±0.08	19 ± 10	2	0		0.11 ±0.06
32.70±0.08			0		
33.68±0.08			0		
37.13±0.09			0		
41.34±0.10			0		
43.25±0.11	570 ± 40	1	0		3.23 ±0.23
43.61±0.11			0		
45.49±0.11			0		
46.16±0.12			0		
50.51±0.12			0		
53.30±0.13	12.5± 7.5	2	0		0.070±0.042
54.81±0.14			0		
56.49±0.14			0		
58.16±0.15			0		
64.07±0.16			0		
65.87±0.16	265 ± 25	2	0	2.8 ±0.5	0.27 ±0.05
68.77±0.17			0	3.0 ±0.5	
			0		
			0		
			0		
	180 ± 20	2	0		0.93 ±0.10
			0		
			0		
			0		
			0		
	150 ± 20	1	0		0.74 ±0.10
			0		
			0		
			0		
			0		
	12.5± 10.0	2	0		0.060±0.048
			0		
			0		
			0		
			0		
	37.5± 17.5	2	0		0.18 ±0.08
			0		
			0		
			0		
			0		
	50 ± 6	1	0		0.23 ±0.03
			0		
			0		
			0		
			0		
	40.5± 6.0	1	0		0.19 ±0.03
			0		
			0		
			0		
			0		
	100 ± 9	1	0		0.45 ±0.04
			0		
			0		
			0		
			0		
	176 ± 13	2	0		0.76 ±0.06
			0		
			0		
			0		
			0		
	142 ± 14	1	0		0.61 ±0.06
			0		
			0		
			0		
			0		
	149 ± 13	2	0		0.63 ±0.06
			0		
			0		
			0		
			0		
	133 ± 15	1	0		0.55 ±0.06
			0		
			0		
			0		
			0		
	68 ± 6	2	0		0.27 ±0.02
			0		
			0		
			0		
			0		
	1790 ±225	2	0		6.97 ±0.09
			0		
			0		
			0		
			0		
	1375 ±625	2	0		5.24 ±2.38
			0		
			0		
			0		
			0		

* $2g\Gamma_n\Gamma_\gamma/\Gamma$

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 14.2 \pm 0.3 \text{ b} \\ \sigma_s &= 9.5 \pm 0.4 \text{ b} \\ \sigma_t &= 23.7 \pm 0.5 \text{ b} \\ a_{\text{coh}} &= -8.7 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}l_{\gamma} &= 6.8 \pm 0.2 \text{ b} \\ R' &= 6.2 \pm 0.3 \text{ fm} \\ S_0 &= 2.9 \pm 0.7\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$

$\% \text{Abn} = 3.66$

$S_n = 6837.7 \pm 1.0 \text{ keV}$

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_{γ} (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
4.54 ± 0.05	1600 ± 160	1/2	0	0.76 ± 0.12	23.75 ± 2.29	
42.87 ± 0.01	340 ± 10	1/2	0		1.64 ± 0.05	
56.91 ± 0.02	56 ± 4		[1]			2.5
77.23 ± 0.03	70 ± 7	1/2	0		0.25 ± 0.03	
78.42 ± 0.04	48 ± 7		[1]			1.4
94.7 ± 0.02	2500 ± 100	1/2	0		8.12 ± 0.33	
105.65 ± 0.03	4600 ± 200	1/2	0		14.15 ± 0.62	
137.5	127		>0			
149.3 ± 0.1	140 ± 20	1/2	0		0.36 ± 0.05	
188.2 ± 0.2	90 ± 20		0		0.21 ± 0.05	
214.7 ± 0.2	190 ± 20	1/2	0		0.41 ± 0.04	
229.5 ± 0.04	6250 ± 80	1/2	0		13.25 ± 0.17	
242.2 ± 0.08	780 ± 40	1/2	0		1.58 ± 0.08	
259.5	113		>0			
272.5	333		>0			
280.5	4800 ± 200	1/2	0		9.06 ± 0.38	
286.0	1500 ± 500	1/2	0		2.81 ± 0.93	
297.0	200		>0			
299.5	500		>0			
304.0	800	1/2	0		1.45	
315.5	238		>0			
319.0	375		>0			
323.0	580		>0			
327.0	5500	1/2	0		9.62	
344.2	7500	1/2	0		12.78	
352.0	279		>0			
356.2	2000	1/2	0		3.35	
364.0	194		>0			
374.5	250	1/2	0		0.41	
382.5	1250	1/2	0		2.02	
388.5	4500	1/2	0		7.22	
401.5	1500	1/2	0		2.37	
403.3	392		>0			
420.3	813		>0			
423.0	1500	1/2	0		2.31	
433.0	6500	1/2	0		9.88	

⁶²
₂₈ Ni

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
444.0	350	1/2	0		0.53	
449.8	250		>0			
450.0	236		>0			
458.0	500	1/2	0		0.74	
461.8	550		>0			
475.0	1500	1/2	0		2.18	
480.0	324		>0			
488.5	4000	1/2	0		5.72	
493.5	934	1/2	1			2.8
498.0	1500	1/2	0		2.13	
508.5	500	1/2	0		0.70	
515.5	145		>0			
522.0	390		>0			
529.0	1690	3/2	1			4.7
535.5	1390	1/2	1			
539.0	2000	1/2	0		2.72	
554.0	675		>0			
568.5	843		>0			
571.8	4000	1/2	0		5.29	
581.0	500	1/2	0		0.66	
583.5	10000	1/2	0		13.09	
590.5	2000	1/2	0		2.60	
599.5	905	1/2	1			2.2

⁶³
₂₈ Ni
[100 yr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 23 \pm 3 \text{ b}$$

⁶⁴Ni
28

THERMAL CROSS SECTIONS

$$\sigma_T = 1.49 \pm 0.03 \text{ b } [2.520 \text{ hr } ^{65}\text{Ni}]$$
$$a_{\text{coh}} = -0.38 \pm 0.07 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 1.1 \pm 0.2 \text{ b}$$
$$R' = 6.4 \pm 0.1 \text{ fm}$$
$$S_0 = 1.3 \pm 0.1$$
$$S_1 = 0.6 \pm 0.3$$

RESONANCE PARAMETERS

$$I'' = 0^\circ$$

$$\% \text{Abn} = 1.08$$

$$S_n = 6837.7 \pm 1.0 \text{ keV}$$

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
9.52				^a 1.7 ± 0.2		
14.3 ± 0.2	2900 ± 500	1/2	0	.76 ± .15	24.25 ± 4.18	
25.8 ± 0.1						
31.8 ± 0.1						
33.81 ± 0.04	8900 ± 500	1/2	0		48.40 ± 2.72	
62.4 ± 0.1						
82.8 ± 0.1						
106.52 ± 0.08	110 ± 30		>0			
129.32 ± 0.03	1400 ± 50	1/2	0		3.89 ± 0.14	
141.5 ± 0.1	170 ± 20		>0			
148.8 ± 0.1	80 ± 20	1/2	0		0.21 ± 0.05	
155.0 ± 0.1	3950 ± 100	1/2	0		10.04 ± 0.25	
163.2 ± 0.1	160 ± 20	1/2	0		0.40 ± 0.05	
177.7 ± 0.1	470 ± 30	1/2	0		1.12 ± 0.07	
191.0 ± 0.2	140 ± 30		[1]			
205.3 ± 0.2	60 ± 20	1/2	0		0.13 ± 0.04	
214.7 ± 0.3	90 ± 20		>0			
219.8 ± .1	30 ± 20	1/2	0		0.064 ± 0.043	
226.9 ± .3	120 ± 30	1/2	0		0.25 ± 0.06	
231.95 ± .04	3770 ± 90	1/2	0		7.83 ± 0.19	
237.9 ± 0.1	320 ± 40		>0			
255.7 ± 0.3	170 ± 40		>0			
269.7 ± 0.1	2210 ± 90	1/2	0		4.26 ± 0.17	
283.5 ± 0.4	350 ± 70	1/2	0		0.66 ± 0.13	
298.0 ± 2.5	1000	1/2	0		1.83	
308.5 ± 2.5	1500	1/2	0		2.70	
327.0 ± 2.5	597		>0			
333.0 ± 2.5	250	1/2	0		0.43	
340.2	500	1/2	0		0.86	
360.3	728		>0			
365.0	1857	[3/2]	1			7.6
371.5	1318	[3/2]	1			5.3
383.0	1597	[3/2]	1			
389.0	6000	1/2	0		9.62	
392.5	235		>0			
395.5	815		>0			
407.0	2020	[3/2]	1			7.4

⁶⁴₂₈Ni

E_0 (keV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
414.0	759		>0			
420.8	8000	1/2	0		12.33	
455.5	560	[1/2]	1			
459.5	1100	[3/2]	1			
466.5	995	[1/2]	1			
470.0	535		>0			
479.0	1090	[1/2]	1			
483.0	5000	1/2	0		7.19	
499.5	535		>0			
503.0	766		>0			
519.0	477		>0			
523.0	1000	1/2	0		1.38	
536.5	10000	1/2	0		13.65	
541.5	1670	[3/2]	1			4.5
552.0	2000	1/2	0		2.69	
565.0	900		>0			
576.0	4000	1/2	0		5.27	
583.0	300	1/2	0		0.39	

^a $g\Gamma_n\Gamma_\gamma/\Gamma$

⁶⁵₂₈Ni

[2.520 hr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 24.3 \pm 2.0 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 11 \pm 2 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ni ⁵⁹	σ_a	KAPL-3979(72)+	Eiland
Ni ⁵⁹	pile osci.	PRIVATE COMM.(72)	Kirouac
Ni ⁵⁹	pile osci.	KAPL-3980(72)	Kirouac
Ni ⁶³	radiation balance	ARI,22,777(71)	Barnes
Ni ⁵⁹	σ_a	ANS,14,168(71)	Kangilaski
Ni	σ_y moxon rae	NIM,86,83(70)	Malik
Ni ⁶²	activation	JNE,24,35(70)	Ryves
Ni ⁶⁵	activation	NAP,9,662(70)	Serment
Ni ⁶²	activation	JIN,32,2839(70)	Sims
Ni ⁵⁹	σ_a	ANS,13,557(70)	Weitman
Ni ⁶⁵	mass spectrometry	JIN,31,1241(69)	Pinajian
Ni ⁶⁴	activation	ORNL-4343,71(68)	Emery
Ni ^{61,64}	diffraction	PR,156,1225(67)	Sidhu
Ni ^{61,62,64}	σ_t	PRIVATE COMM.(65)	Doil'nitsyn
Ni ₂ Ni ⁵⁸	σ_t 1.44 ev	NP,61,381(65)	Rayburn
Ni ⁶²	mass spectrometry	PR,125,1619(62)	Horrocks
Ni ⁶⁴	activation	NSE,8,378(60)	Lyon
Ni	pile osci.	JNE,12,32(60)	Tattersall
Ni ^{58,61}	σ_a	ZP,153,106(58)	Munnich
Ni ⁶⁵	activation	PRIVATE COMM.(58)	Schuman
Ni ⁶²	mass spectrometry	CJC,34,1742(56)	McMullen
Ni	mirror reflections	PR,96,1297(54)	Allen
Ni	σ_t	PR,91,451(53)	Goldberg
Ni ^{58,60,61,62,64}	pile osci.	PR,88,412(52)	Pomerance
Ni	pile osci.	CR,232,2089(51)	Grimeland
Ni	local osci.	PR,83,641(51)	Pomerance
Ni ₂ Ni ^{58,60,62}	σ_t diffraction	PR,81,527(51)	Shull
Ni	$\bar{\sigma}_a$	PR,83,379(51)	Weiss
Ni	$\bar{\sigma}_s$	PR,77,575(50)	Bendt
Ni	pile osci.	PPS/A,63,1175(50)	Colmer
Ni	pile osci.	PR,80,342(50)	Harris
Ni ₂ Ni ^{58,60,62}	diffraction	PR,79,395(50)	Koehler
Ni	$\bar{\sigma}_s$	PR,71,666(47)	Fermi
Ni	σ_y	PR,69,411(46)	Coltman
Ni	$\bar{\sigma}_s$	JPJ,24,569(42)	Kimura
Ni	σ_t	PR,60,155(41)	Whitaker
Ni	σ_t	PR,57,976(40)	Beyer
Ni	$\sigma_t \bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber
Ni	$\bar{\sigma}_s$	PR,50,133(36)	Mitchell
Ni	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Ni ⁶²	σ_t	4.6	PRIVATE COMM.(73)	Good
Ni ⁵⁸	$\sigma_t \sigma_\gamma$	15	AERE-PR/NP-18,4(72)	Axmann
Ni ⁶²	$\sigma_t \sigma_\gamma$	4.6	AERE-PR/NP-18,4(72)	Axmann
Ni ⁶¹	$\sigma_t \sigma_\gamma$	1.35-21.3	PRIVATE COMM.(72)	Block
Ni ⁶⁴	$\sigma_t \sigma_\gamma$	14.3-82.8	PRIVATE COMM.(72)	Block
Ni ⁵⁸	σ_γ	13.3-125	PRIVATE COMM.(72)	Froehner
Ni ⁶⁰	σ_γ	12.2-162	PRIVATE COMM.(72)	Froehner
Ni ⁶¹	σ_γ	7.2-69	PRIVATE COMM.(72)	Froehner
Ni ⁵⁹	σ_t	0.203	KAPL-3980(72)	Kirouac
Ni ⁵⁹		0.203	PRIVATE COMM.(72)	Kirouac
Ni ⁶²	σ_t	42.9-288	KFK-1517(72)	Spencer
Ni ⁶⁴	σ_t	14.3-284	KFK-1517(72)	Spencer
Ni ⁵⁸	σ_t	15.3-110.7	KFK-1271/3(71)	Beer
Ni ⁶⁰	σ_t	12.5-194.6	KFK-1271/3(71)	Beer
Ni ⁶²	σ_t	12.9-288	KFK-1271/3(71)	Beer
Ni ⁶⁴	σ_t	14.3-283.5	KFK-1271/3(71)	Beer
Ni ⁵⁸	σ_t	32.2-333	PR/C,3,2447(71)	Garg
Ni ⁶⁰	σ_t	0-207	PR/C,3,2447(71)	Garg
Ni ⁶²	σ_t	12.4-196	PR/C,3,2447(71)	Garg
Ni ⁶²	σ_t	4.5-149	PR/C,3,2447(71)	Garg
Ni ⁶¹	$\sigma(\gamma,n)$	11.6-198	PR/C,4,1314(71)	Jackson
Ni ⁶⁰	$\sigma_t \sigma_\gamma$	1.3-340	NP/A,163,592(71)	Stieglitz
Ni ⁶¹	σ_t	7.2-69	70HELSINKI,1,619(70)	Cho
Ni ⁶⁰	σ_γ	12.5-66	70HELSINKI,1,633(70)	Ernst
Ni ⁶¹	σ_γ	7.2-37	70HELSINKI,1,633(70)	Ernst
Ni ⁵⁸	σ_γ	6.9-124	PR,178,1746(69)	Hockenbury
Ni ⁶⁰	σ_γ	1.3-97	PR,178,1746(69)	Hockenbury
Ni ⁶¹	σ_γ	1.4-90	PR,178,1746(69)	Hockenbury
Ni ⁶²	σ_γ	2.3-4.6	PR,178,1746(69)	Hockenbury
Ni ⁶⁴	σ_γ	9.5-83	PR,178,1746(69)	Hockenbury
Ni ⁵⁸	σ_t	107-600	AP,37,367(66)	Farrell
Ni ⁶⁰	σ_t	97-594	AP,37,367(66)	Farrell
Ni ⁶²	σ_t	94-600	AP,37,367(66)	Farrell
Ni ⁶⁴	σ_t	105-583	AP,37,367(66)	Farrell
Ni ⁶¹	σ_t	7.0-48.4	PR,151,912(66)	Good
Ni ⁵⁸	σ_t	0-207	AP,14,387(61)	Bilpuch
Ni ⁶⁰	σ_t	14.5-199	AP,14,387(61)	Bilpuch
Ni ⁵⁸	σ_t	65	ANL-5498,52(55)	Hibdon
Ni ⁶²	σ_t	4.2	ORNL-1496,14(52)	Pawlicki

²⁹Cu

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 3.79 \pm 0.03 \text{ b} \\ \sigma_s &= 7.9 \pm 0.2 \text{ b} \\ \sigma_t &= 11.7 \pm 0.2 \text{ b} \\ a_{coh} &= 7.63 \pm 0.04 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 3.2 \pm 0.3 \text{ b} \\ R_T &= 7.1 \pm 0.2 \text{ fm} \\ S_0 &= 2.1 \pm 0.4 \\ S_1 &= 0.3 \pm 0.2\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (keV)	$4ag\Gamma_n$ (eV)	$ag\Gamma_n^1$ (eV)
0.400	0.00049 ± 0.00005	0.011
2.211	0.0294 ± 0.0032	0.051
2.319	0.0179 ± 0.0021	0.029
2.851	0.046 ± 0.005	0.054
3.304	0.038 ± 0.004	0.036
3.498	0.036 ± 0.004	0.031
3.583	0.029 ± 0.003	0.024
4.434	0.038 ± 0.005	0.023
5.250	0.030 ± 0.005	0.014
6.290	0.067 ± 0.010	0.024
7.009	0.038 ± 0.006	0.012

⁶³
²⁹Cu

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 4.5 \pm 0.1 \text{ b} \\ \sigma_s &= 5.7 \pm 0.3 \text{ b} \\ \sigma_t &= 10.2 \pm 0.3 \text{ b} \\ a_{coh} &= 6.72 \pm 0.15 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 4.9 \pm 0.4 \text{ b} \\ \langle D \rangle &= 0.62 \pm 0.07 \text{ keV} \\ S_0 &= 2.4 \pm 0.6\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 3/2^-$$

$$\%Abn = 69.1$$

$$S_n = 7916.1 \pm 0.8 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
Bound level					
0.577±0.001	1.08 ± 0.04	2	0	0.520±0.040	0.045 ± 0.002
0.650±0.001	0.0123± 0.0003	1		0.350±0.100	0.00048 ± .00001
0.806±0.001	0.0050± 0.0004				0.000176± .014-3
0.996±0.002	0.0166± 0.001				0.00053 ± .00003
2.038±0.003	31.9 ± 1.0	1	0	0.57 ± 0.07	0.71 ± 0.02
2.642±0.004	5.1 ± 0.2	2	0	0.58 ± 0.05	0.099 ± 0.004
4.393±0.004	3.88 ± 0.10	1	0	0.68 ± 0.07	0.059 ± 0.002
4.852±0.004	10.5 ± 0.3	1	0	0.62 ± 0.06	0.151 ± 0.004
5.387±0.005	44.6 ± 1.5	2	0	0.44 ± 0.05	0.618 ± 0.020
5.819±0.006	11.7 ± 0.7	2	0	0.46 ± 0.04	0.153 ± 0.009
6.840±0.007	0.14 ± 0.04				0.0017 ± 0.0005
7.086±0.008	0.98 ± 0.40	(1)		0.40 ± 0.04	0.012 ± 0.005
7.565±0.009	12.0 ± 0.5	1	0		0.136 ± 0.006
7.930±0.009	110 ± 10	2	0		1.23 ± 0.12
8.350±0.010	4.54 ± 0.20	1		0.68 ± 0.08	0.050 ± 0.002
9.190±0.012	58 ± 6	2	0	0.42 ± 0.04	0.61 ± 0.06
9.930±0.013	72.0 ± 3.5	1	0		0.722 ± 0.035
10.840±0.015	70 ± 4	2	0		0.67 ± 0.04
12.530±0.020	11.0 ± 1.0	1	0	0.75 ± 0.09	0.098 ± 0.009
13.170±0.020	92.4 ± 2.5	2	0		0.80 ± 0.02
13.710±0.022	25 ± 5	1		0.40 ± 0.11	0.21 ± 0.04
15.090±0.025	14.5 ± 1.5	(2)	0	0.51 ± 0.06	0.12 ± 0.01
15.820±0.027	17.7 ± 0.5	(2)	0	0.57 ± 0.07	0.141 ± 0.004
16.320±0.028	13.9 ± 1.4	1		0.56 ± 0.08	0.109 ± 0.011
17.880±0.033	60 ± 3	1	0		0.45 ± 0.02
18.035±0.033	37.2 ± 1.8	2	0		0.277 ± 0.013
20.806±0.040	1.5 ± 0.5				0.010 ± 0.004
20.900±0.042	88.4 ± 9.0	2	0		0.61 ± 0.06
21.050±0.043	3.6 ± 1.6				0.025 ± 0.011
21.124±0.043	76.5 ± 7.6	1	0		0.53 ± 0.05
21.619±0.044	5.2 ± 2.0				0.036 ± 0.014
22.672±0.045	120 ± 6	2	0		0.80 ± 0.04
23.204±0.049	1.4 ± 0.8				0.0092 ± 0.0053
23.487±0.049	2.4 ± 1.0				0.016 ± 0.007
24.765±0.052	94 ± 5	2			0.60 ± 0.03

⁶³
₂₉Cu

E ₀ (keV)	2gΓ _n (eV)	J	ℓ	Γ _γ (eV)	2gΓ _n ⁰ (eV)
25.618±0.056	233 ±23	1			1.46 ±0.14
25.779±0.057	1.6 ± 0.8				0.010 ±0.005
26.447±0.060	90 ±20	1			0.55 ±0.12
29.359±0.069	231.1 ±18.4	1			1.35 ±0.11
30.285±0.073	1.6 ± 0.8				0.009 ±0.005
31.205±0.077	48 ± 5	2			0.27 ±0.03
33.400±0.084	325				1.78
36.200±0.095	308				1.61
39.89 ± .09					
40.06 ± .09					
40.28 ± .09					
40.63 ± .09					
40.75 ± .09					
42.03 ± .10	260	[1]	0		1.3
42.55 ± .10	680	[1]	0		3.3
44.06 ± .11					
44.85 ± .11					
47.74 ± .11					
47.78 ± .11					
50.37 ± .12					
53.16 ± .13					
53.43 ± .13					
53.83 ± .13		[1]			
55.00 ± .13		[2]			
55.42 ± .13		[2]			
56.35 ± .13		[1]			
56.86 ± .14					
57.67 ± .14					
58.85 ± .14		[1]			
59.20 ± .14					
59.51 ± .14					
59.91 ± .14					
60.39 ± .14					
63.29 ± .15					
63.64 ± .15					
65.05 ± .16					
65.23 ± .16					
66.51 ± .16					
67.07 ± .16					
67.82 ± .16					
69.78 ± .17					
71.30 ± .17					
72.97 ± .17					
73.72 ± .17					
74.71 ± .18					
76.05 ± .18					
78.01 ± .18					
79.20 ± .19					
81.70 ± .19		[2]			
83.76 ± .20		[1]			
90.13 ± .22					
91.46 ± .22					

⁶³
²⁹Cu

E ₀ (keV)	2gΓ _n (eV)	J	ℓ	Γ _γ (eV)	2gΓ _n ⁰ (eV)
*92.52 ± .22					
*95.00 ± .23					
*96.28 ± .23					
*97.09 ± .23					
*101.66 ± .24					
*102.36 ± .24					
*104.16 ± .25					
*105.44 ± .25					
*107.89 ± .26					
*109.24 ± .26					

* Isotopic assignment and analysis carried out by NNCSC.

⁶⁵
²⁹Cu

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 2.17 \pm 0.03 \text{ b} \\ \bar{\sigma}_s &= 15.5 \pm 0.4 \text{ b} \\ \sigma_t &= 17.7 \pm 0.4 \text{ b} \\ a_{coh} &= 11.09 \pm 0.19 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 2.4 \pm 0.3 \text{ b} \\ \langle D \rangle &= 1.0 \pm 0.2 \text{ keV} \\ S_0 &= 1.5 \pm 0.4\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 3/2^{-}$$

$$\%Abn = 30.9$$

$$S_n = 7066.7 \pm 0.8 \text{ keV}$$

E ₀ (keV)	2gΓ _n (eV)	J	ℓ	Γ _γ (eV)	2gΓ _n ⁰ (eV)
Bound level					
0.229±0.001	0.0216± 0.0014	2		0.245±0.020	0.0143±0.0001
1.363±0.002	0.022 ± 0.003				0.0006±0.0001
2.528±0.004	21.0 ± 2.2	2	0	0.36 ±0.04	0.418 ±0.044
3.913±0.006	17.7 ± 0.6	1	0	0.47 ±0.05	0.283 ±0.010
4.486±0.006	12.0 ± 1.5	1	0	0.33 ±0.04	0.179 ±0.022
6.448±0.007	32.0 ± 1.2	2	0	0.35 ±0.04	0.400 ±0.015
7.604±0.009	27.3 ± 1.4		0		0.313 ±0.016
7.879±0.010	122 ± 7	2	0		1.37 ±0.08
8.360±0.010	0.42 ± 0.20				0.0046±0.0022
9.775±0.010	1.5 ± 0.6				0.015 ±0.006
12.130±0.018	0.80 ± 0.15				0.0073±0.0014
13.192±0.020	104 ± 6	2	0		0.905 ±0.052
13.617±0.022	1.54 ± 0.50				0.013 ±0.004
14.230±0.023	45 ± 3	[1]	0	0.31 ±0.05	0.38 ±0.03
16.060±0.027	38.0 ± 1.4	1	0		0.300 ±0.011
19.895±0.037	160 ±10	2	0		1.13 ±0.07
21.921±0.044	6.9 ± 3.0				0.046 ±0.020

⁶⁵
29 Cu

E ₀ (keV)	2g _n ⁺ (eV)	J	ℓ	Γ _γ (eV)	2g _n ⁺ (eV)
23.681±0.050	45 ± 3	1			0.29 ±0.02
24.133±0.051	100 ± 6	1			0.64 ±0.04
25.017±0.054	45.4 ± 4.4	2			0.29 ±0.03
25.108±0.060	70 ± 7	1			0.44 ±0.04
25.312±0.060					
25.784±0.060	10.4 ± 4.2				0.065 ±0.026
34.9	324				1.73
39.65 ± .09	285	1	0		1.4
40.17 ± .09					
41.05 ± .09					
43.20 ± .10	190	1	0		0.92
43.84 ± .10					
44.29 ± .11					
45.94 ± .11					
46.81 ± .11					
47.64 ± .11					
50.52 ± .12	85		0		0.38
53.53 ± .13	125		0		0.54
54.47 ± .13					
54.83 ± .13					
56.46 ± .13					
57.19 ± .14					
57.94 ± .14					
58.31 ± .14					
62.15 ± .14					
64.56 ± .15					
65.46 ± .16					
67.30 ± .16		[2]			
68.21 ± .16					
69.63 ± .17					
72.92 ± .17		[1]			
74.76 ± .18					
76.33 ± .18					
78.78 ± .18					
82.66 ± .19					
84.35 ± .20					
86.51 ± .21					
89.91 ± .21					
91.84 ± .22					
94.45 ± .22					
96.69 ± .23					
97.34 ± .23					
98.66 ± .24					
99.85 ± .24					
107.41 ± .26					
107.98 ± .26					
108.76 ± .26					
111.72 ± .27					
114.60 ± .27					
117.81 ± .28					
119.58 ± .29					
122.31 ± .29					
123.94 ± .30					
127.07 ± .30					

Isotopic assignment and analysis carried out by NNCSC.

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29-5

⁶⁶
²⁹Cu
[5.1 min]

THERMAL CROSS SECTIONS

$$\sigma_T = 135 \pm 10 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cu	σ_c	ZP,250,166(72)	Steyerl
Cu	σ_c	AKE,19,172(72)	Suszkyn
Cu	diffraction	ZK,135,416(72)	Zigan
Cu	σ_T moxon rae	NIM,86,33(70)	Malik
Cu ^{63,65}	activation	JNE,24,35(70)	Ryves
Cu ⁶⁶	activation	NAP,9,662(70)	Serment
Cu,Cu ^{63,65}	$\bar{\sigma}_s$	70HEL5INKI,1,651(70)	Vertebnyi
Cu ⁶⁴	activation	AE,24,533(68)	Kondurov
Cu	reactivity	AECL-3073(68)	Okazaki
Cu ⁶³	activation	PRIVATE COMM.(67)	Pinarelli
Cu	$\bar{\sigma}_s$	67JUELICH,80(67)	Simpson
Cu	pile osci.	66PARIS,1,479(66)	Carre
Cu	$\bar{\sigma}_s$	ZAP,18,295(65)	Christ
Cu	σ_c 1.44 ev	NP,61,381(65)	Rayburn
Cu	pile osci.	NKA,8,443(63)	Bouzyk
Cu	n reflection	RSI,33,916(62)	Bally
Cu	pile osci.	ARP,6,(3),311(61)	Stefanescu
Cu	reactivity	NSE,7,184(60)	Donahue
Cu ⁶³	activation	NSE,8,378(60)	Lyon
Cu	pile osci.	JNE,12,32(60)	Tattersall
Cu,Cu ^{63,65}	σ_c reflection	PR,111,261(58)	Keating
Cu ⁶³	activation	ZN/A,13,820(58)	Meister
Cu ⁶⁶	activation	BAP,3,408(58)	Passell
Cu	σ_c	HW-55879,3(58)	Seppi
Cu	reactivity	OP-207(57)	Wade
Cu ^{63,65}	diffraction	RSI,27,620(56)	Heindl
Cu	σ_c	PR,99,611(55)+	Palevsky
Cu ^{63,65}	pile osci.	PR,88,412(52)	Pomerance
Cu	pile osci.	CR,232,2089(51)	Grimeland
Cu	local osci.	PR,83,641(51)	Pomerance
Cu	$\bar{\sigma}_s$	ORNL-1164,3(51)	Rayburn
Cu	diffraction	PR,81,527(51)	Shull
Cu	pile osci.	PPS/A,63,1175(50)	Colmer
Cu	pile osci.	PR,80,342(50)	Harris
Cu	σ_c	PR,73,963(48)	Havens
Cu ⁶⁵	activation	PR,72,888(47)	Seren
Cu	σ_c	PR,68,159(45)	Nix
Cu	σ_c	PR,60,155(41)	Whitaker
Cu ^{63,65}	activation	PR,58,869(40)	Rasetti
Cu	$\bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber
Cu	$\bar{\sigma}_s$	PR,50,133(36)	Mitchell
Cu	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Cu, Cu ^{63,65}		1-15	PRIVATE COMM.(72)	Garg
Cu	$\sigma_{\gamma}(\text{spectra})$	0.229	PR/C,1,1468(70)	Stein
Cu	σ_t	0.229	JPJ,29,1378(70)	Yamamuro
Cu	σ_t	0.200-30.0	NP/A,134,118(69)	Alves
Cu ⁶³	σ_t	0.578-31.205	NP/A,134,118(69)	Alves
Cu ⁶⁵	σ_t	0.23-25.784	NP/A,134,118(69)	Alves
Cu ⁶³	$\sigma_{\gamma}(\text{spectra})$	THERM.-0.580	NP/A,135,241(69)	Alves
Cu ⁶⁵	$\sigma_{\gamma}(\text{spectra})$	THERM.-0.227	NP/A,135,241(69)	Alves
Cu ⁶³	σ_t	0.579-0.651	NP/A,132,129(69)	Julien
Cu ⁶⁵	σ_t	0.229	NP/A,132,129(69)	Julien
Cu ⁶³	σ_t	40-240	PRIVATE COMM.(68)	Rohr
Cu ⁶⁵	σ_t	40-240	PRIVATE COMM.(68)	Rohr
Cu	σ_{γ}	0.229-16.37	ZP,213,411(68)	Weigmann
Cu, Cu ^{63,65}	σ_t	0.230-13.614	CEA-R-3128(67)	Chevillon
Cu ⁶³	σ_t	2.63-42.2	PR,151,912(66)	Good
Cu ⁶⁵	σ_t	2.5-58.0	PR,151,912(66)	Good
Cu	σ_t	0.230-13.6	65ANTWERP,80(65)	Julien
Cu	σ_t	0.229-99.4	CR-1860(64)	Garg
Cu ⁶³	σ_{γ}	0.229	AE,15,120(63)	Kapchigashev
Cu ⁶³	σ_t	5.28-23	BAP,4,42(59)	Miller
Cu ⁶³	σ_t	0.557-5.4	PR,111,288(58)	Cote
Cu ⁶⁵	σ_t	0.229-4.2	PR,111,288(58)	Cote
Cu ⁶³	σ_t	1.1-97.2	PR,106,110(57)	Marshak
Cu ⁶⁵	σ_t	1.1-97.2	PR,106,110(57)	Marshak
Cu ⁶³	σ_t	0.57-2.52	PRIVATE COMM.(57)	Zimmerman

³⁰Zn

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 1.10 \pm 0.04 \text{ b} \\ \sigma_s &= 4.2 \pm 0.2 \text{ b} \\ \sigma_t &= 5.3 \pm 0.2 \text{ b} \\ a_{\text{coh}} &= 5.8 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 2.3 \pm 0.3 \text{ b} \\ R^* &= 6.7 \pm 0.2 \text{ fm}\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (keV)	E_0 (keV)	E_0 (keV)
0.587±0.001	16.010±0.028	29.160±0.069
0.750±0.001	16.090±0.028	29.640±0.070
1.322±0.002	16.430±0.029	30.200±0.072
2.070±0.003	16.680±0.029	31.200±0.076
2.130±0.003	16.920±0.030	32.500±0.081
2.476±0.004	17.060±0.030	33.450±0.084
3.434±0.006	17.270±0.031	34.050±0.087
3.793±0.006	17.800±0.032	34.400±0.088
4.050±0.008	17.950±0.033	34.700±0.089
5.040±0.004	18.440±0.034	35.200±0.091
5.200±0.005	19.010±0.036	35.700±0.093
5.340±0.005	20.160±0.039	36.200±0.095
6.320±0.006	20.420±0.040	36.500±0.096
7.010±0.008	20.820±0.041	36.900±0.098
7.100±0.008	20.980±0.042	37.200±0.099
7.480±0.008	21.500±0.043	37.500±0.100
7.500±0.009	21.680±0.044	39.300±0.108
7.790±0.009	21.840±0.044	39.800±0.110
7.920±0.009	22.090±0.045	40.200±0.111
8.260±0.009	23.080±0.048	41.100±0.115
8.320±0.010	24.490±0.053	41.700±0.118
8.420±0.010	24.760±0.054	42.300±0.120
8.500±0.010	24.920±0.054	42.800±0.122
9.370±0.012	25.140±0.055	43.700±0.126
9.820±0.013	25.250±0.055	44.200±0.129
11.100±0.016	25.420±0.056	44.600±0.130
11.880±0.017	25.740±0.057	45.000±0.132
12.200±0.018	25.980±0.058	45.100±0.133
13.300±0.021	26.190±0.058	46.300±0.138
13.370±0.021	26.520±0.058	46.600±0.139
13.520±0.021	26.900±0.061	48.000±0.146
13.920±0.022	27.080±0.061	49.800±0.154
14.100±0.023	27.250±0.062	50.700±0.158
14.230±0.023	27.450±0.063	51.700±0.163
14.470±0.024	28.080±0.065	52.200±0.165
14.610±0.024	28.520±0.066	53.600±0.172
15.600±0.027	28.750±0.067	54.900±0.178

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.78 \pm 0.02 \text{ b} \\ \sigma_s &= 3.8 \pm 0.2 \text{ b} \\ \sigma_a &= 0.015 \pm 0.010 \text{ mb} \\ a_{coh} &= 5.6 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 1.4 \pm 0.1 \text{ b} \\ R_{\gamma} &= 6.7 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\%abn = 48.9$$

$$S_n = 7979.2 \pm 0.8 \text{ keV}$$

E_0 (keV)	Γ_n (eV)	J	ℓ	Γ_{γ} (eV)	Γ_n^0 (eV)	Γ_a (meV)
0.2818 ± 0.0004	0.0060 ± 0.0006	7/2	[0]	0.294 ± 0.030	$0.00037 \pm .00004$	0.052 ± 0.020
2.637 ± 0.008	70 ± 4	1/2			1.4 ± 0.1	0.12 ± 0.05
4.18 ± 0.01	25 ± 5	1/2	0		0.37 ± 0.07	
10.790 ± 0.015	85	1/2	0		0.82	
13.040 ± 0.020	175	1/2	0		1.54	

⁶⁶₃₀Zn

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 0.85 \pm 0.20 \text{ b} \\ \sigma_a &= 5.0 \pm 0.2 \text{ b} \\ \sigma_n &< 0.020 \text{ mb} \\ \sigma_c &= 5.9 \pm 0.3 \text{ b} \\ \sigma_{coh} &= 6.3 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 0.8 \pm 0.2 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\chi A b n = 27.8$$

$$S_n = 7052.4 \pm 0.7 \text{ keV}$$

E_0 (keV)	Γ_n (eV)	J	ℓ	Γ_γ (eV)	Γ_n^0 (eV)
0.323 ± 0.001	0.010 ± 0.001			0.170 ± 0.020	.00056 ± .00006
10.43 ± 0.02	90 ± 20	1/2	0		0.88 ± 0.19
15.3 ± 0.3	500 ± 100	1/2	0		4.04 ± 0.81
19.56 ± 0.04	355 ± 71				2.54 ± 0.51
21.32 ± 0.08	130 ± 25	1/2	0		0.89 ± 0.16
22.7 ± 0.1	130 ± 25	1/2	0		0.86 ± 0.16
24.3 ± 0.1	650 ± 50	1/2	0		4.17 ± 0.32
30.8 ± 0.2	325 ± 30	1/2	0		1.85 ± 0.17

⁶⁷₃₀Zn

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 6.9 \pm 1.4 \text{ b} \\ \sigma_a &= 0.00\% \pm 0.004 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 20 \pm 4 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$\chi A b n = 4.1$$

$$S_n = 10198.1 \pm 0.5 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)	Γ_n (meV)
0.223 ± 0.001	1.08 ± 0.04	2	0	0.420 ± 0.100	0.072 ± 0.003	< 0.08
0.448 ± 0.001	11 ± 1	3	0	0.5 ± 0.1	0.52 ± 0.05	< 0.03
1.548 ± 0.002	10 ± 3	[0]			0.25 ± 0.08	0.75 ± 0.40
2.246 ± 0.006	43 ± 10	[0]			0.91 ± 0.21	

⁶⁸₃₀Zn

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_f &= 0.072 \pm 0.004 \text{ b [13.8 hr } ^{68}\text{Zn}^*] \\ \sigma_f &= 1.0 \pm 0.1 \text{ b [51 min } ^{68}\text{Zn}^*] \\ \sigma_s &= 5.6 \pm 0.2 \text{ b} \\ \sigma_a &< 0.020 \text{ mb} \\ \sigma_t &= 6.7 \pm 0.2 \text{ b} \\ a_{coh} &= 6.7 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma = 3.3 \pm 0.3 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\chi^2/\text{b} = 18.6$$

$$S_n = 6482.2 \pm 0.9 \text{ keV}$$

E_0 (keV)	Γ_n (eV)	J	ℓ	Γ_γ (eV)	Γ_n^0 (eV)
0.514 ± 0.001	8.7 ± 0.5	1/2	0	0.180 ± 0.030	0.38 ± 0.02
18.82 ± 0.04	400 ± 50	1/2	0		2.92 ± 0.37

⁷⁰₃₀Zn

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_f &= 83 \pm 5 \text{ mb [2.2 min } ^{70}\text{Zn}^*] \\ \sigma_f &= 8.7 \pm 0.5 \text{ mb [3 hr } ^{70}\text{Zn}^*]\end{aligned}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Zn, Zn ^{64, 66, 68}	diffraction	PRIVATE COMM.(73)	Shull
Zn ^{66, 67}	σ_{γ} (spectra)	NP/A, 164, 69(71)	Ottmar
Zn ^{64, 68}	activation	IN-1317, 53(70)	Hogg
Zn ^{64, 68}	activation	CJP, 47, 2031(69)	Ricabarra
Zn ⁶⁶	isom. ratio	NP/A, 124, 15(69)	Zoller
Zn ^{66, 67}	σ_{γ} (spectra)	SNP, 6, 660(68)	Bystrov
Zn	σ_t	JNE, 22, 389(68)	AbuEl-Ela
Zn ⁶⁴	activation	RCA, 9, 61(68)	Kim
Zn ^{68, 70}	isom. ratio	ZP, 210, 13(68)	Mannhart
Zn ⁶⁴	activation	JIN, 29, 2853(67)	Sims
Zn ^{66, 67}	σ_{γ} (spectra)	BAS, 30, 1187(66)	Groshev
Zn	diffraction	ZMP, 16, 820(65)	Fisher
Zn ⁶⁸	activation	PR, 129, 769(63)	Keisch
Zn ^{68, 70}	activation	NP, 36, 542(62)	Mangal
Zn	pile osci.	61BUCHAR, 623(61)	Bouzyk
Zn ⁷⁰	activation	PR, 124, 1526(61)	Thwaites
Zn	diffraction	ARN, 11, 303(61)	Wilkinson
Zn ^{64, 68}	activation	NSE, 8, 378(60)	Lyon
Zn	pile osci.	JNE, 12, 32(60)	Tattersall
Zn ^{64, 68}	σ_a	CR, 234, 1684(52)	Faraggi
Zn ^{66, 67}	σ_a	CR, 235, 425(52)	Faraggi
Zn	σ_t	PR, 83, 1123(51)	Havens
Zn ⁷⁰	activation	PRIVATE COMM.(51)	Hughes
Zn	local osci.	PR, 83, 641(51)	Pomerance
Zn	diffraction	PR, 81, 527(51)	Shull
Zn	pile osci.	PPS/A, 63, 1175(50)	Colmer
Zn	pile osci.	PR, 80, 342(50)	Harris
Zn ⁶⁸	activation	PR, 75, 1781(49)	Hughes
Zn	σ_t	PR, 75, 975(49)	Winsberg
Zn ⁶⁸	activation	PR, 72, 888(47)	Seren
Zn	σ_{γ}	PR, 69, 411(46)	Coltman
Zn	$\bar{\sigma}_s$	SCP, 36, 153(39)	Kimura
Zn	$\bar{\sigma}_s$	PRS/A, 162, 127(37)	Goldhaber
Zn	σ_c	PR, 48, 265(35)	Dunning
Zn	$\bar{\sigma}_s$	PR, 48, 653(35)	Mitchell

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Zn ⁶⁴	σ_a	0.281-2.64	JINR-P3-5875(71)	Popov
Zn ⁶⁷	σ_a	0.229-2.246	JINR-P3-5875(71)	Popov
Zn ^{64,66,67}	σ_t	0.229-0.323	NP/A,132,129(69)	Julien
Zn ⁶⁴	σ_T	0.288	ZET,49,410(65)	Kim
Zn ⁶⁶	σ_T	0.328	ZET,49,410(65)	Kim
Zn ⁶⁸	σ_T	0.514	ZET,49,410(65)	Kim
Zn	σ_t	0.229-54.90	CR-1860(64)	Garg
Zn	σ_t	0.323	PRIVATE COMM.(63)	Rianchi
Zn ⁶⁶	σ_t	10.4-30.8	ORNL-2718,22(59)+	Miller
Zn ⁶⁸	σ_t	20.8	ORNL-2718,22(59)+	Miller
Zn ⁶⁴	σ_t	2.75-4.60	PR,104,1006(56)	Dahlberg
Zn ⁶⁷	σ_t	0.232-2.3	PR,104,1006(56)	Dahlberg
Zn ⁶⁸	σ_t	0.514	PR,104,1006(56)	Dahlberg
Zn	σ_t	0.218-2.51	KAPL-1084(54)	Gaerttner
Zn	σ_t	0.52-3.8	PR,83,1123(51)	Havens

^{31}Ga

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 2.9 \pm 0.1 \text{ b} \\ \sigma_{\alpha} &= 6.5 \pm 0.2 \text{ b} \\ \sigma_{\text{t}} &= 9.4 \pm 0.2 \text{ b} \\ \sigma_{\text{coh}} &= 7.2 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 18.7 \pm 1.5 \text{ b} \\ S_1 &= 0.8 \pm 0.3\end{aligned}$$

Thermal Cross Sections

$$\sigma_T = 1.68 \pm 0.07 \text{ b}$$

Resonance Properties

$$I_T = 15.6 \pm 1.5 \text{ b}$$

$$\langle D \rangle = 230 \pm 55 \text{ eV}$$

$$S_0 = 1.2 \pm 0.4$$

Resonance Parameters

$$I^\pi = 3/2^-$$

$$\% \text{Abn} = 60.0$$

$$S_n = 7651 \pm 1 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	J	Γ_T (eV)	$2g\Gamma_n^0$ (eV)
Bound level				
0.1110 ± 0.0005	.068 ± 0.006	2	0.270 ± 0.030	0.0065 ± 0.0006
0.3340 ± 0.0007	0.220 ± 0.022	2	0.210 ± 0.040	0.0120 ± 0.0013
0.473 ± 0.001	0.144 ± 0.020	1	0.260 ± 0.060	0.0066 ± 0.0009
*0.532 ± 0.002	.0042 ± 0.0008			.00018 ± .00004
*0.611 ± 0.002	0.0052 ± 0.0008			0.00021 ± .00003
0.692 ± 0.002	1.440 ± 0.140	2	0.270 ± 0.040	0.054 ± 0.005
0.941 ± 0.003	0.0052 ± 0.0010			0.00017 ± .00003
1.252 ± 0.005	0.007 ± 0.002			0.00020 ± .00006
1.354 ± 0.005	0.340 ± 0.060	2	0.290 ± 0.060	0.0092 ± 0.0016
1.582 ± 0.006	2.570 ± .375	2	0.260 ± 0.040	0.0647 ± 0.0094
1.638 ± 0.007	3.600 ± 0.320	1	0.260 ± 0.040	0.089 ± 0.008
1.870 ± 0.009	3.200 ± 0.400	2	0.250 ± 0.040	.074 ± .009
1.906 ± 0.009	0.012 ± 0.006			0.00027 ± .00014
*1.994 ± 0.010	0.012 ± 0.006			0.00027 ± .00013
2.167 ± 0.011	0.015 ± 0.004			0.00032 ± .00010
2.458 ± 0.013	9.000 ± 1.000	1	0.290 ± 0.04	0.182 ± 0.020
*2.989 ± 0.019	0.080 ± 0.000			0.0015 ± 0.0007
3.084 ± 0.020	0.220 ± 0.080			0.0040 ± 0.0014
*3.377 ± 0.022	0.020 ± 0.010			0.00034 ± .00017
3.497 ± 0.022	22.400 ± 2.000	2	0.260 ± 0.040	0.379 ± 0.034
*3.739 ± 0.026	0.024 ± 0.010			0.00039 ± .00016
*3.873 ± 0.028	0.040 ± 0.012			0.00064 ± .00019
*3.970 ± 0.030	0.020 ± 0.014			0.00032 ± .00022
4.206 ± 0.030	1.660 ± 0.600			0.0256 ± .00093
4.361 ± 0.032	1.880 ± 0.800			0.0285 ± 0.0120
4.556 ± 0.035	0.400 ± 0.0200			0.0059 ± 0.0030
4.810 ± 0.037	~18.000			~0.260

* Possibly p-wave resonance

⁷¹
³¹ Ga

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.15 \pm 0.05 \text{ b } [36 \text{ ms } ^{72}\text{Ga}^*]$$

$$\sigma_{\gamma} = 4.71 \pm 0.23 \text{ b } [14.2 \text{ hr } ^{72}\text{Ga}^*]$$

RESONANCE PROPERTIES

$$I_{\gamma} = 31.2 \pm 1.9 \text{ b}$$

$$\langle D \rangle = 330 \pm 70 \text{ eV}$$

$$S_0 = 1.4 \pm 0.4$$

RESONANCE PARAMETERS

$I^{\pi} = 3/2^{-}$		$\% \text{Abn} = 40.0$		$S_n = 6519 \pm 1 \text{ keV}$
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (eV)}$	J	$\Gamma_{\gamma} \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$
0.0958 ± 0.0004	0.124 ± 0.024	2	0.260 ± 0.060	0.0127 ± 0.0025
0.2875 ± 0.0017	7.900 ± 0.600	2	0.240 ± 0.040	.466 ± .035
0.3760 ± 0.0008	2.730 ± 0.220	1	0.240 ± 0.030	.141 ± .011
0.705 ± 0.002	0.560 ± 0.056	2	0.230 ± 0.035	0.021 ± 0.002
*1.092 ± 0.004	0.010 ± 0.003			0.00030 ± .00009
*1.135 ± 0.009	0.0158 ± 0.0044			0.00044 ± .00013
*1.481 ± 0.013	0.014 ± 0.008			0.00036 ± .00021
1.525 ± 0.007	4.080 ± 0.500	2	0.220 ± 0.035	0.105 ± 0.013
*1.870 ± 0.009	0.016 ± 0.008			0.00037 ± .00018
1.930 ± 0.010	0.560 ± 0.160	1	0.220 ± 0.040	0.0128 ± 0.0036
2.400 ± 0.012	4.200 ± 0.800	1	0.250 ± 0.040	0.0857 ± 0.016
2.784 ± 0.016	1.520 ± 0.280	2	0.230 ± 0.035	0.0288 ± 0.0053
*2.880 ± 0.018	0.080 ± 0.040			0.0015 ± 0.0008
*3.110 ± 0.018	0.060 ± 0.040			0.0011 ± 0.0007
*3.200 ± 0.020	0.120 ± 0.060			0.0021 ± 0.0011
3.311 ± 0.020	4.000 ± 0.800	1	0.240 ± 0.035	0.0696 ± 0.0140
*3.400 ± 0.023	0.120 ± 0.060			0.0021 ± 0.001
*3.510 ± 0.024	0.040 ± 0.020			0.00068 ± .00034
*3.790 ± 0.028	0.040 ± 0.020			0.00065 ± .00032
4.170 ± 0.030	0.180 ± 0.120			0.0028 ± 0.0019
4.690 ± 0.036	1.200 ± 0.600			0.0175 ± 0.0088
4.810 ± 0.038	~18.000			~0.260
5.054 ± 0.040	12.200 ± 2.600			0.172 ± 0.037

* Possibly p-wave resonance

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ga ^{69,71}	activation	JNE,25,129(71)	Ryves
Ga	$\bar{\sigma}_a$	PRIVATE COMM.(67)	Vertebnyi
Ga ⁷¹	activation	ADF,12,225(63)	Alexander
Ga	diffraction	PR,131,2098(63)	Arnold
Ga	diffraction	KRI,8,785(63)	Konakhovich
Ga	diffraction	KRI,8,675(63)	Kuz'minov
Ga ⁷¹	activation	NSE,8,378(60)	Lyon
Ga	σ_c	PR,92,702(53)	Meikonian
Ga ^{69,71}	local osci.	PR,88,412(52)	Pomerance
Ga ^{69,71}	activation	PR,79,11(50)	Harris
Ga	pile osci.	PR,80,342(50)	Harris
Ga ⁷¹	activation	PR,72,888(47)	Seren
Ga ^{69,71}		PR,59,102(41)	O'Neal

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Ga ⁶⁹	$\sigma_y \sigma_c \sigma_y$ (SI)	0.111-5.9	JINR-P3-4152(68)	Maletski
Ga ⁷¹	$\sigma_y \sigma_c \sigma_y$ (SI)	0.096-5.1	JINR-P3-4152(68)	Maletski
Ga	σ_c	0.287-3.5	PL,10,86(64)	Julien
Ga ⁷¹	analysis	0.706	PR,111,288(58)	Cote
Ga ⁶⁹	σ_c	0.111-0.710	PR,102,228(56)	Palmer
Ga ⁷¹	σ_c	0.095-0.770	PR,102,228(56)	Palmer
Ga	σ_c	0.120-0.310	PR,92,702(53)	Meikonian

³²Ge

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 2.3 \pm 0.2 \text{ b} \\ \sigma_s &= 7.5 \pm 0.2 \text{ b} \\ \sigma_{coh} &= 8.1858 \pm 0.0036 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 6.1 \pm 1.0 \text{ b} \\ R_T &= 6.9 \pm 1.0 \text{ fm}\end{aligned}$$

⁷⁰
³²Ge

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.28 \pm 0.07 \text{ b [20 ms } ^{71}\text{Ge}^a] \\ \sigma_T &= 3.15 \pm 0.16 \text{ b [12 day } ^{71}\text{Ge}^a] \\ \sigma_s &= 8.8 \pm 0.8 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T^c &= 2.4 \pm 0.7 \text{ b} \\ \langle D \rangle &= 1.330 \pm 0.210 \text{ keV} \\ S_0 &= 2.1 \pm 0.9\end{aligned}$$

RESONANCE PARAMETERS

$I^a = 0^\circ$	$\chi^2_{Abn} = 20.7$		$S_n = 7415.2 \pm 1.8 \text{ keV}$
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	$\Gamma_T \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$
^a -0.060±0.030			0.019 ±0.009
1.115±0.004	4.6 ± 1.0	0.160±0.025	0.138 ±0.030
1.469±0.005	0.70 ± 0.12	0.150±0.025	0.018 ±0.003
1.935±0.008	0.030± 0.006		0.00068± .00014
3.140±0.015	0.046± 0.010		0.00082± .00018
4.230±0.025	0.055± 0.025		0.00085± .00038
4.378±0.025	5.4 ± 0.8	0.185±0.040	0.082 ±0.014
5.570±0.035	29 ± 4		.39 ± .06
6.750±0.035	12 ± 3		.145 ± .04
8.635±0.045	45 ± 7		.48 ± .08
9.890±0.080	40 ±10		.40 ± .10
10.310±0.090	60 ±15		.59 ± .15
11.040±0.100	8.3 ± 4.7		0.079 ±0.045
11.780±0.100	22.0 ±10.0		0.202 ±0.092
13.200±0.100	80 ±15		.70 ± .13
18.440±0.150	66 ± 6		.49 ± .04
23.820±0.300	77 ± 8		.50 ± .05
25.880±0.300	100 ±10		.62 ± .06
27.600±0.350	150 ±20		.90 ± .12
28.600±0.400	55 ±20		.32 ± .11
36.100	161		.85
38.400	168		.86

^a Maletski et al reported alternative parameters for the bound level.

⁷²
³²Ge

Thermal Cross Sections

$$\sigma_T = 0.98 \pm 0.09 \text{ b}$$
$$\bar{\sigma}_s = 7.5 \pm 0.7 \text{ b}$$

Resonance Properties

$$I_\gamma^c = 0.88 \pm 0.22 \text{ b}$$
$$\langle D \rangle = 1.550 \pm 0.270 \text{ keV}$$
$$S_0 = 1.2 \pm 0.5$$

Resonance Parameters

$$I^\pi = 0^+$$

$$\% \text{Abn} = 27.5$$

$$S_n = 6780.9 \pm 0.3 \text{ keV}$$

E_0 (keV)	$g\Gamma_n$ (eV)	Γ_γ (eV)	$g\Gamma_n^0$ (eV)
^a -0.330 ± 0.100			0.16 ± 0.05
0.2520 ± 0.0004	0.00034 ± 0.0001		0.000021 ± 0.00000
0.736 ± 0.002	0.0025 ± 0.0008		0.000092 ± 0.00003
2.180 ± 0.007	0.046 ± 0.009		0.00099 ± 0.00019
2.614 ± 0.008	0.79 ± 0.39	0.135 ± 0.030	0.0155 ± 0.0076
2.743 ± 0.008	0.40 ± 0.18	0.230 ± 0.040	0.0076 ± 0.0034
3.650 ± 0.012	0.83 ± 0.43	0.120 ± 0.030	0.0137 ± 0.0071
4.560 ± 0.017	13.0 ± 2.0		.19 ± .03
4.949 ± 0.019	27.0 ± 3.0		.38 ± .04
8.980 ± 0.050	41.0 ± 6.0		0.433 ± 0.063
9.640 ± 0.055	6.0 ± 1.0		.061 ± .010
11.170 ± 0.060	20.0 ± 4.0		.189 ± .034
12.070 ± 0.070	23 ± 7		.21 ± .06
19.080 ± 0.130	115 ± 30		.833 ± .217
29.400 ± 0.300	33.2 ± 4.4		.194 ± .026
33.200	360		1.98
39.500	384		1.93

^a Maletski et al reported alternative parameters for the bound level.

⁷³
32 Ge

THERMAL CROSS SECTIONS

$$\sigma_y = 15 \pm 2 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 65 \pm 6 \text{ b}$$

$$\langle D \rangle = 62 \pm 7 \text{ eV}$$

$$S_0 = 1.5 \pm 0.4$$

RESONANCE PARAMETERS

$$I^n = 9/2^+$$

$$\% \text{Abn} = 7.7$$

$$S_n = 10200.9 \pm 0.8 \text{ keV}$$

E_0 (keV)	$2g\Gamma_n$ (eV)	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)
^a 0.1020±.0002	1.30 ±0.12	0.192±0.030	0.129 ±0.012
^a 0.2040±.0004	0.23 ±0.02	0.210±0.030	0.0161 ±0.0014
0.2247±0.0004	0.45 ±0.04	0.198±0.030	0.030 ±0.003
0.3206±0.0007	0.23 ±0.04	0.190±0.030	0.0129 ±0.0002
0.3320±0.0007	1.36 ±0.12		0.0746 ±0.0066
0.3671±0.0006	0.72 ±0.06	0.200±0.030	0.0376 ±0.003
0.4082±0.0006	0.25 ±0.030	0.200±0.030	0.0124 ±0.0015
0.4903±0.0009	2.00 ±0.15	0.185±0.030	0.090 ±0.007
0.516 ±0.001	0.038±0.005		0.0017 ±0.0002
0.557 ±0.001	0.39 ±0.04	0.190±0.030	0.017 ±0.002
0.668 ±0.001	0.026±0.008		0.0010 ±0.0003
0.735 ±0.002	0.017±0.005		0.00063±.00018
0.752 ±0.002	0.020±0.006		0.00073±.00022
0.807 ±0.002	0.021±0.006		0.00074±.00021
0.849 ±0.002	0.14 ±0.02		0.0048 ±0.0007
0.919 ±0.002	0.15 ±0.02		0.0050 ±0.0007
1.028 ±0.002	0.09 ±0.02		0.0028 ±0.0006
1.056 ±0.002	0.23 ±0.06		0.0071 ±0.0018
1.145 ±0.002	2.10 ±0.60		0.062 ±0.018
1.218 ±0.003	1.3 ±0.2	0.210±0.030	0.037 ±0.006
1.313 ±0.003	1.3 ±0.2	0.210±0.030	0.036 ±0.006
1.353 ±0.003	0.29 ±0.05		0.0079 ±0.0014
1.526 ±0.003	1.2 ±0.2		0.031 ±0.005
1.650 ±0.004	2.5 ±0.2		0.062 ±0.005
1.802 ±0.004	1.6 ±0.2	0.190±0.030	0.038 ±0.005
1.925 ±0.005	0.33 ±0.2		0.0075 ±0.0046
1.934 ±0.005	0.5 ±0.2		0.012 ±0.005
1.950 ±0.005	0.8 ±0.3		0.018 ±0.007
2.011 ±0.006	4.0 ±0.4	0.185±0.030	0.089 ±0.009
2.256 ±0.006	1.7 ±0.2		0.036 ±0.004
2.286 ±0.006	3.2 ±0.3		0.067 ±0.006
2.434 ±0.008	0.6 ±0.2		0.012 ±0.004
2.558 ±0.009	2.1 ±0.3		0.042 ±0.006
2.676 ±0.010	1.3 ±0.2		0.025 ±0.004
2.940 ±0.011	2.6 ±1.0		0.048 ±0.006
4.040 ±0.015	8.4 ±1.0		0.132 ±0.016
4.238 ±0.017	6.0 ±0.9		0.092 ±0.014
4.440 ±0.019	5.5 ±1.0		0.083 ±0.015
4.823 ±0.022	1.4 ±0.6		0.020 ±0.009

⁷³Ge
32

E ₀ (keV)	2g ₁ ⁺ (eV)	Γ _γ (eV)	2g ₁ ⁰ (eV)
5.200 ±0.025	3.0 ±0.9		0.042 ±0.012
5.357 ±0.025	11.0 ±2.0		0.150 ±0.027
5.746 ±0.030	5.5 ±1.1		0.073 ±0.015
6.200 ±0.040	2.7 ±1.3		0.034 ±0.017
6.320 ±0.040	2.3 ±1.0		0.029 ±0.013
6.585 ±0.045	11.0 ±2.0		0.136 ±0.025
7.770 ±0.050	16.5 ±2.5		0.187 ±0.029
8.530 ±0.060	36.0 ±3.0		0.390 ±0.032

^a Spin is 4

⁷⁴Ge
32

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.143 \pm 0.014 \text{ b [48 sec } ^{75}\text{Ge}^{\text{a}}] \\ \sigma_{\gamma} &= 0.24 \pm 0.06 \text{ b [82 min } ^{75}\text{Ge}^{\text{g}}] \\ \sigma_s &= 6.1 \pm 0.4 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 0.43 \pm 0.07 \text{ b} \\ \langle D \rangle &= 3.900 \pm 0.770 \text{ keV} \\ S_0 &= 1.3 \pm 0.8\end{aligned}$$

RESONANCE PARAMETERS

$$\% \text{Abn} = 36.4 \quad S_n = 6505.5 \pm 0.6 \text{ keV}$$

E ₀ (keV)	g ₁ ⁺ (eV)	Γ _γ (eV)	g ₁ ⁰ (eV)
-1.1018 ± 0.300			0.910 ± 0.250
2.846 ± 0.008	8.0 ± 2.0	0.160 ± 0.040	0.15 ± 0.04
3.035 ± 0.012	1.0 ± 0.6	0.230 ± 0.040	0.018 ± 0.011
4.170 ± 0.025	0.064 ± 0.020		0.00099 ± .00031
4.990 ± 0.030	90 ± 10		1.2 ± .14
12.030 ± 0.070	24 ± 13		0.22 ± 0.12
19.450 ± 0.150	100 ± 25		.717 ± .17
21.910 ± 0.200	40 ± 10		.27 ± .06
25.100 ± 0.250	44 ± 21		0.28 ± 0.13
42.800 ± 0.500	500 ± 110		2.42 ± 0.53
61.04 ± 0.900	810 ± 280		3.28 ± 1.13

^a Male'ski et al reported alternative parameters for the bound level.

⁷⁶₃₂Ge

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.092 \pm 0.010 \text{ b [54 sec } ^{77}\text{Ge}^*]$$

$$\sigma_{\gamma} = 0.05 \pm 0.02 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 2.0 \pm 0.4 \text{ b}$$

$$\langle D \rangle = 4.200 \pm 0.835 \text{ keV}$$

$$S_0 = 1.3 \pm 0.7$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^+$$

$$\% \text{abn} = 7.7$$

$$S_n = 6071.8 \pm 1.0 \text{ keV}$$

E_0 (keV)	$g\Gamma_n$ (eV)	Γ_{γ} (eV)	$g\Gamma_n^0$ (eV)
-1.740			1.1
0.550 ± 0.001	0.35 ± 0.08	0.115 ± 0.025	0.015 ± 0.003
4.760 ± 0.020	6.0 ± 2.0		.08 ± .02
13.940 ± 0.090	20 ± 10		.18 ± .08
15.050 ± 0.100	84 ± 11		0.68 ± 0.09
21.040 ± 0.200	41 ± 17		0.28 ± 0.12
22.460 ± 0.200	175 ± 25		1.16 ± .16
29.600 ± 0.300	500 ± 200		2.90 ± 1.16
48.700 ± 0.600	230 ± 120		1.04 ± 0.54

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ge	pendellosung	PRIVATE COMM.(73)	Shull
Ge ^{74,76}	activation	CJP,50,1978(72)	Ricabarra
Ge, Ge ^{70,72,73,74}	$\bar{\sigma}_s$	PRIVATE COMM.(71)	Vertebnyi
Ge, Ge ^{70,72,73,74}	$\bar{\sigma}_s$	ZOHELSINKI,1,551(70)	Vertebnyi
Ge ^{70,74,76}	activation	ZP,210,13(68)	Mannhart
Ge ⁷⁶	isom. ratio	JIN,29,281(67)	Iyer
Ge ⁷⁰	activation	ADP,12,255(63)	Alexander
Ge ^{74,76}	activation	ZP,167,549(62)	Weigmann
Ge ^{70,74,76}	activation	NSE,8,378(60)	Lyon
Ge ^{74,76}	activation	PR,108,766(57)+	Der Mateosian
Ge	pile osci.	JPR,13,171(52)	Ailloud
Ge ^{70,72,73,74,76}	pile osci.	PR,88,412(52)	Pomerance
Ge	local osci.	PR,83,641(51)	Pomerance
Ge	diffraction	PR,81,527(51)	Shull
Ge	pile osci.	PR,80,342(50)	Harris
Ge ^{70,74,76}	activation	PR,72,888(47)	Seren
Ge	σ_c	PR,71,174(47)	Wu
Ge	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Ge ⁷³	σ_γ (spectra)	0.103-0.557	BAP,14,104(69)+	Garber
Ge ⁷⁰	$\sigma_t \sigma_\gamma$ (SI)	1.115-28.600	AE,24,173(68)	Maletski
Ge ⁷²	$\sigma_t \sigma_\gamma$ (SI)	0.252-29.400	AE,24,173(68)	Maletski
Ge ⁷³	$\sigma_t \sigma_\gamma$ (SI)	0.103-8.530	AE,24,173(68)	Maletski
Ge ⁷⁴	$\sigma_t \sigma_\gamma$ (SI)	2.846-61.040	AE,24,173(68)	Maletski
Ge ⁷⁶	$\sigma_t \sigma_\gamma$ (SI)	0.550-48.700	AE,24,173(68)	Maletski
Ge ⁷⁰	σ_t	4.34-38.4	PRIVATE COMM.(66)	Good
Ge ⁷²	σ_t	4.54-39.5	PRIVATE COMM.(66)	Good
Ge ⁷⁴	σ_t	4.97-22.0	PRIVATE COMM.(66)	Good
Ge ⁷⁶	σ_t	4.97-29.3	PRIVATE COMM.(66)	Good
Ge ⁷⁰	σ_t	3.3-13.0	BAP,4,42(59)	Miller
Ge ⁷²	σ_t	4.9-12.0	BAP,4,42(59)	Miller
Ge ⁷⁴	σ_t	4.88-20.0	BAP,4,42(59)	Miller
Ge ⁷⁶	σ_t	4.9-29.0	BAP,4,42(59)	Miller
Ge ⁷⁰	σ_γ	0.111-1.457	NP,3,553(57)	Bovey
Ge ⁷³	σ_γ	0.101-0.471	NP,3,553(57)	Bovey
Ge ⁷⁴	σ_γ	0.352	NP,3,553(57)	Bovey
Ge ⁷⁶	σ_γ	0.524-1.000	NP,3,553(57)	Bovey
Ge	σ_γ	0.095	PR,71,174(47)	Wu

⁷⁵
³³As

THEORETICAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 4.3 \pm 0.1 \text{ b} \\ \sigma_s &= 7 \pm 1 \text{ b} \\ \sigma_c &= 11.3 \pm 1.0 \text{ b} \\ a_{coh} &= 6.4 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 60 \pm 4 \text{ b} \\ \langle D \rangle &= 75 \pm 5 \text{ eV} \\ S_0 &= 1.7 \pm 0.3\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 3/2^-$		$\chi\text{bbr} = 100$		$S_n = 7328.2 \pm 1.0 \text{ keV}$	
E_0 (eV)	Γ (meV)	$2\sigma\Gamma_n$ (meV)	J	Γ_γ (meV)	$2\sigma\Gamma_n^0$ (meV)
Bound level					
47.0 ± 0.2	300 ± 30	44 ± 4		256 ± 40	6.4 ± 0.6
92.4 ± 0.3	270 ± 40	16.0 ± 2.0		254 ± 40	1.7 ± 0.2
252.7 ± 0.5	328 ± 60	57.8 ± 5.0		270 ± 70	3.6 ± 0.4
318.6 ± 0.5	770 ± 80	586 ± 50	2	300 ± 30	33 ± 3
326.7 ± 0.5	885 ± 80	405 ± 30	1	345 ± 60	22.5 ± 1.5
455.5 ± 0.6	370 ± 60	32 ± 8		340 ± 70	1.5 ± 0.2
476.9 ± 0.6	350 ± 50	10.5 ± 3.0		340 ± 100	0.48 ± 0.10
533.4 ± 1.0	2980 ± 200	3375 ± 200	2	280 ± 50	146 ± 9
664.9 ± 0.8	620 ± 70	320 ± 20		300 ± 70	12.3 ± 0.8
733.3 ± 0.8	1545 ± 180	896 ± 90	1	350 ± 200	32.3 ± 3.0
737.4 ± 0.8	2250 ± 200	2445 ± 220	2	300 ± 200	90 ± 8
874.6 ± 0.6		5.91 ± 1.18		(300)	0.20 ± 0.04
895.5 ± 0.8	490 ± 60	160 ± 15	1	280 ± 60	5.3 ± 0.5
929 ± 1	1180 ± 100	1160 ± 75	2	235 ± 120	39 ± 3
1113 ± 1	510 ± 50	135 ± 15	1	330 ± 50	4.1 ± 0.5
1299 ± 2	3250 ± 300	2380 ± 215		325	66 ± 6
1353 ± 2	965 ± 100	535 ± 55	1	255 ± 120	14 ± 2
1443 ± 2	1650 ± 150	1715 ± 140	2	280	45.1 ± 3.6
1479.3 ± 1.5		50 ± 15		(300)	1.3 ± 0.4
1663 ± 2	3500 ± 300	4000 ± 400	2	300	98 ± 10
1739.0 ± 2.0		13.3 ± 3.33		(300)	0.32 ± 0.08
1807 ± 3	1000 ± 200	575 ± 90	1	235	13.5 ± 2.3
1845.6 ± 1.0		17.6 ± 2.6		(300)	0.40 ± 0.06
1904 ± 3	3210 ± 250	3710 ± 300	2	240	85 ± 6
2021.1 ± 1.0		18.8 ± 3.6		(300)	0.42 ± 0.08
2049 ± 3	600 ± 150	300 ± 75	1	200	6.8 ± 2.3
2190 ± 1.5		11.2 ± 3.7		(300)	0.24 ± 0.08
2232 ± 1.5		5.7 ± 1.9		(300)	0.12 ± 0.04
2256 ± 1.5		16.2 ± 2.9		(300)	0.34 ± 0.06
2288 ± 1.5		23.8 ± 4.5		(300)	0.50 ± 0.10
2330 ± 1.5		10.6 ± 1.9		(300)	0.22 ± 0.04
2365 ± 1.5		88 ± 5		(300)	1.8 ± 0.10
2395 ± 1.5		17.6 ± 2.9		(300)	0.36 ± 0.06
2403 ± 1.5		4.9 ± 2.0		(300)	0.10 ± 0.04
2470 ± 1.5		14.9 ± 5.0		(300)	0.30 ± 0.10

⁷⁵As
³³As

E _g (eV)	T (meV)	2g _n ⁰ (meV)	J	J _γ (meV)	2g _n ⁰ (meV)
2511 ± 3	1730 ± 200	1090 ± 113	1	280 ± 60	22 ± 2
2577 ± 1.5		15.2 ± 4.1	(300)		0.30 ± 0.08
2616 ± 3	2650 ± 250	2940 ± 275	2	300	58 ± 5
2673 ± 2		11.4 ± 4.1	(300)		0.22 ± 0.08
2733 ± 4	4040 ± 400	4550 ± 450	2	400	89 ± 9
2821 ± 4	3740 ± 400	2590 ± 250	1	290	49 ± 5
2902 ± 2		30.2 ± 4.3	(300)		0.56 ± 0.08
2939 ± 2		46.8 ± 10.8	(300)		0.90 ± 0.20
3081 ± 2.5		53.3 ± 11.1	(300)		0.96 ± 0.20
3144 ± 5	1960 ± 200	2100 ± 275	2	280	37.5 ± 5.0
3227 ± 2.5		437 ± 45	(300)		7.7 ± 0.8
3306 ± 2.5		14.9 ± 5.8	(300)		0.26 ± 0.10
3459 ± 6	3400 ± 500	3840 ± 540	2	330	66 ± 9
3505 ± 6	5700 ± 600	6890 ± 650	2	300	116 ± 11
3712 ± 6	4550 ± 500	5100 ± 510	2	230	84 ± 10
3749 ± 3		98 ± 25	(300)		1.6 ± 0.4
*3777 ± 3		11 ± 5	(300)		0.18 ± 0.08
3822 ± 3		223 ± 25	1	250	3.6 ± 0.4
3852 ± 6	3100 ± 300	3340 ± 340	2	250	54 ± 5
3933 ± 7	5300 ± 500	5725 ± 560	2	300	59 ± 5
3998 ± 7	3270 ± 400	2230 ± 225	1	300	35 ± 3
4096 ± 3.5		36 ± 13	(300)		0.6 ± 0.2
4146 ± 4		167 ± 51	(300)		2.6 ± 0.8
4253 ± 4		85 ± 20	(300)		1.3 ± 0.3
4289 ± 4		328 ± 52	(300)		5.0 ± 0.8
4358 ± 4		792 ± 132	(300)		12 ± 2
4378 ± 4		20 ± 7	(300)		0.30 ± 0.10
4442 ± 4		60 ± 13	(300)		0.9 ± 0.2
4470 ± 4		36 ± 13	(300)		0.54 ± 0.20
*4488 ± 4		12 ± 7	(300)		0.18 ± 0.10
4514 ± 4		1480 ± 270	(300)		22 ± 4
4576 ± 4		514 ± 108	(300)		7.6 ± 1.6
4669 ± 4		4100 ± 415	(300)		60 ± 6
4761 ± 4.5		3310 ± 415	(300)		48 ± 6
4875 ± 4.5		55 ± 13	(300)		0.8 ± 0.2
4905 ± 4.5		3640 ± 560	(300)		52 ± 8
5006 ± 5		3820 ± 570	(300)		54 ± 8
5043 ± 5		14 ± 14	(300)		0.2 ± 0.2
5090 ± 5		1430 ± 285	(300)		20 ± 4
5183 ± 5		35 ± 15	(300)		0.5 ± 0.2
5303 ± 5		44 ± 15	(300)		0.6 ± 0.2
5324 ± 5		51 ± 15	(300)		0.7 ± 0.2
5367 ± 5.5		1690 ± 290	(300)		23 ± 4
5446 ± 5.5		590 ± 150	(300)		8 ± 2
5466 ± 5.5		37 ± 15	(300)		0.5 ± 0.2
5573 ± 5.5		9260 ± 750	(300)		124 ± 10
5610 ± 5.5		3745 ± 750	(300)		50 ± 10
5709 ± 6		7555 ± 1510	(300)		100 ± 20
5755 ± 6		2730 ± 300	(300)		36 ± 4
5775 ± 6		38 ± 15	(300)		0.5 ± 0.2
5863 ± 6		2300 ± 310	(300)		30 ± 4
5998 ± 6		6210 ± 1550	(300)		105 ± 20

⁷⁵
³³As

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
6070 ± 6.5		78 ± 31	(300)		1.0 ± 0.4
6178 ± 6.5		3300 ± 630	(300)		42 ± 8
6265 ± 6.5		48 ± 16	(300)		0.6 ± 0.2
6336 ± 6.5		400 ± 80	(300)		5.0 ± 1.0
6423 ± 7		4810 ± 640	(300)		60 ± 8
6450 ± 7		5140 ± 640	(300)		64 ± 8
*6506 ± 7		16 ± 16	(300)		0.2 ± 0.2
6549 ± 7		2100 ± 485	(300)		26 ± 6
6593 ± 7		50 ± 16	(300)		0.6 ± 0.2
6765 ± 7		74 ± 33	(300)		0.9 ± 0.4
6904 ± 7.5		220 ± 83	(300)		2.6 ± 1.0
6959 ± 7.5		5340 ± 670	(300)		64 ± 8
7071 ± 7.5		420 ± 85	(300)		5 ± 1
7121 ± 7.5		170 ± 170	(300)		2 ± 2
7254 ± 7.5		26 ± 9	(300)		0.3 ± 0.1
7297 ± 8		17 ± 9	(300)		0.2 ± 0.1
7370 ± 8		2575 ± 515	(300)		30 ± 6
7443 ± 8		1725 ± 345	(300)		20 ± 4
7479 ± 8		17 ± 9	(300)		0.2 ± 0.1
7596 ± 9		610 ± 140	(300)		7.0 ± 1.6
7627 ± 9		1750 ± 350	(300)		20 ± 4
7680 ± 9		525 ± 105	(300)		6.0 ± 1.2
7706 ± 9		175 ± 90	(300)		2.0 ± 1.0
7778 ± 9		1320 ± 260	(300)		15 ± 3
7875 ± 10		125 ± 25	(300)		1.4 ± 0.3
7920 ± 10		660 ± 90	(300)		7.4 ± 1.0
8026 ± 10		27 ± 9	(300)		3.0 ± 1.0
8240 ± 10		3450 ± 730	(300)		38 ± 8
8315 ± 10		2735 ± 550	(300)		30 ± 6
8380 ± 10		5860 ± 915	(300)		64 ± 10
8449 ± 10			(300)		0.2 ± 0.2
8508 ± 10		2210 ± 370	(300)		24 ± 4
8556 ± 11		220 ± 90	(300)		2.4 ± 1.0
8590 ± 10		835 ± 185	(300)		9 ± 2
8650 ± 11		74 ± 37	(300)		0.8 ± 0.4
8766 ± 11		280 ± 90	(300)		3 ± 1
8823 ± 11		71 ± 38	(300)		0.76 ± 0.40
8880 ± 11		1410 ± 380	(300)		15 ± 4
9030 ± 11		10830 ± 1900	(300)		114 ± 20
9135 ± 12		57 ± 57	(300)		0.6 ± 0.6
9173 ± 12		77 ± 38	(300)		0.8 ± 0.4
9215 ± 12		1250 ± 290	(300)		13 ± 3
9375 ± 12		775 ± 190	(300)		8 ± 2
9430 ± 12		195 ± 100	(300)		2 ± 1
9520 ± 13		4290 ± 975	(300)		44 ± 10
9557 ± 13		2350 ± 590	(300)		24 ± 6
9647 ± 13		590 ± 200	(300)		6 ± 2
9686 ± 13		1480 ± 390	(300)		15 ± 4

* Spurious or p-wave level

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
As ⁷⁵	activation	JNE,25,129(71)	Ryves
As ⁷⁵	pile osci.	AE-351(69)	Sokolowski
As ⁷⁵	activation	DA/B,27,919(66)	Kappe
As ⁷⁵	diffraction	PR,131,2098(63)	Arnold
As ⁷⁵	σ_t	60VIENNA,177(60)	Dragomirescu
As ⁷⁵	activation	NSE,8,378(60)	Lyon
As ⁷⁵	local osci.	PR,83,641(51)	Pomerance
As ⁷⁵	diffraction	PR,81,527(51)	Shull
As ⁷⁵	$\bar{\sigma}_s$	PR,83,379(51)	Weiss
As ⁷⁵	activation	PR,79,11(50)	Harris
As ⁷⁵	activation	PR,72,888(47)	Seren
As ⁷⁵	water bath	PR,58,554(40)	Lapointe
As ⁷⁵	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
As	σ_t	47-3993	CEA-R-3385(68)	Julien
As	σ_t	252-9686	PR/B,136,177(64)	Garg
As	σ_t	319-3993	PL,10,86(64)	Julien
As	σ_t	47-533	JINR-1845,51(64)	Kalebin
As	$\sigma_{\gamma}(SI)$	47-896	PR/B,136,177(64)-	Rosen
As	σ_t	252-1723	CR,254,4009(62)	Julien
As	σ_t	47-746	PR,111,288(58)	Cote
As	σ_t	47-97	AE,5,69(58)	Vladimirskii

³⁴Se

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 11.7 \pm 0.2 \text{ b} \\ \sigma_s &= 9.7 \pm 1.0 \text{ b} \\ \sigma_c &= 21.4 \pm 1.0 \text{ b} \\ a_{coh} &= 8.10 \pm 0.05 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 13 \pm 2 \text{ b}$$

⁷⁴
³⁴Se

THERMAL CROSS SECTIONS

$$\sigma_T = 51.8 \pm 1.2 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 565 \pm 40 \text{ b} \\ \langle D \rangle &= 370 \pm 70 \text{ eV} \\ S_0 &= 1.3 \pm 0.8\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\chi_{\text{abn}} = 0.9$		$S_n = 6023 \pm 5 \text{ keV}$
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	ℓ	$\Gamma_\gamma \text{ (meV)}$	$g_n^{J^\pi} \text{ (meV)}$
27.1 ± 0.1	170 ± 8	[1]	210 ± 20	32.7 ± 1.5
271.5 ± 1.0	4500 ± 200		300 ± 45	273 ± 12
1029.0 ± 3.6	2370 ± 380		300 ± 45	73.9 ± 11.9
1386 ± 6	1220 ± 90		320 ± 50	32.8 ± 2.4
1630 ± 7	140 ± 40			3.5 ± 1.0
1746 ± 8	9860 ± 600		270 ± 55	236.0 ± 14.4
2303 ± 24	1610 ± 440			33.6 ± 9.2
7216 ± 68	20640 ± 3900			243.0 ± 45.9

⁷⁶
₃₄Se

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 85 \pm 7 \text{ b}$$
$$\sigma_{\gamma} = 21 \pm 1 \text{ b (17.5 sec } ^{76}\text{Se)}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 44 \pm 5 \text{ b}$$
$$\langle D \rangle = 700 \pm 150 \text{ eV}$$
$$S_0 = 1.7 \pm 0.7$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\% \text{abn} = 9.0$		$S_n = 7418.0 \pm 0.8 \text{ keV}$		
$E_0 \text{ (eV)}$		$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$
377.0 ± 1.0		300 ± 30	1/2	0	240 ± 33	15.4 ± 1.6
862 ± 3		3530 ± 250			220 ± 33	120.2 ± 8.5
920 ± 3		40 ± 8		[1]		1.3 ± 0.2
1210 ± 5		27 ± 5		[1]		0.78 ± 0.14
1355 ± 10		23 ± 4		[1]		0.62 ± 0.11
1480 ± 12		16 ± 4		[1]		0.42 ± 0.10
1646 ± 8		8 ± 4		[1]		0.20 ± 0.10
2120 ± 13		107 ± 15				2.3 ± 0.3
2575 ± 14		14240 ± 850			230 ± 46	280.6 ± 16.8
3170 ± 20		49 ± 10		[1]		0.87 ± 0.18
3363 ± 21		14000 ± 900			250 ± 50	241.4 ± 15.5
3940 ± 27		220 ± 50				5.5 ± 0.8
4313 ± 31		4000 ± 2000			210 ± 50	60.9 ± 30.5
5020 ± 39		<500				<7.1
5387 ± 48		30000 ± 8500				409 ± 116
6437 ± 57		18000 ± 2000				224.4 ± 24.9
7148 ± 66		22800 ± 3500				269.7 ± 41.4
8480 ± 130		2700 ± 1300				29.3 ± 14.2
10210 ± 113		20900 ± 2000				206.8 ± 19.8
11320 ± 200		2430 ± 700				22.9 ± 0.7
13281 ± 251		25200 ± 9000				218.7 ± 78.1
24200		25200				379

⁷⁷
³⁴Se

THERMAL CROSS SECTIONS

$$\sigma_y = 42 \pm 4 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 34 \pm 4 \text{ b}$$

$$\langle D \rangle = 120 \pm 20 \text{ eV}$$

$$S_0 = 1.3 \pm 0.3$$

RESONANCE PARAMETERS

$$1^\pi = 1/2^- \quad \quad \quad \chi_{\text{Abn}} = 7.5 \quad \quad \quad S_n = 10497.0 \pm 1.0 \text{ keV}$$

E_D (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
112.0 ± 1.0	2.4 ± 0.2	1		700 ± 200	.227 ± .019
151.6 ± 1.0	0.38 ± 0.12		[1]		0.031 ± 0.010
176.4 ± 1.0	0.74 ± 0.20		[1]		0.056 ± 0.016
211.6 ± 0.8	760 ± 40	0		350 ± 60	52.2 ± 2.8
290.6 ± 0.8	18.3 ± 1.5	1	0		1.07 ± .09
340.8 ± 1.0	180 ± 10	1	0	440 ± 65	9.75 ± .54
369.0 ± 0.8	2.4 ± 1.2		[1]		0.12 ± 0.06
442.0 ± 1.0	8.7 ± 1.4		[1]		.41 ± .07
482.0 ± 1.2	15.8 ± 1.5	1			.720 ± .068
517.0 ± 1.3	5.0 ± 1.0		[1]		0.22 ± 0.04
552.0 ± 1.4	8.6 ± 1.4		[1]		0.37 ± 0.07
690.0 ± 2.0	1190 ± 60	0		330 ± 50	45.3 ± 2.3
864.0 ± 2.8	920 ± 160				32.5 ± 5.6
970.0 ± 3.3	190 ± 60	[1]			6.1 ± 1.9
997.0 ± 3.5	3800 ± 230	0		450 ± 80	120.4 ± 7.3
1090 ± 4	150 ± 50				4.5 ± 1.5
1265 ± 4	1720 ± 160	1		460 ± 80	48.36 ± 4.50
1300 ± 5	15.2 ± 6.0		[1]		0.42 ± 0.17
1333 ± 5	18.0 ± 6.0		[1]		0.49 ± 0.16
1402 ± 6	200 ± 60				5.3 ± 1.6
1466 ± 6	20 ± 10				0.73 ± 0.26
1485 ± 6	480 ± 70	0		350 ± 100	12.4 ± 1.8
1530 ± 7	11.6 ± 2.0		[1]		0.30 ± 0.05
1687 ± 8	1040 ± 200	1		520 ± 150	25.3 ± 4.9
1795 ± 8	200 ± 100				4.7 ± 2.4
1860 ± 9	48 ± 14				1.1 ± 0.3
1880 ± 9	24 ± 8		[1]		0.55 ± 0.19
2040 ± 10	500 ± 200				11.1 ± 4.4
2267 ± 12	2300 ± 480	1		390 ± 60	48.3 ± 10.1
2321 ± 12	7000 ± 2000	1		350 ± 50	145.3 ± 41.5
2540 ± 28	5000 ± 1000	1		340 ± 50	99.2 ± 19.8
2664 ± 23	1720 ± 440	1		390 ± 60	33.3 ± 8.5
3034 ± 27	1200 ± 400	1		600 ± 250	21.8 ± 7.3
3197 ± 20	4400 ± 600	1		440 ± 80	77.8 ± 10.6
3342 ± 21	2400 ± 500	0		360 ± 50	41.5 ± 8.7
3554 ± 23	3700 ± 600	1		380 ± 60	62.1 ± 10.1
3919 ± 40	4000 ± 800	1		390 ± 60	63.9 ± 12.8

⁷⁸
³⁴Se

Thermal Cross Sections

$$\sigma_T = 0.4 \pm 0.4 \text{ b}$$
$$\sigma_T = 0.33 \pm 0.04 \text{ b [3.9 min } ^{78}\text{Se}^{\text{a}}]$$

Resonance Properties

$$I_\gamma = 4.7 \pm 0.6 \text{ b}$$
$$\langle D \rangle = 1000 \pm 270 \text{ eV}$$
$$S_0 = 1.2 \pm 0.3$$

Resonance Parameters

$I^{\pi} = 0^{+}$		$\lambda_{\text{Abn}} = 23.5$			$S_n = 6978 \pm 6 \text{ keV}$	
$E_0 \text{ (eV)}$		$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_\gamma \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$
383.0 ± 1.0		325 ± 30	1/2	0	210 ± 30	16.6 ± 1.5
850 ± 4		22 ± 4		[1]		0.75 ± 0.14
1350 ± 8		26 ± 5		[1]		0.71 ± 0.14
2027 ± 15		150 ± 30		[1]		3.3 ± 0.7
2397 ± 20		127 ± 25		[1]		2.6 ± 0.5
3227 ± 20		12300 ± 700			260 ± 55	216.5 ± 12.3
3852 ± 40		360 ± 180				5.8 ± 2.9
4626 ± 35		390 ± 170				5.7 ± 2.5
5673 ± 47		1800 ± 1000			230 ± 50	23.9 ± 13.3
6171 ± 54		61400 ± 3000				782 ± 38
6857 ± 63		3500 ± 1800			220 ± 50	42.3 ± 21.7
9250 ± 98		33000 ± 600				343 ± 6
11060 ± 129		8000 ± 6000				761 ± 57
19100 ± 292		30000 ± 8000				217 ± 58
20150 ± 316		17000 ± 5000				120 ± 35
26900		108500				662
29400		67000				391
31200		46400				262
33000		62200				342
40500		150100				746

⁸⁰
³⁴Se

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.610 \pm 0.045 \text{ b} \\ \sigma_T &= 0.080 \pm 0.010 \text{ b [57 min } ^{81}\text{Se}^*] \\ \sigma_T &= 0.530 \pm 0.040 \text{ b [18 min } ^{81}\text{Se}^*]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 1.7 \pm 0.2 \text{ b} \\ \langle D \rangle &= 1200 \pm 380 \text{ eV} \\ S_0 &= 1.6 \pm 0.6\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\% \text{Abn} = 50.0$		$S_n = 6701.2 \pm 1.2 \text{ keV}$
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	ℓ	$\Gamma_\gamma \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$
1470 ± 10	50 ± 13	[1]		1.3 ± 0.3
1970 ± 19	50000 ± 2000			1126.5 ± 45.1
4270 ± 31	52000 ± 13000			795.8 ± 198.9
4720 ± 36	4800 ± 2400		250 ± 100	69.9 ± 34.9
5100 ± 40	74000 ± 19000			1036.2 ± 266
5240 ± 43	<600	[1]		<8.3
5660 ± 46	7000 ± 4000		210 ± 55	93.0 ± 53.2
6120 ± 52	<700	[1]		<8.9
8150 ± 80	<900	[1]		<10
12632 ± 156	26000 ± 8000			231.3 ± 71.2
18300	109800			812
20300 ± 320	70600			488
23122 ± 390	46000 ± 15000			302.5 ± 98.7
29600	36250			211
39900	187000			937

⁸²
³⁴Se

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.045 \pm 0.003 \text{ b} \\ \sigma_T &= 0.0058 \pm 0.0004 \text{ b [25 min } ^{83}\text{Se}^*] \\ \sigma_T &= 0.039 \pm 0.003 \text{ b [69 sec } ^{83}\text{Se}^*]\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\% \text{Abn} = 9.0$		$S_n = 5925 \pm 32 \text{ keV}$
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$		
6580	44100	544		
13800	114000	972		
22700	72400	480		
26550	69000	423		

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Se	diffraction	ACJ,25,1233(71)	Krebs Larsen
Se	ratio	ACJ,22,827(68)	Andresen
Se ^{76,78,82}	activation	ZP,210,13(68)	Mannhart
Se ^{78,80}	ratio	CJP,46,2473(68)	Ricabarra
Se	ratio	PR,153,558(67)	Colominas
Se ⁸²	isom. ratio	JIN,29,281(67)	Iyer
Se ⁷⁴	activation	JIN,29,2853(67)	Sims
Se ⁷⁴	activation	JNE,21,373(67)	Steinnes
Se ^{76,78}	activation	NSE,22,373(65)	Kramer
Se ⁸⁰	isom. ratio	NP,60,241(64)	Bishop
Se ⁷⁶	activation	ADP,12,225(63)	Alexander
Se ⁸⁰	isom. ratio	PR,129,769(63)	Keisch
Se ^{76,78}	activation	ZP,167,549(62)	Weigmann
Se	pile osci.	61BUCHAR,623(61)	Bouzyk
Se	pulsed n	NSE,9,132(61)	Meadows
Se ^{76,78}	activation	NP,20,183(60)	Hans
Se ⁸⁰	isom.ratio	JIN,5,23(57)	Apers
Se	σ_t	AERE-N/R-1147(53)	Egelstaff
Se ^{74,76,77,78,80}	pile osci.	PR,88,412(52)	Pomerance
Se	local osci.	PR,83,641(51)	Pomerance
Se	diffraction	FR,81,527(51)	Shull
Se	pile osci.	PPS/A,63,1175(50)	Colmer
Se	pile osci.	PR,80,342(50)	Harris
Se ^{80,82}	activation	JCP,15,703(47)	Arnold
Se ^{74,80}	activation	PR,72,888(47)	Seren
Se	water bath	PR,58,554(40)	Lapointe
Se	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Se	σ_t	211-688	NP/A,132,129(69)	Julien
Se ⁷⁴	$\sigma_t \sigma_\gamma$	27-7216	YF,9,1119(69)	Maletski
Se ⁷⁶	$\sigma_t \sigma_\gamma$	378-13281	YF,9,1119(69)	Maletski
Se ⁷⁷	$\sigma_t \sigma_\gamma$	112-3919	YF,9,1119(69)	Maletski
Se ⁷⁸	$\sigma_t \sigma_\gamma$	384-20150	YF,9,1119(69)	Maletski
Se ⁸⁰	$\sigma_t \sigma_\gamma$	1470-23122	YF,9,1119(69)	Maletski
Se	σ_t	211-987	CEA-R-3385(68)	Julien
Se ⁷⁶	σ_t	4960-24200	PRIVATE COMM.(66)	Good
Se ⁷⁸	σ_t	5730-40500	PRIVATE COMM.(66)	Good
Se ⁸⁰	σ_t	6580-26550	PRIVATE COMM.(66)	Good
Se ⁷⁴	$\sigma_t \sigma_\gamma$	27-270	PR/B,136,703(64)	Cote
Se ⁷⁶	$\sigma_t \sigma_\gamma$	375-5350	PR/B,136,703(64)	Cote
Se ⁷⁷	$\sigma_t \sigma_\gamma$	112-2250	PR/B,136,703(64)	Cote
Se ⁷⁸	$\sigma_t \sigma_\gamma$	380-3190	PR/B,136,703(64)	Cote
Se	σ_t	27-2230	CR,254,4009(62)	Julien
Se ⁷⁴	σ_t	27-272	NP,14,120(59)	LeBlanc
Se ⁷⁶	σ_t	860-2600	NP,14,120(59)	LeBlanc
Se ⁷⁷	σ_t	209-998	NP,14,120(59)	LeBlanc
Se ⁷⁸	σ_t	382	NP,14,120(59)	LeBlanc
Se ⁸⁰	σ_t	4250-4950	PR,109,926(58)	Good

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 6.8 \pm 0.1 \text{ b} \\ \sigma_S &= 6.1 \pm 0.2 \text{ b} \\ \sigma_C &= 12.9 \pm 0.2 \text{ b} \\ \lambda_{\text{coh}} &= 6.76 \pm 0.04 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 90 \pm 6 \text{ b} \\ S_0 &= 1.20 \pm 0.18\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (eV)	Γ (meV)	$4\pi g_n^2$ (meV)	J	Γ_J (meV)	$4\pi g_n^2$ (meV)
158.0 $\pm$ 0.2		0.60 $\pm$ 0.12		(300)	0.05 $\pm$ 0.01
192.7 $\pm$ 0.3		4 $\pm$ 1	1	(300)	0.3 $\pm$ 0.1
210.4 $\pm$ 0.4		0.6 $\pm$ 0.1		(300)	0.044 $\pm$ 0.008
255.2 $\pm$ 0.4		1.9 $\pm$ 0.6		(300)	0.12 $\pm$ 0.04
336.8 $\pm$ 0.3		1.8 $\pm$ 0.4		(300)	0.10 $\pm$ 0.02
369.1 $\pm$ 0.4		2.7 $\pm$ 0.4		(300)	0.14 $\pm$ 0.02
466.3 $\pm$ 0.4		1.3 $\pm$ 0.4		(300)	0.06 $\pm$ 0.02
467.9 $\pm$ 0.6		58 $\pm$ 9		(300)	2.7 $\pm$ 0.4
483.5 $\pm$ 0.6		70 $\pm$ 10		270 $\pm$ 50	3.2 $\pm$ 0.4
490.5 $\pm$ 0.4		1.8 $\pm$ 0.4		(300)	0.08 $\pm$ 0.02
560.3 $\pm$ 0.8		15 $\pm$ 5		(300)	0.64 $\pm$ 0.20
564.8 $\pm$ 0.8	775 $\pm$ 50	594 $\pm$ 63	2	300 $\pm$ 60	25 $\pm$ 3
578.6 $\pm$ 0.8	670 $\pm$ 60	450 $\pm$ 50	2	310 $\pm$ 60	18.8 $\pm$ 1.9
604.2 $\pm$ 0.8	790 $\pm$ 80	386 $\pm$ 40	1	275 $\pm$ 50	15.8 $\pm$ 1.6
637.8 $\pm$ 0.8	98 $\pm$ 10			(300)	3.9 $\pm$ 0.4
646.2 $\pm$ 1.0	630 $\pm$ 60		2	280 $\pm$ 60	17.1 $\pm$ 1.7
668.8 $\pm$ 1.0	1870 $\pm$ 200	438 $\pm$ 44		2 (300)	72.5 $\pm$ 7.3
749.3 $\pm$ 1.1	780 $\pm$ 100	1913 $\pm$ 191		(300)	12 $\pm$ 1
788.0 $\pm$ 1.2		330 $\pm$ 40	[1]	(300)	27 $\pm$ 3
831.2 $\pm$ 1.2		760 $\pm$ 80		(300)	2.0 $\pm$ 0.2
849.5 $\pm$ 1.3		58 $\pm$ 6		(300)	1.7 $\pm$ 0.2
870.0 $\pm$ 1.4		50 $\pm$ 5		(300)	0.3 $\pm$ 0.1
892.3 $\pm$ 1.4		9 $\pm$ 3		(300)	1.7 $\pm$ 0.2
930.8 $\pm$ 1.6	820 $\pm$ 90	51 $\pm$ 5	[1]	(300)	12.3 $\pm$ 1.2
993.5 $\pm$ 1.7		375 $\pm$ 40		(300)	1.5 $\pm$ 0.2
1042.5 $\pm$ 1.8		47 $\pm$ 5		(300)	1.6 $\pm$ 0.2
1066.5 $\pm$ 1.8		48 $\pm$ 5		(300)	0.20 $\pm$ 0.08
1187.0 $\pm$ 1.1		6.5 $\pm$ 2.6		(300)	1.24 $\pm$ 0.20
1200.0 $\pm$ 1.0	2600 $\pm$ 220	42.7 $\pm$ 3.4	2	(300)	82.5 $\pm$ 6.3
1208.5 $\pm$ 1.1	4650 $\pm$ 360	2860 $\pm$ 275	1	(300)	93.8 $\pm$ 7.5
1227.0 $\pm$ 1.2		3260 $\pm$ 260		(300)	1.5 $\pm$ 0.2
1275.0 $\pm$ 1.2		53 $\pm$ 5		(300)	106 $\pm$ 11
1311.0 $\pm$ 1.3	3365 $\pm$ 300	3790 $\pm$ 360	2	(300)	1.6 $\pm$ 0.2
1378.5 $\pm$ 1.3		58 $\pm$ 6		(300)	1.7 $\pm$ 0.3
1440.5 $\pm$ 1.4		57 $\pm$ 9		(300)	0.28 $\pm$ 0.08
1454.0 $\pm$ 1.5		10.6 $\pm$ 3.0		(300)	24 $\pm$ 3
1460.0 $\pm$ 1.5	1600 $\pm$ 200	915 $\pm$ 110	[1]	(270)	17 $\pm$ 2
1530 $\pm$ 1.6	830 $\pm$ 130	650 $\pm$ 65	[2]	(300)	76 $\pm$ 6
	2730 $\pm$ 280	2975 $\pm$ 250	2	(300)	

³⁵Bf

E _g (eV)	Γ (meV)	4gΓ _n (meV)	J	Γ _y (meV)	4gΓ _n ⁰ (meV)
1546.5±1.6	3965 ±400	4520 ± 375	2	(300)	115 ± 9
1570.0±1.7		174 ± 35		(300)	4.4 ± 0.6
1589.0±1.7	1440 ±150	1350 ± 95	2	(300)	34 ± 3
1632.0±1.8				(300)	0.6 ± 0.2
1654.0±1.8				(300)	0.28 ± 0.08
1674.0±1.8				(300)	0.12 ± 0.04
1706.5±1.9				(300)	2.9 ± 0.3
1720 ±2				(300)	14 ± 2
1743.0±1.0		120 ± 15		(300)	0.24 ± 0.12
1755.0±1.0		10 ± 5		(300)	0.08 ± 0.08
1770 ±2		3 ± 3		(300)	12.5 ± 2.0
1802.0±1.1		525 ± 70		(300)	0.08 ± 0.08
1828 ±2	2690 ±300	3 ± 3	2	(300)	68.8 ± 7.5
1872.5±2.0	2710 ±300	2940 ± 310		(300)	1.7 ± 0.5
1895 ±2		3140 ± 20		(300)	72.5 ± 7.5
1904.0±1.2		74 ± 4		(300)	0.08 ± 0.08
1948.0±1.2		9 ± 4		(300)	0.20 ± 0.08
1967 ±2		4 ± 4		(300)	9.2 ± 1.4
2030.0±1.3		410 ± 60		(300)	23 ± 3
2065.0±1.3		104 ± 14		(300)	0.08 ± 0.08
2079.5±1.3		4 ± 4		(300)	20 ± 2
2093.5±1.3		910 ± 90		(300)	23 ± 2
2139.5±1.4		105 ± 90		(300)	0.35 ± 0.2
2196.0±1.4		16 ± 9		(300)	4.4 ± 2.0
2206.0±1.4		210 ± 93		(300)	34 ± 4
2235.0±1.5		1600 ± 190		(300)	0.80 ± 0.08
2247.5±1.5		38 ± 4		(300)	3.3 ± 0.4
2257.0±1.5		160 ± 20		(300)	0.8 ± 0.2
2283.0±1.5		40 ± 10		(300)	1.1 ± 0.2
2336.0±1.6		52 ± 10		(300)	15 ± 2
2366.0±1.6		725 ± 100		(300)	6.8 ± 1.2
2377.0±1.6		330 ± 60		(300)	10 ± 2
2395.0±1.6		490 ± 100		(300)	0.2 ± 0.1
2461.0±1.7		10 ± 5		(300)	2.0 ± 0.8
2465.0±1.7		100 ± 40		(300)	6 ± 2
2503.0±1.7		300 ± 100		(300)	18 ± 4
2514.0±1.8		900 ± 200		(300)	58 ± 12
2535.0±1.8		2910 ± 600		(300)	0.2 ± 0.2
2576.0±1.8		10 ± 10		(300)	16 ± 2
2593.0±1.8		810 ± 100		(300)	14 ± 2
2616.0±1.9		710 ± 100		(300)	13 ± 2
2643.0±1.9		665 ± 100		(300)	0.16 ± 0.08
2668.0±1.9		8 ± 4		(300)	0.16 ± 0.08
2686.0±1.9		8 ± 4		(300)	0.16 ± 0.08
2707.0±2.0		125 ± 20		(300)	2.4 ± 0.4
2727.0±2.0		625 ± 105		(300)	12 ± 2
2757.0±2.0		56 ± 10		(300)	1.08 ± 0.20
2766.0±2.0		130 ± 20		(300)	2.5 ± 0.4
2813.0±2.1		340 ± 65		(300)	6.4 ± 1.2
2826.0±2.1		14.8 ± 6.4		(300)	0.28 ± 0.12
2846.0±2.1		6.4 ± 2.1		(300)	0.12 ± 0.04
2893.0±2.1		1290 ± 430		(300)	0.12 ± 0.04
					24 ± 8

³⁵Br

E ₀ (eV)	Γ (meV)	4ag _n ⁰ (meV)	J	Γ _y (meV)	4ag _n ⁰ (meV)
2901.0±2.2		4310 ± 1080	(300)	80 ± 20	
2924.0±2.2		290 ± 65	(300)	5.4 ± 1.2	
2940.0±2.2		1190 ± 220	(300)	22 ± 4	
2954.0±2.2		435 ± 220	(300)	8 ± 4	
2967.0±2.2		220 ± 110	(300)	4 ± 2	
3005.0±2.3		11 ± 4	(300)	0.20 ± 0.08	
3042.0±2.3		11 ± 11	(300)	0.2 ± 0.2	
3053.0±2.3		155 ± 66	(300)	2.8 ± 1.2	
3076.0±2.3		28 ± 9	(300)	0.50 ± 0.16	
3093.0±2.4		16 ± 6	(300)	0.3 ± 0.1	
3107.0±2.4		15 ± 6	(300)	0.3 ± 0.1	
3117.0±2.4		310 ± 45	(300)	5.6 ± 0.8	
3162.0±2.5		3370 ± 450	(300)	60 ± 8	
3200.0±2.5		28 ± 11	(300)	0.5 ± 0.2	
3218.0±2.5		1870 ± 340	(300)	33 ± 6	
3232.0±2.5		62 ± 11	(300)	1.1 ± 0.2	
3247.0±2.6		11 ± 5	(300)	0.20 ± 0.08	
3303.0±2.6		14 ± 7	(300)	0.24 ± 0.12	
3323.0±2.6		600 ± 90	(300)	10.4 ± 1.6	
3341.0±2.7		1500 ± 230	(300)	26 ± 4	
3354.0±2.7		12 ± 12	(300)	0.2 ± 0.2	
3381.0±2.7		21 ± 11	(300)	0.36 ± 0.2	
3396.0±2.7		235 ± 50	(300)	4.0 ± 0.8	
3430.0±2.8		40 ± 17	(300)	0.7 ± 0.3	
3466.0±2.8		12 ± 5	(300)	0.20 ± 0.08	
3503.0±2.8		118 ± 23	(300)	2.0 ± 0.4	
3523.0±2.8		59 ± 23	(300)	1.0 ± 0.4	
3563.0±2.9		12 ± 5	(300)	0.20 ± 0.08	
3582.0±2.9		3350 ± 480	(300)	56 ± 8	
3597.0±3.0		23 ± 11	(300)	0.4 ± 0.2	
3610.0±3.0		120 ± 72	(300)	2.0 ± 1.2	
3617.0±3.0		300 ± 120	(300)	5 ± 2	
3662.0±3.1		12 ± 7	(300)	0.20 ± 0.12	
3668.0±3.1		58 ± 24	(300)	0.96 ± 0.4	
3713.0±3.1		915 ± 240	(300)	15 ± 4	
3726.0±3.2		12 ± 6	(300)	0.2 ± 0.1	
3737.0±3.2		36 ± 12	(300)	0.6 ± 0.2	
3775.0±3.2		1540 ± 310	(300)	25 ± 5	
3809.0±3.3		31 ± 12	(300)	0.5 ± 0.2	
3853.0±3.3		1550 ± 310	(300)	25 ± 5	
3874.0±3.3		12 ± 6	(300)	0.2 ± 0.1	
3888.0±3.4		310 ± 60	(300)	5 ± 1	
3931.0±3.4		440 ± 125	(300)	7 ± 2	

* Spurious or p-wave level

⁷⁹
³⁵Br

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 11.1 \pm 0.4 \text{ b} \\ \sigma_{\gamma} &= 2.6 \pm 0.2 \text{ b [4.5 hr } ^{80}\text{Br}^{\text{m}}] \\ \sigma_{\gamma} &= 8.5 \pm 0.3 \text{ b [18 min } ^{80}\text{Br}^{\text{g}}]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 132.5 \pm 10 \text{ b} \\ I_{\gamma} &= 34.5 \pm 4.0 \text{ b [4.5 hr } ^{80}\text{Br}^{\text{m}}] \\ I_{\gamma} &= 92 \pm 10 \text{ b [18 min } ^{80}\text{Br}^{\text{g}}]\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 3/2^{-}$		%Abn = 50.69		$S_n = 7883 \pm 4 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_{\gamma} \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$
Bound level					
35.8 ± 0.1	368 ± 40	54 ± 5	2	325 ± 40	9.0 ± 0.9
53.8 ± 0.2	424 ± 40	25.5 ± 1.5	1	390 ± 40	3.5 ± 0.2
189.5 ± 0.2	413 ± 40	62 ± 6	1	330 ± 40	4.5 ± 0.5
238.5 ± 0.3	855 ± 50	694 ± 70	2	300 ± 40	45 ± 5
293.7 ± 0.4	420 ± 50	75 ± 8		340 ± 60	4.4 ± 0.4
318.5 ± 0.5	900 ± 90	725 ± 75	2	320 ± 50	40.6 ± 4.1
394.5 ± 0.4	460 ± 80	135 ± 14		370 ± 80	6.8 ± 0.8

⁸¹
³⁵Br

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 2.69 \pm 0.09 \text{ b} \\ \sigma_{\gamma} &= 2.43 \pm 0.40 \text{ b [6.1 min } ^{82}\text{Br}^{\text{m}}] \\ \sigma_{\gamma} &= 0.26 \text{ b [36 hr } ^{82}\text{Br}^{\text{g}}]\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 51 \pm 2 \text{ b}$$

RESONANCE PARAMETERS

$I^{\pi} = 3/2^{-}$		%Abn = 49.31		$S_n = 7601 \pm 8 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_{\gamma} \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$
101.0 ± 0.1	430 ± 30	194 ± 13	2	275 ± 40	19.4 ± 1.3
135.5 ± 0.2	700 ± 70	323 ± 26	1	270 ± 50	28 ± 2
205.0 ± 0.3	380 ± 60	12.8 ± 1.3	[2]	370 ± 60	0.9 ± 0.1

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Br	diffraction	ACR/A,28,663(72)	Atoji
Br	Christiansen filter	PRIVATE COMM.(70)	Koester
Br ⁸¹	ratio	70HEL.SINKI,2,589(70)	Ricabarra
Br ⁸¹	ratio	JNE,24,35(70)	Ryves
Br	Christiansen filter	PRIVATE COMM.(68)	Nistler
Br ⁸¹	activation	PR/B,138,1(65)	Anders
Br ⁷⁹	isom. ratio	NP,67,443(65)	Bacso
Br ⁸¹	activation	JIN,27,903(65)	Emery
Br ⁷⁹	isom. ratio	PR,129,769(63)	Keisch
Br	pulsed n	NSE,9,132(61)	Meadows
Br ⁸¹	activation	NSE,8,378(60)	Lyon
Br	σ_t	AERE-N/R-1147(53)	Egelstaff
Br	$\bar{\sigma}_s$	PR,83,1123(51)+	Havens
Br	local osci.	PR,83,641(51)	Pomerance
Br	diffraction	PR,81,527(51)	Shull
Br	pile osci.	PPS/A,63,1175(50)	Colmer
Br	σ_t	NAT,166,825(50)	Egelstaff
Br	pile osci.	PR,80,342(50)	Harris
Br ^{79,81}	ratio	PR,79,789(50)	Reynolds
Br ⁷⁹	activation	PR,75,1781(49)+	Hughes
Br		PR,71,666(47)	Fermi
Br ^{79,81}		PR,72,888(47)	Seren
Br	$\bar{\sigma}_s$	JPJ,25,481(43)	Kimura
Br	water bath	PR,58,554(40)	Lapointe
Br	$\bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Br	σ_t	101-1968	CEA-R-3385(68)	Julien
Br	σ_t	101-1968	NP,66,433(65)	Julien
Br ⁷⁹	$\sigma_t \bar{\sigma}_s$			
	$\sigma_t \sigma_{\gamma}(S1)$	35.9-320	65ANTWERP,185(65)	Kim
Br ⁸¹	$\sigma_t \bar{\sigma}_s$			
	$\sigma_t \sigma_{\gamma}(S1)$	101-136	65ANTWERP,185(65)	Kim
Br	σ_t	101-3931	PR/B,136,177(64)	Garg
Br ⁷⁹	$\bar{\sigma}_s \sigma_{\gamma}(S1)$	35.9-375	ZET,45,1294(63)	Zeliger
Br ⁸¹	$\bar{\sigma}_s \sigma_{\gamma}(S1)$	101-136	ZET,45,1294(63)	Zeliger
Br ⁷⁹	σ_t	35-317	NP,14,120(59)	LeBlanc
Br ⁸¹	σ_t	102-205	NP,14,120(59)	LeBlanc
Br	$\sigma_{\gamma}(S1)$	35.8-995	BAP,4,473(59)	Rosen
Br	$\sigma_{\gamma}(S1)$	35.8-995	CU(PNPL)-206,6(59)	Rosen
Br	σ_t	35.7-136.0	PR,83,1123(51)	Havens

³⁶Kr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 25.0 \pm 1.0 \text{ b} \\ \sigma_a &= 7.50 \pm 0.13 \text{ b} \\ \sigma_{\text{can}} &= 7.44 \pm 0.15 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma = 53 \pm 7 \text{ b}$$

⁷⁸Kr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.21 \pm 0.03 \text{ b (55 sec } ^{78}\text{Kr}^{+}) \\ \sigma_T &= 4.71 \pm 0.68 \text{ b (} ^{78}\text{Kr}^{+})\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma = 5.3 \pm 2.3 \text{ b}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$	$\Sigma \text{Abn} = 0.35$	$S_n = 8368 \pm 11 \text{ keV}$
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
$^{*}640 \pm 25$	1500 ± 300	50 ± 12

* Isotopic assignment uncertain, see Kr-80

⁸⁰Kr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 14.0 \pm 1.5 \text{ b (} ^{80}\text{Kr}^{+}) \\ \sigma_T &= 4.55 \pm 0.65 \text{ b (13 sec } ^{80}\text{Kr}^{+})\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma = 56.1 \pm 5.6 \text{ b}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$	$\Sigma \text{Abn} = 2.25$		$S_n = 7850 \pm 100 \text{ keV}$
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_\gamma \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
Bound level			
106 ± 2	336 ± 30	290 ± 30	33 ± 3
$^{*}640 \pm 25$	1000 ± 200	(200)	40 ± 8

* Isotopic assignment uncertain

⁸²₃₆Kr

THERMAL CROSS SECTIONS

$$\sigma_T = 45 \pm 15 \text{ b } ({}^{82}\text{Kr}^{+19})$$
$$\sigma_T = 20.0 \pm 3.5 \text{ b } (1.86 \text{ hr } {}^{82}\text{Kr}^{+19})$$

RESONANCE PROPERTIES

$$I_T = 200 \pm 40 \text{ b}$$

RESONANCE PARAMETERS

$$I^* = 0^+$$

$$\Gamma_{\text{Abn}} = 11.6$$

$$S_n = 7467 \pm 6 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^2 (meV)
39.8 ± 0.5	91 ± 12	14 ± 2

⁸³₃₆Kr

THERMAL CROSS SECTIONS

$$\sigma_T = 200 \pm 30 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 230 \pm 30 \text{ b}$$

RESONANCE PARAMETERS

$$I^* = 9/2^+$$

$$\Gamma_{\text{Abn}} = 11.5$$

$$S_n = 10518 \pm 5 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_T (meV)	$2g\Gamma_n^2$ (meV)
Bound level			
27.9 ± 0.3	67 ± 10	220 ± 60	13 ± 2
233 ± 6	290 ± 40	(200)	19 ± 3

⁸⁴
³⁶Kr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.130 \pm 0.014 \text{ b } ({}^{83}\text{Kr}^{m+g}) \\ \sigma_T &= 0.090 \pm 0.013 \text{ b } (4.4 \text{ yr } {}^{83}\text{Kr}^g) \\ \sigma_T &= 0.042 \pm 0.004 \text{ b } (10.73 \text{ yr } {}^{83}\text{Kr}^g)\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^* = 2.7 \pm 0.2 \text{ b}$$

RESONANCE PARAMETERS

$J^\pi = 0^+$	$\Gamma_{\text{Abn}} = 57.0$		$S_n = 7111 \pm 4 \text{ keV}$
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_\gamma \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
519 ± 20	345 ± 70	(200)	15 ± 3
500 ± 20	87 ± 20		3.6 ± 0.8

⁸⁵
³⁶Kr
(10.73 yr)

THERMAL CROSS SECTIONS

$$\sigma_T = 1.66 \pm 0.20 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^* = 1.8 \pm 1.0 \text{ b}$$

⁸⁶
³⁶Kr

THERMAL CROSS SECTIONS

$$\sigma_T = 0.060 \pm 0.020 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^* = 0.03 \pm 0.03 \text{ b}$$

⁸⁷
³⁶Kr

THERMAL CROSS SECTIONS

$$\sigma_T < 600 \text{ b}$$

Thermal Cross Sections

Isotope	Measurement	Reference	Author
Kr-80	activation	JET, 15.643(72)	Barabanov
Kr-85	mass spectrometry	NSE, 47.371(72)	Bemis
Kr-80	mass spectrometry	NSE, 47.151(72)	Bradley
Kr-78, 80, 82, 84	σ_f	NP/N, 133.410(69)	Korer
Kr-82	activation	NP/N, 120.329(68)	Kondash
Kr-84	σ_f	PR, 148.1303(66)	Krohn
Kr-82	activation	NSE, 21.114(65)	Ruby
Kr-80, 84	activation	PMWTE COM, (63)	Eastwood
Kr-83	σ_f	JPR, 24.21(63)	Gent
Kr-83	mass spectrometry	JIN, 5.253(58)	Kennicott
Kr-78	σ_f	JNE, 6.113(57)	Cocking
Kr-78	mirror reflections	PR, 102.1321(56)	Crouch
Kr-80	σ_f	NE, 5.191(52)	Bergstrom
Kr-80	σ_f	RMDCH, 51.2.642(51)	Hagland
Kr-80, 82	activation	PR, 80.20(50)	Harris
Kr-80	activation	PR, 80.296(50)	Hachamara
Kr-80	activation	PR, 79.086(50)	Reynolds
Kr-78, 80	activation	NECO-2274(48)	Hay
Kr-80	σ_f	PR, 116.1516(59)	Hann
Kr-82	σ_f	PR, 116.1516(59)	Hann
Kr-83	σ_f	PR, 116.1516(59)	Hann
Kr-84	σ_f	PR, 116.1516(59)	Hann
Kr-80	σ_f	28.3-41.1	Cocking
Kr-80	σ_f	106-640	Hann
Kr-82	σ_f	39.8	Hann
Kr-83	σ_f	27.9-233	Hann
Kr-84	σ_f	519-580	Hann
Kr-80	σ_f	JNE, 6.113(57)	Cocking

Resonance Parameters

Isotope	Measurement	Reference	Author
Kr-80	activation	JET, 15.643(72)	Barabanov
Kr-85	mass spectrometry	NSE, 47.371(72)	Bemis
Kr-80	mass spectrometry	NSE, 47.151(72)	Bradley
Kr-78, 80, 82, 84	σ_f	NP/N, 133.410(69)	Korer
Kr-82	activation	NP/N, 120.329(68)	Kondash
Kr-84	σ_f	PR, 148.1303(66)	Krohn
Kr-82	activation	NSE, 21.114(65)	Ruby
Kr-80, 84	activation	PMWTE COM, (63)	Eastwood
Kr-83	σ_f	JPR, 24.21(63)	Gent
Kr-83	mass spectrometry	JIN, 5.253(58)	Kennicott
Kr-78	σ_f	JNE, 6.113(57)	Cocking
Kr-78	mirror reflections	PR, 102.1321(56)	Crouch
Kr-80	σ_f	NE, 5.191(52)	Bergstrom
Kr-80	σ_f	RMDCH, 51.2.642(51)	Hagland
Kr-80, 82	activation	PR, 80.20(50)	Harris
Kr-80	activation	PR, 80.296(50)	Hachamara
Kr-80	activation	PR, 79.086(50)	Reynolds
Kr-78, 80	activation	NECO-2274(48)	Hay

³⁷Rb

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma}^c &= 0.37 \pm 0.03 \text{ b} \\ \sigma_{\alpha} &= 6.2 \pm 0.3 \text{ b} \\ \sigma_{\text{coh}} &= 7.04 \pm 0.08 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 6.0 \pm 0.5 \text{ b} \\ S_0 &= 1.2 \pm 0.3\end{aligned}$$

⁸⁵
³⁷Rb

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.46 \pm 0.02 \text{ b [} ^{86}\text{Rb}^{***}\text{]} \\ \sigma_{\gamma} &= 0.050 \pm 0.005 \text{ b [1.0 min } ^{86}\text{Rb}^*\text{]} \\ \sigma_{\gamma} &= 0.41 \pm 0.02 \text{ b [18.7 day } ^{86}\text{Rb}^*\text{]} \\ \sigma_{\text{coh}} &= 8.3 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 7.5 \pm 0.5 \text{ b} \\ \langle D \rangle &= 100 \pm 20 \text{ eV} \\ S_0 &= 1.0 \pm 0.4\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 5/2^{-}$$

$$\chi_{\text{Abn}} = 72.17$$

$$S_n = 8650.4 \pm 1.0 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
*176.6 ± 0.3	0.86 ± 0.12				0.065 ± 0.009
*224.7 ± 0.3	1.14 ± 0.16				0.076 ± 0.011
*236.6 ± 0.4	10.8 ± 1.0				0.702 ± 0.065
*429.0 ± 1.0	2.6 ± 0.4				0.13 ± 0.02
*466.0 ± 1.2	1.6 ± 0.4				0.074 ± 0.019
477.0 ± 1.2	41.0 ± 4.0				1.87 ± 0.19
530.0 ± 1.4	1380 ± 60	2	0	220 ± 20	69.6 ± 2.5
*546.0 ± 1.4	6.0 ± 2.0				0.26 ± 0.07
*598.0 ± 1.6	6.4 ± 0.8				0.26 ± 0.03
658 ± 2	315 ± 80				12.2 ± 3.1
807 ± 3	15 ± 2				0.53 ± 0.07
1012 ± 4	140 ± 40				4.4 ± 1.3
1046 ± 4	920 ± 140			94 ± 14	28.5 ± 4.3
1210 ± 5	1680 ± 260			110 ± 16	48.3 ± 7.5
1414 ± 6	6400 ± 600			100 ± 15	170.2 ± 16.0
1514 ± 7	140 ± 40				3.6 ± 1.0
1686 ± 10	680 ± 200			102 ± 15	16.6 ± 4.9
*1943 ± 10	20 ± 10				0.45 ± 0.23
1996 ± 15	520 ± 180			100 ± 15	11.6 ± 4.0
2110 ± 15	500 ± 200				10.9 ± 4.4
*2190 ± 20	20 ± 10				0.43 ± 0.21
*2310 ± 20	40 ± 12				0.83 ± 0.25

⁸⁵
₃₇Rb

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
2420 ± 15	7600 ± 1200				154.5 ± 24
*2550 ± 20	66 ± 20				1.3 ± 0.4
2610 ± 20	100 ± 40				2.0 ± 0.8
*2800 ± 25	40 ± 14				0.76 ± 0.27
3020 ± 15	5200 ± 1200				94.6 ± 21.8
3235 ± 15	2800 ± 700				49.2 ± 12.3
3360 ± 15	600 ± 200				10.4 ± 3.5
4060 ± 20	20000 ± 800				311.1 ± 12.6
4250 ± 15	8400 ± 1600				128.9 ± 24.5
4930 ± 30	12000 ± 2000				170.9 ± 28.5
5180 ± 30	4600 ± 1600				63.9 ± 22.2
5660 ± 25	6000 ± 1600				79.8 ± 21.3
7250 ± 35	12000 ± 3000				140.9 ± 35.3
8430 ± 70	32000 ± 6000				348.5 ± 65.4
9310 ± 70	20000 ± 6000				207.3 ± 62.2
11030 ± 100	16000 ± 6000				152.3 ± 57.1
12880 ± 120	26000 ± 8000				229.1 ± 70.5
15030 ± 100	42000 ± 10000				342.6 ± 81.6
15560 ± 110	16000 ± 6000				128.3 ± 48.1
16690 ± 120	18000 ± 6000				139.3 ± 46.4
17170 ± 120	22000 ± 8000				167.9 ± 61.1

* Possibly p-wave resonances

* Note- There is a large discrepancy between measured and calculated reduced absorption resonance integrals, possibly due to unassigned low energy neutron resonances.

⁸⁷Rb

[4.7 × 10¹⁰ yr]

THERMAL CROSS SECTIONS

$$\sigma_T = 0.12 \pm 0.03 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 2.0 \pm 0.5 \text{ b}$$

$$\langle D \rangle = 1600 \pm 420 \text{ eV}$$

$$S_0 = 1.6 \pm 0.9$$

RESONANCE PARAMETERS

$I^\pi = 3/2^+$		%Abn = 27.83			$S_n = 6083 \pm 15 \text{ keV}$	
$E_0 \text{ (eV)}$		$2g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_\gamma \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$
*269.5 ± 1.0		15.7 ± 1.5				.96 ± .09
378.0 ± 1.5		900 ± 80	2	0	95 ± 13	46.3 ± 4.1
3840 ± 15		23200 ± 3000		0		374.4 ± 48.4
5120 ± 30		43200 ± 5000		0		603.7 ± 83.9
7580 ± 35		102000 ± 14000	1	0		1172 ± 161
8370 ± 40		10000 ± 2000		0		109 ± 22
8790 ± 45		274000 ± 32000		0		2923 ± 341
11160 ± 60		45000 ± 10000		0		436 ± 95
14980 ± 100		40000 ± 12000		0		327 ± 98
23470 ± 400		240000 ± 60000		0		1567 ± 392

* Possibly p-wave resonances

⁸⁸Rb

[17.7 min]

THERMAL CROSS SECTIONS

$$\sigma_T = 1.0 \pm 0.2 \text{ b [15.4 min } ^{89}\text{Rb]}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Rb ⁸⁵	activation	JIN,34,2699(72)	Steinnes
Rb	diffraction	ACR/A,26,376(70)	Copley
Rb	diffraction	CR/B,270,56(70)	Meriel
Rb	diffraction	ACR/A,26,377(70)	Wang
Rb ⁸⁵	activation	CJP,47,2031(69)	Ricabarra
Rb ⁸⁵	isom. ratio	EN,14,228(67)	Foglio
Rb ⁸⁵	activation	JIN,29,2853(67)	Sims
Rb	diffraction	JPR,25,565(64)	Pickart
Rb ⁸⁵	activation	PR,129,769(63)	Keisch
Rb, Rb ⁸⁵	diffraction	ANL-6797,393(63)+	Mueller
Rb ⁸⁵	activation	NP,20,183(60)	Hans
Rb ⁸⁵	activation	NSE,8,378(60)	Lyon
Rb ⁸⁵	activation	PRIVATE COMM.(56)	Brookshank
Rb ⁸⁸	σ_e	PR,99,610(55)+	Joki
Rb	local osci.	PR,83,841(51)	Pomerance
Rb	diffraction	PR,81,527(51)	Shull
Rb ⁸⁵	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Rb ⁸⁵	$\sigma_e \sigma_\gamma$	176-17170	JINR-P3-4357(69)	Grebenyuk
Rb ⁸⁷	$\sigma_e \sigma_\gamma$	270-23470	JINR-P3-4357(69)	Grebenyuk
Rb ⁸⁵	$\sigma_e \sigma_\gamma \sigma_\gamma(SI)$	176-1690	NP,72,298(65)	Iliescu
Rb	$\sigma_e \sigma_\gamma \sigma_\gamma(SI)$	176-3050	NP,72,298(65)	Iliescu
Rb ⁸⁵	$\sigma_e \sigma_\gamma \sigma_\gamma(SI)$	176-1210	ZET,49,410(65)	Kim
Rb ⁸⁷	$\sigma_e \sigma_\gamma \sigma_\gamma(SI)$	267-378	ZET,49,410(65)	Kim
Rb ⁸⁵	σ_e	3300-6900	PR,109,926(58)	Good
Rb ⁸⁷	σ_e	5000-8550	PR,109,926(58)	Good
Rb ⁸⁵	σ_γ	520-1420	NP,3,553(57)	Bovey
Rb ⁸⁷	σ_γ	370	NP,3,553(57)	Bovey

⁸⁸Sr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 1.21 \pm 0.06 \text{ b} \\ \sigma_n &= 10 \pm 1 \text{ b} \\ \sigma_t &= 11 \pm 1 \text{ b} \\ a_{coh} &= 6.88 \pm 0.13 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 11 \pm 2 \text{ b} \\ R^2 &= 6.9 \pm 0.3 \text{ fm}\end{aligned}$$

⁸⁴
³⁸Sr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 0.81 \pm 0.07 \text{ b} \\ \sigma_y &= 0.55 \pm 0.04 \text{ b [70 min } ^{85}\text{Sr}^a] \\ \sigma_y &= 0.26 \pm 0.06 \text{ b [64 day } ^{85}\text{Sr}^a]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 10.6 \pm 1.1 \text{ b} \\ S_0 &= 0.9 \pm 0.4\end{aligned}$$

RESONANCE PARAMETERS

$$I^a = 0^+$$

$$\%abn = 0.56$$

$$S_n = 8528 \pm 5 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (meV)	$g\Gamma_n^0$ (meV)
364.6 ± 0.8	1100 ± 100	57 ± 5
^a 488 ± 4	4.6 ± 0.6	0.21 ± 0.04
517 ± 4	8.0 ± 1.2	0.35 ± 0.05
635 ± 5	500 ± 400	20 ± 15
712 ± 5	72 ± 12	2.7 ± 0.5
1600 ± 20	440 ± 270	11 ± 7
1980 ± 30	330 ± 120	7.5 ± 2.7
2250 ± 35	700 ± 400	15 ± 10
3000 ± 17	4600 ± 500	85 ± 10
3350 ± 20	4400 ± 1200	76 ± 20

^a Possibly p-wave resonances

⁸⁶
³⁸Sr

THERMAL CROSS SECTIONS

$$\sigma_T = 0.84 \pm 0.06 \text{ b [2.83 hr } ^{87}\text{Sr}^*]$$

RESONANCE PROPERTIES

$$\begin{aligned} I_\gamma^c &= 4 \pm 1 \text{ b} \\ \langle \Gamma \rangle &= 1.0 \pm 0.3 \text{ keV} \\ S_0 &= 0.5 \pm 0.2 \end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$			$\chi_{\text{Abn}} = 9.9$	$S_n = 8428.3 \pm 0.8 \text{ keV}$
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$		
588.4 ± 0.4	6000 ± 300	247 ± 12		
1370.0 ± 0.5	56.0 ± 10.0	1.51 ± 0.27		
2592 ± 1	75 ± 17	1.47 ± 0.33		
3247 ± 1	3600 ± 400	63.2 ± 7.0		
4496 ± 2	450 ± 75	6.7 ± 1.1		
5130 ± 2	290 ± 50	4.05 ± 0.67		
6440 ± 4	680 ± 125	8.47 ± 1.56		
7944 ± 5	480 ± 90	5.39 ± 1.01		
8276 ± 5	530 ± 110	5.83 ± 1.21		
9356 ± 6	440 ± 85	4.55 ± 0.88		
10161 ± 7	8500 ± 1500	84.3 ± 14.9		
10345 ± 7	1300 ± 240	12.8 ± 2.4		
10869 ± 8	1700 ± 320	16.3 ± 3.1		
11475 ± 14	14500 ± 2500	135.4 ± 23.3		
11925 ± 9	156 ± 24	1.43 ± 0.22		
13897 ± 12	530 ± 75	4.50 ± 0.64		
14980 ± 13	9200 ± 1700	75.2 ± 13.9		
15399 ± 13	9100 ± 1650	73.3 ± 13.3		
18374 ± 30	37000 ± 6000	273.0 ± 44.3		
21359 ± 15	2500 ± 400	17.1 ± 2.7		
22031 ± 12	114 ± 25	0.77 ± 0.17		
22394 ± 13	184 ± 40	1.23 ± 0.27		
22778 ± 13	1590 ± 275	10.5 ± 1.8		
23087 ± 14	1010 ± 150	6.65 ± 1.0		

* A radiation width of 0.284 eV would account for the thermal absorption cross section.

⁸⁷
³⁸Sr

THERMAL CROSS SECTIONS

$$\sigma_T = 16 \pm 3 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 120 \pm 12 \text{ b}$$

$$R_\gamma^c = 6.9 \pm 0.3 \text{ fm}$$

$$S_0 = 0.26 \pm 0.06$$

RESONANCE PARAMETERS

$$I^\pi = 9/2^+$$

$$\% \text{Abr} = 7.0$$

$$S_n = 11113.0 \pm 0.6 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
3.54±0.02	0.66± 0.09	4	0	205 ±20	0.35 ± 0.05
*35.27±0.04	0.06± 0.02				0.010± 0.003
*321.3 ±0.4	4.8 ± 0.8				0.27 ± 0.05
*543 ±1	3.5 ± 1.4				0.15 ± 0.06
648.3 ±0.9	600 ± 60				25.1 ± 3.1
675.9 ±0.5	60 ± 14				2.2 ± 0.5
741.8 ±2.2	360 ± 50				13.3 ± 1.8
746.9 ±0.6	32 ± 10				1.2 ± 0.4
*966.4 ±1	18 ± 4				0.58 ± 0.13
1184 ±1	14 ± 4				0.41 ± 0.12
*1259 ±1	22.0 ± 5.0				0.62 ± 0.14
1335 ±1	3500 ±300				95.6 ±12.0
1402 ±1	170 ± 24				4.54 ± 0.64
1700 ±3	<6.0				<0.15
1719 ±1	24 ± 4.0				0.58 ± 0.10
2013 ±3	24 ± 8				0.54 ± 0.18
2092 ±1	16 ± 4				0.35 ± 0.09
2112 ±1	450 ± 70				9.8 ± 1.5
2353 ±3	48 ± 8				0.99 ± 0.17
2439 ±1	340 ± 60				6.89 ± 1.22
2756 ±2	500 ± 64				9.52 ± 1.22
2978 ±6	4.0 ± 2.0				0.073± 0.037
3053 ±6	60 ± 10				1.09 ± 0.18
3658 ±2	560 ± 80				9.26 ± 1.32
4037 ±2	3100 ±400				48.8 ± 6.3
4766 ±2	2050 ±350				29.7 ± 5.1
4977 ±2	1960 ±300				27.8 ± 4.3
5196 ±3	880 ±140				12.2 ± 1.9
5503 ±3	1020 ±160				13.75 ± 2.16
5777 ±3	1480 ±240				19.5 ± 3.2
6060 ±3	4300 ±700				55.2 ± 9.0
6150 ±3	5400 ±940				68.9 ±12.0
6815 ±4	2100 ±350				25.4 ± 4.2
7167 ±4	760 ±140				9.0 ± 1.7
7505 ±4	420 ± 76				4.9 ± 0.9
8840 ±5	824 ±144				8.76 ± 1.53
9974 ±7	260 ± 44				2.6 ± 0.4

* Possibly p-wave resonances

THERMAL CROSS SECTIONS

$$\sigma_T = 5.8 \pm 0.4 \text{ mb}$$

RESONANCE PROPERTIES

$$I_T^0 = 0.05 \pm 0.02 \text{ b}$$

$$R^1 = 6.9 \pm 0.3 \text{ fm}$$

$$\langle D \rangle = 14.4 \pm 4.3 \text{ keV}$$

$$S_1 = 2.4 \pm 0.6$$

RESONANCE PARAMETERS

$I^0 = 0^\circ$		$\chi^2/\text{dof} = 82.6$		$S_n = 6360.1 \pm 3.7 \text{ keV}$		
$E_0 \text{ (keV)}$	$g_n^0 \text{ (eV)}$	J	ℓ	$\Gamma_T \text{ (meV)}$	$g_n^0 \text{ (eV)}$	$g_n^1 \text{ (eV)}$
2.780 $\pm$ 0.015	0.100 $\pm$ 0.020				0.018 $\pm$ 0.003	
12.389 $\pm$ 0.010	19 $\pm$ 4	[3/2]	1	181 $\pm$ 27	0.21 $\pm$ 0.04	8.5
13.852 $\pm$ 0.020	240 $\pm$ 60	1/2	0	100 $\pm$ 10	2.06 $\pm$ 0.05	
23.574 $\pm$ 0.025	82 $\pm$ 10	[1/2]	1	185 $\pm$ 30		11.5 $\pm$ 1.5
29.472 $\pm$ 0.030	88 $\pm$ 15	[3/2]	1	150 $\pm$ 25		9.2 $\pm$ 1.6
54.536 $\pm$ 0.040	61 $\pm$ 12	[3/2]	1	150 $\pm$ 25		2.6 $\pm$ 0.5
55.820 $\pm$ 0.045	82 $\pm$ 15	[3/2]	1	135 $\pm$ 20		3.4 $\pm$ 0.6
88.320 $\pm$ 0.090	145 $\pm$ 25		1			3.2 $\pm$ 0.6
92.5 $\pm$ 0.5	670 $\pm$ 270	1/2	0		2.2 $\pm$ 0.9	
96.25 $\pm$ 0.5	320 $\pm$ 97		1			4.2 $\pm$ 1.3
105.5 $\pm$ 1.0	150 $\pm$ 60		0		0.5 $\pm$ 0.2	
110 $\pm$ 1	240 $\pm$ 70		1			2.7 $\pm$ 0.8
122 $\pm$ 1	1870 $\pm$ 560	3/2	1			17.3 $\pm$ 5.2
142 $\pm$ 1	180 $\pm$ 130		0		0.5 $\pm$ 0.3	
151 $\pm$ 1	850 $\pm$ 340		1			6.2 $\pm$ 2.5
153.5 $\pm$ 1	290 $\pm$ 150		1			2.4 $\pm$ 1.2
171 $\pm$ 1	470 $\pm$ 230		1			2.9 $\pm$ 1.4
196 $\pm$ 1	1300 $\pm$ 390		1			7.2 $\pm$ 2.2
200.5 $\pm$ 1	310 $\pm$ 220		1			1.9 $\pm$ 1.3
212.5 $\pm$ 1	790 $\pm$ 160		1			4.6 $\pm$ 0.9
230	1000	3/2	1			6.5
232	1000	1/2	0		2.1	
248	2000	3/2	1			12.0
260	500	1/2	0		0.98	
295	6000	3/2	1			29.4
304	3000	3/2	1			14.2
328	20000	3/2	1			87.0

E_β (keV)	g_β^m (eV)	J	Γ_γ (meV)	g_γ^m (eV)	g_γ^e (eV)
340	18000	3/2			67.0
386	1000	1/2			3.9
387	6000	3/2			21.8
403	6000	1/2			28.0
410	100	3/2			0.3
423	2000	3/2			6.6
431	400	3/2			1.3
503	5000	3/2			13.9
505.5	600	1/2			2.2
508.5	2000	1/2			5.5
511.8	1000	3/2			2.7
515.0	500	1/2			1.4
521.5	45000	5/2	2		26.6
536.5	14000	3/2			20.0
537.0	8000	3/2			15.5
543.0	6000	3/2			5.1
546.0	2000	3/2			5.1
553.5	2000	1/2			29.6
588.5	12000	3/2			6.2
591.0	3400	3/2			5.7
598.5	24000	3/2			8.6
615.5	2000	1/2			10.7
660.5	5000	3/2			12.8
666.0	6000	3/2			12.5
680.0	6000	3/2			2.0
700.0	1000	5/2	2		

THERMAL CROSS SECTIONS

$$\sigma_T = 0.42 \pm 0.04 \text{ b}$$

⁸⁹₃₈Sr
[50.5 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 0.9 \pm 0.5 \text{ b}$$

⁹⁰₃₈Sr
[29 yr]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Sr^{84}	activation	JIN, 34, 2699(72)	Steinnes
Sr	diffraction	ACA/A, 27, 622(71)	Cooper
Sr^{84}	activation	70MELSIK1, 2, 589(70)	Ricabarra
Sr	diffraction	ACA/B, 25, 787(69)	Loopstra
$Sr^{84,86}$	activation	ZP, 210, 13(68)	Mannhart
$Sr^{84,86}$	isom. ratio	EN, 14, 228(67)	Foglio
Sr^{84}	isom. ratio	FKI, 14, 85(66)	Kardon
Sr^{90}	activation	APA, 23, 223(66)	Zeisel
$Sr^{84,86}$	activation	NSE, 22, 373(65)	Kramer
$Sr^{84,86}$	isom. ratio	64PARIS, 2, 703(64)	Gulyas
$Sr^{84,86}$	activation	NP, 20, 183(60)	Mans
$Sr^{84,86}$	activation	NSE, 8, 378(60)	Lyon
Sr^{89}	activation	PIC-2, 16, 54(58)	Eastwood
Sr^{88}	activation	CJC, 36, 731(58)	Roy
Sr^{89}	activation	CJP, 35, 1215(57)	Roy
$Sr^{84,88}$	ratio	NP, 1, 420(56)	Asdente
Sr^{84}	activation	PPS/A, 65, 958(52)	Harrison
Sr	local osci.	PR, 83, 641(51)	Pomerance
Sr	diffraction	PR, 81, 527(51)	Shull
Sr	pile osci.	PPS/A, 63, 1175(50)	Colmer
Sr	reflection	PR, 71, 915(47)	Fermi
$Sr^{86,88}$	activation	PR, 72, 888(47)	Seren
Sr	absorption	PR, 69, 411(46)	Coltman
Sr	$\bar{\sigma}_s$	PRS/A, 162, 127(37)	Goldhaber
Sr	σ_c	PR, 48, 265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Sr^{88}	σ_T	12.4-57.1	BAP, 18, 591(73)+	Winters
Sr^{88}	σ_c	505500-700000	BAP, 16, 495(71)	Divadeenam
Sr^{88}	σ_c	232000-431000	BAP, 16, 495(71)	Pineo
Sr^{86}	σ_c	566.-10345.	PRIVATE COMM.(71)	Rahn
Sr^{87}	σ_c	3.53-7353.	PRIVATE COMM.(71)	Rahn
Sr^{88}	σ_c	12389.-58320.	PRIVATE COMM.(71)	Rahn
Sr^{87}	σ_T (spectra)	thermal	69STUDSVIK, 35(69)	Michaelis
Sr^{87}	σ_T	thermal	NP/A, 113, 134(68)	Irigaray
Sr^{87}	σ_T (spectra)	thermal	ZP, 194, 373(66)	Michaelis
Sr^{84}	$\sigma_c \sigma_T$	364.6-3350.	EON, 2, 183(65)	Adamchuk
Sr^{86}	$\sigma_c \sigma_T$	590.-18800.	EON, 2, 183(65)	Adamchuk
Sr^{87}	$\sigma_c \sigma_T$	3.56-3700.	EON, 2, 183(65)	Adamchuk
Sr^{88}	$\sigma_c \sigma_T$	2780.-23800.	EON, 2, 183(65)	Adamchuk
Sr^{88}	σ_c	12750.	AP, 14, 387(61)	Bilpuch
Sr^{88}	σ_c	14500-212500	AP, 14, 387(61)	Bilpuch
Sr^{86}	σ_c	3000.-11300.	PR, 109, 926(58)	Good
Sr^{88}	σ_c	13600.	PR, 109, 926(58)	Good
Sr^{87}	σ_c	3.56	PR, 108, 353(57)	Stolovy

THERMAL CROSS SECTIONS

$\sigma_T = 1.28 \pm 0.02 \text{ b}$
 $\sigma_T = 1.0 \pm 0.2 \text{ mb (3.2 hr } ^{89}\text{Y)}$
 $\sigma_0 = 7.60 \pm 0.06 \text{ b}$
 $\sigma_1 = 8.88 \pm 0.06 \text{ b}$
 $\lambda_{coh} = 7.78 \pm 0.03 \text{ fm}$

RESONANCE PROPERTIES

$I_T = 1.0 \pm 0.2 \text{ b}$
 $R_T = 6.7 \pm 0.1 \text{ fm}$
 $\langle D \rangle = 1.2 \pm 0.2 \text{ keV}$
 $S_0 = 0.32 \pm 0.11$
 $S_1 = 4.4^{+7.8}_{-1.2}$

RESONANCE PARAMETERS

$I^{\pi} = 1/2^{-}$		$\lambda_{Abn} = 100$		$S_n = 6860.0 \pm 1.4 \text{ keV}$	
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (eV)}$	J	ℓ	$2g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$
-0.300		1	0	0.26	
2.598 ± 0.008	1.46 ± 0.36	(1)	(0)	0.0286 ± 0.0070	
2.608 ± 0.008	1.50 ± 0.26		(1)		3.23
3.380 ± 0.008	0.56 ± 0.08		1		0.82
4.776 ± 0.008	0.082 ± 0.012		1		0.073
5.710 ± 0.010	0.30 ± 0.06		1		0.400
7.496 ± 0.018	31.6 ± 2.0	0	0	0.364 ± 0.023	
9.410 ± 0.025	5.0 ± 0.6		1		1.530
9.728 ± 0.026	2.04 ± 0.24	1	0	0.206 ± 0.024	
10.72 ± 0.03	0.56 ± 0.10				0.150
11.57 ± 0.04	5.8 ± 2.0		(1)		1.360
11.58 ± 0.04	44.0 ± 3.2	0	0	0.408 ± 0.030	
12.99 ± 0.04	12.0 ± 1.2	1	1		2.360
13.79 ± 0.05	2.6 ± 0.4	(1)	0	0.0222 ± 0.0034	
14.21 ± 0.05	4.4 ± 0.6		1		0.760
14.52 ± 0.05	0.76 ± 0.20		1		0.130
15.19 ± 0.05	42.8 ± 2.0	1	0	0.348 ± 0.016	
20.27 ± 0.08	8.4 ± 0.8	1	1		0.860
23.00 ± 0.10	51.0 ± 6.0	(1)	1		4.330
23.62 ± 0.10	4.6 ± 1.0		1		0.380
24.12 ± 0.11	39.4 ± 6.0	(1)	1		3.100
24.56 ± 0.11	70.4 ± 8.0	(1)	1		5.450
26.38 ± 0.12	25.8 ± 2.2	0	0	0.160 ± 0.014	
26.85 ± 0.12	3.6 ± 0.5		0	0.022 ± 0.003	
28.11 ± 0.13	10.6 ± 2.0				0.670
29.26 ± 0.14	124 ± 12	(1)	1		7.440
29.53 ± 0.14	136 ± 14	1	0	0.790 ± 0.081	
30.05 ± 0.15	64 ± 8	(1)	1		3.700
42.10					
53.00					
53.70					
55.10					
56.10					

⁸⁹
³⁹Y

E_0 (keV)	$2g_n^0$ (eV)	J	ℓ	$2g_n^0$ (eV)	g_n^1 (eV)
62.40					
65.30					
68.40					
70.30					
76.80					

⁹⁰
³⁹Y

(64.0 hr)

THERMAL CROSS SECTIONS

$$\sigma_T < 6.5 \text{ b}$$

⁹¹
³⁹Y

(58.6 day)

THERMAL CROSS SECTIONS

$$\sigma_T = 1.4 \pm 0.3 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
^{235}U	activation	JNE,25,129(71)	Ryves
^{235}U	diffraction	ACR,19,679(65)-	Fert
^{235}U	diffraction	ACR,19,679(65)	Paton
^{235}U	diffraction	ACR,19,679(65)-	Villain
^{235}U	σ_t, σ_a	NYO-GEN-72-29,64(64)	Rusted
^{235}U	diffraction	KRI,7,948(62)	Kuz'minov
^{235}U	diffraction	JCP,35,1950(61)	Atoji
^{235}U	activation	PR,123,903(61)	Heath
^{235}U	activation	CJP,38,1690(60)	Hilton
^{235}U	diffraction	ACR,10,797(57)	Prince
^{235}U	activation	PRIVATE COMM.(56)	Lyon
^{235}U	activation	JCP,23,2108(55)	Smith
^{235}U	pile osci.	JPR,12,584(51)	Benoist
^{235}U	local osci.	PR,83,641(51)	Fowerance
^{235}U	activation	PR,72,888(47)	Seren
^{235}U	σ_t	PR5/A,162,127(37)	Goldhaber
^{235}U	σ_a	PR,49,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
^{235}U	σ_t	2.598-30.05	NP/A,123,561(69)	Morgenstern
^{235}U	σ_t	0.68-76.8	JPR,24,994(63)	Bianchi
^{235}U	σ_t	2.590-25.420	PL,3,67(62)	Julien
^{235}U	σ_t	2.5-13.0	AP,14,387(61)	Biipuch
^{235}U	σ_t	2.5-17.0	PR,109,926(58)	Good
^{235}U	σ_t	0.002-2.0	PR,110,692(58)	Seth

⁴⁰Zr

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.185 \pm 0.003 \text{ b} \\ \bar{\sigma}_a &= 6.40 \pm 0.07 \text{ b} \\ a_{coh} &= 7.0 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 1.10 \pm 0.15 \text{ b} \\ R_{\gamma} &= 7.1 \pm 0.4 \text{ fm}\end{aligned}$$

⁹⁰Zr

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.10 \pm 0.07 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 0.20 \pm 0.03 \text{ b} \\ R_{\gamma} &= 7.1 \pm 0.4 \text{ fm} \\ \langle D \rangle &= 3.0 \pm 1.0 \text{ keV} \\ S_0 &= 1.4 \pm 0.5 \\ S_1 &= 4.6 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{Abn} = 51.46$$

$$S_n = 7202.6 \pm 2.7 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (eV)	l	Γ_{γ} (eV)	$g\Gamma_n^0$ (eV)
3848 ± 10	11 ± 2	0	0.30 ± 0.05	0.18 ± 0.02
3988 ± 10	0.16 ± 0.03	[1]	(0.3)	0.003 ± 0.001
7249 ± 22	8.4 ± 0.9	[1]	0.40 ± 0.08	0.10 ± 0.01
7572 ± 24	0.78 ± 0.05		0.32 ± 0.05	0.009 ± 0.001
8823 ± 30	7.3 ± 0.7	[1]	0.50 ± 0.08	0.078 ± 0.008
9565 ± 34	0.086 ± 0.006		(0.3)	0.0009 ± 0.0001
11490 ± 44	0.090 ± 0.008		(0.3)	0.0008 ± 0.0001
12416 ± 50	0.27 ± 0.04		(0.3)	0.0024 ± 0.0004
13310 ± 60	70 ± 10	0	0.25 ± 0.05	0.605 ± 0.087
17230 ± 100	210 ± 15	0	0.21 ± 0.05	1.60 ± 0.11
34700 ± 100	89			0.84
40100 ± 100	94			0.47
41600	362			1.79
42400 ± 200	342			1.68
44100 ± 1000	320			1.03
56000	126			0.54
59000	310			1.29
68000	563			2.20

⁹¹Zr
₄₀

Thermal cross sections

$\sigma_{\gamma} = 1.03 \pm 0.52 \text{ b}$

Resonance properties

$I_{\gamma} = 6.5 \pm 0.8 \text{ b}$
 $R' = 7.1 \pm 0.4 \text{ fm}$
 $\langle D \rangle = 250 \pm 60 \text{ eV}$
 $S_0 = 0.9 \pm 0.3$
 $S_1 = 5.0 \pm 0.8$

Resonance parameters

$I^{\pi} = 5/2^{+}$

$\chi_{\text{Abn}} = 11.23$

$S_n = 8635.1 \pm 1.4 \text{ keV}$

$E_0 \text{ (eV)}$	$2\sigma \Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$2\sigma \Gamma_n^0 \text{ (meV)}$	$2\sigma \Gamma_n^1 \text{ (meV)}$
Bound level		2				
181.8 ± 0.2	10.2 ± 0.8	3	0	120 ± 40	0.76 ± 0.06	
240.0 ± 0.2	3.0 ± 0.5	2	1	300 ± 50	0.19 ± 0.03	388
292.0 ± 0.3	635 ± 40	2	0	150 ± 30	36.6 ± 2.3	
448.0 ± 1.0	4.8 ± 0.4	2	1	(300)	0.23 ± 0.02	215
680.0 ± 0.6	950 ± 70	3	0	150 ± 30	36.4 ± 2.7	
890 ± 1	45 ± 4	3	1	200 ± 100	1.5 ± 0.1	827
1530 ± 1	8600 ± 280	2	0	210 ± 10	220 ± 7	
1947 ± 3	350 ± 30		1		7.9 ± 1.8	2000
1990 ± 2	35 ± 6				7.8 ± 1.3	
2005 ± 2	530 ± 40				11.8 ± 0.9	2895
2370 ± 4	253 ± 40		1	210 ± 20	5.2 ± 0.8	
2461 ± 4	3416 ± 660	[2]	0	(300)	69 ± 13	
2718 ± 4	1085 ± 935	[3]	0	160 ± 30	208 ± 18	
2758 ± 5	233 ± 33	[2]	1	320 ± 40	4.4 ± 0.5	790
3158 ± 6	1400 ± 350	[3]	1	(300)	24.9 ± 6.2	3900
3595 ± 7	292 ± 47	[3]		320 ± 50	4.9 ± 0.8	
3640 ± 8	315 ± 47	[3]		(300)	5.2 ± 0.8	
3854 ± 9	280 ± 47	[3]		(300)	4.5 ± 0.8	
3991 ± 9	14350 ± 2000	[3]		210 ± 30	227 ± 32	
4276 ± 10	238 ± 35			(300)	3.6 ± 0.5	

⁹²Zr
40

THERMAL CROSS SECTIONS

$$\sigma_T = 0.26 \pm 0.08 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 0.54 \pm 0.12 \text{ b}$$

$$R_T = 7.1 \pm 0.4 \text{ fm}$$

$$\langle D \rangle = 1.5 \pm 0.5 \text{ keV}$$

$$S_0 = 1.6 \pm 0.6$$

$$S_1 = 6.5 \pm 1.0$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\chi_{\text{Abn}} = 17.11$$

$$S_n = 6758 \pm 4 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (eV)	ℓ	Γ_T (eV)	$g\Gamma_n^0$ (eV)
2004 $\pm$ 2	0.29 $\pm$ 0.3	1	(0.3)	0.0062 $\pm$ 0.0010
2725 $\pm$ 5	23 $\pm$ 2	0	0.15 $\pm$ 0.03	0.443 $\pm$ 0.039
4160 $\pm$ 10	4.5 $\pm$ 0.5	1	0.50 $\pm$ 0.05	0.070 $\pm$ 0.008
4760 $\pm$ 20	12 $\pm$ 2	0	0.26 $\pm$ 0.04	0.174 $\pm$ 0.029
5023 $\pm$ 12	2.3 $\pm$ 0.3	1	0.24 $\pm$ 0.04	0.032 $\pm$ 0.004
6625 $\pm$ 18	0.21 $\pm$ 0.04	(0.3)	(0.3)	0.003 $\pm$ 0.001
6890 $\pm$ 20	72 $\pm$ 8	0	0.60 $\pm$ 0.08	0.870 $\pm$ 0.098
8822 $\pm$ 28	8.1 $\pm$ 0.7		0.27 $\pm$ 0.04	0.086 $\pm$ 0.007
9108 $\pm$ 26	6.8 $\pm$ 0.3		0.23 $\pm$ 0.03	0.071 $\pm$ 0.006
9791 $\pm$ 33	0.21 $\pm$ 0.03			0.0021 $\pm$ 0.0003
12100	25			0.23
14500	38			0.32
17200	38			0.30
23100	121			0.81
34300	217			1.19
39200	208			1.07
44700	186			0.90
47000 $\pm$ 400	600 $\pm$ 200			2.7 $\pm$ 0.8

⁹³
⁴⁰Zr
[9.5 × 10⁵ yr]

THERMAL CROSS SECTIONS

$$1.3 < \sigma_T < 4 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma \sim 33 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$S_n = 8191 \pm 5 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	$2g\Gamma_n^0$ (meV)
110 ± 2	270 ± 30	26 ± 3

⁹⁴
₄₀Zr

THERMAL CROSS SECTIONS

$$\sigma_T = 0.056 \pm 0.004 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 0.30 \pm 0.03 \text{ b}$$

$$R' = 7.1 \pm 0.4 \text{ fm}$$

$$\langle D \rangle = 1.7 \pm 0.3 \text{ keV}$$

$$S_0 = 1.4 \pm 0.5$$

$$S_1 = 4.6 \pm 0.5$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\chi_{\text{Abn}} = 17.40$$

$$S_n = 6475 \pm 5 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (eV)	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)
2263 ± 3	0.75 ± 0.11		0.135 ± 0.05	0.015 ± 0.002
2728 ± 5	0.0030 ± 0.0003		(0.30)	0.00006 ± 0.0000
4904 ± 11	0.28 ± 0.05	[1]	(0.30)	0.004 ± 0.001
5800 ± 14	22 ± 6	[1]	0.65 ± 0.05	0.290 ± 0.79
7065 ± 20	25 ± 5	0	0.30 ± 0.05	0.33 ± 0.06
7462 ± 20	0.23 ± 0.04	[1]	(0.30)	0.003 ± 0.001
10126 ± 34	0.26 ± 0.04		(0.30)	0.0026 ± 0.0004
12006 ± 37	0.30 ± 0.03		(0.30)	0.0027 ± 0.0003
12600 ± 100	21 ± 6		0.26 ± 0.05	0.19 ± 0.05
12798 ± 57	0.26 ± 0.05		(0.30)	0.0023 ± 0.0004
14229 ± 70	0.27 ± 0.05		(0.30)	0.0022 ± 0.0004
17700 ± 200	16			0.12
17950 ± 200	54 ± 8			0.21
19750 ± 300	110 ± 10			0.79 ± 0.07
20200	85			0.61
23100	50			0.32
23700	43.5			0.28
25100	57			0.36
29000	57			0.34
29800	57			0.34
30200	78			0.45
31800	134			0.75
33800	130			0.71
36300	69			0.36
40000	145			0.73
41600	267			1.29

⁹⁶
₄₀Zr

THERMAL CROSS SECTIONS

$$\sigma_T = 0.017 \pm 0.003 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 5.0 \pm 0.4 \text{ b}$$

$$S_0 = 1.0 \pm 0.6$$

RESONANCE PARAMETERS

$I'' = 0^\circ$		$\chi_{\text{abn}} = 2.80$			$S_n = 5571 \pm 3 \text{ keV}$		
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$	
302 ± 1	0.19 ± 0.03	1/2	1	0.250 ± 0.020	0.011 ± 0.002	17.9	
3845 ± 40	6 ± 2				0.097 ± 0.032		
4120 ± 30	13 ± 1				0.19 ± 0.03		
4610 ± 10	6 ± 2				0.08 ± 0.04		
5500 ± 50	15.7 ± 3.0				0.211 ± 0.050		
5970 ± 90	4				0.05		
15450 ± 100							
22760	46				0.3		
29400	402				2.39		
34500	70				0.4		
36100	93				0.5		
37200	43				0.23		
38900	96				0.49		
40700	180				0.91		
45800	86				0.5		
51600	60				0.25		
54200	1170				5.11		
58300	558				2.35		

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Zr ^{94,96}	activation	NSE,46,314(71)	Fulmer
Zr ^{94,96}	activation	CJP,48,2362(70)	Ricabarra
Zr		NIM,86,83(70)	Malik
Zr	σ_y (0.025 ev)	68WASH,2,857(68)	Lopez
Zr	pile osci.	66PAR15,1,479(66)	Carre
Zr	diffraction	ANL-6797,393(63)	Mueller
Zr	σ_e	NSE,11,298(61)	Joki
Zr	pile osci.	JNE,12,32(60)	Tattersall
Zr ^{94,96}	activation	NSE,8,378(60)	Lyon
Zr	pile osci.	AERE-R/M-100(57)	Cummins
Zr ⁹³	pile osci.	ORNL-1789,50(55)	Pomerance
Zr ^{90,91,92,94,96}	pile osci.	PR,88,412(52)	Pomerance
Zr	pile osci.	PR,83,641(51)	Pomerance
Zr	diffraction	PR,83,88(51)	Pomerance
Zr	diffraction	PR,81,527(51)	Shull
Zr	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Zr	σ_{γ} (spectra)	182-1530	BAP, 17, 16(72)	Mughabghab
Zr	σ_{γ} (spectra)	182-1530	BAP, 17, 18(72)	Mughabghab
Zr ⁹⁰	$\sigma_{\gamma}\sigma_t$	3848-17268	NSE, 37, 137(69)	Bartolome
Zr ⁹¹	$\sigma_{\gamma}\sigma_t$	182-4265	NSE, 37, 137(69)	Bartolome
Zr ⁹²	$\sigma_{\gamma}\sigma_t$	2004-9791	NSE, 37, 137(69)	Bartolome
Zr ⁹⁴	$\sigma_{\gamma}\sigma_t$	2263-14229	NSE, 37, 137(69)	Bartolome
Zr	σ_t	182-2008	NP/A, 132, 129(69)	Julien
Zr	σ_t	182-2008	NP/A, 123, 561(69)	Morgenstern
Zr	σ_t	182-885	BAP, 14, 104(69)	Rimawi
Zr ⁹⁰	σ_t	3800-68000	PR, 165, 1329(68)	Good
Zr ⁹²	σ_t	2700-52000	PR, 165, 1329(68)	Good
Zr ⁹⁴	σ_t	5700-43700	PR, 165, 1329(68)	Good
Zr ⁹⁶	σ_t	2680-58300	PR, 165, 1329(68)	Good
Zr	$\sigma_{\gamma}\sigma_t$	182-3890	68WASH, 2, 857(68)	Lopez
Zr	σ_t	182-293	PL, 14, 123(65)	Muradyan
Zr, Zr ^{90, 91, 94}	σ_{γ}	1-50000	AE, 19, 294(65)	Kapchigashev
Zr ⁹⁰	σ_t	3912-17850	NP, 53, 667(64)	Moskalev
Zr ⁹¹	σ_t	182-5600	NP, 53, 667(64)	Moskalev
Zr ⁹²	σ_t	1860-6880	NP, 53, 667(64)	Moskalev
Zr ⁹⁴	σ_t	2273-19860	NP, 53, 667(64)	Moskalev
Zr ⁹⁶	σ_t	303-5510	NP, 53, 667(64)	Moskalev
Zr ⁹⁰	σ_t	3880-17800	ORNL-3425, 32(63)	Block
Zr ⁹¹	σ_t	182-5600	ORNL-3425, 32(63)	Block
Zr ⁹²	σ_t	2700-47200	ORNL-3425, 32(63)	Block
Zr ⁹⁴	σ_t	2250-24000	ORNL-3425, 32(63)	Block
Zr ⁹⁶	σ_t	301-15400	ORNL-3425, 32(63)	Block
Zr ⁹¹	σ_{γ} (spectra)	182-2050	PR, 131, 2143(63)	Jackson
Zr	σ_t	182-3812	CR, 254, 4009(62)	Julien
Zr	σ_t	182-18007	BAP, 6, 69(61)	Olsen
Zr	σ_t	182-1490	JPR, 22, 719(61)	Corge
Zr	σ_{γ} (spectra)	thermal	BAP, 6, 237(61)	Bartholomev
Zr ⁹³	σ_t	110	ORNL-2610, 22(58)	Block

THERMAL CROSS SECTIONS

$$\sigma_T = 1.15 \pm 0.05 \text{ b}$$

$$a_{coh} = 7.11 \pm 0.04 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 8.5 \pm 0.5 \text{ b}$$

$$R_T = 7.0 \pm 0.2 \text{ fm}$$

$$S_0 = 0.36 \pm 0.06$$

$$S_1 = 5.16 \pm 0.24$$

RESONANCE PARAMETERS

$$I^\pi = 9/2^+$$

$$Z_{Abr} = 100$$

$$S_n = 7228.9 \pm 1.5 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_T (meV)	$2g\Gamma_n^0$ (meV)	$g\Gamma_n^1$ (meV)
35.8 ± 0.1	180 ± 30	0.11 ± 0.01	5	1	180 ± 30		110
42.3 ± 0.1	175 ± 30	0.088 ± 0.008	4	1	175 ± 30		72
94.3 ± 0.1	175 ± 30	0.35 ± 0.04		1	175 ± 30		85
105.8 ± 0.2	145 ± 30	0.45 ± 0.02	4	0	145 ± 50	0.044 ± 0.002	
119.2 ± 0.2	125 ± 15	4.0 ± 0.2	[4]	0	125 ± 15	0.37 ± 0.02	
192.2 ± 0.2		0.5 ± 0.3					
193.8 ± 0.2	161 ± 12	36 ± 4	[4]	0	125 ± 15	2.6 ± 0.3	
243.7 ± 0.2	162 ± 20	2.2 ± 0.2	[5]	1	160 ± 20		125
319.0 ± 0.2	222 ± 40	1.8 ± 0.2	5	1	220 ± 50		68
335.5 ± 0.2	149 ± 20	17.0 ± 1.0	4	0	130 ± 20	0.93 ± 0.09	
362.6 ± 0.3		0.27 ± 0.08					
365.0 ± 0.3		0.50 ± 0.15					
378.4 ± 0.3	302 ± 40	110 ± 10	[4]	0	180 ± 40	5.7 ± 0.6	
392.5 ± 0.3	203 ± 30	2.4 ± 0.2		1	200 ± 30		64
460.3 ± 0.3	170 ± 35	7.9 ± 0.6		0	162 ± 35	0.37 ± 0.02	
500.6 ± 0.4	230 ± 50	4.8 ± 0.6		1	225 ± 50		88
599.3 ± 0.4	145 ± 40	1.2 ± 0.2		[0]		0.05 ± 0.03	
604.4 ± 0.4	160 ± 40	3.4 ± 0.3		0		0.14 ± 0.01	
617.7 ± 0.4	150 ± 40	1.1 ± 0.2					
640.8 ± 0.5	150 ± 40	5.3 ± 0.5				0.21 ± 0.02	
672.0 ± 0.5	220 ± 40	8.7 ± 0.8		1			108
678.2 ± 0.5	135 ± 30	2.0 ± 0.2		1	135 ± 30		24
721.3 ± 0.5	250 ± 50	14.1 ± 1.5		1			158
741.4 ± 0.6	300 ± 25	186 ± 15	[5]	0	129 ± 16	6.8 ± 0.6	
757.3 ± 0.6	250 ± 50	2.0 ± 0.4		1			22
912.3 ± 0.8	200 ± 60	3.8 ± 0.4	4	0		0.13 ± 0.01	

⁹³Nb
41

E_0 (eV)	Γ (meV)	$2g_n^+$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)	g_n^1 (meV)
934.7±0.8	580 ± 30	397 ± 30	4	0	140 ± 20	13.0 ± 1.3	
952.7±0.8	262 ± 80	12.1 ± 1.3		1			127
1009.0±0.9	700 ± 60	560 ± 50		0	138 ± 14	17.6 ± 1.6	
1016.4±0.9	280 ± 70	25.1 ± 3.0		1			166
1107.7±1.0	250 ± 50	9.0 ± 0.9					
1127.2±1.1	250 ± 50	18 ± 2					
1147.7±1.1	305 ± 35	182 ± 25	5	0	140 ± 17	5.37 ± 0.74	
1175.3±1.1	476 ± 40	300 ± 30	4	0	143 ± 16	9.0 ± 0.9	
1193.9±1.1	210 ± 50	39 ± 5		0		1.13 ± 0.11	
1228.9±1.2	195 ± 50	39 ± 4		0		1.11 ± 0.11	
1243.0±1.2	264 ± 50	14.0 ± 1.4		1			69
1283.6±1.3	245 ± 50	10 ± 1		1			53
1350.4±1.4	285 ± 50	32.8 ± 1.6		1			144
1353.9±1.4	260 ± 50	11 ± 3		1			47
1393.1±1.4	344 ± 35	181 ± 27	4	0	144 ± 20		
1452.0±1.5	1176 ± 80	858 ± 77	4	0			
1466.8±1.6	288 ± 60	38 ± 6		1			112
1529.3±1.7	280 ± 60	13.9 ± 2.1					
1539.9±1.7	280 ± 60	27 ± 4					
1556.0±1.7	266 ± 60	15 ± 2					
1576.2±1.7	730 ± 100	199 ± 30		0			
1616.0±1.8	270 ± 60	30 ± 6		0			
1653.8±1.9	220 ± 50	45 ± 7		0			162
1712 ± 2	170 ± 40	53 ± 10		1			
1767 ± 2	180 ± 40	16 ± 5					
1810 ± 2	195 ± 30	89 ± 13					
1832 ± 2	1026 ± 150	715 ± 70	[4]	0			
1981 ± 2	250 ± 60	8 ± 2					
1990 ± 2	130 ± 30	21 ± 2	[4]	0			
2021 ± 2	840 ± 130	715 ± 70	5	0		15.9 ± 1.6	
2068 ± 2	300 ± 40	60 ± 10					
2074 ± 2	324 ± 50	173 ± 25					
2117 ± 2	300	41 ± 6		0			
2146 ± 3	330 ± 60	55 ± 20		[1]			91
2154 ± 3	410 ± 60	290 ± 70		[1]			120
2229 ± 3	230 ± 100	175 ± 25	5	0		6.2 ± 1.5	
2310 ± 3		2.9 ± 2.7		0		3.7 ± 0.5	
2335 ± 3		87 ± 9					
2341 ± 3		465 ± 50					
2361 ± 3		39 ± 4					
2392 ± 3		5.9 ± 1.8					

E_0 (eV)	Γ (meV)	$2g_n^+$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)	g_n^1 (meV)
2419 ± 3	2400 ± 700	2060 ± 300				42 ± 6	
2451 ± 3		25 ± 10					
2463 ± 3		95 ± 25					
2509 ± 3		34 ± 10					
2545 ± 3		50 ± 10					
2576 ± 3	2950 ± 900	35 ± 10				45 ± 6	
2637 ± 3		2310 ± 300		0			
2686 ± 3		45 ± 15					
2709 ± 3		35 ± 5					
2832 ± 3		18 ± 6					
2924 ± 3	370 ± 100 510 ± 150	195 ± 30		0		3.6 ± 0.5 6.8 ± 1.0	
2950 ± 3		370 ± 55		0			
2984 ± 3		13 ± 13					
3224 ± 3		23 ± 12					
3254 ± 3		21 ± 12					
3272 ± 4	900 ± 300	45 ± 15				4.0 ± 1.0	
3281 ± 4		22 ± 11		0			
3355 ± 4		230 ± 60					
3373 ± 4		55 ± 26		0			
3392 ± 4		990 ± 115					
3406 ± 4	970 ± 300	10 ± 5				16 ± 2	
3425 ± 4		8 ± 4		0			
3522 ± 4		950 ± 120					
3587 ± 4		45 ± 20					
3607 ± 4		80 ± 20					
3669 ± 4	750 ± 220	180 ± 35		0		7.0 ± 0.7	
3760 ± 4		430 ± 40					
3839 ± 4		130 ± 30					
3925 ± 4		100 ± 30					
3940 ± 4		80 ± 30					
3974 ± 4	1750 ± 500	580 ± 90				14 ± 1 0.26 ± 0.06 0.40 ± 0.20 0.10 ± 0.10 0.20 ± 0.10 0.20 ± 0.10 0.60 ± 0.20	17
3985 ± 4		100 ± 30					26
4021 ± 4		60 ± 30					6
4036 ± 4		100 ± 30		0			13
4066 ± 4		890 ± 90					38
4120.0 ± 4.0							
4138.0 ± 4.0							
4190.0 ± 4.0							
4228.0 ± 4.0							
4252.0 ± 4.0							
4291.0 ± 4.0							

⁹³Nb
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E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)	g_n^1 (meV)
4320.0±4.0						0.16 ± 0.10	10
4346.0±4.0						0.40 ± 0.20	25
4365.0±4.0						0.10 ± 0.10	6
4380.0±4.0						0.10 ± 0.10	6
4401.0±4.0						0.20 ± 0.10	12
4449.0±4.0						0.30 ± 0.20	18
4480.0±4.0						0.04 ± 0.04	2
4539.0±4.0						0.20 ± 0.20	12
4553.0±4.0						4.60 ± 1.00	
4595.0±4.0						32.00 ± 6.00	
4606.0±4.0						0.20 ± 0.20	12
4647.0±4.0						0.20 ± 0.10	12
4726.0±5.0						0.20 ± 0.10	11
4740.0±5.0						0.30 ± 0.20	17
4780.0±5.0						0.10 ± 0.10	6
4807.0±5.0						1.03 ± 0.10	61
4825.0±5.0						1.08 ± 0.20	60
4840.0±5.0						0.10 ± 0.10	6
4868.0±5.0						0.10 ± 0.10	6
4885.0±5.0						0.06 ± 0.06	3
4910.0±5.0						0.10 ± 0.10	6
4932.0±5.0						0.30 ± 0.10	16
4955.0±5.0						0.10 ± 0.10	5
5043.0±5.0						2.40 ± 0.60	
5063.0±5.0						1.60 ± 0.40	
5085.0±5.0						0.30 ± 0.10	
5105.0±5.0						0.20 ± 0.10	
5150.0±5.0						46.00 ± 10.00	
5165.0±5.0						0.40 ± 0.40	
5176.0±5.0						0.20 ± 0.20	
5229.0±5.0						0.40 ± 0.20	
5265.0±5.0						0.10 ± 0.10	
5292.0±5.0						1.40 ± 0.20	
5335.0±5.0						0.20 ± 0.20	
5387.0±5.0						0.20 ± 0.20	
5465.0±6.0						1.50 ± 0.40	
5480.0±6.0						0.20 ± 0.20	
5509.0±6.0						1.00 ± 0.20	
5543.0±6.0						3.80 ± 0.80	
5571.0±6.0						7.00 ± 1.40	
5600.0±6.0						0.20 ± 0.10	

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	$g\Gamma_n^1$ (meV)
5652.0±6.0						4.00 ± 1.00	
5687.0±6.0						24.00 ± 6.00	
5716.0±6.0						0.20 ± 0.20	
5735.0±6.0						0.40 ± 0.20	
5788.0±6.0						4.60 ± 1.00	
5830.0±6.0						1.00 ± 0.40	
5855.0±6.0						10.00 ± 3.00	
5874.0±6.0						0.24 ± 0.00	
5898.0±6.0						12.00 ± 4.00	
5936.0±6.0						0.10 ± 0.10	
5999.0±6.0						44.00 ± 10.00	
6044.0±7.0						8.00 ± 2.00	
6089.0±7.0						0.60 ± 0.20	
6108.0±7.0						10.00 ± 1.60	
6145.0±7.0						0.20 ± 0.20	
6168.0±7.0						2.80 ± 0.60	
6208.0±7.0						1.60 ± 0.40	
6221.0±7.0						1.80 ± 0.40	
6275.0±7.0						0.70 ± 0.20	
6350.0±7.0						0.30 ± 0.10	
6406.0±7.0						30.00 ± 6.00	
6445.0±7.0						0.60 ± 0.20	
6498.0±7.0						11.00 ± 2.00	
6535.0±7.0						3.30 ± 0.60	
6565.0±7.0						1.30 ± 0.40	
6630.0±7.0						12.00 ± 2.00	
6711.0±8.0						3.00 ± 0.60	
6734.0±8.0						2.80 ± 0.60	
6780.0±8.0						0.90 ± 0.30	
6795.0±8.0						9.00 ± 2.00	
6841.0±8.0						0.60 ± 0.20	
6860.0±8.0						0.20 ± 0.20	
6880.0±8.0						0.40 ± 0.20	
6904.0±8.0						7.00 ± 2.00	
6927.0±8.0						3.00 ± 1.00	
7039.0±8.0						8.00 ± 1.60	
7071.0±8.0						0.50 ± 0.20	
7129.0±8.0						0.70 ± 0.20	
7237.0±9.0						24.00 ± 6.00	
7322.0±9.0						2.20 ± 0.60	

⁹⁴
⁴¹Nb
[2.0 × 10⁴ yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 13.6 \pm 1.5 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 125 \pm 8 \text{ b}$$

RESONANCE PARAMETERS

$$I^{\pi} = 6^{+}$$

$$S_n = 8495.9 \pm 3.2 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
11.63 ± 0.05	5.86 ± 0.68	162 ± 20	1.72 ± 0.20
22.63 ± 0.20	0.95 ± 0.10	213 ± 25	0.20 ± 0.02

⁹⁵
⁴¹Nb
[35.1 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} < 7 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Nb ⁹³	Christiansen filters	ZN,26A,391(71)	Koester
Nb ⁹⁴	activation	PRIVATE COMM.(69)	Schuman
Nb ^{93,94}	activation	ORNL-4306,2(68)	Uruschel
Nb ⁹⁵	activation	ORNL-3488,9(63)	Halperin
Nb ^{93,94}	activation	100-16760,13(61)	Schuman
Nb ^{93,94}	pile osci.	JNE,12,32(60)	Tattersall
Nb ⁹³	pile osci.	AERE-R/R-2516(58)	Jovitt
Nb ⁹⁴	activation	PR,92,369(53)	Douglas
Nb ⁹⁴	pile osci.	PR,83,641(51)	Pomerance
Nb ⁹³	diffraction	PR,81,527(51)	Shull
Nb ⁹⁴	pile osci.	PR,80,342(50)	Harris
Nb ⁹⁴	pile osci.	PP5/A,63,1175(50)	Colmer
Nb ⁹⁴	pile react.	PR,72,16(47)	Anderson
Nb ⁹³	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Nb ⁹³	σ_y (spectra)	35.-336.	PR/C,3,2054(71)	Chrien
Nb ⁹⁴	σ_t	10.-50.	IN-1317,3(69)	Serpa
Nb ⁹³	σ_y (spectra)	35.-119.	PR,174,1421(68)	Prestwich
Nb ⁹³	σ_y	35.-1400.	NP/A,93,340(67)	Lopez
Nb ⁹³	σ_y rot.sample	35.-1228.	65ANTWERP,183(65)	Muradyan
	σ_y (S1)			
Nb ⁹³	$\sigma_t \sigma_y \bar{\sigma}_s$	35.-400.	NP,72,298(65)	Iliescu
	σ_y (S1)			
Nb ⁹³	$\sigma_t \sigma_y \bar{\sigma}_s$	94.-378.	ZET,49,410(65)	Kim
Nb ⁹³	σ_t	35.-4000.	NP,70,497(65)	Poittevin
Nb ⁹³	σ_t	35.-7322.	PR/B,137,547(65)	
Nb ⁹³	σ_t	35.-194.	PL,11,378+488(63)	Jackson
Nb ⁹³	σ_t		PR,131,2153(63)	Jackson
Nb ⁹³	σ_y (S1)	35.-194.	BRP,5,32(60)	Desjardins
Nb ⁹³	σ_y (S1)	94.-1255.	PRIVATE COMM.(59)	Rosen
Nb ⁹³	σ_t	35.-744.	PR,109,1258(58)	Saplakoglu
Nb ⁹³	σ_t	35.-244.	PRIVATE COMM.(55)	Pilcher
Nb ⁹³	$\sigma_t \sigma_y$	195.	SSGENEVA,4,110(55)	Rae

⁴²Mo

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 2.65 \pm 0.08 \text{ b} \\ \sigma_s &= 5.8 \pm 0.2 \text{ b} \\ a_{coh} &= 6.9 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 22 \pm 2 \text{ b} \\ R' &= 6.8 \pm 0.2 \text{ fm} \\ S_0 &= 0.6 \pm 0.2 \\ S_1 &= 5.8 \pm 1.0\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (eV)	$ag\Gamma_n^0$ (meV)	E_0 (eV)	$ag\Gamma_n^0$ (meV)
2166.50 $\pm$ 1.40	0.20 $\pm$ 0.05	3393.0 $\pm$ 3.0	0.38 $\pm$ 0.15
2299.20 $\pm$ 1.50	0.14 $\pm$ 0.05	3489.9 $\pm$ 3.0	0.35 $\pm$ 0.15
2438.00 $\pm$ 1.65	0.78 $\pm$ 0.10	3504.0 $\pm$ 3.0	0.57 $\pm$ 0.20
2580.70 $\pm$ 1.80	0.80 $\pm$ 0.30	3623.0 $\pm$ 3.0	0.60 $\pm$ 0.20
2602.30 $\pm$ 1.80	0.14 $\pm$ 0.04	3650.5 $\pm$ 3.0	0.50 $\pm$ 0.10
3074.00 $\pm$ 2.00	0.25 $\pm$ 0.08	3726.0 $\pm$ 3.0	1.38 $\pm$ 0.40
3209.00 $\pm$ 2.50	0.25 $\pm$ 0.09	4138.0 $\pm$ 4.0	0.53 $\pm$ 0.15
3282.0 $\pm$ 2.5	24.0 $\pm$ 10.0	4178.0 $\pm$ 4.0	0.34 $\pm$ 0.10
3339.8 $\pm$ 2.5	0.28 $\pm$ 0.10	4930.0 $\pm$ 5.0	1.40 $\pm$ 0.40
3369.0 $\pm$ 3.0	0.19 $\pm$ 0.07		

⁹²
⁴²Mo

THERMAL CROSS SECTIONS

$$\sigma_T \sim 45 \text{ mb}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 0.52 \pm 0.11 \text{ b} \\ R' &= 6.4 \pm 0.8 \text{ fm} \\ S_0 &= 0.65 \pm 0.26 \\ S_1 &= 3.3 \pm 1.1\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$ $\%A_{bn} = 15.84$ $S_n = 8072 \pm 2.9 \text{ keV}$

E_0 (eV)	$g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	Γ_n^0 (meV)	$g\Gamma_n^1$ (eV)
347.0 $\pm$ 0.2	7.9 $\pm$ 0.6	1/2	0		0.42 $\pm$ 0.03	
1868.8 $\pm$ 1.1	47 $\pm$ 10	3/2	1			0.29
2322.6 $\pm$ 1.6	50 $\pm$ 6	3/2	1			0.22
3060.0 $\pm$ 2.0	75 $\pm$ 10	[1/2]	1			0.22
3169.0 $\pm$ 2.5	7800 $\pm$ 600	1/2	0	215 $\pm$ 20	138 $\pm$ 12	
4286.0 $\pm$ 4.0	1050 $\pm$ 200	3/2	1	220 $\pm$ 50		1.85

⁹²Mo
42

E ₀ (eV)	g _n ⁺ (meV)	J	ℓ	Γ _γ (meV)	g _n ⁰ (meV)	g _n ¹ (eV)
5568 ± 5	500 ± 50	3/2	1	300 ± 50		0.60
6024 ± 5	580 ± 150	3/2	1			0.62
6470 ± 6	1100 ± 100	1/2	1	108 ± 10		
6800 ± 7	580 ± 50	1/2	0	180 ± 30	7.0 ± 1.2	
7120 ± 7	520 ± 100	1/2	0	190 ± 30	6.2 ± 1.2	
8789 ± 9	2500 ± 500	3/2	1	170 ± 20	26.7 ± 5.3	1.51
8893 ± 9	3500 ± 300	[1/2]	1	220 ± 30		2.08
9127 ± 10	1600 ± 300	[1/2]	1	230 ± 40		0.88
10546 ± 15	460 ± 70	[3/2]	1	370 ± 100		0.21
11079 ± 15	360 ± 60	[3/2]	1	205 ± 30		0.16
11494 ± 15	11000 ± 1500	1/2	0	162 ± 15	103 ± 14	0.076
12800	220 ± 30	3/2	1			
13700	32000 ± 3000	1/2	0	132 ± 20	273 ± 27	1.57
14100	5200 ± 400	1/2	1	155 ± 16		0.63
14500	220 ± 40	3/2	1			1.55
15670	6000 ± 1400	1/2	1	172 ± 20		0.49
15720	1900 ± 700	[3/2]	1	160 ± 40		
16500	62500 ± 6000	1/2	0	166 ± 17	486 ± 50	0.06
17300	250 ± 70	3/2	1	375 ± 150		0.17
18000	800 ± 300	[3/2]	[1]	165 ± 40		1.15
18100	4000 ± 150					
19200	6000 ± 1500	[3/2]	1	180 ± 20		
20300	490 ± 200	1/2	0	160 ± 40		
20600	500 ± 220	1/2		150 ± 30		
20700	140 ± 60					
21100	31000 ± 3000	1/2	0	177 ± 20	210 ± 20	
21700	270 ± 50					
23900	15200 ± 1500	[3/2]	1	355 ± 40		2.11
25500	8400 ± 800	[3/2]	[1]	160 ± 15		1.06
25800	36500 ± 4000	1/2	0	166 ± 17	230 ± 30	
26200	73000 ± 5000					
28000	13000 ± 600					
28700	26000 ± 1900	1/2	0	199 ± 20	210 ± 20	
29800	37000 ± 3600					
30100	630 ± 320					
30300	5600 ± 800	[1/2]	1	127 ± 16	127 ± 16	
31100	57000 ± 3000	1/2	0	260 ± 30	260 ± 30	

■ Possibly complex

THERMAL CROSS SECTIONS

$$\sigma_{\gamma}^c = 16 \text{ mb}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 0.57 \pm 0.12 \text{ b}$$

$$R_{\gamma} = 6.5 \pm 1.3 \text{ fm}$$

$$S_0 = 0.8 \pm 0.4$$

$$S_1 = 5.4 \pm 1.5$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\% \text{Abn} = 9.04$			$S_n = 7375.1 \pm 2.2 \text{ keV}$		
E_0 (eV)	$g\Gamma_n$ (meV)	J	ℓ	Γ_{γ} (meV)	$g\Gamma_n^0$ (meV)	$g\Gamma_n\Gamma_{\gamma}/\Gamma$ (meV)	
108.8 $\pm$ 0.2	0.16 $\pm$ 0.02				0.015 $\pm$ 0.002	0.16 $\pm$ 0.02	
1051.7 $\pm$ 0.8	6.1 $\pm$ 0.6				0.19 $\pm$ 0.02	6.0 $\pm$ 0.6	
1541.8 $\pm$ 0.9	1100 $\pm$ 300			140 $\pm$ 20	28 $\pm$ 8	125 $\pm$ 12	
1660.4 $\pm$ 1.1	12.4 $\pm$ 1.7				0.30 $\pm$ 0.04	11.7 $\pm$ 1.5	
2178.4 $\pm$ 1.4	383 $\pm$ 135	[3/2]	[1]	260 $\pm$ 30	8.2 $\pm$ 2.9	220 $\pm$ 22	
3159.2 $\pm$ 3.0						155 $\pm$ 18	
3572.2 $\pm$ 3.0						195 $\pm$ 19	
3599.0 $\pm$ 3.0	1130 $\pm$ 660			167 $\pm$ 30	18.8 $\pm$ 11.0	145 $\pm$ 13	
4362.7 $\pm$ 4.0	508 $\pm$ 145	[3/2]	[1]	190 $\pm$ 30	7.7 $\pm$ 2.2	260 $\pm$ 24	
4616.4 $\pm$ 4.5	511 $\pm$ 73			192 $\pm$ 19	7.7 $\pm$ 2.2	140 $\pm$ 14	
4916.7 $\pm$ 5.0	1090 $\pm$ 310			200 $\pm$ 30	15.5 $\pm$ 4.4	168 $\pm$ 14	
5124.0 $\pm$ 5.0						175 $\pm$ 17	
5383.0 $\pm$ 5.0	15300 $\pm$ 2000				209 $\pm$ 30		

THERMAL CROSS SECTIONS

$$\sigma_T = 14.5 \pm 0.5 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_\gamma &= 105 \pm 7 \text{ b} \\ R' &= 7.1 \pm 1.4 \text{ fm} \\ S_0 &= 0.35 \pm 0.07 \\ S_1 &= 7 \pm 2 \end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$\% \text{Abn} = 15.72$$

$$S_n = 9154.2 \pm 0.5 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	$2g\Gamma_n^1$ (meV)
Bound level						
44.7±0.2	200 ± 10	3	0	150 ± 10	30.0 ± 1.5	
110.4±0.2	0.16± 0.02	1	1	310 ± 80	0.0153±0.002	
117.8±0.2	0.15± 0.02	2		200 ± 120	0.014 ± 0.002	68
159.5±0.2	14.1 ± 1.0	3	0	145 ± 20	1.26 ± 0.08	
217.9±0.2	1.3 ± 0.1		1		0.088 ± 0.006	200
245.8±0.2	0.50± 0.05				0.032 ± 0.003	
263.7±0.2	1.4 ± 0.2				0.086 ± 0.012	
331.3±0.3	3.4 ± 0.5		[1]		1.9 ± 0.3	280
358.5±0.3	300 ± 60	3	0	145 ± 20	15.8 ± 3.2	
418.2±0.2	1.0 ± 0.1				0.49 ± 0.05	
469.7±0.4	11 ± 1		[1]		0.51 ± 0.05	532
554.4±0.4	110 ± 20	2	0	170 ± 50	4.7 ± 0.9	
595.7±0.5	0.8 ± 0.2				0.03 ± 0.01	
630.0±0.5	20 ± 3		[1]		0.80 ± 0.12	622
661.6±0.5	18.0 ± 1.5	3	0		0.70 ± 0.06	
680.7±0.6	830 ± 50	3	0	145 ± 15	31.8 ± 1.9	
702.8±0.6	2.9 ± 0.3				0.11 ± 0.01	
708.3±0.6	13.4 ± 0.8				0.50 ± 0.03	
745.5±0.6	5 ± 1		1		0.18 ± 0.04	120
769.8±0.7	24 ± 3	3	0		0.97 ± 0.12	
898.4±0.8	250 ± 30	2	0	175 ± 20	8.3 ± 1.0	
932.1±0.8	3.5 ± 0.3				0.12 ± 0.01	
956.5±0.8	1.5 ± 0.7				0.05 ± 0.02	
980.7±0.8	37 ± 6	2			1.2 ± 0.2	
1011.1±0.9	6.3 ± 0.5		[1]		0.18 ± 0.02	88
1025.0±0.9	110 ± 20	3	0		3.4 ± 0.6	
1035.7±0.9	13.2 ± 1.0				0.41 ± 0.03	
1059.2±0.9	9.2 ± 0.8				0.28 ± 0.03	
1122.5±1.1	4.0 ± 0.6				0.12 ± 0.02	
1144.6±1.1	250 ± 50	2	0		7.4 ± 1.5	
1170.5±1.2	20.6 ± 1.8				0.60 ± 0.05	
1203.7±1.2	210 ± 20	3	0	(150)	6.1 ± 0.6	
1296.9±1.3	11 ± 1				0.30 ± 0.03	
1341.2±1.4	94 ± 16				2.6 ± 0.4	
1360.6±1.4	6.0 ± 0.8				0.16 ± 0.02	
1386.7±1.4	11.6 ± 1.0				0.31 ± 0.03	
1419.0±1.4	620 ± 70	0		150 ± 15	16.4 ± 1.9	

⁹⁵₄₂Mo

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_0$ (meV)	$2g\Gamma_1$ (meV)
1437.0±1.4	15.6 ± 1.4				0.41 ±0.04	
1495.6±1.5					^a 80 ±9	
1570.0±1.6	12 ± 1				0.30 ±0.03	
1576.8±1.6	104 ± 1.0			220 ± 50	0.26 ±0.03	
1590.0±1.6	300 ±100				7.5 ±2.5	
1678.0±1.7	100 ± 25				2.4 ±0.6	
1704.1±1.7	82 ± 6				2.0 ±0.2	
1767.0±1.8					^a 70 ±6	
1788.0±1.8	62 ± 10				1.5 ±0.2	
1841.7±1.8	39 ± 5				0.91 ±0.12	
1853.3±1.8	6.4 ± 0.8				0.15 ±0.02	
1925.1±1.9	36 ± 5				0.82 ±0.11	
1950.5±1.9	393 ±110			145 ± 20	8.9 ±2.5	
1961.3±1.9	29 ± 3			(150)	0.66 ±0.07	
2047.0±2.0	250 ±100			195 ± 75	5.5 ±2.3	
2114.2±2.0	65 ± 10				1.4 ±0.2	
2131.0±2.0	290 ± 65			250 ± 60	6.3 ±1.4	
2142.0±2.0	36 ± 4				0.78 ±0.09	

^a $g\Gamma_n\Gamma_\gamma/\Gamma$

THERMAL CROSS SECTIONS

$$\sigma_T = 1.0 \pm 0.6 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_T^c &= 20 \pm 5 \text{ b} \\ R^c &= 6.6 \pm 1.3 \text{ fm} \\ S_0 &= 0.70 \pm 0.26 \\ S_1 &= 4.5 \pm 1.0 \end{aligned}$$

RESONANCE PARAMETERS

$I^n = 0^+$		$\chi_{\text{Abn}} = 16.53$			$S_n = 6816.1 \pm 1.7 \text{ keV}$		
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_\gamma \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$	$g\Gamma_n\Gamma_\gamma/\Gamma \text{ (meV)}$	
113.4 $\pm$ 0.1	0.45 $\pm$ 0.05	3/2	1	100 $\pm$ 25	^a 185	0.45 $\pm$ 0.04	
131.4 $\pm$ 0.1	290 $\pm$ 20				25.3 $\pm$ 1.8	66 $\pm$ 4	
419.0 $\pm$ 0.2	6.0 $\pm$ 0.4				0.29 $\pm$ 0.02	5.8 $\pm$ 0.4	
968.4 $\pm$ 0.8	2.7 $\pm$ 0.4				0.086 $\pm$ 0.013	2.7 $\pm$ 0.4	
1267.0 $\pm$ 0.8	2.2 $\pm$ 0.3				0.062 $\pm$ 0.008	2.2 $\pm$ 0.3	
1496.5 $\pm$ 0.8	9.9 $\pm$ 1.0	1/2	0	164 $\pm$ 15	0.26 $\pm$ 0.03	9.4 $\pm$ 0.7	
2080.6 $\pm$ 1.1	7.4 $\pm$ 1.1				0.16 $\pm$ 0.02	7.1 $\pm$ 1.0	
2363.2 $\pm$ 1.6	4000 $\pm$ 300				82.3 $\pm$ 6.2	158 $\pm$ 15	
2484.2 $\pm$ 1.7	35 $\pm$ 7				0.70 $\pm$ 0.14	27.0 $\pm$ 2.0	
2779.7 $\pm$ 2.0						45 $\pm$ 4	
3282.3 $\pm$ 2.5	9000 $\pm$ 2000	1/2	0	186 $\pm$ 27	157 $\pm$ 35	182 $\pm$ 27	
3572.2 $\pm$ 3.0	3440 $\pm$ 725	1/2	0	105 $\pm$ 8		102 $\pm$ 8	
3757.7 $\pm$ 3.0	371 $\pm$ 148			156 $\pm$ 61	6.1 $\pm$ 2.4	110 $\pm$ 9	
4319.8 $\pm$ 4.0	334 $\pm$ 120			96 $\pm$ 19	5.1 $\pm$ 1.8	75 $\pm$ 7	
4412.1 $\pm$ 4.0						87 $\pm$ 8	
4558.5 $\pm$ 5.0	67 $\pm$ 7			(100)	1.0 $\pm$ 0.1	40 $\pm$ 4	
4941.9 $\pm$ 5.0	20.2 $\pm$ 4.9				0.28 $\pm$ 0.07	18.0 $\pm$ 3.9	
5374							
5402							
5611						195 $\pm$ 19	
5784						68 $\pm$ 6	
6032						155 $\pm$ 16	
6560						220 $\pm$ 26	
7051						108 $\pm$ 11	

⁹⁷
⁴²Mo

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.2 \pm 0.7 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_{\gamma} &= 13 \pm 3 \text{ b} \\ R' &= 6.6 \pm 1.3 \text{ fm} \\ S_0 &= 0.34 \pm 0.06 \\ S_1 &= 8.0 \pm 2.5 \end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 5/2^{+}$		$\%Abn = 9.46$		$S_n = 8642.6 \pm 0.5 \text{ keV}$		
$E_0 \text{ (eV)}$	$2g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$	
70.93 ± 0.03	16.5 ± 1.5	2	0	130 ± 30	1.96 ± 0.18	
79.55 ± 0.04	0.11 ± 0.02			120 ± 60	0.012 ± 0.001	
109.58 ± 0.05	0.22 ± 0.08				0.021 ± 0.008	
126.89 ± 0.06	0.20 ± 0.08				0.018 ± 0.07	
136.37 ± 0.08	1.2 ± 0.1				0.10 ± 0.01	
210.0 ± 0.1	0.7 ± 0.2				0.048 ± 0.014	
227.4 ± 0.1	2.4 ± 0.2	3	[11]		0.159 ± 0.013	
233.3 ± 0.1	0.7 ± 0.01				0.046 ± 0.007	
248.0 ± 0.1	1.8 ± 0.2				0.11 ± 0.01	
268.1 ± 0.1	17.0 ± 1.5	3	0		1.04 ± 0.09	
285.9 ± 0.1	60 ± 6	2	0		3.55 ± 0.36	
311.9 ± 0.2	10.0 ± 1.5	3	0		0.57 ± 0.09	
321.1 ± 0.2	1.9 ± 0.2				0.11 ± 0.01	
352.5 ± 0.2	9.0 ± 1.0				0.48 ± 0.05	
380.7 ± 0.2	7.0 ± 1.0				0.35 ± 0.05	
397.0 ± 0.2	75 ± 8	3	0		3.7 ± 0.4	
475.3 ± 0.3	1.7 ± 0.2				0.080 ± 0.008	
505.4 ± 0.3	52 ± 5				2.31 ± 0.23	
528.3 ± 0.3	1.5 ± 0.2				0.065 ± 0.007	
533.8 ± 0.4	4.4 ± 0.4				0.19 ± 0.02	
548.3 ± 0.4	4.6 ± 0.5				0.20 ± 0.02	
558.3 ± 0.4	600 ± 50	3	0	130 ± 15	25.4 ± 2.1	
564.1 ± 0.4	2.6 ± 1.3				0.11 ± 0.05	
568.0 ± 0.4	6.6 ± 0.8				0.28 ± 0.03	
572.0 ± 0.4	5.6 ± 0.8				0.23 ± 0.03	
578.5 ± 0.4	1.7 ± 0.2				0.07 ± 0.01	
653.2 ± 0.5	2.7 ± 0.3				0.10 ± 0.01	
676.1 ± 0.5	385 ± 50			131 ± 16	14.8 ± 1.9	
694.7 ± 0.5	12.4 ± 0.8				0.47 ± 0.03	
700.7 ± 0.6	9.2 ± 0.6				0.35 ± 0.02	
786.4 ± 0.6	384 ± 118				13.7 ± 4.2	
809.2 ± 0.7	4.0 ± 0.5				0.14 ± 0.02	
862.6 ± 0.7	48 ± 10	2			1.63 ± 0.34	
905.7 ± 0.8	9.8 ± 0.8				0.33 ± 0.03	
975.1 ± 0.8	14.0 ± 1.2				0.45 ± 0.04	
1008.4 ± 0.9	62 ± 10				1.95 ± 0.31	
1108.5 ± 1.0	280 ± 34			114 ± 10	8.5 ± 1.1	
1134.0 ± 1.1	50 ± 12	2			1.48 ± 0.35	

⁹⁷
₄₂Mo

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1176.7 $\pm$ 1.1	75 $\pm$ 10	3	0	150 $\pm$ 20	2.18 $\pm$ 0.42
1194.2 $\pm$ 1.1	9.4 $\pm$ 1.0				0.27 $\pm$ 0.03
1250.0 $\pm$ 1.2	540 $\pm$ 190				15.2 $\pm$ 5.3
1270.4 $\pm$ 1.3	50 $\pm$ 10				1.40 $\pm$ 0.28
1293.5 $\pm$ 1.3	40.2 $\pm$ 6.4				1.11 $\pm$ 0.18
1318.0 $\pm$ 1.3	57.4 $\pm$ 13.2				1.58 $\pm$ 0.36
1333.5 $\pm$ 1.3	54.0 $\pm$ 11.6				1.48 $\pm$ 0.32
1364.6 $\pm$ 0.7	60 $\pm$ 12				1.63 $\pm$ 0.33
1375.4 $\pm$ 0.7	11.2 $\pm$ 1.6				0.30 $\pm$ 0.04
1398.0 $\pm$ 0.8	14.0 $\pm$ 1.4				0.37 $\pm$ 0.04
1425.3 $\pm$ 0.8	41 $\pm$ 4				1.09 $\pm$ 0.11
1453.1 $\pm$ 0.8	18.8 $\pm$ 2.4				0.49 $\pm$ 0.06
1485.0 $\pm$ 0.9	11.6 $\pm$ 1.4			150 $\pm$ 32	0.30 $\pm$ 0.04
1534.7 $\pm$ 0.9	415 $\pm$ 160				10.6 $\pm$ 4.2
1596.6 $\pm$ 0.9	57 $\pm$ 10				1.43 $\pm$ 0.25
1628.4 $\pm$ 0.9	6.9 $\pm$ 0.7				0.17 $\pm$ 0.02
1699.0 $\pm$ 1.0	42 $\pm$ 4				1.02 $\pm$ 0.10
1713.2 $\pm$ 1.0	90 $\pm$ 15				2.2 $\pm$ 0.4
1740.7 $\pm$ 1.0	36.6 $\pm$ 5.4				0.88 $\pm$ 0.12
1795.0 $\pm$ 1.1	52.8 $\pm$ 11.2				1.25 $\pm$ 0.26
1835.9 $\pm$ 1.1	13.6 $\pm$ 1.6				0.32 $\pm$ 0.04
1867.5 $\pm$ 1.1	18 $\pm$ 9				0.42 $\pm$ 0.21
1871.9 $\pm$ 1.1	18 $\pm$ 9				0.42 $\pm$ 0.21
1903.8 $\pm$ 1.1	78 $\pm$ 17				1.8 $\pm$ 0.4
1931.5 $\pm$ 1.2	48 $\pm$ 5				1.1 $\pm$ 0.1
1940.8 $\pm$ 1.2	50 $\pm$ 5				1.1 $\pm$ 0.1

⁹⁸
⁴²Mo

THERMAL CROSS SECTIONS

$$\sigma_T = 0.130 \pm 0.006 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} l_T &= 6.2 \pm 0.3 \text{ b} \\ R_T &= 7.0 \pm 1.4 \text{ fm} \\ S_0 &= 0.7 \pm 0.2 \\ S_1 &= 7.0 \pm 1.0 \end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\% \text{Abn} = 23.78$$

$$S_n = 5928 \pm 3 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (meV)	J	ℓ	Γ_T (meV)	$g\Gamma_n^0$ (meV)	$g\Gamma_n^1$ (meV)
12.1 ± 0.1	0.060 ± 0.004	3/2	1	125 ± 20	0.017 ± 0.001	690
401.8 ± 0.2	3.2 ± 0.2	3/2	1		0.15 ± 0.01	180
429.3 ± 0.2	70 ± 6	1/2	1	160 ± 15	3.4 ± 0.3	3880
467.4 ± 0.3	600 ± 60	1/2	0	110 ± 10	27.8 ± 2.3	
612.5 ± 0.4	65 ± 6	1/2	1	145 ± 15	2.42 ± 0.24	1940
818.1 ± 0.7	160 ± 25	3/2	1	90 ± 10	5.6 ± 0.9	3360
1122.5 ± 1.0	20.5 ± 6.0	3/2	1		0.61 ± 0.18	267
1526.5 ± 1.0	800 ± 100	1/2	0	75 ± 7	20.5 ± 2.5	
1922.0 ± 1.2	23.3 ± 6.9				0.53 ± 0.02	
2021.2 ± 1.2	2.5 ± 0.2				0.055 ± 0.005	
2176.6 ± 1.4	145 ± 50	1/2	1	145 ± 15	3.1 ± 1.1	700
2461.7 ± 1.7	120 ± 60	[1/2]		105 ± 20	2.4 ± 1.2	
2549.0 ± 1.8	1300 ± 200	1/2	0	70 ± 8	25.7 ± 4.0	
2615 ± 2	30 ± 5	3/2	1		0.59 ± 0.10	100
2947 ± 2	24 ± 2	[1/2]	1		0.44 ± 0.04	74
3264 ± 3	90 ± 30	[1/2]	1		1.58 ± 0.53	240
3293 ± 3	4800 ± 800	1/2	0	80 ± 8	84 ± 14	
3797 ± 3	315 ± 100	3/2		90 ± 10	5.1 ± 1.6	663
4013 ± 4	220 ± 25	3/2	1	80 ± 10	3.47 ± 0.40	428
4482 ± 5	309 ± 140	1/2	0	93 ± 32	4.6 ± 2.1	
4574 ± 5	540 ± 196	3/2	1	110 ± 35	8.0 ± 2.9	864
4843 ± 5	1023 ± 292	3/2	1	100 ± 12	14.7 ± 4.2	1500
5276 ± 6	247 ± 58	3/2	1	130 ± 30	3.4 ± 0.8	320
9052 ± 12	47850 ± 4000	1/2	0		50.3 ± 4.2	

¹⁰⁰Mo
42

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.199 \pm 0.003 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 3.75 \pm 0.15 \text{ b}$$

$$R^{\gamma} = 6.5 \pm 1.3 \text{ fm}$$

$$S_0 = 0.30 \pm 0.11$$

$$S_1 = 5.0 \pm 0.5$$

RESONANCE PARAMETERS

$$S_n = 539 \pm 19 \text{ keV}$$

$$\chi_{\text{abn}} = 9.63$$

$$I^n = 0^+$$

E_0 (eV)	g_n^0 (meV)	J	ℓ	Γ_{γ} (meV)	g_n^0 (meV)	g_n^1 (meV)
97.4 ± 0.1	0.38 ± 0.03	1			0.039 ± 0.003	200
363.8 ± 0.2	800 ± 100	1/2 0	68 ± 7		41.94 ± 5.2	
507.1 ± 0.1	4.3 ± 0.4				0.19 ± 0.02	
535.8 ± 0.1	4.1 ± 0.4		103 ± 10		0.18 ± 0.02	
785.68 ± 0.1	5.6 ± 0.5				0.20 ± 0.02	
1069.1 ± 0.1	350 ± 70	1/2 1	103 ± 10		10.7 ± 2.1	4915
1260.7 ± 0.2	300 ± 70	1/2 1	90 ± 10		8.5 ± 0.9	3310
1403.8						33 ± 3
1697.0 ± 1.0	1000 ± 100	1/2 1	118 ± 9		24.3 ± 2.4	7040
1764.8 ± 1.0	20 ± 5.8				0.48 ± 0.14	
1937.2 ± 1.2	1250 ± 200	1/2 0	55 ± 9		28.4 ± 4.5	
2061.7 ± 1.5	6.3 ± 0.8				0.14 ± 0.02	
2420.0 ± 1.7	414 ± 155	[1]	118 ± 25		8.3 ± 3.1	
2630.5 ± 1.9	213 ± 106		76 ± 20		4.2 ± 2.1	11.0 ± 1.1
2663.8 ± 2.0						
2950.0 ± 2.0	57 ± 29				1.04 ± 0.52	
3006.0 ± 2.0	3000 ± 600	1/2 0	51 ± 5		54.7 ± 10.9	
3065.0 ± 2.0	145 ± 46		65 ± 17		2.8 ± 1.0	
3261.5 ± 2.5	331 ± 114		83 ± 20		5.8 ± 2.0	
3539.3 ± 3.0						79 ± 8
3601.7 ± 3.0						59 ± 6
4151.0 ± 4.0	20.1 ± 5.9				0.31 ± 0.09	
4506 ± 5	211 ± 70		97 ± 30		3.1 ± 1.0	
4943.1 ± 5						75 ± 7
4727 ± 5	202 ± 108		59 ± 30		2.9 ± 1.6	

$$g_n^0 \Gamma_{\gamma} / \Gamma$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Mo	diffraction	ACR,A28,357(72)-	Bacon
Mo ¹⁰⁰	activation	CJP,47,2031(69)	Ricabarra
Mo ⁹⁸	activation	PRIVATE COMM.(68)	Fabry
Mo ⁹⁸	activation	JIN,29,2853(67)	Sims
Mo	pile osci.	66PARIS,479(66)	Carre
Mo ⁹⁸	activation	PRIVATE COMM.(61)	Sher
Mo ⁹⁸	activation	JNE,14,53(61)	Dahlberg
Mo ⁹⁸	activation	JIN,21,1(61)	Cabell
Mo ⁹⁸	activation	NSE,8,378(60)	Lyon
Mo ¹⁰⁰	activation	JNE,12,172(60)	Cabell
Mo ⁹⁸	activation	PR,91,1423(53)+	Hughes
Mo ^{92,95-96,100}	pile osci.	PR,88,412(52)	Pomerance
Mo	diffraction	PR,81,527(51)	Shull
Mo	pile osci.	PR,83,641(51)	Pomerance
Mo	pile osci.	NAT,166,825(50)	Lockett
Mo	pile osci.	PR,80,342(50)	Harris
Mo	σ_t	NAT,166,825(50)	Egelstaff
Mo	pile osci.	PPS/A,63,1175(50)	Colmer
Mo ^{92,98,100}	activation	PR,72,888(47)	Seran
Mo	absorption	PR,69,411(46)	Coltman
Mo	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Mo ⁹²	σ_{γ} (spectra)	0.347-31.1	PRIVATE COMM.(72)	Hasson
Mo ⁹²	σ_{γ}	3.06-31.1	PRIVATE COMM.(72)	Hasson
Mo ⁹²	σ_{γ}	0.347-31.1	PRIVATE COMM.(72)	Hasson
Mo ¹⁰⁰	σ_{γ}	0.097-4.727	71KNOX,749(71)	Weigmann
Mo ⁹⁸	σ_{γ}	0.012-5.261	71KNOX,749(71)	Weigmann
Mo ⁹⁷	σ_{γ}	0.071-1.941	71KNOX,749(71)	Weigmann
Mo ⁹⁶	σ_{γ}	0.113-7.051	71KNOX,749(71)	Weigmann
Mo ⁹⁵	σ_{γ}	0.045-2.141	71KNOX,749(71)	Weigmann
Mo ⁹⁴	σ_{γ}	0.108-5.124	71KNOX,749(71)	Weigmann
Mo ⁹²	σ_{γ}	0.347-11.49	71KNOX,749(71)	Weigmann
Mo ⁹⁸	σ_{γ} (spectra)	0.012-0.818	71KNOX,804(71)	Mughabghab
Mo ⁹⁸	σ_{γ} (spectra)	0.012-0.818	71KNOX,808(71)	Mughabghab
Mo ⁹⁸	σ_{γ} (spectra)	0.012-4.842	71ALBANY(71)	Chrien
Mo ⁹⁸	σ_{γ} (spectra)	0.012-4.842	71ALBANY(71)	Cole
Mo ⁹⁸	σ_{γ} (spectra)	0.12-1.5	PR,26,1118(71)	Mughabghab
Mo ⁹²	σ_{γ} (spectra)	0.347-5.5	PR,26,1118(71)	Mughabghab
Mo ⁹²	σ_{γ}	8.5-58.1	PRIVATE COMM.(69)	Divadeenam
Mo	σ_{γ}	0.045-0.159	NP/A,132,129(59)	Julien
Mo ⁹⁷	σ_{γ}	0.071-1.535	PR,179,1148(69)	Shue
Mo ⁹⁵	σ_{γ}	0.045-1.420	PR,179,1148(69)	Shue
Mo	σ_{γ}	0.012-1.5	PR,179,1148(69)	Shue
Mo ⁹⁸	σ_{γ} (spectra)	0.012-0.450	BAP,13,721(68)	Mughabghab
Mo	σ_{γ}	0.071-5.043	PR,166,1234(68)	Wynchank
Mo	σ_{γ}	0.010-25.0	NP/A,104,513(67)	Weigmann
Mo ⁹⁵	σ_{γ}	0.045-1.145	NP/A,104,586(67)	Coceva
Mo ⁹⁷	σ_{γ}	0.071-1.25	NP/A,104,586(67)	Coceva
Mo ⁹⁶	σ_{γ} (spectra)	0.113-.250	BAP,12,1199(67)	Mughabghab
Mo ⁹⁵	σ_{γ} (spectra)	0.045-.250	BAP,12,1199(67)	Mughabghab
Mo ¹⁰⁰	σ_{γ}	0.364-3.007	AERE-PR/NP-10,8(67)	Newstead
Mo ⁹⁸	σ_{γ}	0.429-9.053	AERE-PR/NP-10,8(67)	Newstead
Mo ⁹⁸	σ_{γ}	0.012	PRIVATE COMM.(66)	Cote
Mo	σ_{γ}	0.012-0.161	ZET,49,410(65)	Kim
Mo ¹⁰⁰	σ_{γ}	0.099-1.94	ZET,44,1187(63)	Pevzner
Mo ⁹⁸	σ_{γ}	0.012-9.0	ZET,44,1187(63)	Pevzner
Mo ⁹⁷	σ_{γ}	0.071-2.00	ZET,44,1187(63)	Pevzner
Mo ⁹⁶	σ_{γ}	0.113-3.66	ZET,44,1187(63)	Pevzner
Mo ⁹⁵	σ_{γ}	0.045-7.4	ZET,44,1187(63)	Pevzner
Mo ⁹⁴	σ_{γ}	1.52-5.38	ZET,44,1187(63)	Pevzner
Mo ⁹²	σ_{γ}	0.347-16.6	ZET,44,1187(63)	Pevzner
Mo	σ_{γ}	0.012	PRIVATE COMM.(62)	Boilingier
Mo	σ_{γ}	0.045-2.0	CR,254,4287(62)	Corge
Mo ⁹⁵	σ_{γ} (spectra)	0.045-.700	PR,127,1687(62)	Jackson
Mo	σ_{γ}	0.045-0.134	AE,5,55(56)	Radkevich
Mo ¹⁰⁰	σ_{γ}	0.367	PR,99,10(55)	Harvey
Mo ⁹⁸	σ_{γ}	0.480	PR,99,10(55)	Harvey
Mo ⁹⁷	σ_{γ}	0.071-0.058	PR,99,10(55)	Harvey
Mo ⁹⁶	σ_{γ}	0.133	PR,99,10(55)	Harvey
Mo ⁹⁵	σ_{γ}	0.045-0.700	PR,99,10(55)	Harvey
Mo	σ_{γ}	0.045-0.510	PR,99,10(55)	Harvey

⁹⁸
⁴³Tc
[1.5 × 10⁵ yr]

THERMAL CROSS SECTIONS

$$\sigma_T = 2.6 \pm 1.3 \text{ b}$$

⁹⁹
⁴³Tc
[2.13 × 10⁵ yr]

THERMAL CROSS SECTIONS

$$\sigma_T = 19 \pm 2 \text{ b}$$

$$a_{coh} = 6.8 \pm 0.3 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 340 \pm 20 \text{ b}$$

$$R_T = 6.0 \pm 0.5 \text{ fm}$$

$$S_0 = 0.44 \pm 0.14$$

$$S_1 = 4.6 \pm 1.4$$

RESONANCE PARAMETERS

$$I^n = 9/2^+$$

$$S_n = 6600 \pm 60 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_T (meV)	$2g\Gamma_n^0$ (meV)
5.64 ± 0.05	2.2 ± 0.5	260 ± 6	0.9 ± 0.2
20.3 ± 0.2	5.5 ± 1.0	260 ± 10	1.21 ± 0.2
39.9 ± 0.3	1.2 ± 0.2		0.19 ± 0.03
57.0 ± 0.5	3.0 ± 0.8		0.4 ± 0.1
111.8 ± 0.9	14 ± 2		1.3 ± 0.2
124.6 ± 1.0	4.5 ± 1.1		0.4 ± 0.1
164.0 ± 1.0	64 ± 6		5.0 ± 0.5
182.8 ± 1.5	66 ± 5		4.9 ± 0.4
192.6 ± 1.5	46 ± 3		3.3 ± 0.2
242.1 ± 2.0	50 ± 3		3.2 ± 0.2
280.0 ± 2.0	17 ± 2		1.0 ± 0.1

Note_ resonance parameters give 182 b for the absorption resonance integral

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Tc ⁹⁹	σ_t	NSE, 41, 188(70)	Hatanabe
Tc ⁹⁹	diffraction	ANL-6797, 393(63)	Mueller
Tc ⁹⁹	pile osci.	JNE, 12, 32(60)	Tattersall
Tc ⁹⁹	σ_t	NRDC-103(58)	Hay
Tc ⁹⁸	activation	PR, 110, 427(58)	Anders
Tc ⁹⁹	pile osci.	ORNL-1975, 31(55)	Pomerance

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Tc ⁹⁹	σ_γ	5.6-20.3	KFK-1270, 1(70)	Chou
Tc ⁹⁹	σ_t	0.-280.	NSE, 41, 188(70)	Hatanabe
Tc ⁹⁹	σ_t	5.6	58GENEVA, 16, 44(59)	Pattenden
Tc ⁹⁹	σ_t	5.6-245.	BAP, 3, 364(58)+	Slaughter

⁴⁴Ru

THERMAL CROSS SECTIONS

$$\sigma_T = 2.56 \pm 0.13 \text{ b}$$

$$a_{coh} = 7.3 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 42 \pm 4 \text{ b}$$

$$S_0 = 0.24 \pm 0.10$$

UNASSIGNED RESONANCES

E_0 (eV)	$2ag\Gamma_n$ (meV)	E_0 (eV)	$2ag\Gamma_n$ (meV)
34.19 ± 0.14		318.49 ± 0.50	
36.56 ± 0.13		359.8 ± 0.7	~20
65.66 ± 0.17		383.3 ± 1.0	
74.70 ± 0.20		397.3 ± 0.8	
105.06 ± 0.35		430.7 ± 0.8	
136.37 ± 0.25		446.6 ± 0.6	
137.33 ± 0.20		449.6 ± 0.7	
148.92 ± 0.20		465.0 ± 0.7	
204.26 ± 0.30		474.2 ± 0.7	
212.05 ± 0.30	<0.1	514 ± 3	70 ± 20
220.73 ± 0.35		578 ± 3	60 ± 10
248.41 ± 0.40		797 ± 10	<15
254.74 ± 0.40		870 ± 10	<25
260.3 ± 0.6		918 ± 10	<10
273.52 ± 0.45		971 ± 10	<100
302.64 ± 0.50		1145 ± 15	<15
306.28 ± 0.50		1461 ± 20	<100
308.48 ± 0.50			

⁹⁶
⁴⁴Ru

THERMAL CROSS SECTIONS

$$\sigma_T = 0.25 \pm 0.03 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 6.6 \pm 0.2 \text{ b}$$

⁹⁸
⁴⁴Ru

THERMAL CROSS SECTIONS

$$\sigma_T = 8 \pm 2 \text{ b}$$

⁹⁹
44 Ru

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 5.0 \pm 0.5 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 195 \pm 50 \text{ b}$$

$$S_0 = 0.25 \pm 0.13$$

RESONANCE PARAMETERS

$$I^{\pi} = 5/2^{+}$$

$$\% \text{Abn} = 12.72$$

$$S_n = 9673.5 \pm 1.0 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
10.05 $\pm$ 0.03	185 $\pm$ 10	3.3 $\pm$ 0.9	3	182 $\pm$ 10	1.1 $\pm$ 0.3
25.22 $\pm$ 0.08		8.5 $\pm$ 0.3	3	158 $\pm$ 15	1.7 $\pm$ 0.6
57.11 $\pm$ 0.12		13.0 $\pm$ 1.0	3	160 $\pm$ 30	1.7 $\pm$ 0.1
81.62 $\pm$ 0.13		4.1 $\pm$ 0.2	2	165 $\pm$ 30	0.45 $\pm$ 0.02
104.09 $\pm$ 0.18		60 $\pm$ 3	3	150 $\pm$ 20	5.9 $\pm$ 0.3
154.30 $\pm$ 0.25		55 $\pm$ 12	3	186 $\pm$ 100	4.4 $\pm$ 1.0
198.86 $\pm$ 0.30			2		
218.39 $\pm$ 0.30		32 $\pm$ 6	3		2.2 $\pm$ 0.4
262.70 $\pm$ 0.35		9.7 $\pm$ 1.2	3		0.60 $\pm$ 0.07
334.6 $\pm$ 0.6			2		
342.17 $\pm$ 0.50			2		
401.6 $\pm$ 0.6		21 $\pm$ 2	3		1.05 $\pm$ 0.11
509.7 $\pm$ 0.7			3		

¹⁰⁰
44 Ru

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 5.8 \pm 0.6 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 11.2 \pm 1.1 \text{ b}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{Abn} = 12.62$$

$$S_n = 6805 \pm 4 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_{γ} (meV)	Γ_n^0 (meV)
230.5 $\pm$ 1.5	27 $\pm$ 3	(165)	1.78 $\pm$ 0.18

¹⁰¹
44 Ru

THERMAL CROSS SECTIONS

$$\sigma_y = 3.1 \pm 0.9 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 85 \pm 12 \text{ b}$$

$$S_0 = 0.56 \pm 0.15$$

RESONANCE PARAMETERS

$I'' = 5/2^+$		$\%Abn = 17.07$		$S_n = 9216.1 \pm 1.9 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_\gamma \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$
15.9 ± 0.1	185 ± 15	5.8 ± 0.6	3	180 ± 15	1.45 ± 0.15
42.28 ± 0.12	185 ± 20	12 ± 1	3	175 ± 20	1.85 ± 0.15
52.13 ± 0.13	190 ± 40	1.6 ± 0.2		190 ± 40	0.21 ± 0.02
61.81 ± 0.13	200 ± 30	4.2 ± 0.3	2	195 ± 30	0.53 ± 0.04
66.82 ± 0.14	208 ± 10	40 ± 5	2	160 ± 11	4.9 ± 0.6
100.1 ± 0.17	155 ± 50	6.3 ± 0.8	3	150 ± 50	0.63 ± 0.08
112.5 ± 0.20	200 ± 20	8.1 ± 1.0	2	192 ± 20	0.76 ± 0.09
141.1 ± 0.20		2.5 ± 0.5	3		0.21 ± 0.04
157.0 ± 0.25		11 ± 1	2		0.88 ± 0.09
197.2 ± 0.25		55 ± 30	3		3.9 ± 2.1
243.9 ± 0.30		28 ± 5	3		1.8 ± 0.3
251.4 ± 0.35		2.6 ± 1.0	2		0.16 ± 0.06
311.0 ± 0.45			2		
313.6 ± 0.45		95 ± 15	3		5.36 ± 0.85
325.1 ± 0.45		~1	3		~0.06
325.1 ± 0.45			3		
336.8 ± 0.50			2		
346.2 ± 0.50		~130	2		~7.0
378.3 ± 0.6		210 ± 27	3		10.8 ± 1.39
381.4 ± 0.6					
411.6 ± 0.6			2		
426.8 ± 0.6			2		
432.8 ± 0.6		105 ± 30	3		5.05 ± 1.44
456.8 ± 0.6			2		
462.2 ± 0.6		210 ± 40	3		9.8 ± 1.9
485.2 ± 0.6		20 ± 5	2		0.91 ± 0.14
538.7 ± 0.7			2		
540 ± 3		130 ± 30			5.59 ± 1.29
625 ± 3		100 ± 10			4.0 ± 1.0
670 ± 4		250 ± 50			9.66 ± 1.93

¹⁰²
44Ru

THERMAL CROSS SECTIONS

$$\sigma_T = 1.30 \pm 0.15 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 4.1 \pm 0.4 \text{ b}$$

$$S_0 = 0.06 \pm 0.04$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\%Abn = 31.61$$

$$S_n = 6225 \pm 6 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
165.29 ± 0.25	0.6 ± 0.1	0.05 ± 0.01
415.2 ± 0.6	12.5 ± 2.0	0.61 ± 0.10
1296 ± 10	600 ± 150	16.6 ± 4.2

Note- The resonance at 200 ev was reassigned by Priesmeyer to Ru-101. The resonance parameters then contribute 0.7 b to the absorption resonance integral.

¹⁰⁴
44Ru

THERMAL CROSS SECTIONS

$$\sigma_T = 0.47 \pm 0.20 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 4.6 \pm 1.0 \text{ b}$$

$$S_0 = 0.11 \pm 0.12$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\%Abn = 18.58$$

$$S_n = 5908 \pm 8 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
224.4 ± 0.3	40 ± 5	2.7 ± 0.3
371.6 ± 0.6	36 ± 10	1.9 ± 0.5
630 ± 3	700 ± 300	27.8 ± 12.0
1055 ± 5	800 ± 200	24.6 ± 6.1

¹⁰⁵
44Ru
[4.44 hr]

THERMAL CROSS SECTIONS

$$\sigma_T = 0.20 \pm 0.02 \text{ b}$$

¹⁰⁶
₄₄Ru
[369 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.146 \pm 0.045 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 2.6 \pm 0.6 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ru ^{96,104}	activation	ZOHEL SINKI, 589(70)	Ricabarra
Ru ¹⁰²	activation	NST, 6, 587(69)	Ishikawa
Ru ¹⁰²	activation	CJP, 47, 2031(69)	Ricabarra
Ru ¹⁰²	activation	ORNL-3832, 6(65)	Lantz
Ru ^{96,99,100,101}	activation	ORNL-3832, 4(65)	Halperin
Ru ¹⁰⁶	activation	NSE, 21, 20(65)	Werner
Ru ¹⁰⁶	activation	ORNL-3679, 15(64)	Lantz
Ru ¹⁰⁴	activation	ORNL-3679, 11(64)	Lantz
Ru ¹⁰¹	mass analys.	ORNL-3679, 12(64)	Halperin
Ru ⁹⁸	activation	ORNL-3679, 12(64)	Halperin
Ru ¹⁰⁵	activation	NC, 17, 687(60)	Sharma
Ru	diffraction	JAP, 30, 1323(59)	Sidhu
Ru ^{96,102}	activation	JIN, 7, 194(58)	Katcoff
Ru	pile osci.	PR, 83, 641(51)	Pomerance
Ru	pile osci.	PR, 80, 342(50)	Harris
Ru ¹⁰⁴	activation	PR, 76, 189(49)	Sunyar
Ru ¹⁰⁴	activation	PR, 72, 888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Ru	σ_{γ}	1.-200.	PRIVATE COMM.(72)	Rimawi
Ru ¹⁰⁴	σ_t	226.5-1055.	71KNOX, 688(71)	Priesmeyer
Ru ¹⁰²	σ_t	166.-1296.	71KNOX, 688(71)	Priesmeyer
Ru ¹⁰¹	σ_t	15.9-670.	71KNOX, 688(71)	Priesmeyer
Ru ¹⁰⁰	σ_t	230.5	71KNOX, 688(71)	Priesmeyer
Ru ⁹⁹	σ_t	10.1-403.	71KNOX, 688(71)	Priesmeyer
Ru	σ_{γ}	25.2-553.0	NP/A, 117, 586(68)	Coceva
Ru	$\sigma_t \sigma_{\gamma} \bar{\sigma}_s$	10.-141.	65ANTWERP, 185(65)	Kim
Ru	σ_t	10.-350.	NP, 42, 676(63)	Bolotin

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 150 \pm 5 \text{ b} \\ \sigma_y &= 11 \pm 1 \text{ b } [4.35 \text{ min } ^{104}\text{Rh}^*] \\ \sigma_y &= 139 \pm 7 \text{ b } [42 \text{ sec } ^{104}\text{Rh}^*] \\ a_{\text{coh}} &= 5.91 \pm 0.04 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 1100 \pm 50 \text{ b} \\ R_\gamma &= 6.56 \pm 0.06 \text{ fm} \\ \langle D \rangle &= 12 \pm 1 \text{ eV} \\ S_0 &= 0.54 \pm 0.07 \\ S_1 &= 6.0 \pm 1.5\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 1/2^- \quad \quad \quad \chi_{\text{Abn}} = 100 \quad \quad \quad S_n = 6999.3 \pm 0.31 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1.257 $\pm$ 0.002	156 $\pm$ 4	0.77 $\pm$ 0.02	1	0	155 $\pm$ 5	0.59 $\pm$ 0.01
34.4 $\pm$ 0.1	149 $\pm$ 20	0.024 $\pm$ 0.004		[1]	149 $\pm$ 20	0.039 $\pm$ 0.007
44.5 $\pm$ 1		0.0055 $\pm$ 0.001		[1]		0.00082 $\pm$ 0.0002
46.7 $\pm$ 0.1	155 $\pm$ 20	0.77 $\pm$ 0.03	[0]	[0]	154 $\pm$ 20	0.113 $\pm$ 0.004
51.85		0.002 $\pm$ 0.001				0.00028 $\pm$ 0.0001
68.3 $\pm$ 0.2	180 $\pm$ 20	0.30 $\pm$ 0.01		[0]	180 $\pm$ 20	0.036 $\pm$ 0.001
83.5 $\pm$ 0.3	157 $\pm$ 70	0.012 $\pm$ 0.004		[1]	157 $\pm$ 70	0.0013 $\pm$ 0.004
95.7 $\pm$ 0.3	170 $\pm$ 20	3.5 $\pm$ 0.2	0	0	163 $\pm$ 15	0.357 $\pm$ 0.020
98.7 $\pm$ 0.1	180 $\pm$ 20	0.11 $\pm$ 0.02		[1]	180 $\pm$ 20	0.011 $\pm$ 0.002
108.8 $\pm$ 0.1	100 $\pm$ 80	0.020 $\pm$ 0.005		[1]	100 $\pm$ 80	0.0020 $\pm$ 0.0005
110.8 $\pm$ 0.4	169 $\pm$ 20	0.24 $\pm$ 0.02		[1]	169 $\pm$ 20	0.024 $\pm$ 0.002
114.0 $\pm$ 0.4	175 $\pm$ 20	0.17 $\pm$ 0.03		[1]	175 $\pm$ 20	0.0159 $\pm$ 0.0028
125.5 $\pm$ 0.4	177 $\pm$ 20	10.5 $\pm$ 1.5	1	0	170 $\pm$ 15	0.938 $\pm$ 0.134
154.3 $\pm$ 0.5	320 $\pm$ 50	100 $\pm$ 10	0	0	170 $\pm$ 20	8.06 $\pm$ 0.81
179.4 $\pm$ 0.6	17' $\pm$ 20	0.27 $\pm$ 0.02		[1]	174 $\pm$ 20	0.020 $\pm$ 0.002
187.0 $\pm$ 0.5	194 $\pm$ 20	50 $\pm$ 5	1	0	161 $\pm$ 20	3.65 $\pm$ 0.37
199.7 $\pm$ 0.2	600 $\pm$ 300	0.095 $\pm$ 0.02		[1]	600 $\pm$ 300	0.0067 $\pm$ 0.0014
205.1 $\pm$ 0.6	180 $\pm$ 60	0.150 $\pm$ 0.03		[1]	180 $\pm$ 60	0.0105 $\pm$ 0.0021
251.4 $\pm$ 0.6		0.230 $\pm$ 0.023				0.0145 $\pm$ 0.0015
253.8 $\pm$ 1.7	200 $\pm$ 30	50 $\pm$ 5	1	0	174 $\pm$ 30	3.13 $\pm$ 0.31
263.2 $\pm$ 0.5	220 $\pm$ 50	2.0 $\pm$ 0.6		[1]	218 $\pm$ 50	0.123 $\pm$ 0.037
264.2 $\pm$ 0.8		0.82 $\pm$ 0.17		[1]		0.050 $\pm$ 0.10
272.2 $\pm$ 0.8	220 $\pm$ 20	90 $\pm$ 9	1	0	160 $\pm$ 20	5.46 $\pm$ 0.55

 ^{103}Rh
45

E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)
289.8 $\pm$ 0.8	176 $\pm$ 40	30 $\pm$ 5			146 $\pm$ 40	1.76 $\pm$ 0.29
312.5 $\pm$ 1.0	220 $\pm$ 110	0.35 $\pm$ 0.15		[1]	220 $\pm$ 110	0.020 $\pm$ 0.008
316.5 $\pm$ 1.0		0.06 $\pm$ 0.02				0.0034 $\pm$ 0.0011
319.5 $\pm$ 0.9	250 $\pm$ 40	135 $\pm$ 15	1	0	160 $\pm$ 17	7.55 $\pm$ 0.84
321.8 $\pm$ 1.0		1.95 $\pm$ 0.43				0.109 $\pm$ 0.024
327.7 $\pm$ 0.9	185 $\pm$ 60	1.1 $\pm$ 0.2			184 $\pm$ 60	0.061 $\pm$ 0.011
354.0 $\pm$ 1.0		0.20 $\pm$ 0.05		[1]		0.037 $\pm$ 0.011
362.7 $\pm$ 0.9		0.7 $\pm$ 0.2				0.17 $\pm$ 0.01
366.1 $\pm$ 0.9	135 $\pm$ 25	3.3 $\pm$ 0.2			132 $\pm$ 25	0.039 $\pm$ 0.008
373.9 $\pm$ 0.9	165 $\pm$ 80	0.75 $\pm$ 0.15		[1]	164 $\pm$ 80	0.011 $\pm$ 0.002
376.7 $\pm$ 1.0		0.22 $\pm$ 0.04				0.020 $\pm$ 0.005
388.5 $\pm$ 1.0		0.39 $\pm$ 0.10		[1]		0.99 $\pm$ 0.30
406 $\pm$ 1	195 $\pm$ 30	20 $\pm$ 6	1	0	175 $\pm$ 30	0.089 $\pm$ 0.0012
427.95		0.185 $\pm$ 0.026				0.100 $\pm$ 0.013
433.08		2.08 $\pm$ 0.27				13.7 $\pm$ 1.9
435 $\pm$ 1	384 $\pm$ 50	285 $\pm$ 40	1	0	194 $\pm$ 20	0.021 $\pm$ 0.005
444 $\pm$ 1		0.45 $\pm$ 0.10		[1]		0.014 $\pm$ 0.005
447 $\pm$ 1		0.3 $\pm$ 0.1		[1]		0.283 $\pm$ 0.019
450 $\pm$ 1	151 $\pm$ 50	6.0 $\pm$ 0.4			145 $\pm$ 50	0.083 $\pm$ 0.018
473 $\pm$ 1		1.8 $\pm$ 0.4		1		0.091 $\pm$ 0.009
486 $\pm$ 1		2.0 $\pm$ 0.2				0.014 $\pm$ 0.002
489.56		0.31 $\pm$ 0.05				0.20 $\pm$ 0.02
492 $\pm$ 1	166 $\pm$ 50	4.5 $\pm$ 0.4			161 $\pm$ 50	0.040 $\pm$ 0.005
504 $\pm$ 1		0.9 $\pm$ 0.1		[1]		0.057 $\pm$ 0.004
526 $\pm$ 1		1.3 $\pm$ 0.1				0.0073 $\pm$ 0.0022
547.25		0.17 $\pm$ 0.05				5.52 $\pm$ 1.27
555 $\pm$ 1	268 $\pm$ 30	130 $\pm$ 30	1	0	174 $\pm$ 20	0.17 $\pm$ 0.02
581 $\pm$ 2	155 $\pm$ 40	4.2 $\pm$ 0.4		[1]	151 $\pm$ 40	0.024 $\pm$ 0.004
602.94		0.60 $\pm$ 0.09				0.16 $\pm$ 0.01
605 $\pm$ 1		4.0 $\pm$ 0.3				0.0126 $\pm$ 0.0028
608.1		0.31 $\pm$ 0.07				0.38 $\pm$ 0.04
620.3	390 $\pm$ 120	9.4 $\pm$ 1.0			380 $\pm$ 120	0.066 $\pm$ 0.018
645.09		1.67 $\pm$ 0.47				3.89 $\pm$ 0.79
646 $\pm$ 2	230 $\pm$ 35	99 $\pm$ 20	1	0	158 $\pm$ 18	0.39 $\pm$ 0.04
663 $\pm$ 2	195 $\pm$ 45	10 $\pm$ 1			185 $\pm$ 45	0.15 $\pm$ 0.04
676 $\pm$ 2	130 $\pm$ 70	4 $\pm$ 1			126 $\pm$ 70	0.22 $\pm$ 0.02
683 $\pm$ 3	120 $\pm$ 65	5.7 $\pm$ 0.5			114 $\pm$ 65	4.71 $\pm$ 0.34
692 $\pm$ 2	247 $\pm$ 40	124 $\pm$ 9	1	0	164 $\pm$ 30	0.095 $\pm$ 0.019
699.15		2.5 $\pm$ 0.5				16.6 $\pm$ 1.5
701 $\pm$ 2	470 $\pm$ 45	440 $\pm$ 40	1	0	155 $\pm$ 20	0.037 $\pm$ 0.019
727 $\pm$ 2		1.0 $\pm$ 0.5				

E_0 (eV)	Γ (meV)	$2\sigma_{\Gamma}^0$ (meV)	J	ℓ	Γ_{γ} (meV)	$2\sigma_{\Gamma}^0$ (meV)
741 ± 2		3.2 ± 0.5				0.12 ± 0.02
746 ± 3		3.17 ± 0.2				0.12 ± 0.02
757 ± 3		1.4 ± 0.2				0.051 ± 0.007
760 ± 2		4.2 ± 0.8				0.15 ± 0.03
782 ± 3	218 ± 35	31 ± 6				1.1 ± 0.2
797 ± 3	266 ± 100	5.2 ± 1.0			187 ± 35	0.18 ± 0.04
828.10 ± 3		0.35 ± 0.18			262 ± 100	0.012 ± 0.006
831 ± 3		4.6 ± 0.6				0.16 ± 0.02
845 ± 3	323 ± 40	230 ± 40	1	0	170 ± 20	7.91 ± 1.37
867 ± 3		0.8 ± 0.3				0.027 ± 0.010
885 ± 3		0.8 ± 0.2				0.027 ± 0.007
895 ± 3	142 ± 80	14.0 ± 1.3			129 ± 80	0.47 ± 0.04
913 ± 3	289 ± 25	72 ± 10	0	0	145 ± 20	2.38 ± 0.33
929 ± 3	207 ± 25	82 ± 20	[1]		152 ± 25	2.69 ± 0.66
954 ± 3	276 ± 50	36 ± 10	[0]	0	204 ± 50	1.17 ± 0.32
990 ± 3		1.2 ± 0.3				0.038 ± 0.010
1002 ± 3		2.04 ± 0.31				0.064 ± 0.010
1008 ± 3		0.50 ± 0.35				0.016 ± 0.011
1025 ± 3		4.45 ± 0.45				0.139 ± 0.014
1028.4 ± 3		3.66 ± 0.37				0.114 ± 0.011
1066.4 ± 3		0.60 ± 0.36				0.018 ± 0.011
1073 ± 3		1.2 ± 0.3				0.03 ± 0.01
1077.1 ± 3.0	190 ± 80	16.9 ± 12			173 ± 80	0.51 ± 0.36
1082.8 ± 3		1.28 ± 0.28				0.039 ± 0.009
1093.4 ± 3		1.06 ± 0.29				0.032 ± 0.009
1100.0 ± 3		1.54 ± 0.31				0.046 ± 0.009
1110 ± 3	200 ± 40	43.4 ± 22.0			157 ± 40	1.30 ± 0.65
1122.6 ± 3		0.80 ± 0.32				0.024 ± 0.010
1152 ± 3		1.93 ± 0.58				0.05 ± 0.02
1155 ± 3	346 ± 40	153 ± 75	[1]	[0]	243 ± 50	4.5 ± 2.2
1171 ± 3		50.6 ± 32.9				1.46 ± 0.95
1192 ± 4		300 ± 165				8.67 ± 4.77
1197 ± 3	228 ± 55	5.45 ± 1.09			224 ± 60	0.157 ± 0.03
1201.9 ± 3	524 ± 40	1.7 ± 0.56				0.049 ± 0.016
1205.4 ± 3		4.37 ± 0.61				0.126 ± 0.018
1212.4 ± 3		7.5 ± 6.0				0.21 ± 0.17
1245 ± 3		1.70 ± 0.34				0.048 ± 0.010
1261.5 ± 5		600 ± 200				16.8 ± 5.6
1270 ± 5	690 ± 50	5 ± 4	[1]	[0]	185 ± 30	0.14 ± 0.10
1276.5 ± 5		9.4 ± 1.9				0.26 ± 0.05
1278.8 ± 5						

¹⁰³Rh

E_0 (eV)	Γ (meV)	$2\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2\Gamma_n^0$ (meV)
1287.0		5.0 $\pm$ 0.8				0.14 $\pm$ 0.02
1306	± 3	142 $\pm$ 78	[1]	[0]	154 $\pm$ 35	3.94 $\pm$ 2.17
1326	± 4	57 $\pm$ 40			173 $\pm$ 50	1.57 $\pm$ 1.10
1355.1		3.4 $\pm$ 0.6				0.092 $\pm$ 0.016
1365	± 3	84 $\pm$ 50	[1]	[0]	184 $\pm$ 50	2.27 $\pm$ 1.36
1380.8		5.03 $\pm$ 0.70				0.135 $\pm$ 0.019
1393.6	± 4	6.17 $\pm$ 0.74				0.165 $\pm$ 0.020
1408	± 4	47 $\pm$ 38				1.25 $\pm$ 1.00
1410.9		4.8 $\pm$ 1.0				.12 $\pm$ 0.025
1433.7	± 4	16.3 $\pm$ 1.63				0.43 $\pm$ 0.04
1453.7		4.95 $\pm$ 0.69				0.130 $\pm$ 0.018
1464.5		1.17 $\pm$ 0.47				0.0306 $\pm$ 0.0122
1483.5	± 4	16.3 $\pm$ 1.96				0.423 $\pm$ 0.051
1487.1	± 4	57 $\pm$ 11				1.48 $\pm$ 0.28
1513.6		1.4 $\pm$ 0.6				0.036 $\pm$ 0.001
1531.9	± 6	15.1 $\pm$ 1.4	0	0	122 $\pm$ 60	6.46 $\pm$ 3.55
1542	± 5	254 $\pm$ 140				0.23 $\pm$ 0.03
1552.6		9.1 $\pm$ 1.3				5.0 $\pm$ 3.3
1562	± 4	22.8 $\pm$ 11.4	[1]	[0]	138 $\pm$ 40	0.09 $\pm$ 0.02
1568	± 4	198 $\pm$ 130				10.3 $\pm$ 4.6
1614.3	± 4	3.8 $\pm$ 0.8	[1]	[0]	187 $\pm$ 40	0.059 $\pm$ 0.018
1620	± 4	414 $\pm$ 185				0.13 $\pm$ 0.022
1650.2		2.4 $\pm$ 0.7				2.12 $\pm$ 1.48
1665.6	± 4	5.5 $\pm$ 0.9				10.6 $\pm$ 4.8
1671	± 4	86.5	[1]	[0]	279 $\pm$ 40	0.060 $\pm$ 0.024
1697	± 4	437 $\pm$ 200				0.655 $\pm$ 0.655
1712.5		2.5 $\pm$ 1.0				0.051 $\pm$ 0.020
1735	± 4	27.3 $\pm$ 27.3				0.74 $\pm$ 0.74
1751.5		2.15 $\pm$ 0.86				0.125 $\pm$ 0.024
1763	± 4	31.1 $\pm$ 31.1				2.99 $\pm$ 2.39
1784.5		5.3 $\pm$ 1.0				0.049 $\pm$ 0.025
1794	± 4	127 $\pm$ 102	[1]	[0]	195 $\pm$ 72	15.6 $\pm$ 7.8
1806.0	± 4	2.1 $\pm$ 1.1				0.042 $\pm$ 0.034
1820	± 4	668 $\pm$ 335	[1]	[0]	316 $\pm$ 60	0.203 $\pm$ 0.045
1832	± 6	1.3 $\pm$ 1.4				2.10 $\pm$ 0.21
1837.2		8.7 $\pm$ 1.9				0.107 $\pm$ 0.032
1843.4		90 $\pm$ 9	1	0	60	0.081 $\pm$ 0.024
1849.2		4.6 $\pm$ 1.4				0.093 $\pm$ 0.025
1885.2		3.5 $\pm$ 1.1				0.80 $\pm$ 0.09
1892.4		3.6 $\pm$ 1.1				
1905.1		35 $\pm$ 4.0				

E_0 (eV)	Γ (meV)	$2g_{\pi}^n$ (meV)	J	ℓ	Γ_γ (meV)	$2g_{\pi}^n$ (meV)
1920.4		7.0 $\pm$ 1.3				0.16 $\pm$ 0.03
1941.8		12.1 $\pm$ 1.7				0.275 $\pm$ 0.39
1954.2		8.6 $\pm$ 1.4				0.19 $\pm$ 0.03
1967.3		5.2 $\pm$ 1.1				0.118 $\pm$ 0.026
1982.9	821 $\pm$ 82		[0]	0	285 $\pm$ 90	6.02 $\pm$ 3.31
1986.7		4.6 $\pm$ 1.4				0.103 $\pm$ 0.031
2010.2		29 $\pm$ 4				0.65 $\pm$ 0.08
2021.9	128	2.9 $\pm$ 1.4		0		0.064 $\pm$ 0.030
2034.5		2 $\pm$ 1				0.044 $\pm$ 0.026
2039.9		7.1 $\pm$ 1.3				0.157 $\pm$ 0.028
2060.2	440 $\pm$ 92	98 $\pm$ 74	[0]	0	244 $\pm$ 38	2.16 $\pm$ 1.62
2082.5		8.3 $\pm$ 1.4				0.182 $\pm$ 0.031
2085.9		35.1 $\pm$ 3.5				0.768 $\pm$ 0.077
2102.4	203 $\pm$ 162	35.0 $\pm$ 4.7				0.851 $\pm$ 0.102
2115.8	574 $\pm$ 75	232 $\pm$ 162	[0]	0		5.04 $\pm$ 3.53
2151.7		5.1 $\pm$ 1.5				0.110 $\pm$ 0.033
2161.9		27.5 $\pm$ 3.3				0.59 $\pm$ 0.07
2179.8	97	59.5 $\pm$ 7.7	1	0	139 $\pm$ 70	1.27 $\pm$ 0.17
2195.2	260 $\pm$ 68	182 $\pm$ 146				3.88 $\pm$ 3.10
2244.5		20 $\pm$ 3				0.42 $\pm$ 0.63
2249.0		13.4 $\pm$ 2.4				1.61 $\pm$ 0.19
2260.2	338 $\pm$ 150	76.5 $\pm$ 9.2		0		0.29 $\pm$ 0.05
2278.5		2.66 $\pm$ 1.43				0.056 $\pm$ 0.030
2296.7	660 $\pm$ 53	580 $\pm$ 320	1	0	273 $\pm$ 60	12.1 $\pm$ 6.66
2315.8	322 $\pm$ 180	75.7 $\pm$ 9.8		0		1.57 $\pm$ 0.20
2333.1		91.6 $\pm$ 9.2				1.90 $\pm$ 0.19
2355.6		10.9 $\pm$ 2.3				0.224 $\pm$ 0.047
2365.9		28.7 $\pm$ 4.3				0.59 $\pm$ 0.09
2380.0	280 $\pm$ 182	90 $\pm$ 12			190	1.84 $\pm$ 0.24
2395.8		16.3 $\pm$ 3.3				0.333 $\pm$ 0.067
2410.1	535	28 $\pm$ 5				0.570 $\pm$ 0.103
2416.8	480 $\pm$ 168	191 $\pm$ 21				3.89 $\pm$ 0.43
2434.1	900 $\pm$ 270	90 $\pm$ 12		0		1.82 $\pm$ 0.24
2461.4	530 $\pm$ 60	385 $\pm$ 327	1	0	273 $\pm$ 87	7.76 $\pm$ 6.60
2479.3		3.2 $\pm$ 2.2				0.054 $\pm$ 0.045
2510.9		7.1 $\pm$ 2.4				0.142 $\pm$ 0.048
2516.8		16.7 $\pm$ 3.5				0.335 $\pm$ 0.070
2530.1		11.0 $\pm$ 2.9				0.219 $\pm$ 0.057
2536.3		24.2 $\pm$ 4.6				0.480 $\pm$ 0.091
2549.5		28.4 $\pm$ 5.1				0.562 $\pm$ 0.101
2596.8	504	49.2 $\pm$ 7.3				0.965 $\pm$ 0.145

E_α (eV)	Γ (meV)	$2g_{\pi}^0$ (meV)	J	ℓ	Γ_γ (meV)	$2g_{\pi}^0$ (meV)
2606.0	565 ± 85	613 ± 490	1	0	157 ± 86	12.0 ± 9.6
2630.4	414 ± 104	330 ± 30	1	0	194 ± 107	6.43 ± 0.579
2656.9		22.8 ± 6.2				0.44 ± 0.12
2661.4		19.7 ± 5.7				0.38 ± 0.11
2668.9	1900 ± 855	84 ± 10				1.63 ± 0.20
2695.6		13.6 ± 3.9				0.262 ± 0.076
2701.5		41.0 ± 8.2				0.789 ± 0.158
2721.7	306 ± 174	137 ± 21				2.63 ± 0.39
2731.1		62 ± 14				1.19 ± 0.26
2740.8		30 ± 7				0.57 ± 0.13
2763.4		17 ± 4				0.32 ± 0.08
2787.0		9 ± 4				0.17 ± 0.07
2793.3	216 ± 97	260 ± 26	1	0		4.92 ± 0.49
2816.5		3 ± 1.8				0.056 ± 0.033
2843.1		8.8 ± 3.5				0.165 ± 0.066
2850.4		24 ± 6				0.450 ± 0.108
2858.1	630 ± 250	174 ± 24		0		3.25 ± 0.46
2871.8		10 ± 6				0.187 ± 0.112
2891.7	510 ± 305	100 ± 16		0		1.86 ± 0.30
2897.5		11 ± 5				0.215 ± 0.085
2891.5		6 ± 4				0.117 ± 0.070
2902.4		12 ± 4				0.232 ± 0.077
2916.8		19 ± 4				0.361 ± 0.079
2952.8	2300 ± 805	90 ± 10				1.66 ± 0.18
2968.0		25 ± 8				0.458 ± 0.137
2973.0		48 ± 9				0.880 ± 0.167
2983.9		79 ± 25				1.45 ± 0.46
2998.8	530 ± 190	185 ± 24				3.38 ± 0.43
3030.4	455 ± 140	255 ± 26	(1)	0	285 ± 137	4.63 ± 0.46
3049.6		43 ± 8				0.778 ± 0.148
3063.7		87 ± 14				1.57 ± 0.27
3075.3		10 ± 4				0.180 ± 0.072
3086.3	330 ± 100	340 ± 34	1	0		6.12 ± 0.61
3113.0		5 ± 3				0.089 ± 0.045
3131.6	640 ± 96	575 ± 460	1	0		10.27 ± 8.22
3140.5		22 ± 7				0.392 ± 0.118
3156.2		38 ± 9				0.676 ± 0.162
3168.6	260	99 ± 20				1.75 ± 0.35
3191.7		30 ± 8				0.531 ± 0.133
3198.3		12 ± 5				0.212 ± 0.085
3212.3		7 ± 3				0.123 ± 0.055

E_{β} (eV)	Γ (meV)	$2g_{\beta}^2$ (meV)	J	ℓ	Γ_{γ} (meV)	$2g_{\gamma}^2$ (meV)
3227.5		20				0.352 $\pm$ 0.099
3257.7		9				0.157 $\pm$ 0.071
3264.0		10				0.175 $\pm$ 0.079
3272.9	685 $\pm$ 195	293		0		5.12 $\pm$ 0.51
3286.2		7				0.122 $\pm$ 0.061
3305.0	535 $\pm$ 305	141		0		2.45 $\pm$ 0.42
3323.2		95				1.64 $\pm$ 0.29
3330.0		5				0.086 $\pm$ 0.060
3354.1		75				1.29 $\pm$ 0.25
3361.0		14				0.24 $\pm$ 0.09
3386.2	1730	754	{0}	0		12.9 $\pm$ 9.0
3413.7		25				0.427 $\pm$ 0.171
3439.7		50				0.852 $\pm$ 0.171
3461.0		15				0.258 $\pm$ 0.090
3466.6		34				0.577 $\pm$ 0.127
3492.0	700 $\pm$ 225	233		0		3.94 $\pm$ 0.51
3512.5	570 $\pm$ 115	500	1	0		8.43 $\pm$ 0.76
3537.7		9				0.151 $\pm$ 0.068
3553.7	620	622	1	0	207 $\pm$ 114	10.43 $\pm$ 8.34
3597.2	550 $\pm$ 220	245		0		4.08 $\pm$ 0.57
3646.2	800 $\pm$ 215	374		0		6.19 $\pm$ 0.74
3654.5		22				0.36 $\pm$ 0.14
3687.5	1260 $\pm$ 240	590		0		9.71 $\pm$ 0.97
3713.6		49				0.804 $\pm$ 0.241
3727.3		20				0.327 $\pm$ 0.131
3752.4		69				1.45 $\pm$ 0.33
3772.2		65				1.058 $\pm$ 0.317
3779.0		10				0.162 $\pm$ 0.130
3786.7		100				1.62 $\pm$ 0.37
3798.2		20				0.324 $\pm$ 0.130
3837.0	1200 $\pm$ 600	240				0.322 $\pm$ 0.129
3853.8		110				3.86 $\pm$ 0.62
3874.2		133				1.76 $\pm$ 0.44
3884.3		115				2.13 $\pm$ 0.47
3908.9		20				1.83 $\pm$ 0.53
3926.5		40				0.319 $\pm$ 0.19
3927.0		330				0.637 $\pm$ 0.319
3947.1		73				5.25 $\pm$ 0.95
3955.7		20				1.16 $\pm$ 0.41
3982.7		80				0.31 $\pm$ 0.19
3994.0						1.26 $\pm$ 0.44

¹⁰³
₄₅ Rh

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n$ (meV)
4014.6		64 $\pm$ 24				1.01 $\pm$ 0.38
4040.3		30 $\pm$ 14				0.47 $\pm$ 0.21
4059.4	1940 $\pm$ 640	400 $\pm$ 72		0		6.27 $\pm$ 1.13
4079.9	670 $\pm$ 180	950 $\pm$ 124	1	0		14.8 $\pm$ 1.9
4105.2		61 $\pm$ 29				0.95 $\pm$ 0.45
4127.5		30 $\pm$ 14				0.46 $\pm$ 0.21
4140.3	830 $\pm$ 190	1200 $\pm$ 156	1	0		18.6 $\pm$ 2.4

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 40 \pm 30 \text{ b}$$

^{104g}
45 Rh
[42 sec]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 800 \pm 100 \text{ b}$$

^{104m}
45 Rh
[4.35 min]

THERMAL CROSS SECTIONS

$$\begin{aligned} \sigma_{\gamma} &= 16000 \pm 1500 \text{ b} \\ \sigma_{\gamma} &= 4700. \pm 1200. \text{ b [2.2 hr } ^{105}\text{Rh}^*] \\ \sigma_{\gamma} &= 11250 \pm 1500 \text{ b [30 sec } ^{106}\text{Rh}^*] \end{aligned}$$

¹⁰⁵
45 Rh
[35.5 hr]

RESONANCE PROPERTIES

$$I_{\gamma} = 15800 \pm 1500 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Rh ¹⁰⁵	activation	NSE,29,147(67)	Glendenin
Rh ¹⁰⁵	mass separation	ORNL-3994,2(66)	Halperin
Rh ¹⁰³	activation	CJP,44,1985(66)	Walker
Rh ¹⁰³	diffraction	ACA,18,906(65)	Sidhu
Rh ¹⁰³	isom. ratio	NP,41,316(64)	Bishop
Rh ¹⁰⁵	activation	NSE,20,298(64)	Glendenin
Rh ¹⁰⁵	activation	ORNL-3679,12(64)	Lantz
Rh ¹⁰³	diffraction	PR/A,134,1547(64)	Shirane
Rh ¹⁰³	activation	NP,41,316(63)	Csikai
Rh ¹⁰⁵	activation	ANL-6797,388(63)	Glendenin
Rh ¹⁰³	isom. ratio	PR,129,769(63)	Keisch
Rh ¹⁰³	diffraction	NEUTRON DIFF.(62)	Bacon
Rh ¹⁰⁵	activation	JIN,24,1009(62)	Cunningham
Rh ¹⁰³	pile osci.	JAERI-1009(60)	Fuketa
Rh ¹⁰⁴	activation	PR-CM-15,10(58)	Roy
Rh ¹⁰³	activation	AERE-R/R-2333(57)	Cummins
Rh ¹⁰³	mirror reflection	PRIVATE COMM.(52)	Reynolds
Rh ¹⁰³	activation	PR,83,641(51)	Pomerance
Rh ¹⁰³	activation	PR,80,342(50)	Harris
Rh ¹⁰³	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Rh ¹⁰³	σ_Y	1.3-988.	PRIVATE COMM.(70)	Carlson
Rh ¹⁰³	$\sigma_Y(SI)$	1.3	KP,15,271(70)	Fleck
Rh ¹⁰³	$\sigma_t \bar{\sigma}_s$	1.3-4140.	NP/A,143,130(70)	Ribon
Rh ¹⁰³	$\sigma_Y(\text{spectra})$	1.3-907.	PR/C,2,1793(70)	Rimawi
Rh ¹⁰³	$\bar{\sigma}_s$	1.54-555.	NP/A,138,556(69)	King
Rh ¹⁰³	$\bar{\sigma}_s$	1.3-702.	CEA-R-3360(67)	Trochon
Rh ¹⁰³	$\bar{\sigma}_s$	1.3-701.	CR,262,1507(66)	Trochon
Rh ¹⁰³	σ_t	1.3-757.	SSANTWERP,165(65)	Ribon
Rh ¹⁰³	σ_t	34.4-290.	PRIVATE COMM.(64)	Pattenden
Rh ¹⁰³	σ_t	1.3-795.	JPR,24,987(63)	Ribon
Rh ¹⁰³	$\sigma_t \bar{\sigma}_s, \sigma_Y(SI)$	34.4-321.	ZET,45,1743(63)	Wang
Rh ¹⁰²	σ_t	34.4-648.	ZET,45,1743(63)	Wang
Pn ¹⁰³	σ_Y	134.-290.	AEC-TR-5734,52(62)	Kim
Rh ¹⁰³	σ_t	34.4-113.8	AERE-PR/NP-2,27(62)	Pattenden
Rh ¹⁰³	σ_t	34.4-648.	AEC-TR-5734,48(62)	Wang
Rh ¹⁰³	σ_Y	94.7-633.	615ACLAY,439(61)	Moxon
Rh ¹⁰³	σ_t	34.4-84.5	JPR,22,708(61)	Ribon
Rh ¹⁰³	σ_t	328.-1899.	BIS,60(60)	Julien
Rh ¹⁰³	σ_t	43.8-326.	PRIVATE COMM.(59)	Chrien
Rh ¹⁰³	σ_t	46.5-186.	PRIVATE COMM.(58)	Firk
Rh ¹⁰³	σ_t	1.3	AERE-NP/M-87(58)	Pattenden
Rh ¹⁰⁴	activation		PR-CM,14,12(58)	Roy
Rh ¹⁰³	σ_t	1.3	PR,94,1215(54)	Landon
Rh ¹⁰³	σ_Y	1.3	CJP,31,432(53)	Brockhouse
Rh ¹⁰³	σ_t	1.3	PR,91,53(53)	Sailor

⁴⁶Pd

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 6.9 \pm 0.4 \text{ b} \\ \bar{\sigma}_s &= 5.0 \pm 0.3 \text{ b} \\ a_{coh} &= 6.3 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 90 \pm 5 \text{ b} \\ S_0 &= 0.4 \pm 0.1 \\ S_1 &= 5.0 \pm 1.0\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (eV)	$ag\Gamma_n$ (meV)	$ag\Gamma_n^0$ (meV)
27.8 ±0.2	0.0010±0.0003	0.00019± .00006
42.8 ±0.3	0.0065±0.0020	0.0010 ±0.0003
44.8 ±0.5		
63.46±0.15	0.010 ±0.003	0.0013 ±0.0004
72.53±0.12		
80.59±0.15		
83.16±0.20		
101.16±0.20		
109.70±0.15		
112.77±0.13		
117.01±0.16		
130.54±0.20		
136.53±0.20		
146.45±0.19		
147.98±0.29		
156.91±0.21		
170.80±0.30		
176.79±0.30		
182.6 ±0.6		
190.73±0.25		
215.72±0.35		
222.97±0.35		
262.90±0.30		
266.83±0.35		
282.1 ±0.6		
294.80±0.40		
300.36±0.40		
303.18±0.35		
339.83±0.50		
347.1 ±0.6		
349.2 ±0.6		
384.8 ±0.6		
392.8 ±0.6		
394.8 ±0.6		
407.0 ±0.7		
411.6 ±0.6		
421.2 ±0.6		
427.4 ±0.6		

⁴⁶Pd

E_0 (eV)	$ag\Gamma_n$ (meV)	$zg\Gamma_n^0$ (meV)
462.8 ±0.7		
480.7 ±1.0		
492.4 ±0.8		
498.9 ±0.8		
511.5 ±0.8		
513.1 ±0.8		
^a 522.3 ±0.7		
^a 544.8 ±0.9		
^a 553.2 ±0.8		
563.9 ±0.8		
610.9 ±0.9		
628.8 ±1.0		
^a 635.9 ±1.0		
638.9 ±1.4		
642.9 ±1.0		
645.7 ±1.0		
659.5 ±1.1		
671.3 ±1.1		
675.4 ±1.4		
679.2 ±1.2		
717.4 ±1.0		
733.9 ±1.0		
737.8 ±1.2		
740.0 ±1.1		
750.4 ±1.0		
798.4 ±1.1		
802.9 ±1.4		

^a Even-Even isotope

¹⁰²
⁴⁶Pd

THERMAL CROSS SECTIONS

$$\sigma_y = 4.8 \pm 1.5 \text{ b}$$

RESONANCE PARAMETERS

$$J^\pi = 0^+$$

$$\%Abn = 0.96$$

$$S_n = 7608 \pm 28 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
186 ±5	270 ±22	(200)	19.8 ±1.6

¹⁰⁴
₄₆Pd

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\%Abn = 10.97$$

$$S_n = 7094.1 \pm 7.0 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
186 ± 5	270 ± 22	(200)	19.8 ± 1.6

¹⁰⁵
₄₆Pd

THERMAL CROSS SECTIONS

$$\sigma_\gamma^c = 14 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 90 \pm 10 \text{ b}$$

$$S_0 = 0.35 \pm 0.20$$

RESONANCE PARAMETERS

$$I^n = 5/2^+$$

$$\%Abn = 22.23$$

$$S_n = 9562.8 \pm 1.1 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
Bound level				
11.80 ± 0.05	0.22 ± 0.02	3	149 ± 10	0.064 ± 0.007
13.2 ± 0.1	2.60 ± 0.03	2	170 ± 10	0.715 ± 0.007
25.3 ± 0.1	3.50 ± 0.05	3	147 ± 7	0.777 ± 0.008
30.2 ± 0.2	0.30 ± 0.07	2	160 ± 27	0.054 ± 0.012
38.4 ± 0.4	0.34 ± 0.02	3		0.055 ± 0.003
55.7 ± 0.4	8.4 ± 0.4	3	151 ± 20	1.13 ± 0.05
68.8 ± 0.4	2.1 ± 0.4	3		0.26 ± 0.05
78.3 ± 0.4	14 ± 3	2		1.6 ± 0.3
86.8 ± 0.2	18.7 ± 3.5	3		1.9 ± 0.2
104.04 ± 0.14		3		
126.29 ± 0.14	3.64 ± 0.94	3		0.32 ± 0.08
141.18 ± 0.15	9.7 ± 1.8	2		0.82 ± 0.14
150.06 ± 0.16		2		
154.70 ± 0.15		3		
158.74 ± 0.16		2		
168.29 ± 0.22		3		
184.02 ± 0.25		2		
202.58 ± 0.25		2		
226.99 ± 0.25		3		
252.20 ± 0.50		2		
252.60 ± 0.40		3		
260.13 ± 0.30		2		
287.04 ± 0.35		3		
305.40 ± 0.35		2		
313.64 ± 0.35		2		
327.86 ± 0.40		3		
347.1 ± 0.6		3		
354.40 ± 0.45		3		

¹⁰⁵
46 Pd

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
370.54±0.45		2		
377.36±0.45		2		
389.2 ±0.5		3		
401.7 ±0.5		3		
418.5 ±0.6				
431.1 ±0.6		2		
449.6 ±0.6		3		
466.7 ±0.6		2		
482.3 ±0.7				
532.2 ±0.7		3		
546.2 ±0.8		3		
568.0 ±0.8		2		
578.7 ±0.8		3		
591.0 ±0.8		3		
593.3 ±0.8		2		
605.1 ±0.8		3		
617.1 ±0.8				
621.0 ±0.8		3		
663.0 ±1.0		2		
682.4 ±1.0		3		
696.8 ±1.0		3		
700.4 ±1.0		2		
712.1 ±1.0		3		
713.9 ±1.5				
724.4 ±1.0		3		
757.2 ±1.0		3		
780.4 ±1.0		3		
789.3 ±1.1		2		
794.3 ±1.1		3		
807.8 ±1.1		2		

¹⁰⁶
46 Pd

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 0.013 \pm 0.002 \text{ b } [22 \text{ sec } ^{107}\text{Pd}^m]$$

$$\sigma_\gamma = 0.292 \pm 0.029 \text{ b } [7 \times 10^6 \text{ yr } ^{107}\text{Pd}^g]$$

RESONANCE PROPERTIES

$$I_\gamma = 5.73 \pm 0.57 \text{ b}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$	$\%Abn = 27.33$	$S_n = 6542 \pm 7 \text{ keV}$
E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
282.1±0.6	536 ±34	32 ±2

¹⁰⁸₄₆Pd

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 12 \pm 2 \text{ b } [13.5 \text{ hr } ^{109}\text{Pd}^g]$$
$$\sigma_{\gamma} = 0.20 \pm 0.04 \text{ b } [4.7 \text{ min } ^{109}\text{Pd}^m]$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 250 \pm 30 \text{ b}$$

RESONANCE PARAMETERS

$I^n = 0^+$		$\% \text{Abn} = 26.71$		$S_n = 6154 \pm 1 \text{ keV}$		
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$		J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
2.96 ± 0.01	$.00504 \pm .00005$		3/2	1	90 ± 2	$.00293 \pm .00003$
33.2 ± 0.17	117	± 8				20.3 ± 1.4
91.6 ± 0.5	207	± 15				21.6 ± 1.6

¹¹⁰₄₆Pd

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.020 \pm 0.015 \text{ b } [5.5 \text{ hr } ^{111}\text{Pd}^m]$$
$$\sigma_{\gamma} = 0.20 \pm 0.06 \text{ b } [22 \text{ min } ^{111}\text{Pd}^g]$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pd ^{106,108}	activation	NSE,31,545(68)	Tilbury
Pd ¹⁰⁸	isom. ratio	NP,60,241(64)	Bishop
Pd ¹⁰⁶	mass separation	ORNL-3679,10(64)	Lantz
Pd ¹¹⁰	activation	NP,41,372(63)	Mangal
Pd ¹¹⁰	isom. ratio	JIN,25,1(63)	Namboodiri
Pd ¹⁰⁸	activation	NSE,8,378(60)	Lyon
Pd ^{108,110}	activation	NP,12,261(59)	Sehgal
Pd ¹⁰⁸	activation	ZN,13A,820(58)	Meister
Pd ¹¹⁰	isom. ratio	DDK,2,154(57)	Dzantiev
Pd ¹⁰²	activation	PR,90,410(53)	Meinke
Pd	pile osci.	PR,83,643(51)	Pomerance
Pd	diffraction	PR,81,527(51)	Shull
Pd	scattering	PR,83,379(51)	Weiss
Pd	pile osci.	PP5/A,63,1175(50)	Colmer
Pd	pile osci.	PR,80,342(50)	Harris
Pd ^{108,110}	activation	PR,72,888(47)	Seren
Pd	$\bar{\sigma}_s$	PR5/A,162,127(37)	Soldhaber

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pd ¹⁰⁸	σ_y (spectra)	2.96	72BUD,216(72)	Mughabghab
Pd	σ_t	11.-142.	BT1,109,19(72)	Yamamuro
Pd	σ_y (spectra)	11.-313.	PR/C,1,1501(70)	Wetzel
Pd	σ_y	55.-808.	NP/A,117,586(68)	Coceva
Pd	σ_t	0.-10.	NSE,30,145(67)	Teich
Pd ^{105,106}	σ_t	10.-92.	65ANTWERP,72(65)	Coceva
Pd	$\sigma_t \sigma_y$	11.-152.	PL,16,159(65)	Coceva
Pd	σ_y	13.-389.	64PARIS,2,673(64)	Bollinger
Pd	σ_t	1.5-40.	NWS,50,397(63)	Richter
Pd ^{105,106}	σ_c		PRIVATE COMM.(59)	Chrien
Pd	σ_t	10.-891.	AE,1,55(56)	Radkevich

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 63.6 \pm 0.6 \text{ b}$$

$$a_{coh} = 6.1 \pm 0.2 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 747 \pm 20 \text{ b}$$

$$S_0 = 0.48 \pm 0.04$$

$$S_1 = 2.5 \pm 1.5$$

UNASSIGNED RESONANCES

E_0 (eV)	$4ag\Gamma_n^0$ (meV)	E_0 (eV)	$4ag\Gamma_n^0$ (meV)
764.00±0.59	0.13±0.04	1394.0 ±0.7	0.02±0.02
779.94±0.61	0.80±0.16	1398.5 ±0.7	0.48±0.04
792.65±0.62	0.20±0.08	1402.0 ±0.7	0.02±0.02
822.00±0.35	0.16±0.06	1410.0 ±0.7	0.08±0.04
844.04±0.68	0.24±0.06	1414.5 ±0.7	10.00±2.00
848.78±0.69	1.00±0.20	1423.0 ±0.7	0.18±0.04
872.34±0.72	0.64±0.12	1433.0 ±0.8	0.04±0.04
878.75±0.72	0.52±0.12	1438.5 ±0.8	1.28±0.20
908.82±0.76	0.52±0.12	1446.5 ±0.8	2.00±0.20
923.29±0.78	0.32±0.04	1461.0 ±0.8	1.44±0.16
981.40±0.85	0.02±0.02	1473.5 ±0.8	0.63±0.08
1016.91±0.90	0.52±0.08	1483.0 ±0.8	1.28±0.12
1027.69±0.92	0.01±0.01	1496.0 ±0.8	0.56±0.08
1036.79±0.93	0.84±0.15	1504.0 ±0.8	0.48±0.08
1067.71±0.97	3.20±0.40	1511.0 ±0.8	3.60±0.40
1078.33±0.98	0.07±0.02	1519.0 ±0.8	0.36±0.08
1087.00±1.00	0.04±0.04	1529.5 ±0.8	0.28±0.08
1092.00±1.00	0.05±0.02	1534.5 ±0.8	0.12±0.08
1102.00±1.00	0.05±0.02	1542.0 ±0.8	0.24±0.08
1159.45±1.10	0.14±0.04	1553.0 ±0.9	0.04±0.04
1173.60±1.12	0.24±0.04	1561.0 ±0.9	0.24±0.08
1199.50±1.15	0.40±0.40	1566.0 ±0.9	0.04±0.04
1226.00±0.6	0.20±0.04	1568.5 ±0.9	0.44±0.08
1254.2 ±0.6	1.00±0.20	1577.0 ±0.9	0.02±0.02
1270.8 ±0.6	0.24±0.20	1586.0 ±0.9	10.40±2.00
1276.4 ±0.6	0.76±0.08	1613.5 ±0.9	0.08±0.04
1283.3 ±0.6	0.20±0.04	1621.0 ±0.9	0.80±0.20
1283.3 ±0.6	0.20±0.04	1626.5 ±0.9	0.80±0.20
1289.3 ±0.7	3.20±0.24	1634.0 ±0.9	3.20±0.60
1303.1 ±0.7	0.16±0.04	1638.0 ±0.9	0.08±0.08
1310.3 ±0.7	0.72±0.08	1642.0 ±0.9	0.60±0.20
1332.0 ±0.7	0.04±0.04	1642.0 ±0.9	2.80±0.60
1341.0 ±0.7	0.12±0.04	1655.5 ±0.9	0.12±0.04
1346.5 ±0.7	0.92±0.12	1677.0 ±1.0	3.00±0.60
1352.0 ±0.7	0.32±0.08	1686.0 ±1.0	0.04±0.04
1363.0 ±0.7	0.08±0.04	1695.0 ±1.0	0.16±0.04
1371.0 ±0.7	0.60±0.20	1705.0 ±1.0	0.32±0.20
1373.0 ±0.7	0.60±0.20	1713.0 ±1.0	0.20±0.04
1382.5 ±0.6	2.20±0.20	1718.0 ±1.0	3.60±0.80
		1726.0 ±1.0	1.40±0.20

⁴⁷Ag

E_0 (eV)	$\gamma_{ag}^{E_0}$ (meV)	E_0 (eV)	$\gamma_{ag}^{E_0}$ (meV)
1740.0 ±1.0	0.08±0.08	2216.0 ±1.0	0.12±0.12
1745.0 ±1.0	0.20±0.08	2225.0 ±1.0	0.20±0.20
1754.0 ±1.0	0.48±0.04	2244.0 ±1.0	0.08±0.08
1767.0 ±1.0	0.12±0.04	2253.0 ±1.0	0.60±0.20
1772.0 ±1.0	0.04±0.02	2262.0 ±1.0	0.08±0.08
1776.5 ±1.0	0.72±0.16	2269.0 ±2.0	0.08±0.08
*1793.0 ±1.1	0.08±0.08	2273.0 ±2.0	0.24±0.08
1806.0 ±1.1	0.72±0.08	2290.0 ±2.0	0.08±0.08
1818.0 ±1.1	0.12±0.08	2300.0 ±2.0	0.20±0.08
1831.0 ±1.1	0.80±0.20	2311.0 ±2.0	3.80±0.80
1835.0 ±1.1	0.92±0.20	2317.0 ±2.0	2.00±0.40
1841.5 ±1.1	0.20±0.08	2326.0 ±2.0	2.00±0.40
1853.0 ±1.1	1.60±0.24	2338.0 ±2.0	0.40±0.00
1863.5 ±1.1	0.08±0.08	2349.0 ±2.0	1.24±0.12
1870.0 ±1.1	0.12±0.04	2369.0 ±2.0	0.60±0.20
1874.5 ±1.1	0.20±0.04	2378.0 ±2.0	0.12±0.12
1881.5 ±1.1	0.40±0.16	2390.0 ±2.0	14.60±2.00
1904.5 ±1.2	8.00±2.00	2431.0 ±2.00	2.20±0.40
1913.0 ±1.2	8.80±2.00	2441.0 ±2.0	0.40±0.20
1926.0 ±1.2	0.28±0.08	2454.0 ±2.0	1.80±0.20
1934.5 ±1.2	8.00±2.00	2464.0 ±2.0	0.40±0.20
1937.0 ±1.2	12.00±4.00	2470.0 ±2.0	0.20±0.12
1945.0 ±1.2	0.08±0.04	2479.0 ±2.0	0.20±0.12
1957.0 ±1.2	1.32±0.12	2495.0 ±2.0	1.60±0.40
1968.0 ±1.2	2.52±0.28	2505.0 ±2.0	7.20±1.20
1987.0 ±1.2	3.20±0.40	2522.0 ±2.0	2.80±0.60
*1993.0 ±1.2	0.04±0.02	2536.0 ±2.0	0.80±0.40
*2000.0 ±1.2	0.04±0.04	2543.0 ±2.0	0.08±0.08
2022.0 ±1.0	2.00±0.60	2554.0 ±2.0	0.84±0.20
2026.0 ±1.0	0.80±0.40	2558.0 ±2.0	0.40±0.20
2036.0 ±1.0	0.20±0.08	2574.0 ±2.0	6.40±1.60
2045.0 ±1.0	8.00±2.00	2595.0 ±2.0	0.08±0.08
2059.0 ±1.0	0.08±0.08	2608.0 ±2.0	1.00±0.20
2067.0 ±1.0	0.16±0.08	2617.0 ±2.0	0.48±0.16
2072.0 ±1.0	0.40±0.20	2628.0 ±2.0	0.20±0.20
2080.0 ±1.0	0.08±0.08	2636.0 ±2.0	0.80±0.20
2090.0 ±1.0	3.60±0.80	2645.0 ±2.0	0.12±0.12
2093.0 ±1.0	1.20±0.20	2658.0 ±2.0	10.00±2.00
2099.0 ±1.0	0.08±0.08	2677.0 ±2.0	1.00±0.20
2103.0 ±1.0	0.64±0.08	2683.0 ±2.0	1.20±0.40
2110.0 ±1.0	0.64±0.08	2698.0 ±2.0	0.96±0.20
2114.0 ±1.0	0.16±0.08	2711.0 ±2.0	2.80±0.40
2128.0 ±1.0	7.20±1.60	2724.0 ±2.0	1.60±0.40
2139.0 ±1.0	0.56±0.20	2731.0 ±2.0	0.24±0.12
2150.0 ±1.0	1.52±0.32	2739.0 ±2.0	0.08±0.08
2156.0 ±1.0	0.16±0.08	2749.0 ±2.0	0.80±0.20
2163.0 ±1.0	0.24±0.16	2753.0 ±2.0	0.80±0.20
2167.0 ±1.0	0.60±0.20	2767.0 ±2.0	0.08±0.08
2174.0 ±1.0	7.20±1.60	2777.0 ±2.0	6.40±1.20
2185.0 ±1.0	0.08±0.08	2791.0 ±2.0	0.08±0.08
2190.0 ±1.0	0.24±0.08	2805.0 ±2.0	0.60±0.20
2197.0 ±1.0	0.16±0.08	2813.0 ±2.0	0.20±0.20

Ag

E_0 (eV)	$\gamma_{Ag}^{E_0}$ (meV)	E_0 (eV)	$\gamma_{Ag}^{E_0}$ (meV)
2824.0 $\pm$ 2.0	2.80 $\pm$ 0.60	3365.0 $\pm$ 3.0	5.20 $\pm$ 1.20
2831.0 $\pm$ 2.0	2.80 $\pm$ 0.60	3378.0 $\pm$ 3.0	0.60 $\pm$ 0.20
2846.0 $\pm$ 2.0	4.40 $\pm$ 0.80	3391.0 $\pm$ 3.0	2.00 $\pm$ 0.40
2860.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3405.0 $\pm$ 3.0	0.40 $\pm$ 0.20
2869.0 $\pm$ 2.0	1.60 $\pm$ 0.40	3423.0 $\pm$ 3.0	1.20 $\pm$ 0.40
2875.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3432.0 $\pm$ 3.0	0.60 $\pm$ 0.20
2887.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3444.0 $\pm$ 3.0	0.08 $\pm$ 0.08
2901.0 $\pm$ 2.0	1.20 $\pm$ 0.20	3457.0 $\pm$ 3.0	0.40 $\pm$ 0.20
2915.0 $\pm$ 2.0	2.80 $\pm$ 0.40	3471.0 $\pm$ 3.0	0.20 $\pm$ 0.20
2937.0 $\pm$ 2.0	0.20 $\pm$ 0.20	3485.0 $\pm$ 3.0	4.40 $\pm$ 0.80
2944.0 $\pm$ 2.0	2.00 $\pm$ 0.40	3509.0 $\pm$ 3.0	2.20 $\pm$ 0.40
2958.0 $\pm$ 2.0	8.00 $\pm$ 2.00	3511.0 $\pm$ 3.0	0.08 $\pm$ 0.08
2978.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3522.0 $\pm$ 3.0	6.00 $\pm$ 1.20
2989.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3540.0 $\pm$ 3.0	2.40 $\pm$ 0.80
3000.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3562.0 $\pm$ 3.0	0.20 $\pm$ 0.20
3016.0 $\pm$ 2.0	1.00 $\pm$ 0.40	3578.0 $\pm$ 3.0	0.80 $\pm$ 0.40
3028.0 $\pm$ 2.0	4.80 $\pm$ 0.92	3586.0 $\pm$ 3.0	0.80 $\pm$ 0.08
3039.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3610.0 $\pm$ 3.0	20.00 $\pm$ 4.00
3046.0 $\pm$ 2.0	6.80 $\pm$ 1.40	3620.0 $\pm$ 3.0	0.08 $\pm$ 0.08
3058.0 $\pm$ 2.0	0.20 $\pm$ 0.20	3633.0 $\pm$ 3.0	5.20 $\pm$ 1.20
3079.0 $\pm$ 2.0	6.00 $\pm$ 1.20	3658.0 $\pm$ 3.0	0.40 $\pm$ 0.40
3100.0 $\pm$ 2.0	2.00 $\pm$ 0.40	3664.0 $\pm$ 3.0	6.40 $\pm$ 1.60
3112.0 $\pm$ 2.0	4.80 $\pm$ 1.20	3676.0 $\pm$ 3.0	0.08 $\pm$ 0.08
3120.0 $\pm$ 2.0	0.08 $\pm$ 0.08	3692.0 $\pm$ 3.0	12.00 $\pm$ 2.80
3131.0 $\pm$ 2.0	2.40 $\pm$ 0.60	3714.0 $\pm$ 3.0	0.20 $\pm$ 0.20
3148.0 $\pm$ 2.0	1.20 $\pm$ 0.40	3726.0 $\pm$ 3.0	2.00 $\pm$ 2.00
3153.0 $\pm$ 2.0	0.60 $\pm$ 0.20	3733.0 $\pm$ 3.0	6.00 $\pm$ 2.00
3160.0 $\pm$ 2.0	0.40 $\pm$ 0.20	3751.0 $\pm$ 3.0	0.40 $\pm$ 0.20
3175.0 $\pm$ 2.0	0.60 $\pm$ 0.20	3757.0 $\pm$ 3.0	0.20 $\pm$ 0.20
3185.0 $\pm$ 2.0	0.20 $\pm$ 0.20	3780.0 $\pm$ 3.0	1.00 $\pm$ 0.40
3192.0 $\pm$ 3.0	4.40 $\pm$ 1.20	3790.0 $\pm$ 3.0	2.80 $\pm$ 1.20
3207.0 $\pm$ 3.0	0.40 $\pm$ 0.20	3815.0 $\pm$ 3.0	2.40 $\pm$ 0.80
3214.0 $\pm$ 3.0	5.20 $\pm$ 1.20	3832.0 $\pm$ 3.0	6.40 $\pm$ 2.00
3224.0 $\pm$ 3.0	0.20 $\pm$ 0.20	3848.0 $\pm$ 3.0	0.20 $\pm$ 0.20
3234.0 $\pm$ 3.0	0.40 $\pm$ 0.20	3855.0 $\pm$ 3.0	0.08 $\pm$ 0.08
3242.0 $\pm$ 3.0	9.20 $\pm$ 2.00	3864.0 $\pm$ 3.0	0.80 $\pm$ 0.20
3260.0 $\pm$ 3.0	0.08 $\pm$ 0.08	3870.0 $\pm$ 3.0	0.08 $\pm$ 0.08
3265.0 $\pm$ 3.0	0.08 $\pm$ 0.08	3887.0 $\pm$ 3.0	14.00 $\pm$ 4.00
3273.0 $\pm$ 3.0	2.80 $\pm$ 0.80	3904.0 $\pm$ 3.0	17.20 $\pm$ 4.00
3280.0 $\pm$ 3.0	0.40 $\pm$ 0.20	3917.0 $\pm$ 3.0	0.20 $\pm$ 0.20
3301.0 $\pm$ 3.0	0.80 $\pm$ 0.40	3942.0 $\pm$ 3.0	0.08 $\pm$ 0.08
3306.0 $\pm$ 3.0	0.08 $\pm$ 0.08	3958.0 $\pm$ 3.0	0.40 $\pm$ 0.20
3311.0 $\pm$ 3.0	0.08 $\pm$ 0.08	3972.0 $\pm$ 3.0	0.20 $\pm$ 0.20
3324.0 $\pm$ 3.0	0.60 $\pm$ 0.20	3989.0 $\pm$ 3.0	14.00 $\pm$ 4.00
3332.0 $\pm$ 3.0	0.20 $\pm$ 0.20	3996.0 $\pm$ 4.0	0.40 $\pm$ 0.40
3349.0 $\pm$ 3.0	0.08 $\pm$ 0.08		

* Resonances are considered to be p-wave levels by Wynchank et al.

¹⁰⁷₄₇Ag

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 37.2 \pm 1.2 \text{ b} \\ \sigma_{Tc} &= 3.0 \pm 1.5 \text{ b (127 yr } ^{100}\text{Ag}^{\circ}) \\ \tau_{\text{cath}} &= 8.3 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 94 \pm 8 \text{ b} \\ R^2 &= 6.3 \pm 0.2 \text{ fm} \\ S_0 &= 0.35 \pm 0.07 \\ S_1 &= 2.5 \pm 1.0\end{aligned}$$

RESONANCE PARAMETERS

$I^{\circ} = 1/2^{\circ}$		$\chi^2/\text{dof} = 51.82$		$S_n = 7269 \pm 1 \text{ keV}$	
$E_0 \text{ (eV)}$	$2\sigma_{E_n}^2 \text{ (meV)}$	J	$\Gamma_T \text{ (meV)}$	$2\sigma_{\Gamma_n}^2 \text{ (meV)}$	
Bound level					
16.30 ± 0.05	5.8 ± 0.2	0	146 ± 8	1.44 ± 0.06	
41.5 ± 0.1	8.05 ± 0.64	1	137 ± 8	1.25 ± 0.10	
44.8 ± 0.1	1.74 ± 0.20	0	147 ± 11	0.26 ± 0.03	
51.4 ± 0.1	34.4 ± 1.7	1	133 ± 10	4.80 ± 0.24	
82.6 ± 0.2	6.028 ± 0.006			0.0031 ± 0.0007	
128.1 ± 0.2	0.11 ± 0.05			0.010 ± 0.004	
144.2 ± 0.2	10.0 ± 0.7	0	130 ± 15	0.83 ± 0.06	
155.0 ± 0.3	0.06 ± 0.03			0.005 ± 0.002	
162.4 ± 0.1	0.25 ± 0.13			0.02 ± 0.01	
167.1 ± 0.1	0.23 ± 0.05			0.018 ± 0.004	
173.5 ± 0.5	65.9 ± 5.3			5.0 ± 0.4	
183.6 ± 0.2	0.16 ± 0.05			0.012 ± 0.004	
202.5 ± 0.2	19.3 ± 1.7	1	154 ± 15	1.36 ± 0.12	
218.2 ± 0.4	0.18 ± 0.09			0.012 ± 0.006	
228.3 ± 0.4	1.7 ± 0.6			0.11 ± 0.04	
251.4 ± 0.4	15.8 ± 7.9			1.0 ± 0.5	
259.4 ± 0.5	0.27 ± 0.06			0.017 ± 0.004	
264.7 ± 0.5	4.6 ± 0.7		150 ± 40	0.28 ± 0.04	
270.5 ± 0.5	0.082 ± 0.033			0.005 ± 0.002	
311.0 ± 0.2	176 ± 14	1	134 ± 10	10.0 ± 0.8	
329.0 ± 0.2	0.33 ± 0.07			0.018 ± 0.004	
347.3 ± 0.2	0.56 ± 0.19			0.03 ± 0.01	
356.2 ± 0.2	0.26 ± 0.15			0.014 ± 0.006	
361.8 ± 0.2	34.3 ± 2.8	1	175 ± 25	1.80 ± 0.15	
374.3 ± 0.2	0.39 ± 0.19			0.02 ± 0.01	
382.1 ± 0.2	0.39 ± 0.20			0.02 ± 0.01	
402.0 ± 0.2	0.48 ± 0.24			0.024 ± 0.012	
410.0 ± 0.2	0.32 ± 0.16			0.016 ± 0.008	
444.7 ± 0.3	33.7 ± 4.2			1.6 ± 0.2	
461.4 ± 0.3	23.2 ± 2.6			1.08 ± 0.12	
466.7 ± 0.3	121 ± 26	1	138 ± 40	5.6 ± 1.2	
472.3 ± 0.3	28 ± 4			1.27 ± 0.19	
476.2 ± 0.3	3.5 ± 0.9			0.16 ± 0.04	
479.7 ± 0.3	0.20 ± 0.07			0.09 ± 0.03	
512.4 ± 0.3	17.2 ± 3.6			0.76 ± 0.16	

¹⁰⁷₄₇Ag

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
525.0 $\pm$ 0.3	0.30 $\pm$ 0.18			0.013 $\pm$ 0.008
532.2 $\pm$ 0.3	0.16 $\pm$ 0.05			0.07 $\pm$ 0.02
554.5 $\pm$ 0.3	212 $\pm$ 24	0		9.0 $\pm$ 1.0
576.8 $\pm$ 0.4	43 $\pm$ 5			1.8 $\pm$ 0.2
587.6 $\pm$ 0.4	99 $\pm$ 10	0	118 $\pm$ 40	4.1 $\pm$ 0.4
605.1 $\pm$ 0.4	3.2 $\pm$ 0.5			0.13 $\pm$ 0.02
625.6 $\pm$ 0.4	25 $\pm$ 5			1.0 $\pm$ 0.2
653.4 $\pm$ 0.5	20 $\pm$ 3			0.80 $\pm$ 0.10
674.7 $\pm$ 0.5	65 $\pm$ 8		130 $\pm$ 30	2.5 $\pm$ 0.3
695.9 $\pm$ 0.5	23.7 $\pm$ 2.6			0.9 $\pm$ 0.1
703.5 $\pm$ 0.5	6.9 $\pm$ 0.5			0.26 $\pm$ 0.02
721.5 $\pm$ 0.5	1.1 $\pm$ 0.3			0.04 $\pm$ 0.01
734.7 $\pm$ 0.6	1.1 $\pm$ 0.3			0.04 $\pm$ 0.01
753.0 $\pm$ 0.6	66 $\pm$ 11			2.4 $\pm$ 0.4
813.0 $\pm$ 0.6	6.8 $\pm$ 1.7			0.24 $\pm$ 0.06
848.9 $\pm$ 0.7	8.7 $\pm$ 1.5			0.30 $\pm$ 0.05
882.3 $\pm$ 0.7	119 $\pm$ 18			4.0 $\pm$ 0.6
886.7 $\pm$ 0.7	12 $\pm$ 4			0.40 $\pm$ 0.12
914.9 $\pm$ 0.7	7.3 $\pm$ 1.2			0.24 $\pm$ 0.04
935.4 $\pm$ 0.8	324 $\pm$ 33			10.6 $\pm$ 1.1
946 $\pm$ 0.8	62 $\pm$ 6			2.0 $\pm$ 0.2
990.0 $\pm$ 0.9	120 $\pm$ 12			3.8 $\pm$ 0.4
1048.0 $\pm$ 0.9	97 $\pm$ 10			3.0 $\pm$ 0.3
1135.0 $\pm$ 1	74 $\pm$ 7			2.2 $\pm$ 0.2
1148.0 $\pm$ 1.1	41 $\pm$ 7			1.2 $\pm$ 0.2
1179.0 $\pm$ 1.1	196 $\pm$ 21			5.7 $\pm$ 0.6
1415.0 $\pm$ 0.7	188 $\pm$ 38			5.0 $\pm$ 1.0
1592.0 $\pm$ 0.7	80 $\pm$ 24			2.0 $\pm$ 0.6
1627.0 $\pm$ 1	125 $\pm$ 24			3.1 $\pm$ 0.6
1643.0 $\pm$ 1	154 $\pm$ 32			3.8 $\pm$ 0.8
1719.0 $\pm$ 1	137 $\pm$ 25			3.3 $\pm$ 0.6
1836.0 $\pm$ 1	86 $\pm$ 17			2.0 $\pm$ 0.4
1905.0 $\pm$ 1	305 $\pm$ 31			7.0 $\pm$ 0.7
1938.0 $\pm$ 1	660 $\pm$ 45			15 $\pm$ 1
1988.0 $\pm$ 1	143 $\pm$ 18			3.2 $\pm$ 0.4
2046.0 $\pm$ 1	370 $\pm$ 55			8.2 $\pm$ 1.2
2176.0 $\pm$ 2	360 $\pm$ 50			7.7 $\pm$ 1.0
2312.0 $\pm$ 2	163 $\pm$ 40			3.4 $\pm$ 0.8
2391.0 $\pm$ 2	780 $\pm$ 100			16 $\pm$ 2
2659.0 $\pm$ 2	650 $\pm$ 100			12.6 $\pm$ 2.0

¹⁰⁹
⁴⁷Ag

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 91 \pm 3 \text{ b } (^{110}\text{Ag}^{g.s.}) \\ \sigma_{\gamma} &= 89 \pm 4 \text{ b } (24 \text{ sec } ^{110}\text{Ag}^g) \\ \sigma_{\gamma} &= 4.5 \pm 0.2 \text{ b } (290 \text{ day } ^{110}\text{Ag}^e) \\ a_{\text{coh}} &= 4.3 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 1450 \pm 40 \text{ b} \\ R' &= 6.3 \pm 0.2 \text{ fm} \\ S_0 &= 0.50 \pm 0.15 \\ S_1 &= 2.5 \pm 1.0\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 1/2^{-}$$

$$ZAbn = 48.18$$

$$S_n = 6805.5 \pm 0.7 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
5.19±0.01	149 ± 6	19.1 ± 0.3	1	136 ± 6	8.29 ± 0.06
30.4 ± 0.1	137 ± 6	11.0 ± 0.6	1	130 ± 6	1.98 ± 0.12
40.1 ± 0.1	136 ± 7	7.5 ± 0.2	1	131 ± 7	1.18 ± 0.03
55.7 ± 0.2	176 ± 9	18.6 ± 1.5	0	139 ± 7	2.5 ± 0.2
70.8 ± 0.2	147 ± 5	40 ± 3	1	120 ± 5	4.8 ± 0.4
87.7 ± 0.2	136 ± 15	9.4 ± 0.3	1	130 ± 15	1.00 ± 0.03
91.5 ± 0.2		0.05 ± 0.01			0.005 ± 0.001
106.3 ± 0.3		0.20 ± 0.3			0.020 ± 0.003
133.9 ± 0.2	200 ± 7	120 ± 6	1	120 ± 5	10.4 ± 0.5
139.7 ± 0.2	135 ± 46	2.4 ± 0.3		133 ± 46	0.20 ± 0.03
169.8 ± 0.2		0.39 ± 0.13			0.03 ± 0.01
173.1 ± 0.2	188 ± 20	72 ± 6	1	140 ± 15	5.5 ± 0.5
209.6 ± 0.2	157 ± 20	36 ± 2	1	133 ± 20	2.50 ± 0.15
251.3 ± 0.3	131 ± 20	17 ± 3	1	120 ± 20	1.1 ± 0.2
259.0 ± 0.3		2.1 ± 0.3			0.13 ± 0.02
264.7 ± 0.3		0.36 ± 0.07			0.022 ± 0.004
272.6 ± 0.4		2.3 ± 0.3			0.14 ± 0.02
291.0 ± 0.3	176 ± 25	18 ± 3	0	140 ± 20	1.05 ± 0.15
293.3 ± 0.3		0.34 ± 0.14			0.020 ± 0.008
300.9 ± 0.3		1.4 ± 0.5			0.08 ± 0.03
316.5 ± 0.3	300 ± 50	250 ± 18	1		14 ± 1
322.1 ± 0.3		0.22 ± 0.14			0.012 ± 0.008
327.8 ± 0.3		7.2 ± 1.8			0.4 ± 0.1
340.2 ± 0.3		0.26 ± 0.07			0.014 ± 0.004
387.0 ± 0.4	190 ± 25	65 ± 3	1	147 ± 25	3.20 ± 0.20
391.6 ± 0.4		0.32 ± 0.08			0.016 ± 0.004
398.0 ± 0.4	162 ± 20	33 ± 3	1	140 ± 20	1.65 ± 0.15
404.4 ± 0.4	346 ± 30	100 ± 4	0	146 ± 10	5.0 ± 0.2
428.6 ± 0.4		19 ± 2			0.90 ± 0.08
441.0 ± 0.4		0.19 ± 0.04			0.009 ± 0.002
469.7 ± 0.4	280 ± 70	69 ± 9	0		3.2 ± 0.4
487.7 ± 0.5		25 ± 2			1.14 ± 0.08
495.2 ± 0.5		0.9 ± 0.4			0.04 ± 0.02
500.6 ± 0.5	280 ± 30	226 ± 16	1	119 ± 30	10.1 ± 0.06
515.4 ± 0.5	250 ± 40	91 ± 9	(0)	68 ± 40	4.0 ± 0.4

¹⁰⁹
₄₇Ag

E ₀ (eV)	Γ (meV)	2g _n ⁰ (meV)	J	Γ _J (meV)	2g _n ⁰ (meV)
526.7 ±0.5		1.4 ± 0.9			0.06 ±0.04
557.2 ±0.5		26 ± 4			1.12 ±0.17
560.7 ±0.5		132 ±11	0	127 ±60	5.57 ±0.45
565.5 ±0.5	230 ±40	138 ± 8	1	138 ±40	5.8 ±0.6
608.0 ±0.5	190 ±30	50 ± 5	1	157 ±30	2.0 ±0.2
622.4 ±0.4	310 ±40	100 ± 7	0	110 ±40	4.0 ±0.3
634.5 ±0.5		1.0 ± 0.5			0.04 ±0.02
648.3 ±0.6		1.0 ± 0.5			0.04 ±0.02
669.5 ±0.6		37 ± 4			1.44 ±0.14
681.5 ±0.6		4.2 ± 1.0			0.16 ±0.04
687.4 ±0.6		2.1 ± 0.5			0.08 ±0.02
713.8 ±0.6		1.6 ± 0.5			0.06 ±0.02
726.1 ±0.6		30 ± 3			1.2 ±0.1
730.3 ±0.7		1.6 ± 0.5			0.06 ±0.02
747.6 ±0.7	310 ±70	108 ±16			4.0 ±0.6
752.6 ±0.6		70 ±14			2.5 ±0.5
784.7 ±0.7		280 ±30			10 ± 1
803.8 ±0.7		51 ±11			1.8 ±0.4
831.4 ±0.8		6 ± 2			0.20 ±0.08
861.8 ±0.8		16 ± 2			0.52 ±0.08
883.0 ±0.8		110 ±11			3.7 ±0.4
902.8 ±0.8		18 ± 4			0.60 ±0.12
933.0 ±0.8		110 ±12			3.6 ±0.4
949.3 ±0.8		12 ± 3			0.40 ±0.10
961.0 ±0.8		31 ± 6			1.0 ±0.2
976.0 ±0.9		103 ± 5			3.30 ±0.3
1009 ± 1		1.3 ±13			4.2 ±0.4
1057 ± 1		60 ± 7			1.8 ±0.2
1062 ± 1		60 ± 7			1.8 ±0.2
1116 ± 1		80 ± 7			2.4 ±0.2
1204 ± 1		260 ±35			7.4 ±1.0
1219 ± 1		280 ±35			8.0 ±1.0
1236 ± 1		140 ± 7			4.0 ±0.2
1300 ± 1		125 ± 7			3.4 ±0.2
1383 ± 1		90 ±10			2.4 ±0.3
1415 ± 1		195 ±26			5.2 ±0.7
1484 ± 1		58 ±11			1.5 ±0.3
1512 ± 1		155 ±16			1.5 ±0.3
1587 ± 1		240 ±40			4.0 ±1.0
1678 ± 1		140 ±25			6.0 ±1.0
1914 ± 2		480 ±90			3.4 ±0.6
2091 ± 2		180 ±45			11 ± 2
2129 ± 2		380 ±75			4.0 ±1.0
2329 ± 2		512 ±80			8.2 ±1.6
2350 ± 2		63 ±10			*10.6 ±1.6
2506 ± 2		35 ± 6			1.3 ±0.2
					7.0 ±1.2

* Possibly doublet

THERMAL CROSS SECTIONS

$$\sigma_T = 82 \pm 1 \text{ b}$$

¹¹⁰
₄₇Ag
[332 day]

¹¹¹
₄₇Ag
[7.47 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 3 \pm 2 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 105 \pm 20 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ag ^{107,109}	activation	JNE, 25, 129(71)	Ryves
Ag	σ_{γ}	UCRL-72865(70)	Cranston
Ag ¹⁰⁹	moxon-rae	NIM, 86, 83(70)	Malik
Ag ¹⁰⁹	activation	JIN, 30, 349(68)	Sims
Ag ¹¹¹	activation	ORNL-3994, 7(67)	Druschel
Ag ^{110m}	activation	CJP, 41, 1321(63)	Hart
Ag	pile osci.	KE, 6, 336(63)	Huttel
Ag ¹⁰⁹	isom. ratio	PR, 129, 769(63)	Keisch
Ag ¹⁰⁹	ratio	NP, 29, 66(62)	Nilsson
Ag	pile osci.	61BUCHAR(61)	Bouzyk
Ag	decay tech.	NSE, 9, 132(61)	Meadows
Ag	pile osci.	JAERI-1009(60)	Fuketa
Ag ¹⁰⁹	activation	NSE, 8, 378(60)	Lyon
Ag, Ag ¹⁰⁹	pile osci.	JNE, 12, 32(60)	Tattersall
Ag	pile osci.	AERE-R/R-2333(57)	Cummins
Ag	pile osci.	AERE-R/M-100(57)	Cummins
Ag ¹⁰⁹	activation	IJP, 31, 630(57)	Sehgal
Ag ¹⁰⁹	activation	PRIVATE COMM.(56)	Grimeland
Ag	pile osci.	JNE, 1, 144(54)	Green
Ag	pulsed n	PR, 95, 582(54)	Scott
Ag ^{107,109}	pile osci.	PR, 88, 412(52)	Pomerance
Ag	pile osci.	PR, 83, 641(51)	Pomerance
Ag, Ag ^{107,109}	diffraction	PR, 81, 527(51)	Shull
Ag	pile osci.	PR, 80, 342(50)	Harris
Ag ^{107,109}	activation	PR, 72, 888(47)	Seren
Ag	$\bar{\sigma}_s$	PR, 50, 133(36)	Mitchell

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Ag	σ_t	291.-753.	NP/A,131,305(69)	Julien
Ag	σ_t	41.-2665.	AERE-PR/NP-16(69)	Pattenden
Ag ¹⁰⁹	σ_t	55.-2587.	AERE-PR/NP-16(69)	Pattenden
Ag ¹⁰⁹	σ_t	30.-317.	PR,141,1129(66)	Chrien
Ag	σ_γ	16.3-915.	66PARIS,1,79(66)	Muradyan
Ag	σ_γ	5.2-903.	66PARIS,1,79(66)	Muradyan
Ag ¹⁰⁹	$\bar{\sigma}_s$	5.-404.	65ANTWERP,65(65)	Asghar
Ag ¹⁰⁹	σ_t	100.-3996.	PR/B,137,547(65)	Garg
Ag ¹⁰⁷	σ_t	62.-630.	65ANTWERP,92(65)	Pattenden
Ag ¹⁰⁹	$\sigma_t \bar{\sigma}_s$	16.-174.	BAP,8,334(63)	Singh
Ag	σ_γ	144.-173.	CR,254,4162(62)	Julien
Ag	σ_γ	16.-317.	61SACLAY,439(61)	Moxon
Ag	σ_γ	5.-728.	PR,120,2214(60)	Desjardins
Ag	$\sigma_t \sigma_\gamma \bar{\sigma}_s$	5.-133.	NP,5,89(58)	Rae
Ag	σ_t	16.-316.	PR,103,1778(56)	Fluharty
Ag	σ_γ	16.-250.	CU-155(56)	Grimm
Ag	$\bar{\sigma}_s$	1.-20.	PR,104,1425(56)	Wood
Ag	$\bar{\sigma}_s$	0.-20.	PR,98,565(55)	Sheer
Ag, Ag ¹⁰⁹	σ_t	5.-90.	PR,95,476(54)	Seidl
Ag	σ_t	5.-53.	PR,84,869(51)	Selove

THERMAL CROSS SECTIONS

$$\sigma_T = 2450 \pm 20 \text{ b}$$

$$\bar{\sigma}_s = 5.6 \pm 0.3 \text{ b}$$

$$a_{coh} = 0.37 \pm 0.16 i \text{ fm}$$

RESONANCE PROPERTIES

$$S_0 = 0.45 \pm 0.15$$

$$S_1 = 3.3 \pm 1.0$$

UNASSIGNED RESONANCES

E_0 (eV)	$ag\Gamma_n$ (meV)	$ag\Gamma_n^0$ (meV)
4.58 ± 0.03		
6.98 ± 0.03		
54.17 ± 0.06	0.0043 ± 0.0015	$.0006 \pm .0002$
59.65 ± 0.08	0.0043 ± 0.0015	$.0006 \pm .0002$
62.41 ± 0.09	0.0053 ± 0.0025	$.0006 \pm 0.003$
110.77 ± 0.11	0.013 ± 0.006	$.0012 \pm .0006$
115.84 ± 0.11	0.012 ± 0.006	$.0011 \pm .0006$
125.34 ± 0.13	0.018 ± 0.010	$.0016 \pm .0009$
145.89 ± 0.16	0.022 ± 0.010	$.0018 \pm .0008$
245.95 ± 0.22		
281.57 ± 0.26	0.055 ± 0.027	$.0033 \pm .0016$
361.65 ± 0.30	0.078 ± 0.040	$.0041 \pm .0021$
376.56 ± 0.32	0.098 ± 0.050	$.0050 \pm .0026$
446.67 ± 0.41	0.38 ± 0.20	$.018 \pm .010$
456.55 ± 0.43	1.4 ± 0.2	$.066 \pm .009$
489.66 ± 0.48	0.11 ± 0.07	$.0050 \pm .0032$
494.64 ± 0.62	0.05 ± 0.04	$.0022 \pm .0018$
592.37 ± 0.81	0.19 ± 0.12	$.0078 \pm .0049$
661.27 ± 0.74	0.26 ± 0.13	$.010 \pm .005$
717.94 ± 0.42	1.7 ± 0.3	$.063 \pm .011$
901.28 ± 0.30	2.0 ± 0.5	$.067 \pm .017$
939.18 ± 0.32	0.75 ± 0.25	$.025 \pm .008$
955.14 ± 0.65	0.30 ± 0.15	$.0097 \pm .0049$
975.51 ± 0.34	1.5 ± 0.3	$.048 \pm .010$
1169.1 ± 0.5	0.56 ± 0.20	$.016 \pm .006$
1333.7 ± 0.5	1.6 ± 0.5	$.044 \pm .014$
1356.1 ± 0.6	0.81 ± 0.50	$.022 \pm .014$
1460.3 ± 0.6	1.1 ± 0.6	$.029 \pm .016$
1710.5 ± 0.8	0.50 ± 0.40	$.012 \pm .010$
1734.0 ± 0.4	2.1 ± 0.6	$.050 \pm .014$
1752.3 ± 0.8	1.6 ± 0.9	$.038 \pm .022$
1753.9 ± 0.8	1.0 ± 0.6	$.024 \pm .014$
1770.9 ± 0.8	1.5 ± 1.1	$.036 \pm .026$
1928.5 ± 0.9	1.1 ± 0.8	$.025 \pm .018$
2007.5 ± 0.5	1.8 ± 0.7	$.040 \pm .016$
2018.7 ± 0.5	1.5 ± 0.6	$.033 \pm .013$
2256.4 ± 1.2	1.3 ± 0.8	$.027 \pm .017$
2275.9 ± 0.6	0.95 ± 0.50	$.020 \pm .010$
2290.5 ± 0.6	1.7 ± 0.8	$.036 \pm .017$

⁴⁸Cd

E_0 (eV)	$ag\Gamma_n$ (meV)	$ag\Gamma_n^0$ (meV)
2303.5 ±1.2		
2330.4 ±0.6		
2345.2 ±0.6		
2388.1 ±1.3		
2430.8 ±0.7		
2450.0 ±0.7		
2465.3 ±1.4		
2470.0 ±0.7		
2489.0 ±0.7		
2497.1 ±0.7		
2526.1 ±0.7		
2534.1 ±0.7		
2560.5 ±0.7		
2603.6 ±0.7		
2650.1 ±0.8		
2745.7 ±0.8		
2752.3 ±0.8		
2771.8 ±0.8		
2777.4 ±0.8		
2791.9 ±0.8		
2827.4 ±1.6		
2867.3 ±0.9		
2883.8 ±0.9		
2899.9 ±0.9		
2927.9 ±0.9		
2943.6 ±0.9		
2965.6 ±0.9		
2993.6 ±0.9		
3020.3 ±0.9		
3054.2 ±0.9		
3073.3 ±0.9		
3082.1 ±1.0		
3089.7 ±1.0		
3120.4 ±1.0		
3141.1 ±1.0		
3197.7 ±2.0		
3213.6 ±1.0		
3240.8 ±1.0		
3256.5 ±1.0		
3274.4 ±1.0		
3320.5 ±1.0		
3375.1 ±1.1		
3391.3 ±1.1		
3430.0 ±1.1		
3456.6 ±1.1		
3478.4 ±1.1		
3516.9 ±2.2		
3528.3 ±2.3		
3535.2 ±2.4		
3549.1 ±1.2		
3579.4 ±1.2		
3605.3 ±1.2		

^{48}Cd

E_0 (eV)	$ag_{\alpha}^{\pm}$ (meV)	$ag_{\alpha}^{0\pm}$ (meV)
3616.0 $\pm$ 1.2		
3676.3 $\pm$ 1.2		
3683.7 $\pm$ 1.2		
3729.4 $\pm$ 2.4		
3804.1 $\pm$ 1.3		
3829.9 $\pm$ 1.3		
3914.3 $\pm$ 1.4		
3926.4 $\pm$ 1.4		
3992.6 $\pm$ 1.4		
4054.1 $\pm$ 1.4		
4127.9 $\pm$ 2.9		
4141.7 $\pm$ 1.5		
4192.6 $\pm$ 1.5		
4221.0 $\pm$ 3.0		
4304.8 $\pm$ 1.6		
4340.6 $\pm$ 1.6		
4346.9 $\pm$ 3.2		
4368.1 $\pm$ 1.6		
4414.3 $\pm$ 1.6		
4436.1 $\pm$ 1.6		
4468.6 $\pm$ 1.6		
4513.1 $\pm$ 1.7		
4582.8 $\pm$ 1.7		
4624.8 $\pm$ 1.7		
4645.5 $\pm$ 1.8		
4657.7 $\pm$ 1.8		
4747.7 $\pm$ 1.8		
4773.8 $\pm$ 1.8		
4807.4 $\pm$ 1.8		
4842.3 $\pm$ 1.9		
4889.7 $\pm$ 1.9		
4952.0 $\pm$ 1.9		
4979.8 $\pm$ 2.0		
5001.1 $\pm$ 2.0		
5011.8 $\pm$ 2.0		
5043.0 $\pm$ 2.0		
5170.9 $\pm$ 2.1		
5194.4 $\pm$ 2.1		
5236.6 $\pm$ 2.1		
5273.2 $\pm$ 2.1		
5317.5 $\pm$ 2.1		
5328.1 $\pm$ 2.1		
5394.8 $\pm$ 2.2		
5418.7 $\pm$ 2.2		
5447.2 $\pm$ 4.4		
5479.3 $\pm$ 2.2		
5500.5 $\pm$ 2.2		
5574.9 $\pm$ 2.2		
5602.4 $\pm$ 2.3		
5623.1 $\pm$ 2.3		
5764.3 $\pm$ 2.4		
5776.3 $\pm$ 2.4		

⁴⁸Cd

E_γ (eV)	$\sigma_{\gamma}^{n_0}$ (neV)	$\sigma_{\gamma}^{n_0}$ (neV)
5802.8 ±2.4		
5824.7 ±2.5		
5850.9 ±2.5		
5930.8 ±2.5		
6014.2 ±5.2		
6221.2 ±2.7		
6406.6 ±5.6		
6433.4 ±5.6		
6556.6 ±5.8		
6601.9 ±3.0		
6683.5 ±3.0		
6719.5 ±3.0		
6795.6 ±3.1		
6804.8 ±3.1		
6827.9 ±3.1		
6863.6 ±3.1		
7010.7 ±3.2		
7051.1 ±3.3		
7129.5 ±3.3		
7232.8 ±3.4		
7276.8 ±3.5		
7481.6 ±3.6		
7513.6 ±3.6		
7574.6 ±3.6		
7698.9 ±3.7		
7910.3 ±3.7		
8048.9 ±4.0		
8122.6 ±4.0		
8154.7 ±4.1		
8419.1 ±4.3		
8461.6 ±4.3		
8604.0 ±4.4		
8745.6 ±4.5		
8861.0 ±4.6		
8913.7 ±4.6		
9328.6 ±4.9		
9443.1 ±5.0		
9496.1 ±5.1		
9603.5 ±5.2		
9720.5 ±5.3		
9773.2 ±5.3		

* Small Resonance

**¹⁰⁸
⁴⁸Cd**

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 1.1 \pm 0.3 \text{ b}$$

**¹⁰⁹
⁴⁸Cd**

[453 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 650 \pm 100 \text{ b}$$

¹¹⁰₄₈Cd

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 11 \pm 1 \text{ b } ({}^{111}\text{Cd}^{90}) \\ \sigma_T &= 0.10 \pm 0.03 \text{ b } [48.6 \text{ min } {}^{111}\text{Cd}] \\ \bar{\sigma}_s &= 6 \pm 1 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 40 \pm 4 \text{ b} \\ R_T &= 7. \pm 0.5 \text{ fm} \\ S_0 &= 0.50 \pm 0.08\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\chi_{\text{Abr}} = 12.39$$

$$S_n = 6976.8 \pm 3.5 \text{ keV}$$

E_0 (eV)	g_n^0 (meV)	Γ_T (meV)	g_n^0 (meV)
89.27 $\pm$ 0.15	142 $\pm$ 10	110 $\pm$ 15	15.0 $\pm$ 1.0
230.93 $\pm$ 0.16	8.3 $\pm$ 0.9		.54 $\pm$.05
339.66 $\pm$ 0.28	0.71 $\pm$ 0.09		.038 $\pm$.004
369.61 $\pm$ 0.20	23 $\pm$ 2	97 $\pm$ 20	1.1 $\pm$.1
505.34 $\pm$ 0.25	1.44 $\pm$ 0.18		.064 $\pm$.008
652.05 $\pm$ 0.37	3.8 $\pm$ 0.4		.14 $\pm$.02
761.78 $\pm$ 0.46	11 $\pm$ 1		.39 $\pm$ 0.04
799.76 $\pm$ 0.50	410 $\pm$ 30	125 $\pm$ 25	14.4 $\pm$ 1.0
824.08 $\pm$ 0.52	7 $\pm$ 1		.24 $\pm$ 0.04
916.89 $\pm$ 0.31	20 $\pm$ 4		.66 $\pm$.13
920.85 $\pm$ 0.31	75 $\pm$ 7		2.4 $\pm$.2
1115.9 $\pm$ 0.4	31 $\pm$ 4	85 $\pm$ 20	.92 $\pm$.12
1135.3 $\pm$ 0.4	7.1 $\pm$ 1.4		.21 $\pm$.04
1241.5 $\pm$ 0.5	4.9 $\pm$ 1.2		.13 $\pm$.03
1318.1 $\pm$ 0.3	20 $\pm$ 2		.55 $\pm$ 0.06
1346.7 $\pm$ 0.3	960 $\pm$ 80		26.1 $\pm$ 2.1
1685.8 $\pm$ 0.4	13 $\pm$ 2		.32 $\pm$ 0.05
1809.5 $\pm$ 0.4	24 $\pm$ 5		.56 $\pm$.12
1828.2 $\pm$ 0.4	340 $\pm$ 40	97 $\pm$ 20	7.95 $\pm$.93
1982.9 $\pm$ 0.5	275 $\pm$ 30	90 $\pm$ 20	6.17 $\pm$.67
2065.7 $\pm$ 0.5	2100 $\pm$ 200		46.20 $\pm$ 4.40
2100.4 $\pm$ 2.7	11 $\pm$ 4		.24 $\pm$ 0.09
2353.0 $\pm$ 0.6	12 $\pm$ 3		.24 $\pm$ 0.06
2376.0 $\pm$ 0.6	2100 $\pm$ 200		43.08 $\pm$ 4.10
2410.6 $\pm$ 0.7	34 $\pm$ 6		.69 $\pm$.12
2476.8 $\pm$ 0.7	59 $\pm$ 10		1.2 $\pm$.20
2492.0 $\pm$ 0.7	49 $\pm$ 8		.98 $\pm$.16
2723.2 $\pm$ 4.0	16 $\pm$ 6		.31 $\pm$.11
2739.7 $\pm$ 0.8	57 $\pm$ 10		1.09 $\pm$.19
3042.2 $\pm$ 0.9	1500 $\pm$ 200		27.20 $\pm$ 3.63
3105.7 $\pm$ 1.0	134 $\pm$ 20		2.40 $\pm$.35
3153.1 $\pm$ 1.0	74 $\pm$ 14		1.32 $\pm$.24
3183.7 $\pm$ 5.0	22 $\pm$ 8		.39 $\pm$.15
3375.1 $\pm$ 1.1	220 $\pm$ 40		3.79 $\pm$.69
3496.4 $\pm$ 1.1	95 $\pm$ 18		1.61 $\pm$.30
3636.4 $\pm$ 1.2	110 $\pm$ 15		1.82 $\pm$.25
3667.8 $\pm$ 2.4	67 $\pm$ 12		1.11 $\pm$.20

¹¹⁰
₄₈Cd

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
3702.1 ±1.2	103 ± 20		1.69 ± .33
3744.4 ±1.3	500 ± 70		8.17 ±1.14
3804.4 ±6.6	25 ± 10		.41 ± .16
3953.5 ±1.4	1000 ±120		15.90 ±1.90
3980.9 ±7.0	28 ± 11		.44 ± .17
4099.0 ±1.4	56 ± 10		.87 ± .16
4161.5 ±1.5	47 ± 10		.73 ± .16
4180.7 ±1.5	110 ± 20		1.70 ± .31
4242.8 ±1.5	330 ± 50		5.07 ± .77
4304.8 ±1.6	140 ± 30		2.13 ± .46
4402.3 ±1.6	340 ± 50		5.12 ± .75
4480.0 ±8.4	105 ± 40		1.57 ± .60
4661.1 ±1.8	76 ± 15		1.11 ± .22
4675.1 ±1.8	92 ± 20		1.35 ± .29
4747.7 ±1.8	144 ± 30		2.08 ± .43
4864.5 ±1.9	260 ± 40		3.73 ± .57
5121.4 ±2.0	720 ±120		1.01 ±1.68
5291.0 ±2.1	540 ± 80		7.42 ±1.10
5369.9 ±2.2	160 ± 40		2.18 ± .55
5694.2 ±2.4	310 ± 70		4.11 ± .93
5802.8 ±2.4	190 ± 50		2.49 ± .66
5983.7 ±2.6	1300 ±200		16.80 ±2.59
6089.0 ±2.6	810 ±150		10.4 ±1.92
6259.0 ±2.7	230 ± 50		2.91 ± .63
6343.9 ±2.8	540 ±100		6.78 ±1.26
6468.9 ±2.9	200 ± 40		2.48 ± .50
6487.4 ±2.9	180 ± 40		2.23 ± .50
6601.9 ±3.0	390 ± 80		4.80 ± .98
6913.7 ±3.2	1000 ±200		12.02 ±2.40
6937.3 ±3.2	240 ± 80		2.88 ± .96
7083.6 ±3.3	330 ± 70		3.92 ± .83
7276.8 ±3.4	260 ± 80		3.28 ± .94
7669.4 ±3.7	1100 ±200		12.56 ±2.28
8718.8 ±4.5	1300 ±700		13.92 ±2.14
8822.2 ±4.6	2800 ±500		29.81 ±5.32
8934.5 ±4.7	530 ±120		5.61 ±1.27
9025.4 ±4.7	510 ±150		5.37 ±1.58
9146.3 ±4.8	990 ±200		10.35 ±2.09
9221.0 ±4.9	920 ±250		9.58 ±2.60
9250.2 ±4.9	1000 ±300		10.40 ±3.11
9269.7 ±4.9	1700 ±500		17.65 ±5.19
9896.0 ±5.4	2300 ±600		23.12 ±6.03

¹¹¹Cd

THERMAL CROSS SECTIONS

$$\sigma_T = 24.3 \pm 3.0 \text{ b}$$
$$\bar{\sigma}_0 = 5.2 \pm 0.3 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 51 \pm 5 \text{ b}$$
$$R_T^2 = 6.4 \pm 0.6 \text{ fm}$$
$$S_0 = 0.45 \pm 0.06$$

RESONANCE PARAMETERS

$I^\pi = 1/2^+$		$\% \text{Abn} = 12.75$		$S_n = 9397.0 \pm 2.9 \text{ keV}$		
$E_0 \text{ (eV)}$	$2g_n^0 \text{ (meV)}$	J	ℓ	$\Gamma_\gamma \text{ (meV)}$	$2g_n^0 \text{ (meV)}$	$g_n^1 \text{ (meV)}$
27.53±0.03	7.2 ± 0.4	1		105 ± 15	1.37 ± .07	
69.43±0.10	0.17± 0.04				0.020± .005	
85.11±0.07	3.8 ± 0.4				.41 ± .04	
99.41±0.09	20.4 ± 1.4	1		108 ± 14	2.04 ± .14	
102.93±0.09	1.54± .14				0.151± .014	
114.75±0.11	.28± 0.10				.026± .009	
138.11±0.14	15.0 ± 1.0	1		95 ± 12	1.28 ± .09	
140.78±0.15	0.38± 0.08				.032± .006	
164.11±0.18	90 ± 6	1		125 ± 15	7.0 ± .5	
203.52±0.16	.46± .20				.032± .014	
208.57±0.17	.52± .20				.036± .014	
225.05±0.15	44 ± 6				2.9 ± .4	
233.41±0.16	114 ± 8	0		102 ± 20	7.46 ± .52	
275.56±0.21	29.4 ± 4.0		0	98 ± 20	1.77 ± .24	
286.47±0.27	0.68± .36		1		.040± .021	34
311.38±0.24	86 ± 8			160 ± 40	4.87 ± .45	
313.0 ± 0.5	1.2				0.04	
331.97±0.27	11.0 ± 1.0		0		0.60 ± .05	
336.66±0.27	2.2 ± 0.4				.12 ± .02	
355.99±0.29	64 ± 6		0	97 ± 15	3.39 ± .32	
389.02±0.33	40 ± 16		0		2.03 ± .81	
410.01±0.36	3.4 ± 1.2		1		.17 ± .06	101
422.66±0.38	3.4 ± 1.2		1		.17 ± .06	99
438.31±0.40	12.8 ± 1.6		0		.611± .076	
443.0 ± 0.5	1.2				0.04	
453.0 ± 0.5	0.8				0.03	
466.0 ± 0.5	2.0		1		0.09	47
478.01±0.45	5.6 ± 1.4				.26 ± .06	
484.01±0.47	5.2 ± 1.4		1		.24 ± .06	122
517.90±0.33	1.6 ± 1.0				.070± .044	
530.64±0.27	2.0 ± 0.8				.087± .034	
540.27±0.28	36 ± 4		0		1.55 ± .17	
543.40±0.40	1.90± .80				.082± .03	
548.20±0.28	5.4 ± 1.6				.23 ± .07	
552 ± 1	0.4		1		0.02	9
564 ± 1	0.4		1		0.02	9
568 ± 1	2.4				0.12	
575.92±0.30	74 ± 6		0	115 ± 20	3.08 ± .25	

¹¹¹₄₈Cd

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	$g\Gamma_n^1$ (meV)
583 ±1	1.6				0.08	
598.67±0.32	3.4 ± 1.0				.14 ± .04	
603.52±0.33	52 ± 6		0		2.12 ± .24	
607 ±1	0.8				0.04	
622.63±0.34	120 ±14			160 ±30	4.81 ± .56	
654 ±1	3.6				0.16	
671 ±1	5.2				0.20	
685 ±1	0.4				0.02	
688.53±0.79	5.6 ± 2.0				.21 ± .08	
706.28±0.82	10.6 ± 4.0				.40 ± .15	
740 ±1	3.6		1		0.13	43
764.32±0.47	24 ± 6		0		.87 ± .22	
782.69±0.47	4.2 ± 2.2				.15 ± .08	
790.43±0.49	110 ±12		0	80 ±20	3.91 ± .43	
809.26±0.51	98 ±14		0		3.44 ± .49	
836 ±2	0.8				0.03	
845 ±2	1.6				0.04	
858 ±2	2.8		1		0.10	29
860.48±0.55	38 ± 6				1.30 ± .20	
876 ±2	9.2				0.32	
878.17±0.57	66 ± 8		0		2.23 ± .27	
885 ±2	28.8				0.96	
900 ±2	2.8				0.08	
903.65±0.30	18 ± 4		0		.60 ± .13	
908 ±3	2.8				0.08	
924.69±0.62	5.6 ± 3.0				.18 ± .10	
928.10±0.62	4.8 ± 2.8				.16 ± .09	
960 ±2	3.6				0.12	
965.24±0.33	120 ±16				3.86 ± .51	
969 ±2	2.4				0.08	
991 ±2	5.6				0.16	
1003.1±0.4	6.8 ± 2.4				.21 ± .08	
1018.2±0.7	10.8 ± 3.6				.339± .11	
1023.1±1.1	4.8 ± 2.2				.15 ± .07	
1035 ±2	3.6		1		0.11	26
1042.0±0.4	70 ± 8				2.17 ± .25	
1056.9±0.8	5.6 ± 2.8				.17 ± .09	
1068 ±2	4.4		1		0.14	32
1082.1±1.0	4 ± 2				.12 ± .06	
1097 ±2	7.6		1		0.23	52
1115 ±2	1.6				0.04	
1138.9±0.8	11.0 ± 5.4				0.33 ± .16	
1148.8±0.4	17.4 ± 6.0				.513± .17	
1157.1±0.9	5.0 ± 2.6				.15 ± .08	
1174.4±0.5	10.8 ± 4.0				.315± .117	
1191 ±2	4.0				0.12	
1202.2±0.5	10.2 ± 4.0				.294± .12	
1216.8±0.5	226 ±30		0		6.48 ± .86	
1221.0±0.5	9.4 ± 5.0		1		.27 ± .14	54
1237.2±0.5	18.2 ± 6.0				.517± .17	
1252.1±0.5	310 ±30			65 ±25	8.75 ± .85	
1261.6±0.5	44 ± 6				1.24 ± .17	

¹¹¹₄₈Cd

E ₀ (eV)	2g _n ⁰ (meV)	J	t	Γ _γ (meV)	2g _n ⁰ (meV)	g _n ¹ (meV)
1289.4±0.5	19.8 ± 5.0				.551 ± .13	
1307.6±0.5	22 ± 8				.61 ± .22	
1337 ± 3	50				1.4	
1350 ± 3	6.4				0.16	
1362 ± 3	6.4				0.16	
1371.2±0.6	34 ± 8				.92 ± .22	
1386 ± 3	6.4				0.16	
1399.1±0.3	90 ± 14				2.41 ± .37	
1403.2±0.3	132 ± 20				3.52 ± .53	
1423 ± 3	4.4				0.12	
1424 ± 3	11				0.28	
1448.6±0.6	36 ± 12				.95 ± .32	
1467.7±0.6	220 ± 40				5.74 ± 1.04	
1491 ± 3	4.0				0.12	
1511.1±0.7	9.6 ± 6.0				.25 ± .15	
1522.3±0.3	32 ± 8		0		.82 ± .21	
1538 ± 3	12				0.32	
1551 ± 3	1.6				0.04	
1566.5±0.6	94 ± 32				2.38 ± .80	
1581.7±0.4	300 ± 40	0	0	75 ± 30	7.54 ± 1.01	
1596.9±0.4	156 ± 20		0		3.90 ± .50	
1617.4±0.4	280 ± 50		0		6.96 ± 1.24	
1630.9±0.4	340 ± 80		0		8.42 ± 1.98	
1654.2±0.4	160 ± 20		0		3.93 ± .49	
1665 ± 3	12.8				0.32	
1688 ± 3	7.2				0.16	
1698.5±0.7	6.6 ± 3.2				.16 ± .08	
1742.3±0.4	560 ± 80		0		13.4 ± 1.9	
1768.5±0.8	22 ± 6				.52 ± .14	
1776 ± 3	6.0				0.12	
1787.0±0.4	340 ± 60		0		8.04 ± 1.42	
1791.1±0.8	15.0 ± 8.0				.354 ± .19	
1820.5±0.4	210 ± 40		0		4.92 ± .94	
1825.6±0.9	74 ± 35		0		1.73 ± .84	
1883.6±0.5	200 ± 30		0		4.60 ± .69	
1920 ± 3	20				0.46	
1934.1±0.5	220 ± 40		0		5.00 ± .91	
1953 ± 3	20				0.44	
1979 ± 3	16				0.36	
2016 ± 3	3.6				0.08	
2022.7±0.5	116 ± 20		0		2.58 ± .45	
2045 ± 3	16				0.35	
2065 ± 3	2				0.08	
2082.8±1.1	48 ± 32				1.05 ± .70	
2089 ± 3	12.4				0.44	
2110.7±1.1	26 ± 14				.57 ± .30	
2118.6±1.1	12 ± 6				.26 ± .13	
2138.3±1.1	72 ± 36		0		1.56 ± .77	
2144.0±1.1	180 ± 40		0		3.89 ± .86	
2158.2±1.1	24 ± 14				.52 ± .30	
2172.0±1.1	22 ± 12				.47 ± .26	
2202 ± 4	9.6				0.20	

¹¹¹₄₈Cd

E ₀ (eV)	2g _n ⁰ (meV)	J	ℓ	Γ _γ (meV)	2g _n ⁰ (meV)	g _n ¹ (meV)
2205 ±4	30.8				6.4	
2236.6±0.6	82 ±24				1.73 ± .51	
2286 ±4	12.8				0.28	
2294.4±1.2	48 ±24				1.00 ± .50	

¹¹²₄₈Cd

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.2 \pm 0.5 \text{ b } [^{113}\text{Cd}^{g+m}]$$

$$\bar{\sigma}_s = 6.9 \pm 0.3 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 15 \pm 3 \text{ b}$$

$$R^2 = 6.7 \pm 0.4 \text{ fm}$$

$$S_0 = 0.58 \pm 0.08$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{Abn} = 24.07$$

$$S_n = 6539.8 \pm 2.8 \text{ keV}$$

E ₀ (eV)	g _n ⁰ (meV)	Γ _γ (meV)	g _n ⁰ (meV)
66.77±0.09	7.0 ± 0.6	85 ±20	0.86 ± .07
82.57±0.09	0.08± 0.02		.009± .002
83.24±0.07	0.37± 0.03		.041± .003
226.46±0.15	21 ± 2	115 ±20	1.40 ± .13
442.97±0.41	67 ± 5	105 ±15	3.18 ± .24
452.68±0.27	3.4 ± 0.3		.16 ± .01
565.76±0.30	2.6 ± 0.3		.11 ± .01
737.28±0.44	300 ± 30	100 ±25	11.06 ±1.11
810.61±0.65	3.0 ± 0.6		.11 ± .02
884.47±0.57	6.0 ± 1.0		.20 ± .03
894.50±0.30	6.7 ± 1.0		.22 ± .03
908.73±0.30	250 ± 20	105 ±30	8.29 ± .66
1052.5 ±0.4	13 ± 2		.40 ± .06
1101.5 ±0.4	6.1 ± 1.5		.18 ± .04
1115.4 ±0.4	710 ± 70		21.3 ±2.1
1207.3 ±0.5	14 ± 3		.40 ± .08
1337.3 ±0.5	36 ± 5		.98 ± .1
1423.3 ±0.6	690 ± 70		18.2 ±1.9
1640.1 ±0.4	8.7 ± 1.8		.21 ± .04
1706.0 ±0.4	290 ± 30		7.02 ± .73
1814.4 ±0.4	19 ± 4		.45 ± .09
1942.5 ±0.5	46 ± 6		1.04 ± .14
2035.5 ±0.5	1500 ±150		33.24 ±3.32
2226.2 ±0.6	39 ± 6		.83 ± .13
2336.5 ±0.6	750 ± 70		15.5 ±1.4
2456.6 ±0.7	17 ± 3		.34 ± .06
2573.7 ±0.7	1700 ±170		33.50 ±3.35

¹¹²
48 Cd

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
2684.8 $\pm$ 0.8	1600 $\pm$ 200		30.88 $\pm$ 3.86
2813.4 $\pm$ 0.8	19 $\pm$ 4		.36 $\pm$.08
2817.5 $\pm$ 0.8	56 $\pm$ 10		1.06 $\pm$.19
2951.5 $\pm$ 0.9	230 $\pm$ 30		4.23 $\pm$.55
3005.8 $\pm$ 1.8	21 $\pm$ 6		.38 $\pm$.11
3103.8 $\pm$ 1.0	490 $\pm$ 60		8.80 $\pm$ 1.08
3153.6 $\pm$ 1.0	105 $\pm$ 15		1.87 $\pm$.27
3224.7 $\pm$ 1.0	47 $\pm$ 8		.83 $\pm$.14
3289.8 $\pm$ 1.0	46 $\pm$ 9		.80 $\pm$.16
3306.9 $\pm$ 1.0	155 $\pm$ 25		2.69 $\pm$.43
3320.5 $\pm$ 1.1	140 $\pm$ 20		2.42 $\pm$.35
3404.3 $\pm$ 1.1	25 $\pm$ 6		.43 $\pm$.10
3491.9 $\pm$ 1.2	140 $\pm$ 20		2.37 $\pm$.34
3710.1 $\pm$ 1.2	47 $\pm$ 12		.77 $\pm$.20
3776.6 $\pm$ 1.3	220 $\pm$ 30		3.60 $\pm$.49
3861.9 $\pm$ 1.3	55 $\pm$ 10		.89 $\pm$.16
3885.7 $\pm$ 1.3	69 $\pm$ 14		1.11 $\pm$.22
4106.9 $\pm$ 1.4	210 $\pm$ 30		3.28 $\pm$.47
4152.7 $\pm$ 1.5	34 $\pm$ 8		.53 $\pm$.12
4200.0 $\pm$ 1.5	100 $\pm$ 20		1.54 $\pm$.31
4263.3 $\pm$ 1.5	46 $\pm$ 12		.70 $\pm$.18
4392.7 $\pm$ 1.6	92 $\pm$ 20		1.39 $\pm$.30
4486.7 $\pm$ 1.7	97 $\pm$ 24		1.45 $\pm$.36
4558.3 $\pm$ 1.7	1700 $\pm$ 200		25.18 $\pm$ 2.96
4798.3 $\pm$ 1.8	125 $\pm$ 25		1.80 $\pm$.36
4854.3 $\pm$ 1.9	92 $\pm$ 20		1.32 $\pm$.29
4907.5 $\pm$ 1.9	940 $\pm$ 120		13.4 $\pm$ 1.71
5001.1 $\pm$ 2.0	240 $\pm$ 50		3.39 $\pm$.70
5136.5 $\pm$ 2.0	210 $\pm$ 40		2.93 $\pm$.56
5236.6 $\pm$ 2.1	160 $\pm$ 30		2.21 $\pm$.42
5285.8 $\pm$ 2.1	91 $\pm$ 25		1.25 $\pm$.34
5552.2 $\pm$ 2.3	88 $\pm$ 18		1.18 $\pm$.24
5574.9 $\pm$ 2.3	750 $\pm$ 100		10.00 $\pm$ 1.33
5686.0 $\pm$ 2.4	950 $\pm$ 150		12.59 $\pm$ 2.00
5734.4 $\pm$ 2.4	93 $\pm$ 25		1.23 $\pm$.33
5948.3 $\pm$ 2.5	620 $\pm$ 120		8.04 $\pm$ 1.56
6085.1 $\pm$ 2.6	1600 $\pm$ 300		20.51 $\pm$ 3.85
6112.4 $\pm$ 2.6	160 $\pm$ 30		2.05 $\pm$.38
6359.1 $\pm$ 2.8	520 $\pm$ 120		6.52 $\pm$ 1.50
6433.4 $\pm$ 2.8	210 $\pm$ 50		2.62 $\pm$.62
6529.1 $\pm$ 2.9	320 $\pm$ 60		3.96 $\pm$.74
6577.0 $\pm$ 2.9	2400 $\pm$ 300		29.59 $\pm$ 3.70
6874.5 $\pm$ 3.1	140 $\pm$ 40		1.69 $\pm$.48
6920.0 $\pm$ 3.2	390 $\pm$ 100		4.69 $\pm$ 1.20
6937.3 $\pm$ 3.2	220 $\pm$ 60		2.64 $\pm$.72
6975.5 $\pm$ 3.2	2900 $\pm$ 400		34.72 $\pm$ 4.79
7167.6 $\pm$ 3.3	400 $\pm$ 80		4.73 $\pm$.95
7640.0 $\pm$ 3.7	170 $\pm$ 50		1.95 $\pm$.57
8007.5 $\pm$ 3.9	440 $\pm$ 120		4.92 $\pm$ 1.34
8029.2 $\pm$ 3.9	480 $\pm$ 100		5.36 $\pm$ 1.12
8248.3 $\pm$ 4.1	1600 $\pm$ 300		17.62 $\pm$ 3.30
8377.0 $\pm$ 4.2	730 $\pm$ 160		7.98 $\pm$ 1.75

¹¹²₄₈Cd

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
8519.4 ± 4.3	540 ± 150		5.85 ± 1.62
8536.7 ± 4.3	760 ± 200		8.23 ± 2.16
8665.5 ± 4.4	350 ± 90		3.76 $\pm .97$
9041.9 ± 4.7	400 ± 100		4.21 ± 1.05
9153.5 ± 4.8	2000 ± 400		20.90 ± 4.18
9225.9 ± 4.9	550 ± 140		5.73 ± 1.46
9570.1 ± 5.1	1100 ± 200		11.24 ± 2.04
9738.9 ± 5.3	370 ± 100		3.75 ± 1.01
10043 ± 6	630 ± 180		6.29 ± 1.80
10262 ± 6	940 ± 300		9.28 ± 2.96
10464 ± 6	390 ± 120		3.81 ± 1.17
10582 ± 6	610 ± 200		5.92 ± 1.94
10678 ± 6	3300 ± 900		31.94 ± 8.71
10899 ± 6	2500 ± 600		23.95 ± 5.75
11018 ± 7	510 ± 200		4.86 ± 1.91
11153 ± 7	860 ± 250		8.14 ± 2.37
11280 ± 7	800 ± 250		7.53 ± 2.35
11322 ± 7	530 ± 200		4.98 ± 1.88
11455 ± 7	2100 ± 600		19.56 ± 5.60

¹¹³
⁴⁸Cd

Thermal Cross Sections

$\sigma_T = 19910 \pm 300 \text{ b}$
 $a_{coh} = -1.5 \pm 1.2 i \text{ fm}$

Resonance Properties

$R' = 6.7 \pm 0.4 \text{ fm}$
 $S_0 = 0.32 \pm 0.07$

Resonance Parameters

$I'' = 1/2^+$ $\chi_{abn} = 12.26$ $S_n = 9041.0 \pm 1.4 \text{ keV}$

$E_0 \text{ (eV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_\gamma \text{ (meV)}$	$2g\Gamma_0^0 \text{ (meV)}$
0.1776 ± 0.0006	0.968 ± 0.020	1	114 ± 1	2.28 ± 0.02
56.3 ± 0.2	0.2 ± 0.1			0.270 ± 0.014
18.40 ± 0.03	0.28 ± 0.02	1		0.0653 ± 0.0047
63.68 ± 0.09	4.8 ± 0.4	1	100 ± 20	0.600 ± 0.050
84.82 ± 0.07	45 ± 4	1	113 ± 10	4.88 ± 0.43
108.30 ± 0.10	16.4 ± 1.2	1	90 ± 12	1.57 ± 0.115
143.08 ± 0.15	5.2 ± 0.4			0.433 ± 0.0334
158.72 ± 0.17	14.0 ± 1.0			1.03 ± 0.08
192.82 ± 0.14	92 ± 6	0	110 ± 15	6.62 ± 0.43
215.16 ± 0.28	40 ± 4	1	97 ± 14	2.72 ± 0.27
261.03 ± 0.19	54 ± 4	1	97 ± 12	3.34 ± 0.25
269.26 ± 0.20	35 ± 4	0	100 ± 16	2.14 ± 0.24
291.56 ± 0.22	10.0 ± 0.8			0.585 ± 0.047
414.03 ± 0.37	195 ± 18	1	103 ± 15	9.58 ± 0.885
431.94 ± 0.39	47 ± 6	1		2.26 ± 0.29
500.89 ± 0.25	86 ± 6	1	108 ± 20	3.84 ± 0.27
524.66 ± 0.26	56 ± 6	1	102 ± 25	2.45 ± 0.26
551.59 ± 0.29	155 ± 15	1	95 ± 20	7.03 ± 0.64
634.89 ± 0.35	170 ± 18	0	170 ± 50	6.75 ± 0.71
723.45 ± 0.43	40 ± 4			1.48 ± 0.15
841.45 ± 0.54	112 ± 18			3.86 ± 0.62
851.43 ± 0.55	720 ± 80	1	115 ± 30	24.67 ± 2.74
1088.6 ± 0.4	92 ± 14			2.79 ± 0.424
1120.0 ± 0.4	200 ± 60			5.98 ± 1.79
1267.3 ± 0.5	300 ± 40	1	95 ± 25	8.43 ± 1.12
1310.2 ± 0.5	58 ± 18			1.60 ± 0.497
1318.1 ± 0.5	150 ± 50			4.13 ± 1.38
1364.0 ± 0.6	260 ± 40	1	90 ± 30	7.04 ± 1.08
1628.0 ± 0.4	110 ± 36			2.73 ± 0.89
1645.6 ± 0.4	66 ± 14			1.63 ± 0.35
1659.7 ± 0.4	90 ± 16			2.21 ± 0.44
1866.9 ± 0.5	56 ± 12			1.30 ± 0.28
1908.2 ± 0.5	158 ± 30			3.62 ± 0.69
1963.3 ± 1.0	124 ± 50			2.80 ± 1.13
2053.2 ± 0.5	152 ± 40			3.36 ± 0.88
2114.6 ± 0.6	70 ± 28			1.52 ± 0.61
2200.0 ± 0.6	122 ± 36			2.60 ± 0.77
2241.2 ± 0.6	90 ± 30			1.90 ± 0.63

¹¹⁴Cd
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THERMAL CROSS SECTIONS

$\sigma_T = 0.300 \pm 0.015$ b [53.5 hr $^{115}\text{Cd}^g$]
 $\sigma_T = 0.036 \pm 0.007$ b [43 day $^{115}\text{Cd}^m$]
 $\bar{\sigma}_n = 6 \pm 1$ b

RESONANCE PROPERTIES

$I\gamma = 20 \pm 2$ b
 $R\gamma = 6.6 \pm 0.4$ fm
 $S_0 = 0.54 \pm 0.11$

RESONANCE PARAMETERS

$I^\pi = 0^+$

$\chi R b n = 28.86$

$S_n = 6148 \pm 10$ keV

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
56.40 $\pm$ 0.05	0.078 $\pm$ 0.015	95 $\pm$ 15	.0103 $\pm$.001
120.10 $\pm$ 0.15	50 $\pm$ 3		4.57 $\pm$.27
227.07 $\pm$ 0.15	3.1 $\pm$ 0.5		.21 $\pm$.03
392.24 $\pm$ 0.34	940 $\pm$ 50		42.41 $\pm$ 2.52
567.78 $\pm$ 0.38	2.1 $\pm$ 0.3		0.88 $\pm$ 0.13
670.68 $\pm$ 0.38	360 $\pm$ 30	130 $\pm$ 30	13.90 $\pm$ 1.16
752.19 $\pm$ 0.45	370 $\pm$ 30	110 $\pm$ 25	13.49 $\pm$ 1.09
962.13 $\pm$ 0.33	17 $\pm$ 3		.55 $\pm$.10
1037.9 $\pm$ 0.9	4.0 $\pm$ 1.2		.12 $\pm$.04
1089.7 $\pm$ 0.4	250 $\pm$ 20		7.54 $\pm$.60
1326.5 $\pm$ 0.3	31 $\pm$ 3		.85 $\pm$.08
1425.7 $\pm$ 0.6	1600 $\pm$ 200		47.67 $\pm$ 5.29
1475.3 $\pm$ 0.3	42 $\pm$ 4		1.09 $\pm$.10
1485.3 $\pm$ 0.6	12 $\pm$ 3		.31 $\pm$.08
1604.3 $\pm$ 0.4	28 $\pm$ 4		.70 $\pm$.10
1637.3 $\pm$ 1.9	20 $\pm$ 7		.49 $\pm$.17
1690.0 $\pm$ 0.7	15 $\pm$ 3		.36 $\pm$.07
1921.1 $\pm$ 0.5	490 $\pm$ 60		11.18 $\pm$ 1.37
1964.9 $\pm$ 0.5	37 $\pm$ 7		.84 $\pm$.16
2132.6 $\pm$ 0.6	310 $\pm$ 40		6.71 $\pm$.87
2267.3 $\pm$ 0.6	22 $\pm$ 4		.46 $\pm$.08
2284.2 $\pm$ 0.6	68 $\pm$ 10		1.42 $\pm$.21
2512.9 $\pm$ 0.7	56 $\pm$ 8		1.12 $\pm$.16
2589.3 $\pm$ 3.7	45 $\pm$ 17		.88 $\pm$.33
2635.9 $\pm$ 0.8	72 $\pm$ 14		1.40 $\pm$.27
2678.3 $\pm$ 0.8	1500 $\pm$ 200		28.98 $\pm$ 3.86
2804.0 $\pm$ 0.8	350 $\pm$ 50		6.61 $\pm$.94
2849.3 $\pm$ 0.9	40 $\pm$ 8		.75 $\pm$.15
2955.6 $\pm$ 4.5	40 $\pm$ 24		1.12 $\pm$.44
3027.1 $\pm$ 0.9	61 $\pm$ 10		.89 $\pm$.18
3178.0 $\pm$ 1.0	49 $\pm$ 10		60.31 $\pm$ 8.87
3305.4 $\pm$ 2.1	3400 $\pm$ 500		1.50 $\pm$.42
3333.6 $\pm$ 1.1	86 $\pm$ 24		5.72 $\pm$.87
3698.4 $\pm$ 6.3	330 $\pm$ 50		.87 $\pm$.38
3819.5 $\pm$ 1.3	53 $\pm$ 23		15.69 $\pm$ 2.10
4258.0 $\pm$ 1.5	970 $\pm$ 130		32.18 $\pm$ 4.60
4418.4 $\pm$ 3.2	2100 $\pm$ 300		1.81 $\pm$.45
120	120 $\pm$ 30		

¹¹⁴₄₈Cd

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
4582.8 $\pm$ 1.7	260 $\pm$ 60		3.84 $\pm$.89
4645.5 $\pm$ 1.7	190 $\pm$ 50		2.79 $\pm$.74
4691.8 $\pm$ 1.8	320 $\pm$ 50		4.67 $\pm$.73
5357.0 $\pm$ 2.2	430 $\pm$ 90		5.88 $\pm$ 1.23
5515.0 $\pm$ 2.3	680 $\pm$ 100		9.16 $\pm$ 1.35
6042.4 $\pm$ 2.6	580 $\pm$ 90		7.46 $\pm$ 1.16
6406.6 $\pm$ 2.8	770 $\pm$ 150		9.62 $\pm$ 1.87
7202.6 $\pm$ 3.4	1200 $\pm$ 200		14.14 $\pm$ 2.36
7393.8 $\pm$ 3.5	420 $\pm$ 70		4.88 $\pm$.81
7495.8 $\pm$ 3.6	1200 $\pm$ 300		13.86 $\pm$ 3.47
7662.0 $\pm$ 3.7	490 $\pm$ 120		5.60 $\pm$ 1.37
7837.6 $\pm$ 3.8	1600 $\pm$ 400		18.07 $\pm$ 4.52
8368.6 $\pm$ 4.2	1400 $\pm$ 400		15.30 $\pm$ 4.37
8946.0 $\pm$ 4.6	880 $\pm$ 250		9.30 $\pm$ 2.64
9262.4 $\pm$ 4.9	7800 $\pm$ 1400		81.05 $\pm$ 14.55
9958.3 $\pm$ 5.5	950 $\pm$ 170		9.52 $\pm$ 1.70
10098 $\pm$ 6	1300 $\pm$ 300		12.94 $\pm$ 2.99

¹¹⁶₄₈Cd

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_f &= 0.050 \pm 0.008 \text{ b } [2.4 \text{ hr } ^{117}\text{Cd}^g] \\ \sigma_f &= 0.027 \pm 0.005 \text{ b } [3.4 \text{ hr } ^{117}\text{Cd}^a] \\ \sigma_s &= 5.6 \pm 0.3 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$S_0 = 0.21 \pm 0.06$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\% \text{Abn} = 7.58$		$S_n = 5765 \pm 13 \text{ keV}$
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	$\Gamma_f \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$	
28.97 ± 0.05	0.056 ± 0.007		.010 ± .001	
676.41 ± 0.39	22 ± 2		.85 ± .08	
888.96 ± 0.29	49 ± 5	125 ± 30	1.64 ± .17	
1048.3 ± 0.4	430 ± 40		13.28 ± 1.24	
1122.4 ± 1.1	19 ± 6		.57 ± .18	
1384.1 ± 0.3	120 ± 10		3.23 ± .27	
1568.5 ± 0.4	95 ± 15		2.40 ± .38	
1857.7 ± 0.5	77 ± 15		1.79 ± .35	
1968.5 ± 0.5	230 ± 40		5.18 ± .90	
2361.5 ± 0.6	1400 ± 200		28.81 ± 4.12	
2541.2 ± 0.7	24 ± 7		.48 ± .14	
2651.6 ± 0.8	230 ± 50		4.47 ± .97	
3358.0 ± 1.1	240 ± 40		4.14 ± .69	
3652.6 ± 1.2	670 ± 100		11.09 ± 1.66	
4206.7 ± 1.5	140 ± 40		2.16 ± 0.17	
4615.3 ± 1.7	170 ± 50		2.50 ± .74	
4873.8 ± 1.9	750 ± 180		10.74 ± 2.58	
5072.5 ± 2.0	640 ± 120		8.99 ± 1.68	
5300.5 ± 2.2	1600 ± 400		21.98 ± 5.49	
7347.1 ± 3.5	1500 ± 400		17.50 ± 4.67	
8822.2 ± 4.6	3600 ± 900		38.33 ± 9.58	

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cd, Cd ¹¹³		ACR, A25, 391 (69)-	Bacon
Cd, Cd ¹¹¹	σ_c	AE, 27, 1117 (69)	Vertebnyi
Cd ^{112, 114, 116}	σ_c	AE, 27, 1117 (69)	Vertebnyi
Cd	pulsed n	NSE, 31, 152 (68)	Meadows
Cd	local osci.	ZFK-132, 18 (67)	Fahrman
Cd ^{111, 112}	activation	ORNL-3994, 1 (66)	Baldock
Cd ¹¹³	diffraction	AERE-R-5195 (66)	Dale
Cd ¹¹⁶	activation	RCA, 6, 29 (66)	Decat
Cd ^{106, 109}	mass separation	ORNL-4013, 3 (66)	Gillette
Cd ¹¹⁴	activation	NSE, 26, 281 (66)	Pearlstein
Cd ¹¹⁰	activation	NSE, 22, 373 (65)	Kramer
Cd ¹⁰⁸	activation	AE, 16, 145 (64)	Bedas
Cd ¹⁰⁸	activation	PHY, 30, 124 (64)	Boyd
Cd	pulsed n	PRIVATE COMM. (64)	Kay
Cd, Cd ¹¹³	diffraction	JPR, 25, 615 (64)	Smith
Cd	σ_c pile osci.	NUK, 6, 245 (64)	Sokolovsky
Cd	diffraction	PR, 126, 2262 (62)	Arnold
Cd	mirror reflections	RSI, 33, 916 (62)	Bally
Cd ^{108, 110}	activation	NP, 36, 542 (62)	Mangal
Cd	bragg scattering	JPJ, 17, 335 (62)	Peterson
Cd	diffraction	PR, 126, 2262 (62)-	Peterson
Cd	diffraction	PR, 124, 1848 (61)	Arnold
Cd	reflection	PR, 124, 1848 (61)-	Brockhouse
Cd	pulsed n	NSE, 9, 132 (61)	Meadows
Cd, Cd ¹¹³	diffraction	PRL, 6, 7 (61)	Peterson
Cd	pile osci.	AERE-R/R-2516 (59)	Jowitt
Cd	pile osci.	AERE-R/R-2516 (58)	Jowitt
Cd	local osci.	PR, 83, 643 (51)	Pomerance
Cd ¹¹⁴	activation	PR, 72, 888 (47)	Seren
Cd	$\bar{\sigma}_s$	PR, 50, 133 (36)	Mitchell

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Cd ¹¹⁰	σ_t	89.3-9896	BAP,18,96(73)+	Liou
Cd ¹¹²	σ_t	66.8-11455	BAP,18,96(73)+	Liou
Cd ¹¹⁴	σ_t	56.4-9958	BAP,18,96(73)+	Liou
Cd ¹¹⁶	σ_t	29.0-8822	BAP,18,96(73)+	Liou
Cd ¹¹¹	σ_γ	276-2301	PR/C,7,780(73)+	Nasson
Cd	σ_t	27.4-99.8	NP/A,132,129(69)	Julien
Cd	$\bar{\sigma}_s$	102-1401	NP/A,138,556(69)	King
Cd	σ_t	18.34-214.3	68WASH,2,789(68)	Asami
Cd	σ_t	0.01-10.0	NUK,11,297(68)	Widder
Cd	σ_t	0.025-1.0	NSE,28,359(67)	Akyuz
Cd	σ_γ	0.2-215	66PARIS,673(66)	Bollinger
Cd ¹¹⁰	$\sigma_t \sigma_\gamma$	89.6-372	66PARIS,93(66)	Shepkin
Cd ¹¹¹	$\sigma_t \sigma_\gamma$	27.5-625	66PARIS,93(66)	Shepkin
Cd ¹¹²	$\sigma_t \sigma_\gamma$	66.7-1450	66PARIS,93(66)	Shepkin
Cd ¹¹³	$\sigma_t \sigma_\gamma$	0.178-858	66PARIS,93(66)	Shepkin
Cd ¹¹⁴	$\sigma_t \sigma_\gamma$	120-1107	66PARIS,93(66)	Shepkin
Cd ¹¹⁶	$\sigma_t \sigma_\gamma$	29.3	66PARIS,93(66)	Shepkin
Cd ¹¹¹	σ_γ	28	ZET,45,875(63)	Ignatiev
Cd	σ_γ	0.2-234	PR,124,1142(61)	Jackson
Cd	σ_γ	83.4-554	BAP,2,42(57)	Desjardins
Cd ^{111,113}	σ_t	10-165	BAP,1,187(57)	Schwartz
Cd ^{111,113}	σ_t	10-233	PR,105,616(57)	Simpson
Cd,Cd ^{108,110}	σ_t	18-400	PR,102,228(56)	Palmer
Cd ^{111,112}	σ_t	18-400	PR,102,228(56)	Palmer
Cd	$\sigma_t \bar{\sigma}_s$	0.02-0.4	CJP,31,432(53)	Brockhouse
Cd	$\bar{\sigma}_s$	0.178	PR,72,986(47)	Beeman
Cd	σ_t	0-0.28	PR,71,65(47)	Rainwater
Cd	σ_t	0-0.6	PR,72,109(47)	Sawyer

⁴⁹In

THERMAL CROSS SECTIONS

$$\sigma_T = 193.5 \pm 1.5 \text{ b}$$
$$a_{coh} = 3.9 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 3200. \pm 50. \text{ b}$$
$$S_0 = 0.30 \pm 0.04$$
$$S_1 = 2.5 \pm 0.5$$

¹¹³
⁴⁹In

THERMAL CROSS SECTIONS

$$\sigma_T = 11.4 \pm 1.1 \text{ b}$$
$$\sigma_T = 3.1 \pm 0.7 \text{ b [42 ms } ^{114}\text{In}^{\text{m}2}]$$
$$\sigma_T = 4.4 \pm 0.7 \text{ b [49 day } ^{114}\text{In}^{\text{m}1}]$$
$$\sigma_T = 3.9 \pm 0.4 \text{ b [72 sec } ^{114}\text{In}^{\text{g}}]$$

RESONANCE PROPERTIES

$$I_\gamma = 282 \pm 30 \text{ b}$$
$$R' = 6.6 \pm 0.4 \text{ fm}$$
$$S_0 = 0.85 \pm 0.20$$

RESONANCE PARAMETERS

$$I^\pi = 9/2^+$$

$$\%abn = 4.28$$

$$S_n = 7313 \pm 10 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1.80±0.03	<0.1		<0.08
4.70±0.03	0.104± 0.016		0.048±0.007
14.6 ±0.1	7.6 ± 0.6	60 ±20	2.1 ±0.2
21.55±0.01	2.8 ± 0.2		0.60 ±0.04
24.99±0.02	9.4 ± 0.2	80 ± 5	1.88 ±0.04
26.78±0.02	0.21 ± 0.05		0.04 ±0.01
32.24±0.02	7.7 ± 0.4	72 ±10	1.36 ±0.07
44.71±0.03	2.2 ± 0.2		0.33 ±0.03
45.38±0.03	1.68 ± 0.02		0.250±0.003
70.29±0.03	7.6 ± 0.2		0.90 ±0.02
91.59±0.05	30 ±10		3.12 ±1.04
93.00±0.05	4.24 ± 0.08		0.44 ±0.008
103.95±0.05	30 ± 2	70 ± 5	3.0 ±0.2
123.45±0.08	12 ± 1		1.08
203.36±0.16	38 ± 2		2.66
228.50±0.19	37.0 ± 9.2		2.44
234.48±0.20	13.0 ± 1.4		0.84
236.06±0.20	7.0 ± 1.8		0.44
241.73±0.21	16.6 ± 1.8		1.08
270.45±0.12	8.8 ± 1.4		0.54
304.26±0.15	12.4 ± 1.4		0.72
313.93±0.15	7.0 ± 1.8		0.40

¹¹³
₄₉In

E ₀ (eV)	2gΓ _n (meV)	Γ _γ (meV)	2gΓ _n ⁰ (meV)
325.83±0.16	11.54 ± 2.32		0.64
441.45±0.25	13.8 ± 1.8		0.66
511.56±0.32	39.2 ± 4.6		1.73
544.78±0.35	83.2 ± 4.6		3.6
555.37±0.36	23.6 ± 2.4		1.0
582.87±0.38	11.1 ± 4.6		4.6
593.02±0.40	41.6 ± 2.4		1.70
625.54±0.43	69.2 ± 4.6		2.78
660.81±0.47	74.0 ± 4.6		2.88
714.59±0.52	92.4 ± 9.2		3.46
769.91±0.59	74.0 ± 4.6		2.68
777.57±0.59	31.8 ± 1.4		1.14
785.35±0.60	40.6 ± 2.4		1.45
809.39±0.63	38.4 ± 2.4		1.34
912.01±0.38	180.2 ± 23.2		5.96
1064.6 ± 0.48	46.2 ± 4.6		1.42
1230.0 ± 0.59	110.8 ± 9.2		3.14
1254.6 ± 0.61	120 ± 14		3.4
1761.9 ± 1.0	124 ± 10		2.98
2004.1 ± 1.2	414 ± 14		9.50

¹¹⁵
₄₉In

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 202 \pm 2 \text{ b} \\ \sigma_{\gamma} &= 92 \pm 14 \text{ b [2.12 sec } ^{116}\text{In}^{m2}] \\ \sigma_{\gamma} &= 65 \pm 5 \text{ b [54 min } ^{116}\text{In}^{m1}] \\ \sigma_{\gamma} &= 45 \pm 4 \text{ b [13 sec } ^{116}\text{In}^g]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 3300 \pm 100 \text{ b} \\ R^2 &= 6.6 \pm 0.2 \text{ fm} \\ \langle D \rangle &= 10.7 \pm 0.6 \text{ eV} \\ S_0 &= 0.26 \pm 0.03 \\ S_1 &= 2.5 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

I ⁿ = 9/2 ⁺		%Abn = 95.72		S _n = 6780 ± 1 keV	
E ₀ (eV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)	
1.457±0.002	3.34 ± 0.06	5	72 ± 2	2.77 ± 0.04	
3.86 ± 0.01	0.319 ± 0.013	4	81 ± 4	0.162 ± 0.007	
9.12 ± 0.04	1.73 ± 0.17	5	80 ± 40	0.57 ± 0.06	
12.1 ± 0.1	0.112 ± 0.008		140 ± 60	0.032 ± 0.002	
23.0 ± 0.2	1.18 ± 0.14			0.246 ± 0.029	
22.73 ± 0.01	1.04 ± 0.04		81 ± 5	0.218 ± 0.010	
39.60 ± 0.03	4.0 ± 0.2		76 ± 5	0.635 ± 0.030	

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
46.36 ±0.04	0.26 ± 0.02			0.038 ±0.003
48.14 ±0.04	0.60 ± 0.10		90 ± 5	0.086 ±0.014
63.00 ±0.03	0.84 ± 0.10		95 ±10	0.106 ±0.011
69.50 ±0.03	0.40 ± 0.10			0.048 ±0.012
73.08 ±0.04	0.012 ± 0.006			0.0014 ±0.0007
80.87 ±0.04	1.50 ± 0.10		70 ±10	0.166 ±0.011
83.28 ±0.04	6.6 ± 0.8		73 ± 5	0.72 ±0.09
86.36 ±0.05	0.052 ± 0.026			0.0056 ±0.0028
94.34 ±0.05	2.9 ± 0.3		90 ±10	0.298 ±0.030
100.83 ±0.05	0.044 ± 0.020			0.0042
110.90 ±0.06	0.048 ± 0.024			0.0046
114.43 ±0.06	0.104 ± 0.010			0.0098
120.71 ±0.07	0.008 ± 0.004			0.00072
125.89 ±0.08	3.8 ± 0.2		65 ±20	0.34
132.81 ±0.08	5.4 ± 1.0		180 ±50	0.46
144.04 ±0.09	0.146 ± 0.020			0.0122
145.76 ±0.09	0.06 ± 0.02			0.0050
150.29 ±0.10	4.6 ± 0.1		85 ±10	0.38
158.59 ±0.11	0.146 ± 0.070			0.0116
164.67 ±0.12	18.0 ± 1.0		82 ±10	1.40
168.08 ±0.12	2.10 ± 0.10			0.162
174.08 ±0.13	0.20 ± 0.08			0.0142
177.92 ±0.13	3.0 ± 0.5		80 ±20	0.22
186.96 ±0.14	20.0 ± 2.0		100 ±20	1.462
192.24 ±0.15	0.0320 ± 0.0008			0.0023
194.45 ±0.15	0.124 ± 0.060			0.0088
198.83 ±0.15	0.072 ± 0.040			0.0052
203.60 ±0.16	23.0 ± 6.0			1.604
211.88 ±0.17	0.52 ± 0.10			0.036
214.09 ±0.17	0.176 ± 0.010			0.012
224.03 ±0.18	32 ± 6		60 ±15	2.14
226.81 ±0.19	1.32 ± 0.80			0.088
239.28 ±0.20	0.254 ± 0.120			0.0164
246.74 ±0.21	0.192 ± 0.100			0.0122
250.17 ±0.22	60 ± 4		85 ±10	3.8
266.96 ±0.12	4.0 ± 0.2			0.24
276.77 ±0.12	0.136 ± 0.060			0.0082
282.28 ±0.13	0.186 ± 0.080			0.011
288.88 ±0.13	20 ± 2			1.18
294.33 ±0.14	44 ± 0			2.6
302.52 ±0.14	0.104 ± 0.042			0.006
308.37 ±0.15	0.126 ± 0.060			0.0072
319.49 ±0.16	15.0 ± 1.0			0.84
329.57 ±0.16	0.20 ± 0.10			0.011
336.73 ±0.17	0.20 ± 0.10			0.0112
339.80 ±0.17	1.90 ± 0.10			0.104
345.18 ±0.18	0.03 ± 0.14			0.016
354.13 ±0.18	6.28 ± 2.00			0.334
360.60 ±0.19	0.20 ± 0.10			0.0104
362.10 ±0.19	10.88 ± 0.42			0.572
366.87 ±0.19	0.34 ± 0.16			0.0172
370.94 ±0.20	6.90 ± 0.42			0.358

¹¹⁵
₄₉In

E ₀ (eV)	2g _n ⁺ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
379.10 ± 0.20	0.628 ± 0.104			0.0322
312.97 ± 0.20	1.22 ± 0.60			0.062
384.20 ± 0.21	5.86 ± 0.62			0.298
402.35 ± 0.22	31.4 ± 6.2			1.57
411.56 ± 0.23	31.4 ± 6.2			1.54
423.00 ± 0.24	10.46 ± 1.04			0.508
431.21 ± 0.25	0.22 ± 0.10			0.0106
437.16 ± 0.25	1.04 ± 0.10			0.050
448.90 ± 0.26	12.54 ± 2.10			0.592
453.89 ± 0.27	21.0 ± 4.2			0.982
456.82 ± 0.27	19.2 ± 2.0			0.90
469.65 ± 0.28	5.44 ± 0.62			0.250
473.58 ± 0.28	0.56 ± 0.20			0.026
477.55 ± 0.29	3.14 ± 0.22			0.144
488.01 ± 0.29	0.64 ± 0.30			0.030
493.67 ± 0.30	0.50 ± 0.20			0.022
498.20 ± 0.30	2.92 ± 0.22			0.131
501.88 ± 0.31	1.04 ± 0.50			0.046
503.73 ± 0.31	25.0 ± 4.2			1.12
506.21 ± 0.31	1.08 ± 0.50			0.048
513.15 ± 0.32	0.098 ± 0.050			0.0044
515.38 ± 0.32	3.34 ± 0.22			0.147
525.46 ± 0.33	14.22 ± 2.10			0.620
530.11 ± 0.33	0.94 ± 0.10			0.04
547.92 ± 0.35	5.44 ± 0.22			0.232
551.10 ± 0.35	1.68 ± 0.10			0.072
559.70 ± 0.36	0.64 ± 0.30			0.026
562.61 ± 0.36	0.94 ± 0.08			0.040
569.62 ± 0.37	0.52 ± 0.20			0.022
571.86 ± 0.37	35.54 ± 2.13			1.49
580.19 ± 0.38	7.94 ± 0.42			3.30
589.09 ± 0.39	6.70 ± 0.22			0.276
602.22 ± 0.40	2.10 ± 0.42			0.085
609.99 ± 0.41	0.84 ± 0.06			0.034
614.13 ± 0.42	37.64 ± 2.10			1.52
619.59 ± 0.42	16.72 ± 1.04			0.672
643.93 ± 0.45	4.80 ± 0.22			0.189
647.07 ± 0.45	5.72 ± 0.20			0.146
654.80 ± 0.46	9.00 ± 0.20			0.352
674.03 ± 0.48	11.28 ± 0.22			0.434
683.23 ± 0.49	3.14 ± 0.22			0.12
694.62 ± 0.50	4.18 ± 0.22			0.159
699.15 ± 0.50	1.22 ± 0.60			0.046
704.75 ± 0.51	2.30 ± 0.22			0.0866
707.83 ± 0.52	5.86 ± 1.04			0.220
719.85 ± 0.53	3.14 ± 0.22			0.117
724.10 ± 0.54	1.00 ± 0.50			0.036
727.84 ± 0.54	3.34 ± 0.22			0.124
733.25 ± 0.54	12.34 ± 0.22			0.456
752.66 ± 0.57	2.30 ± 0.22			0.0838
760.06 ± 0.58	1.08 ± 0.50			0.0392
774.02 ± 0.59	20.90 ± 2.10			0.752

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
783.54 $\pm$ 0.60	15.88 $\pm$ 0.42			0.568
789.58 $\pm$ 0.61	16.72 $\pm$ 1.04			0.596
795.08 $\pm$ 0.62	5.8 $\pm$ 4.0			0.20
800.63 $\pm$ 0.62	0.90 $\pm$ 0.40			0.032
812.55 $\pm$ 0.63	0.50 $\pm$ 0.20			0.018
815.73 $\pm$ 0.64	3.34 $\pm$ 0.62			0.117
819.41 $\pm$ 0.32	8.36 $\pm$ 1.04			0.292
829.79 $\pm$ 0.33	10.68 $\pm$ 0.62			0.378
836.70 $\pm$ 0.33	17.76 $\pm$ 0.62			0.614
853.52 $\pm$ 0.34	58.54 $\pm$ 4.18			2.004
861.06 $\pm$ 0.35	23.0 $\pm$ 4.2			0.784
863.85 $\pm$ 0.35	18.8 $\pm$ 4.2			0.64
869.44 $\pm$ 0.35	1.58 $\pm$ 0.80			0.054
875.09 $\pm$ 0.35	6.90 $\pm$ 0.42			0.234
882.58 $\pm$ 0.36	0.76 $\pm$ 0.40			0.026
891.62 $\pm$ 0.37	15.88 $\pm$ 0.42			0.532
898.96 $\pm$ 0.37	3.56 $\pm$ 0.42			0.119
907.76 $\pm$ 0.38	0.56 $\pm$ 0.30			0.019
913.90 $\pm$ 0.38	13.8 $\pm$ 0.6			0.46
923.43 $\pm$ 0.38	6.28 $\pm$ 1.46			0.206
931.94 $\pm$ 0.39	2.28 $\pm$ 1.0			0.075
943.74 $\pm$ 0.39	1.10 $\pm$ 0.50			0.036
948.12 $\pm$ 0.40	52.2 $\pm$ 0.20			1.70
956.57 $\pm$ 0.40	31.36 $\pm$ 2.10			1.014
973.81 $\pm$ 0.41	1.24 $\pm$ 0.60			0.040
977.99 $\pm$ 0.42	36.3 $\pm$ 2.0			1.17
981.76 $\pm$ 0.42	2.90 $\pm$ 0.42			0.0926
997.97 $\pm$ 0.43	33.4 $\pm$ 2.0			1.06
1007.1 $\pm$ 0.5	0.82 $\pm$ 0.40			0.026
1019.5 $\pm$ 0.5	0.90 $\pm$ 0.40			0.028
1035.7 $\pm$ 0.5	6.90 $\pm$ 1.04			0.214
1043.0 $\pm$ 0.5	52.2 $\pm$ 4.2			1.618
1049.0 $\pm$ 0.5	5.22 $\pm$ 0.62			0.1614
1055.1 $\pm$ 0.5	10.04 $\pm$ 0.50			0.032
1060.3 $\pm$ 0.5	12.96 $\pm$ 0.62			0.398
1075.1 $\pm$ 0.5	35.6 $\pm$ 4.2			1.084
1085.8 $\pm$ 0.5	33.4 $\pm$ 2.0			1.016
1103.7 $\pm$ 0.5	1.42 $\pm$ 0.60			0.042
1111.7 $\pm$ 0.5	13.18 $\pm$ 0.62			0.394
1140.2 $\pm$ 0.5	19.24 $\pm$ 0.84			0.516
1170.3 $\pm$ 0.6	16.72 $\pm$ 2.08			0.488
1179.7 $\pm$ 0.6	19.24 $\pm$ 0.62			0.560
1188.0 $\pm$ 0.6	3.0 $\pm$ 1.0			0.088
1190.8 $\pm$ 0.6	3.34 $\pm$ 0.42			0.0970
1199.3 $\pm$ 0.6	0.82 $\pm$ 0.40			0.024
1213.1 $\pm$ 0.6	48.0 $\pm$ 6.2			1.38
1216.6 $\pm$ 0.6	10.2 $\pm$ 3.0			0.292
1224.2 $\pm$ 0.6	39.8 $\pm$ 4.2			1.14
1237.8 $\pm$ 0.60	1.50 $\pm$ 0.60			0.042
1243.1 $\pm$ 0.6	20.90 $\pm$ 2.10			0.600
1270.0 $\pm$ 0.6	3.58 $\pm$ 1.8			0.1002
1276.8 $\pm$ 0.6	5.52 $\pm$ 2.8			0.154

$^{115}_{49}\text{In}$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1281.2 ± 0.6	16.52 ± 0.62			0.462
1304.7 ± 0.6	1.82 ± 0.80			0.050
1309.3 ± 0.7	14.22 ± 0.62			0.392
1325.0 ± 0.7	11.50 ± 4.18			0.316
1330.9 ± 0.7	12.96 ± 0.84			0.356
1334.3 ± 0.7	7.94 ± 0.62			0.218
1342.3 ± 0.7	8.16 ± 0.62			0.222
1346.0 ± 0.7	14.2 ± 0.6			0.38
1349.8 ± 0.7	29.2 ± 4.2			0.796
1357.9 ± 0.7	7.32 ± 0.62			0.199
1367.6 ± 0.7	1.52 ± 0.80			0.044
1372.4 ± 0.7	2.84 ± 1.40			0.0764
1389.3 ± 0.7	10.24 ± 0.84			0.274
1397.9 ± 0.7	12.96 ± 1.04			0.346
1402.2 ± 0.7	7.32 ± 0.42			0.195
1415.9 ± 0.7	25.0 ± 2.0			0.666
1421.0 ± 0.7	3.28 ± 1.6			0.0872
1430.6 ± 0.8	8.70 ± 0.62			0.230
1441.8 ± 0.8	2.90 ± 0.42			0.0764
1448.6 ± 0.8	3.14 ± 0.62			0.0824
1460.7 ± 0.8	2.18 ± 0.80			0.0570
1468.4 ± 0.8	29.2 ± 4.2			0.764
1480.0 ± 0.8	6.90 ± 0.62			0.179
1484.7 ± 0.8	0.52 ± 0.20			0.0136
1492.6 ± 0.8	4.32 ± 1.4			0.112
1520.6 ± 0.8	44.0 ± 2.0			1.13
1546.1 ± 0.8	27.2 ± 2.0			0.692
1554.4 ± 0.8	9.52 ± 4.14			0.242
1562.9 ± 0.8	5.0 ± 2.0			0.126
1567.1 ± 0.9	20.90 ± 2.10			0.528
1579.9 ± 0.9	3.0 ± 1.0			0.076
1595.5 ± 0.9	31.4 ± 2.0			0.786
1614.0 ± 0.9	37.6 ± 4.2			0.936
1619.3 ± 0.9	188.2 ± 21.0			4.68
1640.9 ± 0.9	46.0 ± 2.0			1.14
1646.4 ± 0.9	2.46 ± 1.00			0.0608
1654.7 ± 0.9	2.4 ± 1.0			0.060
1664.9 ± 0.9	15.68 ± 6.2			3.84
1675.1 ± 0.9	1.6 ± 0.6			0.04
1679.8 ± 0.9	14.2 ± 0.4			0.34
1688.4 ± 1.0	167.2 ± 2.0			4.08
1694.1 ± 1.0	12.0 ± 3.0			0.30
1704.6 ± 1.0	2.12 ± 1.0			0.0512
1711.4 ± 1.0	58.6 ± 6.2			1.414
1724.1 ± 1.0	9.0 ± 0.4			0.22
1735.9 ± 1.0	73.2 ± 10.4			1.76
1739.9 ± 1.0	8.8 ± 3.0			0.211
1765.0 ± 1.0	6.2 ± 2.4			0.146
1780.3 ± 1.0	5.2 ± 0.4			0.124
1789.6 ± 1.0	2.0 ± 0.8			0.048
1796.9 ± 1.0	39.72 ± 2.08			0.937
1808.4 ± 1.0	3.8 ± 1.4			0.088

¹¹⁵₄₉In

E_0 (eV)	$2g_n^+$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)
1813.7 $\pm$ 1.0	2.36 $\pm$ 1.00			0.0554
1826.4 $\pm$ 1.0	3.6 $\pm$ 1.6			0.084
1833.9 $\pm$ 1.1	4.6 $\pm$ 1.6			0.108
1843.6 $\pm$ 1.1	6.4 $\pm$ 2.0			0.150
1854.5 $\pm$ 1.1	54.4 $\pm$ 6.2			1.262
1865.5 $\pm$ 1.1	13.6 $\pm$ 1.0			0.32
1878.8 $\pm$ 1.1	6.6 $\pm$ 3.0			0.154
1891.1 $\pm$ 1.1	129.5 $\pm$ 6.2			2.98
1904.7 $\pm$ 1.1	16.6 $\pm$ 4.2			0.38
1918.5 $\pm$ 1.1	35.6 $\pm$ 6.2			0.812
1925.4 $\pm$ 1.1	2.70 $\pm$ 1.2			0.0614
1939.3 $\pm$ 1.2	18.2 $\pm$ 1.0			0.42
1946.4 $\pm$ 1.2	33.4 $\pm$ 2.0			0.758
1959.4 $\pm$ 1.2	31.4 $\pm$ 2.0			0.708
1967.7 $\pm$ 1.2	16.72 $\pm$ 4.18			0.378
1980.9 $\pm$ 1.2	41.8 $\pm$ 6.2			0.94

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
In ¹¹⁵	activation	JNE,24,35(70)	Ryves
In ¹¹³	activation	CJP,47,2031(69)	Ricabarra
In	pile osci.	AE-351(69)	Sokolowski
In ^{113,115}	activation	NP/A,112,474(68)	Alexander
In ^{113,115}	activation	BAP,12,544(67)	Clark
In ¹¹⁵	isom. ratio	YF,1,250(65)	Balodis
In ¹¹⁵	isom. ratio	NP,66,297(65)	Poenitz
In ¹¹⁵	isom. ratio	NSE,19,464(64)	Greenfield
In	pile osci.	64PARIS,479(64)	Vidal
In ¹¹⁵	activation	ADP,12,225(63)	Alexander
In	diffraction	PR,131,2098(63)	Arnold
In ¹¹⁵	activation	NSE,17,329(63)	Beckurts
In	pile osci.	KE,6,336(63)	Muttel
In ¹¹³	isom. ratio	PR,129,769(63)	Keisch
In ¹¹⁵	activation	NKA,8,437(63)	Jozefowicz
In ¹¹⁵	isom. ratio	PL,3,40(62)	Fettweis
In	pile osci.	61BUCHAR(61)	Bouzyk
In	pulsed n	NSE,9,132(61)	Meadows
In ¹¹⁵	isom. ratio	PR,119,208(60)	Domanic
In	pile osci.	JAERI-1009(60)	Fuketa
In	pile osci.	JNE,12,32(60)	Tattersall
In	diffraction	JAP,30,1323(59)	Sidhu
In ¹¹⁵	activation	ZN,13A,820(58)	Meister
In	pile osci.	AERE-R/M-100(57)	Cummins
In ¹¹⁵	activation	JNE,5,230(57)	Myasishcheva
In ¹¹⁵	activation	IJP,31,630(57)	Sehgal
In	pile osci.	PR,83,641(51)	Pomerance
In ¹¹³	activation	PR,74,1248(48)	Goldhaber
In ¹¹⁵	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
In ¹¹³	σ_γ (spectra)	26.6-2002	PRIVATE COMM.(72)	Coceva
In ¹¹⁵	σ_γ (spectra)	1.5-1982	PRIVATE COMM.(72)	Coceva
In ¹¹³	$\sigma_t \sigma_\gamma$	21-2004	COLUMBIA, THESIS(71)	Hacken
In ¹¹⁵	$\sigma_t \sigma_\gamma$	22.7-1981	COLUMBIA, THESIS(71)	Hacken
In	σ_γ	1.46	NUK, 12, 259(69)	Fleck
In	σ_t	1.4-9.2	AE, 16, 523(64)	Begzhanov
In ¹¹⁵	polarization	1.46	PR, 127, 1124(62)	Sailor
In	$\bar{\sigma}_s$	1.46	JPR, 22, 707(61)	Ceulemans
In	polarization	1.46	PRIVATE COMM.(61)	Marshak
In	polarization	1.4-9.2	PR, 118, 211(60)	Stolovy
In	σ_t	1.4-9.2	PR, 109, 417(58)	Moore
In	σ_t	9.0-12.9	AE, 5, 55(56)	Radkevich
In	polarization	1.4	PR, 98, 1512(55)	Dabbs
In ¹¹³	σ_t	4.7-105	PR, 99, 10(55)	Harvey
In ¹¹⁵	σ_t	3.8-95	PR, 99, 10(55)	Harvey
In	σ_t	1.4-3.9	PR, 98, 1267(55)	Landon
In ¹¹³	σ_t	1.8-22	PR, 87, 161(52)	Sailor
In ¹¹⁵	σ_t	1.4-24	PR, 87, 161(52)	Sailor

⁵⁰Sn

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.63 \pm 0.01 \text{ b}$$

$$a_{coh} = 6.1 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 8.5 \pm 2.0 \text{ b}$$

$$S_0 = 0.18 \pm 0.09$$

$$S_1 = 2.0 \pm 1.5$$

¹¹²
⁵⁰Sn

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.35 \pm 0.08 \text{ b [20 min } ^{113}\text{Sn}^*]$$

$$\sigma_{\gamma} = 0.8 \pm 0.1 \text{ b [118 day } ^{113}\text{Sn}^*]$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 27 \pm 5 \text{ b}$$

$$R_{\gamma}^c = 7.0 \pm 0.5 \text{ fm}$$

$$S_0 = 0.5 \pm 0.2$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\%Abn = 0.96$		$S_n = 7744 \pm 3 \text{ keV}$	
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$
21.02	0.0039 ± 0.0012			(110)	0.0009 ± 0.0003
46.38	0.028 ± 0.021			(110)	0.004 ± 0.003
64.66	0.44 ± 0.04			(110)	0.055 ± 0.006
72.26	0.34 ± 0.05			(110)	0.040 ± 0.006
98.8 ± 0.2	88 ± 3	1/2	0	110 ± 21	8.8 ± 0.4
104.7	9.2 ± 1.0				0.90 ± 0.4
151.1	2.6 ± 0.4				0.16 ± 0.02
514	51 ± 10				2.2 ± 0.4
577	24 ± 6				1.0 ± 0.3
877	200 ± 50				6.8 ± 1.7
1321	700 ± 200				19 ± 6
1416	120 ± 60				3.2 ± 1.6

¹¹⁴₅₀Sn

RESONANCE PROPERTIES

$$\begin{aligned} I_{\gamma}^c &= 1.2 \pm 0.6 \text{ b} \\ R^{\dagger} &= 8.6 \pm 0.8 \text{ fm} \\ S_0 &= 0.7 \pm 0.3 \end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{Abn} = 0.66$$

$$S_n = 7534 \pm 7 \text{ keV}$$

E_0 (eV)	$g\Gamma_n$ (meV)	$g\Gamma_n^0$ (meV)
578 $\pm$ 20	8 $\pm$ 0.83	0.3
666 $\pm$ 250	60 $\pm$ 9.7	2.0
984 $\pm$ 460	140 $\pm$ 15	4.5
1367 $\pm$ 210	110 $\pm$ 6	3
1980 $\pm$ 900	700 $\pm$ 20	16

¹¹⁵₅₀Sn

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 50 \pm 20 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_{\gamma}^c &= 23 \pm 9 \text{ b} \\ S_0 &= 0.3 \pm 0.2 \end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 1/2^{+}$$

$$\% \text{Abn} = 0.35$$

$$S_n = 9566 \pm 6 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	$2g\Gamma_n^0$ (meV)
292 $\pm$ 0.5	33 $\pm$ 8	1.9 $\pm$ 0.5
448	90 $\pm$ 30	4.3 $\pm$ 1.3
493.7	120 $\pm$ 40	5.4 $\pm$ 1.6
866	280 $\pm$ 170	10 $\pm$ 6

¹¹⁶₅₀Sn

THERMAL CROSS SECTIONS

$$\sigma_T = 0.006 \pm 0.002 \text{ b [14 day } ^{117}\text{Sn}^*]$$

$$a_{coh} = 5.8 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 11 \pm 3 \text{ b}$$

$$R_\gamma^c = 6.2 \pm 0.2 \text{ fm}$$

$$S_0 = 0.26 \pm 0.05$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		%Abn = 14.3		$S_n = 6942.5 \pm 2.9 \text{ keV}$			
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_\gamma \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$	$g\Gamma_n^1 \text{ (meV)}$	
111.2 ± 0.1	58 ± 3	1/2	0	52 ± 8	6.45 ± 0.28		
147.9 ± 0.1	3.5 ± 0.2	3/2	1		0.29 ± 0.02	826	
632 ± 2	30 ± 6	3/2	1		1.17 ± 0.20	910	
750 ± 2	4.3 ± 0.9				0.16 ± 0.03		
981 ± 2	16 ± 5				0.51 ± 0.18		
1338 ± 3	300 ± 75				8.2 ± 2.0		
1553 ± 8	2600 ± 300	1/2	0		66 ± 8		
1802 ± 10	255 ± 100				6.0 ± 2.0		
3380 ± 15	3900 ± 1000				67.0 ± 17.0		
3460 ± 15	1400 ± 500				23.8 ± 3.5		
4640 ± 20	4000 ± 1000				58.7 ± 14.7		

¹¹⁷₅₀Sn

THERMAL CROSS SECTIONS

$$\sigma_T = 2.6 \pm 1.0 \text{ b}$$

$$a_{coh} = 6.4 \pm 0.25 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 16 \pm 5 \text{ b}$$

$$R_\gamma^c = 6.2 \pm 0.2 \text{ fm}$$

$$S_0 = 0.19 \pm 0.02$$

RESONANCE PARAMETERS

$I^\pi = 1/2^+$		%Abn = 7.61		$S_n = 9327.3 \pm 1.3 \text{ keV}$			
$E_0 \text{ (eV)}$	$2g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_\gamma \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$		
1.32 ± 0.01	0.0002 ± 0.0001				.00018 ± .00009		
34.05 ± 0.05	0.034 ± 0.002				.0058 ± .0004		
38.8 ± 0.05	6.2 ± 0.3	1	0	100 ± 15	1.00 ± 0.05		
74.47 ± 0.2	0.065 ± 0.010				0.0075 ± 0.0011		
120.4 ± 0.3	12 ± 1	1		65 ± 15	1.09 ± 0.11		
123.7 ± 0.3	4.4 ± 0.4	0		70 ± 16	0.40 ± 0.04		

¹¹⁷₅₀Sn

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
148.0 ± 0.3	0.14 ± 0.06				0.012 ± 0.005
166.2 ± 0.4	0.40 ± 0.10				0.031 ± 0.008
196.1 ± 0.5	27 ± 3	1	0	122 ± 40	1.9 ± 0.2
200.8 ± 0.5	0.97 ± 0.14				0.068 ± 0.010
221.4 ± 0.6	0.71 ± 0.20				0.048 ± 0.013
275.6 ± 0.8	0.34 ± 0.09				0.021 ± 0.005
298.7 ± 1.0	0.7 ± 0.2				0.041 ± 0.012
342.7 ± 1.0	33 ± 3	0		54 ± 26	1.78 ± 0.18
360.0 ± 1.0	24 ± 7				1.3 ± 0.5
401.0 ± 1.0	8.8 ± 1.0				0.44 ± 0.05
421.9 ± 1.0	125 ± 15	1		130 ± 60	6.1 ± 0.7
460.0 ± 1.0	25 ± 3	0		62 ± 29	1.17 ± 0.12
527.1 ± 1.0	0.15 ± 0.04				0.0065 ± 0.0016
533.0 ± 1.0	3.6 ± 0.8				0.16 ± 0.03
557.8 ± 1.0	1.4 ± 0.4				0.0059 ± 0.0015
580.8 ± 1.0	60 ± 6	0		50 ± 25	2.49 ± 0.25
647.9 ± 1.0	4 ± 2				0.16 ± 0.08
659.6 ± 1.0	4 ± 2				0.16 ± 0.08
687.4 ± 1.0	2.8 ± 1.1				0.11 ± 0.04
706.5 ± 1.0	4.6 ± 1.4				0.17 ± 0.05
791.3 ± 1.0	10 ± 3				0.36 ± 0.11
814.5 ± 2.0	130 ± 12	1		64 ± 25	4.56 ± 0.42
867.2 ± 2.0	21.0 ± 4.2				0.71 ± 0.14
882.3 ± 2.0	5.6 ± 2.0				0.19 ± 0.07
941.5 ± 2.0	40 ± 4				1.3 ± 0.1
993.0 ± 2.0	400 ± 60				12.7 ± 1.9
999.0 ± 2.0	180 ± 30				5.7 ± 0.9
1167.0 ± 2.0	24 ± 5				0.7 ± 0.2
1193.0 ± 3.0	16 ± 8				0.46 ± 0.23
1123.0 ± 3.0	24 ± 12				0.69 ± 0.35
1281.0 ± 3.0	26 ± 10				0.72 ± 0.28
1318.0 ± 3.0	3.2 ± 1.6				0.008 ± 0.004
1361.0 ± 3.0	175 ± 18	1		65 ± 20	4.75 ± 0.50
1443.0 ± 3.0	8.2 ± 2.5				0.22 ± 0.06
1493.0 ± 4.0	148 ± 15				3.83 ± 0.38
1552.0 ± 4.0	10 ± 6				0.25 ± 0.15
1630.0 ± 4.0	70 ± 21				1.7 ± 0.5
1674.0 ± 4.0	100 ± 40				2.4 ± 1.0
1754.0 ± 4.0	120 ± 30				2.86 ± 0.72
1812.0 ± 5.0	50 ± 30				1.2 ± 0.7
1871.0 ± 5.0	80 ± 48				1.9 ± 1.1
1903.0 ± 6.0	80 ± 20				1.83 ± 0.46
2013.0 ± 6.0	400 ± 80				8.91 ± 1.78
2084.0 ± 6.0	450 ± 95				9.8 ± 2.0
2160.0 ± 6.0	70 ± 28				1.5 ± 0.6
2193.0 ± 6.0	70 ± 28				1.5 ± 0.6
2282.0 ± 7.0	100 ± 20				2.09 ± 0.42
2320.0 ± 7.0	75 ± 19				1.56 ± 0.39
2587.0 ± 8.0	480 ± 100				9.43 ± 1.89
2978.0 ± 10	580 ± 145				10.6 ± 2.7

¹¹⁸₅₀Sn

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.016 \pm 0.006 \text{ b [250 day } ^{119}\text{Sn}^{\text{m}}]$$

$$a_{\text{coh}} = 5.8 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 7 \pm 2 \text{ b}$$

$$R' = 6.7 \pm 0.4 \text{ fm}$$

$$S_0 = 0.4 \pm 0.15$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		%Abn = 24.03				$S_n = 6485.0 \pm 1.2 \text{ keV}$	
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$	$g\Gamma_n^1 \text{ (meV)}$	
45.75 ± 0.15	0.72 ± 0.04	3/2	1	110 ± 10	0.106 ± 0.005	1150	
289.0 ± 1.0	0.50 ± 0.15				0.029 ± 0.009		
307.5 ± 1.0	0.80 ± 0.08				0.046 ± 0.005		
243.9 ± 2.0	2.3 ± 0.2				0.124 ± 0.012		
360 ± 2	315 ± 20	1/2	0		16.6 ± 1.1		
772 ± 5	800 ± 80	1/2	0		28.8 ± 2.9		
1584 ± 7	320 ± 50				8.05 ± 1.26		
1710 ± 8	33 ± 12				0.80 ± 0.30		
2976 ± 16	1400 ± 200				25.7 ± 3.7		
3460 ± 20	1750 ± 300				29.75 ± 5.10		
3960 ± 25	1100 ± 500				17.4 ± 7.8		
4725 ± 30	6300 ± 2000				91.7 ± 29.2		

¹¹⁹₅₀Sn

THERMAL CROSS SECTIONS

$$\sigma_T = 2.3 \pm 1.0 \text{ b}$$
$$a_{coh} = 6.00 \pm 0.25 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 3.5 \pm 1.0 \text{ b}$$
$$R_\gamma^c = 6.2 \pm 0.2 \text{ fm}$$
$$S_0 = 0.08 \pm 0.03$$

RESONANCE PARAMETERS

$$I^\pi = 1/2^+$$

$$\%abn = 8.58$$

$$S_n = 9104.4 \pm 1.3 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	$2g\Gamma_n^0$ (meV)
6.22	0.0037 ± 0.002	$.00146 \pm .00007$
74.76	0.062 ± 0.009	0.0072 ± 0.0010
114.8	0.55 ± 0.05	0.051 ± 0.005
140.9 ± 0.2	5.0 ± 0.7	0.42 ± 0.06
145.7	0.58 ± 0.09	0.048 ± 0.007
222.6 ± 0.4	12.0 ± 0.9	0.80 ± 0.06
261.6	2.1 ± 0.2	0.130 ± 0.013
283.1	0.88 ± 0.13	0.052 ± 0.008
330.0	0.38 ± 0.11	0.021 ± 0.006
456 ± 1	40 ± 7	1.9 ± 0.3
697	50 ± 10	1.9 ± 0.4
830	110 ± 20	3.8 ± 0.8
885	11 ± 4	0.37 ± 0.15
948	350 ± 50	11.4 ± 1.6
1150	35 ± 14	1.0 ± 0.4
1258	80 ± 40	2.3 ± 1.2

¹²⁰₅₀Sn

THERMAL CROSS SECTIONS

$\sigma_T = 0.001 \pm 0.001$ b [76 yr ¹²¹Sn*]
 $\sigma_T = 0.14 \pm 0.03$ b [27 hr ¹²¹Sn*]
 $a_{coh} = 6.4 \pm 0.1$ fm

RESONANCE PROPERTIES

$I_\gamma^c = 1.5 \pm 0.5$ b
 $R_\gamma = 6.5 \pm 0.2$ fm
 $S_0 = 0.08 \pm 0.06$
 $S_1 = 1.1 \pm 0.4$

RESONANCE PARAMETERS

$I^\pi = 0^+$

$\chi_{abn} = 32.85$

$S_n = 6180.1 \pm 2.7$ keV

E_0 (eV)	$g\Gamma_n$ (meV)	J	ℓ	$g\Gamma_n^0$ (meV)	$g\Gamma_n^1$ (meV)
67.32	0.035±	0.011		0.004 ±0.001	
150.0	0.045±	0.009		0.0036±0.0007	
365.2	2.5 ±	0.3	1	0.13 ±0.01	175
427 ± 1	11 ±	0.6	1/2	0.54 ±0.03	
920 ± 2	22 ±	5	[3/2]	0.73 ±0.17	390
952 ± 2	90 ±	10	0	2.9 ±0.3	
1288 ± 3	15 ±	2	1	0.42 ±0.06	190
1424 ± 4	21 ±	6	1	0.56 ±0.16	320
1720 ± 6	155 ±	30	1	3.74 ±0.72	1070
2835 ± 4	32 ±	6	1	0.60 ±0.11	104
3122 ± 5	670 ±	60	0	12.0 ±1.1	
3283 ± 5	2.9 ±	1.5		0.050 ±0.025	
3853 ± 6	95 ±	15	1	1.5 ±0.2	
4250 ±10	35 ±	4	1	0.54 ±0.05	
4327 ±10	26 ±	2	[1]	0.39 ±0.03	
4365 ±10	400 ±	4	1	6.05 ±0.61	685
5030 ±10	75 ±	5	1	1.1 ±0.1	108
5070 ±10	585 ±	60	1	8.2 ±0.8	600
5192	67.73 ±	6.49	1	0.94 ±0.09	
6680	89.09 ±	31.06		1.09 ±0.38	
6826	16.52 ±	9.91	1	0.20 ±0.12	
6981	88.57 ±	35.09		1.06 ±0.42	
7118	47.25 ±	18.56	1	0.56 ±0.22	
7308	466.76 ±	117.12	0	5.46 ±1.37	
7501	102.20 ±	35.51	1	1.18 ±0.41	
8160	853.64 ±	51.49	1	9.45 ±0.57	
8608	115.05 ±	6.49	1	1.24 ±0.07	
8664	68.88 ±	5.58	1	0.74 ±0.06	
8943	7652 ±	114.43	0	80.92 ±1.21	
9117	52.52 ±	3.82	1	0.55 ±0.04	
9543	1710.52 ±	68.38	1	17.51 ±0.70	
10320	268.19 ±	19.30	1	2.64 ±0.19	
10880	646.71 ±	44.85	1	6.20 ±0.43	
11280	832.67 ±	58.41	1	7.84 ±0.55	
11480	303.22 ±	24.64	0	2.83 ±0.23	
11660	150.09 ±	11.88	1	1.39 ±0.11	

¹²⁰₅₀Sn

E ₀ (eV)	g _n ⁺ (meV)	J	ℓ	g _n ⁰ (meV)	g _n ¹ (meV)
11790	597.20 ± 35.83		0	5.50 ± 0.33	
12350	60.01 ± 7.22		[1]	0.540 ± 0.06	
12680	47.29 ± 38.29			0.42 ± 0.34	
12870	645.51 ± 51.06		1	5.69 ± 0.45	
13050	615.74 ± 48.12		0	5.39 ± 0.43	
14260	160.02 ± 10.75		1	1.34 ± 0.09	
14730	246.38 ± 16.99		1	2.03 ± 0.14	
15620	30.00 ± 12.50			0.24 ± 0.10	
16140	5812.23 ± 232.49		1	45.75 ± 1.83	
16600	5153.64 ± 206.15		1	40.0 ± 1.60	
16710	261.12 ± 25.85		[1]	2.02 ± 0.20	
17170	9756.82 ± 292.21		1	74.46 ± 2.23	
17310					
17340	429.28 ± 43.45		1	3.26 ± 0.33	
17430	113.54 ± 18.48		[1]	0.86 ± 0.14	
18020	965.18 ± 67.12		0	7.19 ± 0.50	
18230	344.30 ± 35.10		1	2.55 ± 0.26	
18320	56.85 ± 17.60			0.42 ± 0.13	
19000	1417.00 ± 850.48		0	10.28 ± 6.17	
19300	2122.8 ± 1273.9		0	15.28 ± 9.17	
19700					
20970	5139.31 ± 125.50		0	35.49 ± 1.06	
21410	1738.30 ± 86.33		1	11.88 ± 0.59	
21870	2427.90 ± 121.32		1	16.41 ± 0.82	
22190	1460.69 ± 119.17		1	9.94 ± 0.80	
22670	1166.7 ± 117.4		[1]	7.75 ± 0.78	
22720	1053.6 ± 105.5		[1]	6.99 ± 0.70	
23030	8799.7 ± 349.0		0	57.59 ± 2.30	
23310	7035.3 ± 280.9		1	46.08 ± 1.84	
23590	2677.1 ± 133.6		1	17.43 ± 0.87	
23660	1775.1 ± 124.6		0	11.54 ± 0.81	
24040	2586.2 ± 155.0		1	16.68 ± 1.00	
24450	1083.6 ± 107.9		1	6.93 ± 0.69	
24820	9499.5 ± 285.2		1	60.29 ± 1.81	
25170	3325.3 ± 199.9		1	20.96 ± 1.26	
25520	4284.5 ± 170.9		1	26.82 ± 1.07	
25990	2237.7 ± 178.9		1	13.88 ± 1.11	
26210	7635.0 ± 306.0		0	47.16 ± 1.89	
26290	1571.2 ± 157.3		[1]	9.69 ± 0.97	
26480	3130.9 ± 187.1		1	19.24 ± 1.15	
27130	8558.4 ± 257.0		1	51.96 ± 1.56	
27400	3135.1 ± 188.7		1	18.94 ± 1.14	
27960	1177.2 ± 140.5			7.04 ± 0.84	
28250	7318.1 ± 292.5		1	43.54 ± 1.74	
28520	7592.8 ± 304.0		1	44.96 ± 1.80	
28610	1343.0 ± 160.7		1	7.94 ± 0.95	
29170	4078.5 ± 244.2		1	23.88 ± 1.43	
29320	2385.3 ± 190.1		0	13.93 ± 1.11	
29660	2660.8 ± 213.6		1	15.45 ± 1.24	
30610	3810.6 ± 267.7		0	21.78 ± 1.53	
31230	148.45 ± 60.08			0.84 ± 0.34	
31710	9297.2 ± 372.2		1	52.21 ± 7.09	

¹²⁰
50 Sn

E_0 (eV)	g_n^0 (meV)	J	ℓ	g_n^0 (meV)	g_n^1 (meV)
32040	365.15 ± 59.07			2.04 ± 0.33	
32070	528.29 ± 84.17		[1]	2.95 ± 0.47	
32720	3095.0 ± 200.8		1	17.11 ± 1.71	
32760	832.59 ± 99.55		1	4.60 ± 0.55	
32800	11517 ± 576		1	63.59 ± 3.18	
32960	14747 ± 737		1	81.23 ± 4.06	
33100	332.94 ± 83.69			1.83 ± 0.46	
33200	508.36 ± 91.10			2.79 ± 0.50	
33250	3967.9 ± 397.5		1	21.76 ± 2.18	
33420	329.06 ± 65.81			1.80 ± 0.36	
33460	1189.0 ± 166.5		[1]	6.50 ± 0.91	
35020	149.71 ± 65.50		[0]	0.80 ± 0.35	
35060	672.20		[1]	3.59	
35110	1950.6 ± 234.2		[1]	10.41 ± 1.25	
35160	658.2 ± 105.0		[1]	3.51 ± 0.56	
36060	3619.4 ± 470.9		[1]	19.06 ± 2.48	
36470	2293.6 ± 275.0		[1]	12.01 ± 1.44	
36500	492.91 ± 99.36			2.58 ± 0.52	
37630	853.53 ± 118.33		1	4.40 ± 0.61	
37880	1741.9 ± 208.3		1	8.95 ± 1.07	
37900	4146.7 ± 208.3		1	21.30 ± 1.07	
37940	1753.0 ± 214.3		1	9.0 ± 1.1	
38160	2953.6 ± 353.6		1	15.12 ± 1.81	
38570	13640 ± 681		1	69.45 ± 3.47	
38860	1305.0 ± 163.3		0	6.62 ± 0.93	
39250	624.7 ± 99.1		1	3.15 ± 0.50	
39270	1797.4 ± 249.7		1	9.07 ± 1.26	
40020	2564.7 ± 310.1		1	12.92 ± 1.55	
40140	2714.7 ± 244.4		0	13.55 ± 1.22	
40820	442.47 ± 107.1			2.19 ± 0.53	
40870	3998.8 ± 400.3		1	19.78 ± 1.98	
40950	242.83 ± 87.12			1.20 ± 0.43	
40990	1060.9 ± 170.1		[1]	5.24 ± 0.84	
42470	8684.3 ± 694.5		1	42.14 ± 3.37	
42690	2911.2 ± 349.2		1	14.09 ± 1.69	
43500	1249.3 ± 200.2		1	5.99 ± 0.96	
43750	690.25 ± 138.0			3.30 ± 0.66	
43810	6639.3 ± 531.6		1	31.72 ± 2.54	
44130	1035.7 ± 176.5		1	4.93 ± 0.84	
44580	29855 ± 1195		1	141.40 ± 5.66	
45500	5383.9 ± 537.5		1	25.24 ± 2.52	
45550	7551.0 ± 678.7		1	35.38 ± 3.18	
47470	1601.4 ± 224.4		1	7.35 ± 1.03	
47560	4241.7 ± 508.1		1	19.45 ± 2.33	
47690	7979.6 ± 1196.7		0	36.54 ± 5.48	
48110	3397.6 ± 476.0		1	15.49 ± 2.17	
48370	5271.8 ± 633.4		1	23.97 ± 2.88	
48740	291.42 ± 145.71			1.32 ± 0.66	
48780	430.68 ± 150.19			1.95 ± 0.68	
49320	13929 ± 974.9		[0]	62.72 ± 4.39	
49380	1378 ± 193			6.20 ± 0.87	
49470	10256 ± 718		1	46.11 ± 3.23	

$^{120}_{50}\text{Sn}$

E_0 (eV)	$g\Gamma_n$ (meV)	J	ℓ	$g\Gamma_n^0$ (meV)	$g\Gamma_n^1$ (meV)
50110	3647 ± 475		1	16.29 ± 2.12	
50380	1515 ± 258		1	6.75 ± 1.15	
50420	754 ± 150		1	3.36 ± 0.67	
50460	4533 ± 499		1	20.18 ± 2.22	
50650	4989 ± 599		1	22.17 ± 2.66	
51090	827 ± 199		[1]	3.66 ± 0.88	
51310	5366 ± 643		1	23.69 ± 2.84	
51710	355 ± 141		[1]	1.56 ± 0.62	
51890	10718 ± 857		1	47.05 ± 3.76	
52040	5427 ± 543		1	23.78 ± 2.38	
52140	1121 ± 221		[1]	4.87 ± 0.97	
52680	11313 ± 792		1	49.29 ± 3.45	
53010	1101 ± 265		1	4.78 ± 1.15	
53160	3938 ± 786		1	17.08 ± 3.41	
53450	1209 ± 243		1	5.23 ± 1.05	
53660	3389 ± 473		1	14.63 ± 2.04	
54220	28175 ± 1118		1	121.0 ± 4.8	
54410	30650 ± 1540		0	131.4 ± 6.5	
54920	1411 ± 169			6.02 ± 0.72	
55090	11834 ± 946		1	50.42 ± 4.03	
55370	3278 ± 459		1	13.93 ± 1.95	
55450	6459 ± 645		1	27.43 ± 2.74	
55600	1247 ± 250			5.29 ± 1.06	
55680	5295 ± 583		1	22.44 ± 2.47	
56540	3593 ± 466		1	15.11 ± 1.96	
56610	12487 ± 873		1	52.48 ± 3.67	
56690	1548			6.50	
56760	5794 ± 638		1	24.32 ± 2.68	
57170	3685		1	15.41	

¹²²₅₀Sn

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.0010 \pm 0.0005 \text{ b [40 min } ^{123}\text{Sn}^*] \\ \sigma_{\gamma} &= 0.180 \pm 0.050 \text{ b [125 day } ^{123}\text{Sn}^*] \\ a_{\text{coh}} &= 5.5 \pm 0.3 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 0.60 \pm 0.18 \text{ b} \\ R_{\gamma}^c &= 6.2 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		%Abn = 4.72		$S_n = 5948 \pm 3 \text{ keV}$	
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	J	ℓ	$g\Gamma_n^0 \text{ (meV)}$	
106.9 ± 0.2	0.77 ± 0.08	3/2	1	0.075 ± 0.008	
259.9 ± 0.3	1.75 ± 0.12	1/2		0.108 ± 0.008	
1756 ± 8	3400 ± 500	1/2	0	81.1 ± 11.9	
3450 ± 25	120 ± 100			2.0 ± 1.6	
5400 ± 80	5000 ± 2000			68 ± 44	
6865 ± 30	19000 ± 3000			277 ± 44	

¹²⁴₅₀Sn

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.13 \pm 0.03 \text{ b [9.7 min } ^{125}\text{Sn}^*] \\ \sigma_{\gamma} &= 0.004 \pm 0.002 \text{ b [9.62 day } ^{125}\text{Sn}^*] \\ a_{\text{coh}} &= 5.9 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 6.9 \pm 1.0 \text{ b} \\ R_{\gamma} &= 6.5 \pm 0.2 \text{ fm} \\ S_0 &= 0.15 \pm 0.08\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		%Abn = 5.94		$S_n = 5732 \pm 3 \text{ keV}$	
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$
62.0 ± 0.1	6.3 ± 0.4	1/2	1	239 ± 25	0.80 ± 0.05
579 ± 3	1.5 ± 0.5				0.062 ± 0.019
950 ± 2	6 ± 3				0.19 ± 0.10
2380 ± 20	2700 ± 100				55.3 ± 2.1
3390 ± 40	1400 ± 600				24 ± 10
5360 ± 40	700 ± 700				9.5 ± 9.5
9970 ± 120	7100 ± 1500				71.1 ± 14.9

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Sn ¹²⁶	activation	70HELSINKI, 589(70)	Ricabarra
Sn ^{112, 122, 124}	activation	NSE, 31, 545(68)	Tilbury
Sn ¹¹²	activation	ORNL-4196, 66(67)	Emery
Sn ^{118, 117, 118, 119}	diffraction	ACR, 23, 868(67)	Kay
Sn ^{120, 122, 124}	diffraction	ACR, 23, 868(67)	Kay
Sn ^{122, 124}	activation	NP, 41, 372(63)	Mangal
Sn ¹¹²	activation	PR, 124, 1186(61)	Schmorak
Sn ^{115, 117, 119}	σ_{γ} (spectra)	JNE, 12, 47(60)	Groshev
Sn	pile osci.	JNE, 12, 32(60)	Tattersall
Sn ¹²⁴	activation	PR, 91, 1423(53)+	Hughes
Sn	local osci.	PR, 83, 641(51)	Pomerance
Sn	pile osci.	PPS/A, 63, 1175(50)	Colmer
Sn	pile osci.	PR, 80, 342(50)	Harris
Sn ¹¹⁸	activation	PR, 77, 743(50)	Mihelich
Sn ^{112, 116, 120, 122}	activation	ORNL-828, 49(50)	Nelson
Sn ¹²⁴	activation	ORNL-828, 49(50)	Nelson
Sn ¹²⁴	activation	BNL-C-9, 89(49)	Studier
Sn ^{118, 120, 122, 124}	activation	PR, 72, 888(47)	Seren
Sn	absorption	PR, 69, 411(46)	Coltman
Sn	$\bar{\sigma}_s$	PR, 50, 133(36)	Mitchell

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Sn ¹¹⁸	σ_γ (spectra)	147-632	BAP, 17, 17(72)	Bhat
Sn ¹²²	σ_γ (spectra)	106-260	BAP, 17, 17(72)	Bhat
Sn ¹²⁰	σ_t	367-57170	PRIVATE COMM.(72)	Harvey
Sn ¹²⁰	$\sigma_t \sigma_\gamma$	67-9587	NP/A, 147, 205(70)	Muradyan
Sn ¹¹⁷	$\sigma_t \sigma_\gamma \bar{\sigma}_s$	1.3-2978	YF, 10, 18(69)	Adamchuk
Sn	σ_t	38-197	NP/A, 132, 129(69)	Julien
Sn ¹¹⁷	σ_γ (spectra)	38.8	PR, 166, 1111(68)	Bhat
Sn ¹¹⁸	σ_γ (spectra)	46-359	PR, 166, 1111(68)	Bhat
Sn ¹²⁰	σ_γ (spectra)	427	PR, 166, 1111(68)	Bhat
Sn ¹²⁴	σ_γ (spectra)	62	PR, 166, 1111(68)	Bhat
Sn ¹¹⁸	σ_t	111-4640	YF, 3, 801(66)	Adamchuk
Sn ¹¹⁸	σ_t	45-4725	YF, 3, 801(66)	Adamchuk
Sn ¹²⁰	σ_t	364-12070	YF, 3, 801(66)	Adamchuk
Sn ¹²²	σ_t	106-6880	YF, 3, 801(66)	Adamchuk
Sn ¹²⁴	σ_t	61-9960	YF, 3, 801(66)	Adamchuk
Sn ¹¹⁸	σ_γ (spectra)	45.8	BAP, 11, 841(66)	Slaughter
Sn ¹²²	σ_γ (spectra)	107-260	BAP, 11, 841(66)	Slaughter
Sn ¹²⁴	σ_γ (spectra)	62	BAP, 11, 841(66)	Slaughter
Sn ¹¹⁸	σ_t	45-7400	65ANTWERP, 76(65)	Harvey
Sn ¹²⁰	σ_t	365-1720	65ANTWERP, 76(65)	Harvey
Sn ¹²⁴	σ_t	62	65ANTWERP, 76(65)	Harvey
Sn ¹²⁴	σ_γ (spectra)	82	CJP, 43, 2156(65)	McNeill
Sn ¹¹²	σ_t	21-1416	ORNL-3425, 36(63)	Fuketa
Sn ¹¹⁴	σ_t	277-1980	ORNL-3425, 36(63)	Fuketa
Sn ¹¹⁵	σ_t	292-866	ORNL-3425, 36(63)	Fuketa
Sn ¹¹⁶	σ_t	111-3400	ORNL-3425, 36(63)	Fuketa
Sn ¹¹⁷	σ_t	1.3-1363	ORNL-3425, 36(63)	Fuketa
Sn ¹¹⁸	σ_t	45-3450	ORNL-3425, 36(63)	Fuketa
Sn ¹¹⁹	σ_t	6.2-1258	ORNL-3425, 36(63)	Fuketa
Sn ¹²⁰	σ_t	364-1714	ORNL-3425, 36(63)	Fuketa
Sn ¹²²	σ_t	107-6850	ORNL-3425, 36(63)	Fuketa
Sn ¹²⁴	σ_t	61-9680	ORNL-3425, 36(63)	Fuketa
Sn ¹¹²	σ_t	96-200	PR, 99, 10(56)	Harvey
Sn ¹¹⁴	σ_t	280	PR, 99, 10(56)	Harvey
Sn ¹¹⁵	σ_t	290	PR, 99, 10(56)	Harvey
Sn ¹¹⁶	σ_t	112-149	PR, 99, 10(56)	Harvey
Sn ¹¹⁷	σ_t	39-460	PR, 99, 10(56)	Harvey
Sn ¹¹⁸	σ_t	46-368	PR, 99, 10(56)	Harvey
Sn ¹¹⁹	σ_t	141-460	PR, 99, 10(56)	Harvey
Sn ¹²⁰	σ_t	425	PR, 99, 10(56)	Harvey
Sn ¹²⁴	σ_t	62	PR, 99, 10(56)	Harvey

⁵¹Sb

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 5.4 \pm 0.6 \text{ b} \\ \sigma_s &= 4.2 \pm 0.2 \text{ b} \\ \sigma_t &= 9.6 \pm 0.6 \text{ b} \\ a_{coh} &= 5.641 \pm 0.012 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 175 \pm 10 \text{ b} \\ \langle D \rangle &= 7.0 \pm 0.5 \text{ eV} \\ S_0 &= 0.26 \pm 0.07 \\ S_1 &= 1.5 \pm 1.0\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (eV)	$ag\Gamma_n^0$ (meV)	E_0 (eV)	$ag\Gamma_n^0$ (meV)
157.10 ± 0.06	0.004 ± 0.001	1467.2 ± 0.8	0.01 ± 0.01
282.70 ± 0.12	0.002 ± 0.001	1533.7 ± 0.9	0.01 ± 0.01
295.90 ± 0.12	0.020 ± 0.003	1541.1 ± 0.9	0.01 ± 0.01
307.10 ± 0.15	0.006 ± 0.002	1550.2 ± 0.9	0.01 ± 0.01
317.00 ± 0.15	0.005 ± 0.002	1581.6 ± 0.9	0.01 ± 0.01
344.00 ± 0.15	0.005 ± 0.001	1601.5 ± 1.0	0.02 ± 0.01
372.96 ± 0.20	0.010 ± 0.002	1653.8 ± 1.0	0.02 ± 0.01
500.00 ± 0.30	0.004 ± 0.001	1662.9 ± 1.0	0.02 ± 0.01
577.05 ± 0.40	0.006 ± 0.002	1681.7 ± 1.0	0.02 ± 0.01
587.00 ± 0.40	0.008 ± 0.002	1687.3 ± 1.0	0.02 ± 0.01
592.50 ± 0.40	0.005 ± 0.002	1708.0 ± 1.0	0.02 ± 0.01
651.80 ± 0.50	0.002 ± 0.001	1723.8 ± 1.0	0.20 ± 0.04
665.50 ± 0.50	0.004 ± 0.001	1733.8 ± 1.0	0.20 ± 0.02
697.00 ± 0.50	0.005 ± 0.001	1752.0 ± 1.1	0.01 ± 0.01
705.00 ± 0.55	0.003 ± 0.001	1766.0 ± 1.1	0.01 ± 0.01
727.8 ± 0.55	0.005 ± 0.002	1790.5 ± 1.1	0.10 ± 0.05
754.5 ± 0.60	0.0025 ± 0.0005	1808.2 ± 1.2	0.02 ± 0.01
762.6 ± 0.60	0.005 ± 0.001	1811.4 ± 1.2	0.02 ± 0.02
774.8 ± 0.60	0.10 ± 0.05	1821.0 ± 1.2	0.10 ± 0.05
865.20 ± 0.70	0.005 ± 0.003	1829.5 ± 1.2	0.02 ± 0.01
929.50 ± 0.80	0.10 ± 0.02	1836.0 ± 1.2	0.02 ± 0.01
952.0 ± 0.8	0.005 ± 0.002	1893.0 ± 1.2	0.25 ± 0.05
983.5 ± 0.8	0.002 ± 0.001	1938.0 ± 1.3	0.02 ± 0.02
1032.7 ± 0.9	0.003 ± 0.001	2010 ± 1.4	0.01 ± 0.01
1058.0 ± 0.9	0.003 ± 0.002	2024 ± 1.4	0.04 ± 0.02
1072.5 ± 0.9	0.008 ± 0.004	2045 ± 1.4	0.01 ± 0.01
1128.2 ± 1.0	0.010 ± 0.005	2053 ± 1.4	0.05 ± 0.02
1213.0 ± 1.2	0.02 ± 0.01	2085 ± 1.4	0.22 ± 0.05
1233.0 ± 1.2	0.02 ± 0.01	2115 ± 1.5	0.28 ± 0.05
1265.0 ± 1.3	0.01 ± 0.01	2190 ± 1.5	0.04 ± 0.02
1334.3 ± 1.3	0.03 ± 0.01	2196 ± 1.5	0.03 ± 0.02
1353.9 ± 1.4	0.020 ± 0.005	2222 ± 1.5	0.30 ± 0.10
1397.9 ± 0.7	0.025 ± 0.005	2250 ± 1.5	0.01 ± 0.01
1415.2 ± 0.7	0.050 ± 0.010	2255 ± 1.5	0.35 ± 0.05
1421.1 ± 0.7	0.06 ± 0.01	2280 ± 1.5	0.03 ± 0.02
1438.1 ± 0.8	0.25 ± 0.10	2325 ± 1.6	0.02 ± 0.01

⁵¹Sb

E ₀ (eV)	ag ⁿ _n (meV)	E ₀ (eV)	ag ⁿ _n (meV)
2335 ±1.6	0.01 ±0.01	2641 ±1.9	0.05 ±0.02
2346 ±1.6	0.02 ±0.01	2652 ±1.9	0.04 ±0.02
2375 ±1.6	0.04 ±0.02	2658 ±1.9	0.05 ±0.03
2411 ±1.7	0.03 ±0.02	2666 ±1.9	0.03 ±0.03
2419 ±1.7	0.01 ±0.01	2686 ±1.9	0.40 ±0.15
2431 ±1.7	0.01 ±0.01	2716 ±2.0	0.17 ±0.06
2462 ±1.7	0.20 ±0.04	2755 ±2.0	0.02 ±0.02
2473 ±1.7	0.03 ±0.01	2767 ±2.0	0.27 ±0.05
2500 ±1.8	0.04 ±0.02	2802 ±2.1	0.03 ±0.03
2509 ±1.8	0.03 ±0.02	2810 ±2.1	0.04 ±0.02
2533 ±1.8	0.17 ±0.03	2825 ±2.1	0.25 ±0.05
2538 ±1.8	0.03 ±0.02	2850 ±2.1	0.37 ±0.10
2552 ±1.8	0.04 ±0.02	2874 ±2.1	0.14 ±0.05
2560 ±1.8	0.18 ±0.03	2885 ±2.1	0.05 ±0.03
2570 ±1.8	0.03 ±0.02	2915 ±2.2	0.80 ±0.15
2572 ±1.8	0.03 ±0.02	2942 ±2.2	0.05 ±0.03
2586 ±1.8	0.05 ±0.02	2962 ±2.2	0.03 ±0.02
2604 ±1.9	0.15 ±0.03	2974 ±2.2	0.20 ±0.05
2615 ±1.9	0.06 ±0.02	2996 ±2.2	1.25 ±0.20
2627 ±1.9	0.12 ±0.05		

¹²¹Sb
⁵¹

THERMAL CROSS SECTIONS

$\sigma_{\gamma} = 0.055 \pm 0.010$ b [4,1 min $^{122}\text{Sb}^{\text{m}}$]
 $\sigma_{\gamma} = 6.2 \pm 0.2$ b [2.8 day $^{122}\text{Sb}^{\text{g}}$]

RESONANCE PROPERTIES

$I_{\gamma} = 200 \pm 5$ b
 $<D> = 10.3 \pm 1.0$ eV
 $S_0 = 0.29 \pm 0.05$
 $S_1 = 1.1 \pm 1.3$

RESONANCE PARAMETERS

E ₀ (eV)	2g ⁿ _n (meV)	J	Γ _γ (meV)	2g ⁿ _n (meV)
6.24 ± 0.03	2.1 ± 0.1	3	88 ± 3	0.84 ± 0.04
15.41 ± 0.06	6.9 ± 0.4	2	95 ± 10	1.75 ± 0.10
29.65 ± 0.05	5.1 ± 0.4	3	85 ± 10	0.94 ± 0.09
37.77 ± 0.15	0.017 ± 0.003			0.0028 ± 0.0005
53.55 ± 0.15	2.0 ± 0.2	2		0.27 ± 0.03
55.1 ± 0.2	0.04 ± 0.01		88 ± 15	0.0054 ± 0.0013
64.5 ± 0.1	0.65 ± 0.05	3	90 ± 10	0.081 ± 0.006
73.8 ± 0.1	7.5 ± 0.5	2	99 ± 10	0.87 ± 0.06
89.6 ± 0.1	7.0 ± 1.0	[3]		0.74 ± 0.11
90.3 ± 0.1	4.4 ± 0.7			0.46 ± 0.07

¹²¹Sb
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E ₀ (eV)	2gI _n ⁰ (meV)	J	Γ _γ (meV)	2gI _n ⁰ (meV)
111.4 ±0.1	2.8 ± 0.3	2		0.27 ±0.03
126.8 ±0.1	27 ± 3	3	85 ±15	2.4 ±0.2
131.9 ±0.1	10.5 ± 1.0	3		0.91 ±0.09
144.3 ±0.1	13 ± 1	2	94 ±15	1.1 ±0.1
149.9 ±0.1	28 ± 1	3	100 ±15	2.29 ±0.08
160.6 ±0.1	1.5 ± 0.3	[2]		0.12 ±0.02
167.1 ±0.1	15 ± 2	2	99 ±30	1.16 ±0.15
176.6 ±0.1	0.08 ± 0.02			0.006 ±0.002
184.7 ±0.1	0.18 ± 0.02			0.013 ±0.02
192.3 ±0.1	1.3 ± 0.2			0.094 ±0.014
214.0 ±0.1	1.4 ± 0.2			0.096 ±0.014
222.6 ±0.1	4.0 ± 0.2	3	143 ±20	0.27 ±0.04
230.6 ±0.1	0.8 ± 0.2			0.053 ±0.013
245.9 ±0.1	0.29 ± 0.05			0.019 ±0.003
248.8 ±0.1	0.28 ± 0.06			0.018 ±0.004
261.6 ±0.2	0.2 ± 0.1			0.012 ±0.006
265.8 ±0.2	0.2 ± 0.1			0.018 ±0.006
270.1 ±0.2	0.3 ± 0.1			0.017 ±0.004
274.9 ±0.2	0.28 ± 0.07			0.65 ±0.04
286.4 ±0.2	11.0 ± 0.7	3	119 ±25	0.008 ±0.003
293.7 ±0.2	0.13 ± 0.05			0.15 ±0.05
309.3 ±0.2	2.6 ± 0.9			0.028 ±0.007
320.5 ±0.2	0.50 ± 0.12			0.15 ±0.02
331.4 ±0.2	2.7 ± 0.4	[2]		0.45 ±0.05
336.5 ±0.2	8.3 ± 0.9			0.0086 ±0.0024
347.2 ±0.2	0.16 ± 0.05			0.013 ±0.003
355.8 ±0.2	0.24 ± 0.06			0.017 ±0.004
367.1 ±0.2	0.32 ± 0.02			1.0 ±0.2
392.8 ±0.2	20 ± 2			0.060 ±0.007
405.7 ±0.3	1.2 ± 0.2			0.03 ±0.01
414.6 ±0.3	0.06 ± 0.18			0.44 ±0.05
421.4 ±0.3	9.0 ± 1.0	3		0.0096 ±0.0048
432.6 ±1.2	0.2 ± 0.1			2.0 ±1.0
443.5 ±0.3	42 ± 21			1.5 ±0.3
447.6 ±0.3	32 ± 6			1.7 ±0.4
450.2 ±0.3	36 ± 9			7.3 ±1.0
453.8 ±0.3	156 ± 21			0.089 ±0.027
463.6 ±1.2	1.9 ± 0.6			0.58 ±0.06
470.1 ±0.3	12.5 ± 1.3			0.028 ±0.007
476.6 ±1.2	0.60 ± 0.15			0.068 ±0.020
481.6 ±0.3	1.5 ± 0.5			0.30 ±0.04
497.0 ±0.3	6.7 ± 0.9			0.036 ±0.015
500.0 ±0.3	0.60 ± 0.33			0.021 ±0.010
507.1 ±0.3	0.47 ± 0.24			0.35 ±0.03
535.1 ±0.4	8.1 ± 0.7			4.4 ±0.4
543.2 ±0.4	102 ± 9			0.034 ±0.017
551.2 ±1.5	0.79 ± 0.39			0.82 ±0.28
558.9 ±0.4	19.4 ± 6.6			0.05 ±0.01
563.5 ±0.4	1.2 ± 0.2			0.020 ±0.006
580.0 ±0.4	0.48 ± 0.14			0.20 ±0.04
599.0 ±0.4	4.9 ± 1.0			2.3 ±0.4
605.6 ±0.5	57 ± 10			

¹²¹
51 Sb

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
613.5 ±0.5	11.9 ± 1.2			0.48 ±0.05
630.8 ±0.4	32.7 ± 2.8			1.30 ±0.11
644.0 ±0.5	0.25 ± 0.15			0.010 ±0.006
661.2 ±0.5	30.3 ± 2.1			1.18 ±0.08
671.1 ±0.5	36 ± 5			1.4 ±0.2
675.8 ±0.5	16 ± 3			0.60 ±0.11
710.5 ±0.6	16.0 ± 1.5			0.60 ±0.06
715.2 ±0.6	1.9 ± 0.8			0.07 ±0.03
718.6 ±0.6	38 ± 3			1.4 ±0.1
735.3 ±0.6	5.4 ± 1.1			0.20 ±0.04
772.3 ±0.6	81 ± 8			2.9 ±0.3
789.7 ±0.6	23 ± 4			0.81 ±0.15
795.2 ±0.6	42 ± 8			1.5 ±0.3
800.2 ±0.7	93 ±14			3.3 ±0.5
803.5 ±0.7	88 ±14			3.1 ±0.5
839.2 ±0.7	24 ± 2			0.83 ±0.08
859.2 ±0.7	11.7 ± 1.5			0.40 ±0.05
889.6 ±0.7	6.9 ± 0.9			0.23 ±0.03
911.5 ±0.7	11.5 ± 3.0			0.38 ±0.10
917.0 ±0.8	115 ±21			3.8 ±0.7
936.2 ±0.8	4.3 ± 1.2			0.14 ±0.04
947.5 ±0.8	46 ± 6			1.5 ±0.2
962.4 ±0.8	40 ± 6			1.3 ±0.2
993.5 ±0.8	120 ±10			3.8 ±0.3
1012.7 ±0.9	27 ± 3			0.84 ±0.09
1036.4 ±0.9	6.5 ± 1.6			0.20 ±0.05
1048 ±4	9.7 ± 1.9			0.30 ±0.06
1084.5 ±1.0	31 ± 3			0.93 ±0.09
1110.9 ±1.0	127 ±18			3.8 ±0.5
1123.5 ±1.0	6.0 ± 1.3			0.18 ±0.04
1145.0 ±1.1	13.1 ± 3.4			0.39 ±0.10
1180.5 ±1.1	96 ±38			2.8 ±1.1
1183.7 ±1.1	110 ±38			3.2 ±1.1
1201.7 ±1.2	64 ± 7			1.85 ±0.20
1220.0 ±1.2	31 ± 3			0.9 ±0.1
1250.0 ±1.2	61 ± 6			1.73 ±0.17
1260.5 ±1.2	12 ± 3			0.32 ±0.07
1307.5 ±1.3	104 ±10			2.88 ±0.29
1329.2 ±1.3	33 ± 4			0.90 ±0.10
1347.2 ±1.3	21 ± 3			0.58 ±0.08
1364.9 ±1.7	119 ± 6			3.22 ±0.17
1436.6 ±0.8	64 ±15			1.7 ±0.4
1451.6 ±0.8	12 ± 3			0.31 ±0.07
1483.5 ±0.8	77 ± 8			2.0 ±0.2
1521.4 ±0.9	11 ± 3			0.28 ±0.07
1529.6 ±0.9	9 ± 3			0.24 ±0.07
1555.0 ±0.9	15 ± 3			0.37 ±0.07
1574.8 ±0.9	11 ± 3			0.28 ±0.07
1595.0 ±0.9	100 ±16			2.5 ±0.4
1640.0 ±1.0	28 ± 6			0.70 ±0.14
1698.8 ±1.0	71 ±11			1.7 ±0.3
1729 ±2	57 ±17			1.4 ±0.4

¹²¹Sb
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E ₀ (eV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
1741.0 ±1.0	10 ± 3			0.24 ±0.07
1776.0 ±1.1	90 ±23			2.1 ±0.5
1796.7 ±1.1	170 ±50			4.0 ±1.2
1824.0 ±1.2	180 ±45			4.2 ±1.1
1844.0 ±1.2	35 ± 9			0.81 ±0.20
1903.0 ±1.3	130 ±30			3.0 ±0.7
1917.0 ±1.3	70 ±18			1.6 ±0.4
1978.0 ±1.3	134 ±18			3.0 ±0.4
2000.0 ±1.4	214 ±54			4.8 ±1.2
2035.0 ±1.4	65 ±16			1.4 ±0.4
2107.0 ±1.5	92 ±18			2.0 ±0.4
2124 ±3	59 ±21			1.3 ±0.5
2153.0 ±1.5	110 ±33			2.4 ±0.7
2268.0 ±1.5	48 ±24			1.0 ±0.5
2275 ±3	105 ±42			2.2 ±0.9
2310 ±3	120 ±30			2.5 ±0.6
2366.0 ±1.6	107 ±20			2.2 ±0.4
2394.0 ±1.6	78 ±10			1.6 ±0.2
2436.0 ±1.7	69 ±10			1.4 ±0.2
2526.0 ±1.8	347 ±85			6.9 ±1.7

¹²³Sb
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THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.011 \pm 0.0025 \text{ b [21 min } ^{123}\text{Sb}^{\text{m}1}] \\ \sigma_{\gamma} &= 0.035 \pm 0.02^{\text{b}} \text{ b [1.3 min } ^{123}\text{Sb}^{\text{m}2}] \\ \sigma_{\gamma} &= 4.28 \pm 0.16 \text{ b [60.2 day } ^{123}\text{Sb}^{\text{g}}]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 140 \pm 10 \text{ b} \\ \langle D \rangle &= 20.7 \pm 3.0 \text{ eV} \\ S_0 &= 0.22 \pm 0.07 \\ S_1 &= 2 \pm 1\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 7/2^{+}$$

$$\% \text{Abn} = 42.75$$

$$S_n = 6466.8 \pm 1.4 \text{ keV}$$

E ₀ (eV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
21.4 ± 0.1	30 ± 3	4	100 ± 10	6.5 ± 0.7
50.5 ± 0.1	3.0 ± 0.3	3	87 ± 20	0.42 ± 0.04
76.7 ± 0.1	5.7 ± 0.4	4	107 ± 15	0.65 ± 0.05
105.0 ± 0.1	53 ± 5	3	78 ± 15	5.16 ± 0.52
176.4 ± 0.1	0.28 ± 0.05			0.021 ± 0.004
186.1 ± 0.1	0.32 ± 0.06			0.023 ± 0.004
191.8 ± 0.1	23 ± 3	3	90 ± 10	1.66 ± 0.22
197.8 ± 0.1	0.39 ± 0.03			0.028 ± 0.002
218.6 ± 0.1	4.1 ± 0.4			0.28 ± 0.03

¹²³
51 Sb

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
225.1±0.1	0.28± 0.04			0.019± 0.003
240.6±0.1	18 ± 3	4	122 ±20	1.16 ± 0.19
295.9±0.1	1.6 ± 0.2			0.090± 0.014
299.3±0.2	25.9 ± 2.4	4	120 ±20	1.50 ± 0.14
323.7±0.2	33.6 ± 3.4			1.87 ± 0.19
331.4±0.2	1.1 ± 0.3			0.062± 0.030
339.0±0.2	0.63± 0.21			0.034± 0.011
351.2±0.2	6.4 ± 0.6			0.34 ± 0.03
373.0±0.2	1.4 ± 0.2			0.07 ± 0.01
392.8±0.2	2.3 ± 0.4			0.12 ± 0.02
395.0±0.2	25.8 ± 2.0			1.3 ± 0.1
414.6±0.3	0.63± 0.13			0.031± 0.06
470.9±0.3	4.3 ± 0.4			0.20 ± 0.02
481.6±0.3	11.5 ± 1.2			0.52 ± 0.05
520.0±0.4	0.93± 0.20			0.041± 0.009
533.1±0.4	11.5 ± 1.2			0.50 ± 0.05
571.1±0.4	26 ± 3			1.1 ± 0.1
599.0±0.4	8.8 ± 0.9			0.36 ± 0.04
627.6±0.5	27 ± 3			1.1 ± 0.1
644.0±0.5	1.4 ± 0.4			0.054± 0.016
659.1± .5	18.5 ± 1.9			0.72 ± 0.07
691.5±0.5	3.4 ± 0.9			0.13 ± 0.03
702.6±2.0	0.9 ± 0.5			0.034± 0.017
719.4±2.5	4.4 ± 1.3			0.16 ± 0.05
747.4±0.6	169 ± 27			6.2 ± 1.0
815.5±0.7	29 ± 6			1.0 ± 0.2
839.2±0.7	93 ± 9			3.2 ± 0.3
872.0±0.7	207 ± 30			7.0 ± 1.0
885.2±0.7	85 ± 9			2.85 ± 0.29
893.5±0.7	2.1 ± 0.9			0.07 ± 0.03
910.8±0.7	21 ± 2			0.69 ± 0.07
933.3	19 ± 2			0.62 ± 0.06
968.7±0.8	35 ± 4			1.12 ± 0.11
977.5±0.8	5.0 ± 0.6			0.16 ± 0.02
988.3±0.8	88 ± 8			2.8 ± 0.3
1026.3±0.9	13 ± 3			0.42 ± 0.09
1048.4±1.0	58 ± 6			1.8 ± 0.2
1084.5±1.0	12 ± 4			0.36 ± 0.11
1094 ±4	6 ± 2			0.18 ± 0.06
1110.9±1.0	24 ± 6			0.72 ± 0.18
1117.5±1.0	60 ± 13			1.8 ± 0.4
1165.0±1.1	88 ± 5			2.57 ± 0.14
1228 ±3	6 ± 2			0.17 ± 0.07
1239 ±3	5 ± 2			0.14 ± 0.06
1250.0±1.2	41 ± 8			1.16 ± 0.22
1273.2±1.3	50 ± 7			1.4 ± 0.2
1307.5±1.3	28 ± 4			0.78 ± 0.12
1329.2±1.3	19 ± 6			0.52 ± 0.16
1385.5±0.7	18 ± 2			0.50 ± 0.05
1407 ±3	5 ± 3			0.13 ± 0.07
1458 ±3	8 ± 3			0.2 ± 0.1
1483.5±0.8	170 ± 43			4.4 ± 1.1

¹²³
51Sb

E ₀ (eV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
1491.0±0.8	62 ± 19			1.6 ± 0.5
1494.0±0.8	46 ± 19			1.2 ± 0.5
1571 ±4	6.7 ± 1.7			0.17 ± 0.04
1598.8±0.9	20 ± 3			0.55 ± 0.07
1619.5±1.0	116 ± 12			2.87 ± 0.29
1648.2±1.0	41 ± 4			1.0 ± 0.1
1671.5±1.0	6.5 ± 1.2			0.16 ± 0.03
1698.8±1.0	157 ± 16			3.82 ± 0.30
1740 ±3	4 ± 2			0.096± 0.048
1783.0±1.1	80 ± 25			1.9 ± 0.6
1796.7±1.1	270 ± 40			6.3 ± 0.9
1860.0±1.2	120 ± 13			2.8 ± 0.3
1871.0±1.2	160 ± 20			3.7 ± 0.5
1900 ±3	6 ± 3			0.14 ± 0.07
1932.0±1.3	66 ± 9			1.5 ± 0.2
1965.0±1.3	11 ± 5			0.25 ± 0.12
2000.0±1.4	360 ± 36			8.03 ± 0.80
2035.0±1.4	10 ± 6			0.22 ± 0.13
2107.0±1.5	106 ± 14			2.3 ± 0.3
2143 ±3	155 ± 23			3.4 ± 0.5
2148.0±1.5	280 ± 28			6.1 ± 0.6
2172.0±1.5	102 ± 14			2.2 ± 0.3
2204.0±1.5	61 ± 23			1.3 ± 0.5
2237.0±1.5	200 ± 20			4.2 ± 0.4
2274 ±1.5	47 ± 9			1.0 ± 0.2
2315 ±1.6	98 ± 15			2.0 ± 0.3
2357.0±1.6	112 ± 44			2.3 ± 0.9
2384.0±1.6	55 ± 17			1.2 ± 0.3
2444.0±1.6	34 ± 9			0.69 ± 0.17
2479 ±1.7	60 ± 25			1.2 ± 0.2
2665 ±3	50 ± 15			1.0 ± 0.3
2708 ±2	360 ± 72			6.9 ± 1.4
2782	40 ± 12			0.76 ± 0.22
2839	120 ± 30			2.2 ± 0.6
2907	52 ± 16			0.96 ± 0.29
3020	310 ± 78			5.7 ± 1.4
3128	130 ± 33			2.3 ± 0.6
3243	190 ± 76			3.3 ± 1.3
3266	194 ± 78			3.4 ± 1.4
3314	280 ± 42			4.8 ± 0.7
3370	150 ± 75			2.6 ± 1.3
3401	200 ± 80			3.4 ± 1.4
3530	67 ± 20			1.1 ± 0.3
3696	280 ± 84			4.6 ± 1.4
3984	390 ± 195			6.2 ± 3.1
4166	1800 ±1440			28 ±22

¹²⁴
51Sb
[60.20 day]

THERMAL CROSS SECTIONS

$\sigma_{\gamma} = 6.5 \pm 1.5 \text{ b}$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Sb	Christiansen filters	ZN,26,391(71)	Koester
Sb ^{121,123}	activation	JN-1317,53(70)	Hogg
Sb ^{121,123}	activation	JNE,24,35(70)	Ryves
Sb ^{121,123}	activation	CJP,47,2031(69)	Ricabarra
Sb	σ_c 0.002-0.4	JNE,22,389(68)	AbuEl-Ela
Sb ^{121,123}	activation	JIN,30,1353(68)	Orvini
Sb ¹²³	activation	JIN,30,349(68)	Sims
Sb ^{123,124}	activation	CJP,44,2956(66)	Courtemanche
Sb ¹²¹	isom. ratio	64PARIS,2,703(64)	Gulyas
Sb	diffraction	PR,131,2098(63)	Arnold
Sb ¹²⁴	activation	PR-CM-36,7(63)	Eastwood
Sb ¹²¹	isom. ratio	PR,129,769(63)	Keisch
Sb ^{121,123}	isom. ratio	PR,125,1615(62)	Der Mateosian
Sb ¹²³	isom. ratio	NP,37,90(62)	Vanhorenbeeck
Sb ¹²¹	isom. ratio	NSA,20,22052(60)	Kardon
Sb ¹²¹	activation	NSE,8,378(60)	Lyon
Sb ¹²¹	activation	NP,12,261(59)	Sehgal
Sb ^{121,123}	pile osci.	PR,88,412(52)	Pomerance
Sb	pile osci.	PR,83,641(51)	Pomerance
Sb	diffraction	PR,81,527(51)	Shull
Sb	$\bar{\sigma}_s$	PR,83,379(51)	Weiss
Sb	pile osci.	PPS/A,63,1175(50)	Colmer
Sb ¹²¹	activation	PR,72,888(47)	Seren
Sb	absorption	PR,69,411(46)	Coltman

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Sb	σ_c	6.2-1400	JPJ,33,1185(72)	Ohkubo
Sb ¹²¹	σ_γ	6.2-421	71KNDX,785(71)	Cauvin
Sb ¹²³	σ_γ	21.6-299	71KNOX,785(71)	Cauvin
Sb	σ_γ	6.2-127	PR/C,2,1115(70)	Bhat
Sb	σ_t	6.2	JNE,24,245(70)	Mateiciuc
Sb	σ_c	6.2-249	68WASH,2,789(68)	Asami
Sb ¹²¹	$\sigma_c \sigma_\gamma$	6.2-2533	YF,8,852(68)	Muradyan
Sb ¹²³	$\sigma_c \sigma_\gamma$	21.6-4166	YF,8,852(68)	Muradyan
Sb	σ_c	15.4-2996	PR,166,1234(68)	Wynchank
Sb	σ_t	0.05-21.6	RAP,12,907(67)	Mateiciuc
Sb	σ_c polar.	6.2-15	PR,155,1330(67)	Stolovy
Sb	σ_c	6.2-21	NP,42,676(63)	Bolotin
Sb	σ_γ	6.2-190	PR,124,1142(61)	Jackson
Sb	σ_c	6.2-21.6	PR,108,353(57)	Stolovy
Sb, Sb ¹²³	σ_c	6.2-190	PR,102,228(56)	Palmer

¹²⁰Te

THERMAL CROSS SECTIONS

$$\sigma_T = 4.7 \pm 0.1 \text{ b}$$
$$a_{coh} = 5.43 \pm 0.04 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 54 \pm 3 \text{ b}$$
$$\langle D \rangle = 11.2 \pm 3.0 \text{ eV}$$
$$S_0 = 0.28 \pm 0.03$$

UNASSIGNED RESONANCES

E_0 (eV)	$2\text{ag}\Gamma_n$ (meV)	$2\text{ag}\Gamma_n^0$ (meV)
320.3±0.5	0.10±0.05	0.0056±0.0028
375.0±0.5	0.60±0.30	0.031 ±0.015
391.9±1.0	0.20±0.10	0.010 ±0.005
410.0±0.5	0.23±0.10	0.011 ±0.005
505.2±1.0	1.2 ±0.5	0.053 ±0.022
531.4±1.0	0.40±0.20	0.017 ±0.009
543.0±0.5	0.40±0.20	0.017 ±0.009
548.0±0.5	0.20±0.10	0.0085±0.0043
755.5±0.7	0.30±0.10	0.011 ±0.004
1095.5±1.0	0.70±0.30	0.021 ±0.009
1145.7±1.0	0.50±0.20	0.015 ±0.006
1236.0±1.0	1.0 ±0.5	0.028 ±0.014
1408.4±2.0	1.5 ±0.5	0.040 ±0.013
1475.0±1.5	1.0 ±0.5	0.026 ±0.013
1594.0±1.5	0.66±0.30	0.017 ±0.008
1648.7±2.0	2.0 ±1.0	0.049 ±0.025
1840.7±2.0	8.0 ±3.0	0.19 ±0.07
1952.0±2.0	2.0 ±1.0	0.045 ±0.022
2011.2±2.0	2.0 ±1.0	0.045 ±0.022
2079.0±2.0	2.0 ±1.0	0.44 ±0.022
2447.0±3.0	5.0 ±2.0	0.10 ±0.04
2504.4±3.0	5.0 ±2.0	0.10 ±0.04
2539.6±3.0	5.0 ±2.0	0.10 ±0.04
2547.3±3.0	4.0 ±2.0	0.079 ±0.04
2581.7±3.0	6.0 ±3.0	0.11 ±0.06
2592.5±3.0	4.0 ±2.0	0.079 ±0.04
2668.7±3.0	4.0 ±2.0	0.077 ±0.04

¹²⁰Te

THERMAL CROSS SECTIONS

$$\sigma_T = 0.340 \pm 0.060 \text{ b [150 day } ^{121}\text{Te}^*]$$
$$\sigma_T = 2.0 \pm 0.3 \text{ b [17 day } ^{121}\text{Te}^*]$$
$$a_{coh} = 5.2 \pm 0.5 \text{ fm}$$

¹²²
₅₂Te

Thermal Cross Sections

$\sigma_f = 2.8 \pm 0.9 \text{ b}$
 $\sigma_f = 1.1 \pm 0.5 \text{ b (117 day } ^{123}\text{Te}^*)$
 $\sigma_f = 1.7 \pm 0.8 \text{ b (} ^{123}\text{Te}^*)$

Resonance Properties

$\Gamma_0^c = 80 \pm 5 \text{ b}$
 $\langle D \rangle = 132 \pm 15 \text{ eV}$
 $S_0 = 0.79 \pm 0.2$

Resonance Parameters

$\Gamma^* = 0^+$

$\chi_{\text{obs}} = 2.46$

$S_1 = 6929.9 \pm 2.6 \text{ keV}$

$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$g_f^0 \text{ (meV)}$	$\Gamma_f \text{ (meV)}$	$g_f^0 \text{ (meV)}$
72.79 ± 0.05	393 ± 30	133 ± 10	260 ± 27	15.6 ± 1.2
230.9 ± 0.1	125 ± 41	16.2 ± 0.75	109 ± 41	1.06 ± 0.05
332.6 ± 0.1	434 ± 30	375 ± 20	59 ± 36	20.6 ± 1.1
454.5 ± 0.1	232 ± 35	148.5 ± 5.0	83.5 ± 35.4	6.97 ± 0.23
612.4 ± 0.2	1260 ± 50	1085 ± 25	195 ± 56	43.1 ± 1.0
922.4 ± 0.3	800 ± 60	729 ± 30		24 ± 1
978.8 ± 0.4	450 ± 100	275 ± 10		8.79 ± 0.32
1127.0 ± 0.5	440 ± 150	255 ± 125		7.6 ± 0.4
1358.1 ± 0.6	450 ± 150	450 ± 20		12.2 ± 0.5
1627.0 ± 0.6		89 ± 16		2.2 ± 0.4
1783.0 ± 0.8	1260 ± 340	506 ± 40		12 ± 1
1804.0 ± 1.0	480 ± 260	552 ± 42		13 ± 1
1903.0 ± 1.0		120 ± 35		3.5 ± 0.8
2274.0 ± 3.0		540 ± 45		11.3 ± 1.0
2325.0 ± 3.0		250 ± 38		5.19 ± 0.78
2378.0 ± 1.5	1590 ± 330	1330 ± 68		27.3 ± 1.4
2512.0 ± 1.5		400 ± 50		8.0 ± 1.0
2868.0 ± 3.0		780 ± 80		14.6 ± 1.5
2966.2 ± 3.0		595 ± 400		10.9 ± 7.3
3189.3 ± 4.0		1270 ± 300		22.5 ± 2.7
3486.0 ± 4.0		885 ± 110		15.0 ± 1.9
3706.0 ± 4.0		620 ± 250		10.2 ± 4.1
4214.0 ± 4.0		640 ± 250		8.5 ± 3.9
4280.0 ± 4.0		675 ± 250		10.3 ± 3.8
4767.5 ± 5.0		830 ± 140		12 ± 2
4851.2 ± 5.0		1475 ± 200		21.2 ± 2.9
5007.4 ± 6.0		2475 ± 350		35.0 ± 5.0
5477.5 ± 6.0		3815 ± 500		51.5 ± 6.8
5808.0 ± 3.0		1500		19.7
6128 ± 4		1450 ± 400		18.5 ± 5.1
6338 ± 10				
6494 ± 10				
6533 ± 10		2950 ± 500		36.5 ± 6.2
7027 ± 10		3750 ± 500		44.8 ± 6.0
7650 ± 10				
7870 ± 10		16000 ± 1100		180.4 ± 12.4
8175 ± 10				

¹²²₅₂Te

E_0 (eV)	Γ (meV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
9642 ±10				
9797 ±10		7200 ±1250		72.7 ±12.6
9995 ±10				
10824 ±15				

¹²³₅₂Te

THERMAL CROSS SECTIONS

[1.2 × 10¹³ yr]

$$\sigma_\gamma = 406 \pm 30 \text{ b}$$

$$a_{\text{coh}} = 5.7 \pm 0.3 \text{ fm}$$

RESONANCE PROPERTIES

$$i_\gamma^c = 5630 \pm 300 \text{ b}$$

$$R_\gamma^c = 6.0 \pm 0.2 \text{ fm}$$

$$\langle D \rangle = 26.3 \pm 3.9 \text{ eV}$$

$$S_0 = 0.98 \pm 0.20$$

RESONANCE PARAMETERS

$I^\pi = 1/2^+$		$\chi_{\text{abn}} = 0.87$		$S_n = 9423.8 \pm 1.4 \text{ keV}$	
E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
2.334 ± 0.008	114 ± 3	15.6 ± 0.9	1	104 ± 3	10.2 ± 1.2
24.1 ± 0.1	182 ± 20	37 ± 5	0	108 ± 18	7.5 ± 1.0
35.9 ± 0.1	110 ± 10	12 ± 1	1	102 ± 10	2.0 ± 0.2
73.1 ± 0.1	108 ± 20	6.0 ± 0.2			0.70 ± 0.02
96.8 ± 0.1	145 ± 20	14.5 ± 0.5	0	116 ± 20	1.48 ± 0.05
108.8 ± 0.2	100 ± 40	5.2 ± 0.2			0.50 ± 0.02
119.9 ± 0.1	100 ± 20	14.9 ± 0.5			1.37 ± 0.05
132.7 ± 0.2	253 ± 25	98 ± 75	1	188 ± 25	8.5 ± 0.7
158.6 ± 0.2	261 ± 30	242 ± 20	1	100 ± 20	19.2 ± 1.6
182.1 ± 0.3	150	20			1.48
235.3 ± 0.2	310 ± 30	74 ± 3	0	162 ± 30	4.8 ± 0.2
274.8 ± 0.2	101 ± 35	66 ± 2	1	57 ± 35	4.00 ± 0.13
317.5 ± 0.2	520 ± 50	153 ± 5	0	214 ± 50	8.6 ± 0.3
334.6 ± 0.2		36 ± 4	1		2.0 ± 0.2
341.7 ± 0.3	109 ± 50	107 ± 6	1		5.8 ± 0.3
363.4 ± 0.3	328 ± 50	290 ± 20	1	135 ± 50	15.2 ± 1.1
374.5 ± 0.3	140 ± 70	68 ± 4	1		3.5 ± 0.2
409.5 ± 0.3		51.8 ± 5.0	1		2.56 ± 0.25
436.6 ± 0.3	450 ± 170	72 ± 4	(1)		3.45 ± 0.19
467.6 ± 0.3		69 ± 4	1		3.2 ± 0.2
493.5 ± 0.5		20	0		0.90
498.3 ± 0.5		49.7 ± 5.0	1		2.23 ± 0.22
562.5 ± 1.0	300	200			0.84
608.0 ± 1.0		300			1.22
616.8 ± 0.5	1750 ± 200	580 ± 20	0		23.4 ± 0.8

¹²³
₅₂Te

E ₀ (eV)	Γ (meV)	2g _n ⁰ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
620.7 ± 0.6	300	80 ± 7			3.21 ± 0.29
664.4 ± 0.5	180 ± 100	180 ± 18	1		7.0 ± 0.7
747.1 ± 0.6		186 ± 25			6.8 ± 0.9
854.7 ± 0.7		213 ± 35			7.3 ± 1.2
918.0 ± 0.8		275 ± 45			9.08 ± 1.49
997.4 ± 1.0		340 ± 115			10.77 ± 3.64
1062.7 ± 1.0		256 ± 35			7.86 ± 1.07
1073.5 ± 1.0		400 ± 170			12.2 ± 5.19
1099.0 ± 1.0		230 ± 115			6.94 ± 3.47
1111.7 ± 1.0		300 ± 45			3.33 ± 1.74
1182.6 ± 1.0		115 ± 60			9.00 ± 1.35
1225.8 ± 1.0		340 ± 170			9.71 ± 4.86
1309.0 ± 1.0		220 ± 54			6.1 ± 1.5
1437.8 ± 0.8		190 ± 75			5.0 ± 2.0
1507.9 ± 2.0		170 ± 60			4.38 ± 1.55
1727.1 ± 1.0		850 ± 115			20.5 ± 2.8
1813.0 ± 1.1		340 ± 115			8.0 ± 2.7
1998.0 ± 2.0		920 ± 350			20.6 ± 7.8

¹²⁴
₅₂Te

Thermal Cross Sections

$$\sigma_{\gamma} = 6.8 \pm 1.3 \text{ b } [^{125}\text{Te}^{9+10}]$$

$$\sigma_{\gamma} = 0.040 \pm 0.025 \text{ b } [58 \text{ day } ^{125}\text{Te}^{*}]$$

$$a_{\text{coh}} = 5.5 \pm 0.3 \text{ fm}$$

Resonance Properties

$$I_{\gamma}^{\text{c}} = 7 \pm 2 \text{ b}$$

$$\langle D \rangle = 147 \pm 12 \text{ eV}$$

$$S_0 = 0.68 \pm 0.20$$

Resonance Parameters

$$I^{\pi} = 0^{+} \quad \Sigma \text{Abn} = 4.61 \quad S_n = 6584.9 \pm 2.0 \text{ keV}$$

E ₀ (eV)	Γ (meV)	g _n ⁰ (meV)	Γ _γ (meV)	g _n ⁰ (meV)
347.0 ± 0.5	200 ± 100	0.60 ±	199 ± 100	0.0322 ± 0.013
351.6 ± 0.5	130 ± 60	18.0 ±	128 ± 60	0.96 ± 0.027
419.1 ± 0.5	150 ± 60	0.68 ±		0.033 ± 0.024
421.5 ± 0.5	200 ± 100	1.2 ±	199 ± 100	0.059 ± 0.024
440.1 ± 0.5	200 ± 100	2.1 ±	198 ± 100	0.100 ± 0.024
446.6 ± 0.1	200 ± 100	0.65 ±	199 ± 100	0.0307 ± 0.0190
541.0 ± 0.5	130 ± 20	94.0 ±		4.04 ± 0.107
678.5 ± 0.5	188 ± 30	86 ±	102 ± 30	3.3 ± 0.4
692.0 ± 2.0		4.75 ±		0.180 ± 0.019
814.2 ± 0.5	340 ± 40	237 ±	103 ± 45	8.3 ± 1.1
1001.7 ± 1.0	130 ± 60	34.0 ±	96 ± 60	1.07 ± 0.11
1028.0 ± 0.9	160 ± 80	80 ±		2.5 ± 0.5

¹²⁴
52 Te

E ₀ (eV)	Γ (meV)	gΓ _n (meV)	Γ _γ (meV)	gΓ _n ⁰ (meV)
1459.0± 1.0	600 ± 60	607.5 ± 12.5		15.04 ± 0.33
1555.0± 1.0	3120 ±100	3470 ± 240		86 ± 6
1682.0± 2.0	± 15.0	7.5		0.366 ± 0.183
1690.0± 1.0	350 ±150	225 ± 20		5.47 ± 0.48
1989.0± 1.0	3720 ±100	3700 ± 150		82.0 ± 3.4
2091.0± 1.3	250 ±100	78 ± 27		1.7 ± 0.6
2348.9± 3.0		43 ± 13		0.88 ± 0.26
2602.0± 2.0	2175 ±300	1630 ± 160		32 ± 3
2663.5± 3.0		41 ± 15		0.79 ± 0.29
2828.0± 3.0	1820 ±300	1380 ± 210		26 ± 4
2918.0± 2.0		290 ± 10		5.4 ± 0.2
3331.0± 3.0		235 ± 35		4.94 ± 0.60
3388.0± 3.0	1470 ±500	720 ± 50		12.38 ± 0.86
3539.0± 3.0		202 ± 50		3.4 ± 0.8
3850.0± 4.0		2790 ± 300		45 ± 5
4017 ± 4		120 ± 50		1.89 ± 0.79
4226.0± 4.0		1756 ± 195		27 ± 3
4468 ± 4		218 ± 50		3.25 ± 0.75
4509.0± 4.0				7.5 ± 1.5
4631.0± 5.0		544 ± 140		8 ± 2
4863.0± 5.0		740 ± 100		10.6 ± 1.4
5047.0± 5.0		155 ± 125		2.18 ± 1.76
5144.0± 5.0		3300 ± 75		46.01 ± 1.05
5588.0± 5.0		2850 ± 150		38.12 ± 2.01
6626.0± 6.0		2190 ± 350		26.91 ± 3.07
6637.0± 6.0		3225 ± 250		39.59 ± 3.07
6655.0± 7.0		925 ± 150		11.30 ± 1.83
6934 ± 7.0		300 ± 120		3.60 ± 1.44
7465 ± 8.0		1650 ± 300		19.10 ± 3.47
7859.0± 8.0		2150 ± 300		24.03 ± 3.38
8753.0		1100 ± 250		11.76 ± 2.67
8972.0± 5.0		480 ± 200		5.18 ± 2.11
9700.0±20		315		3.2
9748.0±15		1450 ± 500		14.65 ± 5.07
9965.0±15		4075 ± 750		40.82 ± 7.52
10035 ±15		315		3.14
10135 ±15		690 ± 250		6.85 ± 2.48
10200 ±15		545 ± 300		5.40 ± 2.97
10245 ±15		610 ± 300		6.03 ± 2.96
10450 ±15		5900 ±1000		57.7 ± 9.8
10680 ±15		640 ± 400		6.20 ± 3.87
10775 ±15		1345 ± 550		12.96 ± 5.30
11000 ±10		1205 ±1000		11.49 ± 9.54
11088 ±10		755 ± 400		7.17 ± 3.80
11250 ±15		2800 ± 650		26.40 ± 6.13
11670 ±15		1830 ± 750		16.94 ± 6.94
11840 ±15		2440 ± 750		22.42 ± 6.90
12353 ±15		2080 ± 600		18.72 ± 5.40
12570 ±15		3150		28.10
12700 ±15		3765 ± 650		33.41 ± 5.77
12860 ±15		2150 ± 650		18.96 ± 5.74
13020 ±20		1050		9.20

¹²⁴₅₂Te

E ₀ (eV)	Γ (meV)	gΓ _n (meV)	Γ _γ (meV)	gΓ _n ⁰ (meV)
13220 ±25		1050		9.13
13380 ±20		1325 ± 650		11.46 ± 5.62
13490 ±20		4530 ± 650		39.00 ± 5.60
13574 ±20		5235 ± 600		44.93 ± 5.15
15405 ±20		3600 ± 650		29.01 ± 5.24
15560 ±20		2450 ± 850		19.64 ± 6.82
17450 ±25		8450 ± 850		63.97 ± 6.44
19965 ±25		16000 ±4000		113.25 ±28.31
20330 ±25		4900 ±2500		34.37 ±17.54
20700 ±25		3850 ±2500		26.76 ±17.38
21475 ±25		3150		21.50
21835 ±25		2100		14.21
22810 ±25		11200 ±4000		74.15 ±26.49
23000 ±30		2750 ±2000		18.13 ±13.19
23405 ±30		4900 ±2500		32.03 ±16.34
23790 ±30		11900 ±4000		77.15 ±25.94
23970 ±30		6450 ±2500		41.66 ±16.10
24810 ±30		3600 ±2500		22.86 ±15.87
26475 ±30		22250 ±5000		136.75 ±30.73
28080 ±30		4385 ±2500		26.17 ±14.92

¹²⁵₅₂Te

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 1.55 \pm 0.16 \text{ b}$$

$$a_{coh} = 5.6 \pm 0.3 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 20 \pm 4 \text{ b}$$

$$\langle Q \rangle = 38 \pm 3 \text{ eV}$$

$$S_0 = 0.49 \pm 0.10$$

RESONANCE PARAMETERS

$$I^n = 1/2^+$$

$$\%Abn = 6.99$$

$$S_n = 9109.3 \pm 1.0 \text{ keV}$$

E ₀ (eV)	Γ (meV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
26.3 ± 0.1		1.00 ± 0.015	1	102 ± 20	0.20 ± 0.03
90.2 ± 0.1		0.15			0.016
106.0 ± 0.1	160 ± 40	0.44 ± 0.10			0.043 ± 0.01
134.9 ± 0.2	152 ± 15	27 ± 2		134 ± 15	2.33 ± 0.17
215.9 ± 0.2	188 ± 15	63.9 ± 2.2	1	145 ± 15	4.35 ± 0.15
230.7 ± 0.2	155 ± 40	25.2 ± 1.0		105 ± 40	1.6 ± 0.5
262.8 ± 0.2	240 ± 15	113 ± 4	1	165 ± 15	6.98 ± 0.26
289.7 ± 0.2	251 ± 15	190 ± 50	1	125 ± 25	11.4 ± 2.5
322.0 ± 0.2	190 ± 20	25.0 ± 1.0		173 ± 20	1.39 ± 0.06
397.8 ± 0.2	150 ± 20	33.7 ± 1.0	1	128 ± 20	1.69 ± 0.05
426.5 ± 0.4	130 ± 100	80.2 ± 5.0			3.88 ± 0.24

¹²⁵
⁵²Te

E ₀ (eV)	Γ (meV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
431.7 ± 0.5	1800 ± 200	780 ± 20	0		37.5 ± 1.0
517.0 ± 0.5	160 ± 40	77 ± 7	0		3.4 ± 0.3
578.4 ± 0.5	1160 ± 40	510 ± 50	0	140 ± 40	21.2 ± 2.1
628.0 ± 0.5	170 ± 40	37 ± 3	1	145 ± 40	1.5 ± 0.2
682.5 ± 0.5	208 ± 30	81 ± 8	1	154 ± 30	3.1 ± 0.3
700.5 ± 0.5	243 ± 30	152 ± 5	1	142 ± 30	5.75 ± 0.19
754.0 ± 0.6		12 ± 2			0.45 ± 0.07
780.9 ± 0.6	336 ± 30	265 ± 11	1	159 ± 30	9.5 ± 0.4
801.0 ± 1.0	200 ± 200	6.0 ± 3.0			0.21 ± 0.11
816.8 ± 1.0	200 ± 100	20.7 ± 1.0			0.724 ± 0.035
863.8 ± 1.0	200 ± 200	6.0 ± 3.0			0.204 ± 0.102
937.5 ± 0.5	314 ± 50	160 ± 40	1		5.2 ± 1.3
1000.0 ± 0.9	424 ± 40	210 ± 20	1	284 ± 45	6.63 ± 0.63
1032.3 ± 0.9	1300 ± 100	450 ± 20	0		14.0 ± 0.62
1076.3 ± 1.0	550 ± 60	381 ± 20	1		11.6 ± 0.6
1085.0 ± 1.5	200 ± 200	4.0 ± 2.0			0.12 ± 0.06
1128.8 ± 1.1	626 ± 60	390 ± 20	1		11.61 ± 0.50
1165.3 ± 1.5	150 ± 100	21 ± 2			0.62 ± 0.06
1188.7 ± 1.2	214 ± 90	72 ± 2	1	166 ± 90	2.09 ± 0.06
1220.8 ± 1.5	200 ± 150	16 ± 8			0.46 ± 0.23
1249.0 ± 1.2		258 ± 20	1		7.3 ± 0.6
1315.8 ± 1.3		247 ± 36	1		6.8 ± 1.0
1521.4 ± 0.8		184 ± 40	1		4.71 ± 0.51
1543.8 ± 1.5	200	28 ± 3			0.71 ± 0.08
1574.0 ± 0.9	237 ± 170	79.7 ± 5.0			2.01 ± 0.13
1643.3 ± 1.5	520 ± 350	47.1 ± 5.0			1.16 ± 0.12
1676.8 ± 2.0	200	22.2 ± 2.5			0.54 ± 0.06
1713.7 ± 1.0	210 ± 150	112 ± 8	1		2.71 ± 0.19
1748.0 ± 1.1	1250 ± 100	1170 ± 83	1		28.0 ± 2.0
1813.5 ± 1.1		64 ± 13			1.5 ± 0.3
1876.0 ± 3.0	35 ± 20				0.81 ± 0.46
1914.3 ± 1.2		35 ± 13			0.80 ± 0.29
1933.0 ± 1.2		235 ± 10	1		5.35 ± 0.23
2026.0 ± 1.3	700 ± 200	351 ± 100	0		5.58 ± 0.22
2033.8 ± 2.0		23 ± 10			0.51 ± 0.22
2054.0 ± 2.0	595 ± 150	312 ± 20	1		6.9 ± 0.4
2059.7 ± 2.0		16 ± 10			0.35 ± 0.22
2118.7 ± 2.5	400 ± 300	36 ± 15			0.78 ± 0.33
2155.0 ± 2.5	400 ± 300	31 ± 15			0.67 ± 0.32
2205.0 ± 1.5	600 ± 300	80 ± 10			1.7 ± 0.2
2274.0 ± 1.5		650 ± 100	1		13.64 ± 2.10
2373.0 ± 1.6	650 ± 150	490 ± 50	1		10.07 ± 1.03
2395.2 ± 2.5	200	58 ± 10			1.19 ± 0.20
2493.3 ± 1.7		98 ± 7			1.96 ± 0.14
2525 ± 3		326 ± 25	1		6.49 ± 0.50
2559.3 ± 3.0	500	420 ± 10			0.83 ± 0.20
2628.8 ± 1.9		1160 ± 50	0		22.63 ± 0.98
2638.0 ± 1.9	400 ± 200	130 ± 20			2.53 ± 0.39
2740.0 ± 2.0	1040 ± 250	715 ± 50	1		13.67 ± 0.96
2788.0 ± 2.0		180 ± 20	1		3.41 ± 0.37
2849.4 ± 2.1		860 ± 107	1		16.0 ± 2.0
2990 ± 3	500	1150 ± 20			2.10 ± 0.37

¹²⁵
₅₂Te

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
3006 ± 4	400	30 ± 15			0.55 ± 0.27
3095 ± 4	400	110 ± 50			1.98 ± 0.90
3120.0 ± 2.3		260 ± 30			4.66 ± 0.54
3154 ± 4	300	50 ± 20			0.85 ± 0.36
3178.7 ± 4.0	480 ± 430	242 ± 20			4.29 ± 0.35
3233.0 ± 4.0	400	50 ± 20			0.88 ± 0.35
3300.0 ± 2.6		741 ± 30	1		12.90 ± 0.52
3393.3 ± 2.7		575 ± 30	1		9.87 ± 0.52
3438.0 ± 2.7		1088 ± 60			18.56 ± 1.02
3585.0 ± 2.0		927 ± 50			15.49 ± 0.84
3625.7 ± 4.0	500	80 ± 40			1.33 ± 0.66
3649.0 ± 4.0	500	120 ± 50			1.99 ± 0.83
3695.0 ± 5.0	500	100 ± 50			1.65 ± 0.82
3739.9 ± 5.0	500	120 ± 50			1.96 ± 0.82
3822.0 ± 3.2		676 ± 40			10.94 ± 0.65
3874.4 ± 5.0	500	100 ± 50			1.61 ± 0.80
3986.0 ± 5.0	500	210 ± 100			3.33 ± 1.58
4007.0 ± 3.5	2300 ± 500	1090 ± 50			15.6 ± 1.5
4053.0 ± 5.0	740 ± 560	425 ± 50			6.68 ± 0.79
4085.8 ± 3.6	1100 ± 760	343 ± 40			5.37 ± 0.63
4118 ± 5	500	80 ± 40			1.25 ± 0.62
4128 ± 5		110 ± 40			1.72 ± 0.62
4182.0 ± 5.0		80 ± 40			1.24 ± 0.62
4244.0 ± 5.0		290 ± 100			4.45 ± 1.54
4318.0 ± 5.0		100 ± 50			1.52 ± 0.76
4427.0 ± 5.0		210 ± 100			3.16 ± 1.50
4595.0 ± 6.0		345 ± 35			5.09 ± 0.52
4689.0 ± 6.0		200 ± 25			2.32 ± 0.37
4798.0 ± 6.0		80 ± 40			1.15 ± 0.58
4850.0 ± 6.0		570 ± 60			8.18 ± 0.86
4969.0 ± 6.0		2030 ± 120			28.80 ± 1.70
4982.0 ± 6.0		1090 ± 150			15.44 ± 2.13
5211.0 ± 7.0		1500 ± 80			22.03 ± 1.11
5309.0 ± 7.0		270 ± 100			3.71 ± 1.37
5432.0 ± 7.0		315 ± 100			4.27 ± 1.36
5481.0 ± 7.0		1250 ± 60			1.69 ± 0.81
5536.0 ± 7.0		270 ± 100			3.63 ± 1.34
5598.0 ± 8.0		790 ± 60			10.56 ± 0.80
5664.0 ± 8.0		214 ± 60			2.84 ± 0.80
5704.0		312 ± 60			4.13 ± 0.79
5759.0		517 ± 80			6.81 ± 1.05
5821.0		195 ± 70			2.56 ± 0.92
6033.0 ± 10.0		210 ± 100			2.70 ± 1.29
6188.0 ± 10.0		2190 ± 150			27.84 ± 1.91
6480.0 ± 10.0		660 ± 100			8.20 ± 1.24
6511.0 ± 10.0		1120 ± 180			13.88 ± 2.23
7102.0 ± 10.0		2900 ± 200			34.41 ± 2.37
7162.0 ± 10.0		250 ± 100			2.95 ± 1.18
7275.0 ± 10.0		1120 ± 150			13.13 ± 1.76
7400.0 ± 10.0		350 ± 180			4.07 ± 2.09
7636.0 ± 10.0		520 ± 250			5.95 ± 2.86
7748.0 ± 10.0		1100 ± 200			12.50 ± 2.27

¹²⁶
₅₂Te

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.135 \pm 0.23 \text{ b [104 day } ^{127}\text{Te}^*]$$

$$\sigma_{\gamma} = 0.90 \pm 0.15 \text{ b [9.3 hr } ^{127}\text{Te}^*]$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 10 \pm 2 \text{ b}$$

$$\langle D \rangle = 210 \pm 20 \text{ eV}$$

$$S_0 = 0.30 \pm 0.10$$

RESONANCE PARAMETERS

$$I'' = 0^+$$

$$\% \text{Abn} = 18.71$$

$$S_n = 6289 \pm 3 \text{ keV}$$

E_0 (eV)	Γ (meV)	$g\Gamma_n$ (meV)	ℓ	Γ_{γ} (meV)	$g\Gamma_n^0$ (meV)
200.5 ± 0.1		283 ± 11	0	118 ± 56	20.0 ± 0.8
428.0 ± 0.5	220 ± 30	6.25 ± 0.50		158 ± 30	0.302 ± 0.024
1081.3 ± 0.5	200	3.0 ± 1.0		197	0.091 ± 0.025
1293.0 ± 1.0	200 ± 100	7 ± 1		193 ± 100	0.194 ± 0.028
1360.3 ± 0.7	150 ± 100	30.5 ± 1.5			0.537 ± 0.040
1448.0 ± 1.0	150 ± 100	13.65 ± 1.50			0.359 ± 0.039
1538.0 ± 0.9		17.7 ± 1.2			0.45 ± 0.03
1693.3 ± 1.0		29 ± 4			0.7 ± 0.1
1750.0 ± 1.0	180 ± 140	60 ± 3			1.43 ± 0.05
2146.5 ± 2.0					1.5 ± 0.3
2521.0 ± 2.0	3000 ± 600	2505 ± 100	0		49.9 ± 2.0
2938.0 ± 3.0		1630 ± 160			30 ± 3
3282.0 ± 3.0	500 ± 300	30.5 ± 5.0		470 ± 300	0.503 ± 0.088
3676.0 ± 4.0	500 ± 300	48.5 ± 7.5			0.63 ± 0.13
3775.0 ± 4.0	500 ± 300	44.5 ± 7.5		456 ± 300	0.72 ± 0.12
4557.0 ± 5.0		740 ± 40			11.0 ± 0.56
4662.0 ± 5.0		158 ± 20			2.3 ± 0.3
5102.0 ± 5.0		156 ± 23			2.2 ± 0.3
5318.0 ± 5.0		280 ± 30			3.8 ± 0.4
5474.8 ± 5.0		1221 ± 33			16.5 ± 0.9
5961.1 ± 6.0		1600 ± 70			20.7 ± 0.9
6567.0 ± 6.0		40 ± 20			0.49 ± 0.25
6748.6 ± 7.0		578.5 ± 40.0			7.04 ± 0.49
6830.9 ± 7.0		187.5 ± 35.0			2.27 ± 0.43
7255.9 ± 7.0		397.5 ± 50.0			4.67 ± 0.59
7385.0 ± 7.0		425 ± 50			4.95 ± 0.58
7759.8 ± 8.0		632 ± 50			7.17 ± 0.57
8460.0 ± 8.0		200 ± 100			2.17 ± 1.08
8854.0 ± 9.0		715 ± 80			7.96 ± 0.85
9038.0 ± 10.0		495 ± 68			5.20 ± 0.70
9623.0 ± 10.0		810 ± 200			8.25 ± 2.04
9948.0 ± 10		305 ± 75			3.06 ± 0.75
10483 ± 10		1075 ± 225			10.5 ± 2.2
10549 ± 10		875 ± 130			8.52 ± 1.27
10592 ± 10		890 ± 110			8.65 ± 1.07
10956 ± 11		899 ± 110			8.58 ± 1.05
11155 ± 11		370 ± 60			3.5 ± 0.6
11751 ± 11		2600 ± 140			24.0 ± 1.3

¹²⁶
₅₂Te

E_0 (eV)	Γ (meV)	$g\Gamma_n$ (meV)	l	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
11911					
12008					
12212					
12479 ± 12		4480 ± 173			40.1 ± 1.5
12724					
12816					
13153					
13458 ± 13		4800 ± 200			41.38 ± 1.72
13585 ± 14		1025 ± 173			8.80 ± 1.48
13867					
13919					
14097					
14468 ± 14		2108 ± 300			17.52 ± 3.00
14537 ± 15		1675 ± 265			13.9 ± 2.2
15165					
15332					
15822					
15894					
16135					
16249					
16590					
16669 ± 17		1450 ± 193			11.23 ± 1.49
17080 ± 18		7750 ± 350			59.3 ± 2.7
17541					
17640					
17750					

THERMAL CROSS SECTIONS

$$\sigma_y = 0.015 \pm 0.001 \text{ b [34 day } ^{129}\text{Te}^n]$$

$$\sigma_y = 0.1997 \pm 0.0080 \text{ b [69 min } ^{129}\text{Te}^g]$$

RESONANCE PROPERTIES

$$I_y = 1.5 \pm 0.1 \text{ b}$$

$$\langle D \rangle = 262.5 \pm 30.0 \text{ eV}$$

$$S_0 = 0.25 \pm 0.10$$

RESONANCE PARAMETERS

$1^\circ = 0^\circ$		$\chi_{\text{Abn}} = 31.79$			$S_n = 6085 \pm 3 \text{ keV}$		
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$g\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_y \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$	
348.1 $\pm$ 0.5	150 $\pm$ 100	0.30 $\pm$ 0.15			150 $\pm$ 100	0.016 $\pm$ 0.008	
424.0 $\pm$ 0.5	125 $\pm$ 10	61.0 $\pm$ 2.5	1/2		64 $\pm$ 10	2.97 $\pm$ 0.12	
435.5 $\pm$ 0.5	176 $\pm$ 20	18.50 $\pm$ 0.25	1/2	1	157.5 $\pm$ 20.0	0.885 $\pm$ 0.01	
941.0 $\pm$ 0.5	200 $\pm$ 60	14.7 $\pm$ 0.2	1/2	1	185 $\pm$ 60	0.48 $\pm$ 0.06	
1320.5 $\pm$ 0.5		11 $\pm$ 4				0.3 $\pm$ 0.1	
1459.0 $\pm$ 1.0	280 $\pm$ 50	115 $\pm$ 5			165 $\pm$ 50	3.01 $\pm$ 0.13	
1583.0 $\pm$ 1.0		10.5 $\pm$ 1.0				0.264 $\pm$ 0.025	
1837 $\pm$ 1		600 $\pm$ 85				14 $\pm$ 2	
2971 $\pm$ 3		1960 $\pm$ 165				36 $\pm$ 3	
3265 $\pm$ 3		95 $\pm$ 15				1.67 $\pm$ 0.27	
3544 $\pm$ 3		21 $\pm$ 7				0.36 $\pm$ 0.12	
4080 $\pm$ 4	600	25			575	0.39	
5330 $\pm$ 5		540 $\pm$ 50				7.40 $\pm$ 0.69	
6108 $\pm$ 1		213 $\pm$ 3				1.38 $\pm$ 0.19	
7076 $\pm$ 7		890 $\pm$ 100				5.29 $\pm$ 0.60	
7936 $\pm$ 8		140				0.785	
10012 $\pm$ 10		860 $\pm$ 75				8.60 $\pm$ 0.75	
10355 $\pm$ 10		100				0.98	
10656 $\pm$ 10		7450 $\pm$ 1250				72.2 $\pm$ 12.1	
10830 $\pm$ 11		2000 $\pm$ 100				19.22 $\pm$ 0.96	
11495 $\pm$ 15		12400 $\pm$ 125				11.6 $\pm$ 1.16	
12098 $\pm$ 15		300				2.73	
12828 $\pm$ 15		500				4.415	
12893 $\pm$ 15		4975 $\pm$ 250				43.82 $\pm$ 2.20	
12960 $\pm$ 20		250				2.20	
13080 $\pm$ 20		1358 $\pm$ 130				11.87 $\pm$ 1.135	
14600 $\pm$ 20		3200 $\pm$ 300				26.49 $\pm$ 2.9	

 $^{128}_{52}\text{Te}$

¹²⁸
⁵²Te

E_0 (eV)	Γ (meV)	$g_{\Gamma_n}^0$ (meV)	J	ℓ	Γ_γ (meV)	$g_{\Gamma_n}^0$ (meV)
15330 $\pm$ 20		500				4.04
16340 $\pm$ 20		700				5.48
17010 $\pm$ 20		4075				31.25 $\pm$ 3.07
17520 $\pm$ 20		2775 $\pm$ 400				21.0 $\pm$ 2.3
17990 $\pm$ 25		1680 $\pm$ 300				12.6 $\pm$ 1.9
18900 $\pm$ 25		1000 $\pm$ 250				7.28
19420 $\pm$ 25		3525 $\pm$ 375				25.3 $\pm$ 2.7
19700 $\pm$ 25		500				3.6
20220 $\pm$ 25		500				3.52
21025 $\pm$ 25		500				3.45
21820		14150 $\pm$ 500				9.58 $\pm$ 3.39

¹³⁰
₅₂Te

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.02 \pm 0.01 \text{ b [30 hr } ^{131}\text{Te}^{\text{m}}] \\ \sigma_{\gamma} &= 0.270 \pm 0.06 \text{ b [25 min } ^{131}\text{Te}^{\text{g}}] \\ a_{\text{coh}} &= 5.7 \pm 0.3 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 0.61 \pm 0.20 \text{ b} \\ \langle D \rangle &= 870 \pm 140 \text{ eV} \\ S_0 &= 0.14 \pm 0.05\end{aligned}$$

RESONANCE PARAMETERS

$$J^{\pi} = 0^{+}$$

$$\% \text{Abn} = 34.48$$

$$S_n = 5927 \pm 3 \text{ keV}$$

E_0 (eV)	Γ (meV)	$g\Gamma_n$ (meV)	$g\Gamma_n^0$ (meV)
1140.5 ± 1.1		9.5 ± 0.5	0.262 ± 0.020
1713.0 ± 1.0		42.5 ± 1.75	1.028 ± 0.042
2235 ± 3	1500	8.0	0.17
3200 ± 3		51 ± 5	0.90 ± 0.05
4444 ± 5	1500 ± 500	347.5 ± 25.0	5.22 ± 0.38
5555 ± 5	1650 ± 1200	235.0 ± 20.0	3.16 ± 0.27
5785 ± 10		12 ± 12	0.158 ± 0.158
7015 ± 8		1558 ± 50	18.60 ± 0.60
8047 ± 10		908 ± 53	10.12 ± 0.59
10020 ± 10		7700 ± 200	76.9 ± 2.0
13644 ± 15		400	3.43
14580 ± 15		500	4.14
17843 ± 20		700	5.24
18764 ± 20		2200 ± 250	16.06 ± 1.83
19183 ± 20		500	3.61
20960 ± 30		1200	8.29
21540 ± 30		3200 ± 50	21.80 ± 0.34
23350 ± 30		5045 ± 550	33.02 ± 3.6
24220 ± 30		12150 ± 750	78.05 ± 4.82
27760 ± 30		3000	18.0
29760 ± 35		23000 ± 1500	133.3 ± 8.7
30170 ± 35		5010 ± 1000	29.36 ± 5.76

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Te	Christiansen filters	ZN,26,391(71)	Koester
Te ¹²⁸	activation	NSE,35,88(69)	Maxie
Te ¹³⁰	activation	CJP,46,2473(68)	Ricabarra
Te ¹³⁰	isom. ratio	JIN,28,1(66)	Namoodiri
Te ¹²⁸	isom. ratio	NP,60,241(64)	Bishop
Te ¹²⁸	isom. ratio	PR,129,769(63)	Keisch
Te ^{128,128,130}	activation	NP,36,542(62)	Nangal
Te ^{120,130}	activation	PR,128,761(62)	Sehgal
Te ¹²⁰	activation	BNP,6,70(61)	Esch
Te ^{124,125}	diffraction	MM,11,303(61)	Wilkinson
Te	pile osci.	JNE,12,32(60)	Tattersall
Te ¹²⁴	activation	ZEI,36,632(59)	Gvozdev
Te	mirror reflections	NSI,27,620(56)	Heindl
Te ^{120,122,123,124}	pile osci.	PR,88,412(52)	Pomerance
Te ^{125,126,128,130}	pile osci.	PR,88,412(52)	Pomerance
Te	pile osci.	PR,83,641(51)	Pomerance
Te	pile osci.	PR,60,342(50)	Harris
Te ^{122,124}	activation	PR,76,333(49)	Hill
Te ^{126,128,130}	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Te	σ_T (spectra)	20-1500	BNP,17,556(72)	Hughabghab
Te ¹²³	σ_a	24-663	71KNOX,3,785(71)	Cauvin
Te ¹²⁵	σ_a	135-3393	71KNOX,3,785(71)	Cauvin
Te ¹²²	σ_a	72-10824	CEA-N-1268(70)	Tellier
Te ¹²³	σ_a	24-1998	CEA-N-1268(70)	Tellier
Te ¹²⁴	σ_a	347-28080	CEA-N-1268(70)	Tellier
Te ¹²⁵	σ_a	90-7748	CEA-N-1268(70)	Tellier
Te ¹²⁶	σ_a	200-17750	CEA-N-1268(70)	Tellier
Te ¹²⁸	σ_a	348-21820	CEA-N-1268(70)	Tellier
Te ¹³⁰	σ_a	1140-30170	CEA-N-1268(70)	Tellier
Te	σ_a	320-2669	CEA-N-1268(70)	Tellier
Te	σ_T (spectra)	2-600	BNP,13,1390(68)	Hughabghab
Te	σ_a	17-4852	PR,166,1234(68)	Hynchank
Te, Te ¹²⁸	σ_a, σ_T	2.3-10500	PRIVATE COMM.(64)	Cote
Te ¹²²	σ_T	72-1770	NE,14,264(63)	Danglyan
Te ¹²³	σ_T	2.3-365	NE,14,264(63)	Danglyan
Te ¹²⁴	σ_T	198-1890	NE,14,264(63)	Danglyan
Te ¹²⁵	σ_T	25-768	NE,14,264(63)	Danglyan
Te, Te ¹²⁸	σ_a, σ_T	2.3-10500	PRIVATE COMM.(63)	Singh
Te ¹³⁰	σ_a	1500-117500	NP,14,387(61)	Bilpuch
Te, Te ¹²³	σ_a	24-400	BNP,5,18(60)	Boletin
Te	σ_a	23-35	PRIVATE COMM.(56)	Simpson
Te	σ_a	2.3-24	PR,94,790(54)	Footo

THERMAL CROSS SECTIONS

$$\sigma_T = 89 \pm 90 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 13730 \pm 2000 \text{ b}$$

125
53
(59.7 day)

THERMAL CROSS SECTIONS

$$\sigma_T = 5960 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 40600 \text{ b}$$

124
53
(120 day)

THERMAL CROSS SECTIONS

$$\sigma_T = 6.2 \pm 0.2 \text{ b}$$

$$a_{\text{can}} = 5.25 \pm 0.04 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 147 \pm 6 \text{ b}$$

$$\langle \delta \rangle = 13.0 \pm 0.5 \text{ eV}$$

$$S_0 = 0.62 \pm 0.09$$

$$S_1 = 1.5 \pm 1.5$$

RESONANCE PARAMETERS

$$I^* = 5/2^+$$

$$Zn_{\text{bn}} = 100$$

$$S_n = 6825.7 \pm 0.5 \text{ keV}$$

$E_0 \text{ (eV)}$	$2g_{\text{fn}}^0 \text{ (meV)}$	J	L	$2g_{\text{fn}}^0 \text{ (meV)}$
10.7				
14.5				
20.5 ± 0.1	1.4 ± 0.1	3		0.21 ± 0.02
31.3 ± 0.1	19 ± 3	2		3.4 ± 0.4
37.8 ± 0.1	45 ± 5	2		7.4 ± 0.8
45.5 ± 0.2	23 ± 4	2		3.4 ± 0.6
66.1 ± 0.2	2.4 ± 0.3	2		0.30 ± 0.04
78.5 ± 0.3	35 ± 4	2		4.0 ± 0.4
90.3 ± 0.3	27 ± 3	3		2.8 ± 0.3
139.6 ± 0.4	65 ± 4	3	0	5.5 ± 0.3
145.70 ± 0.10				0.012 ± 0.0017
*153.81 ± 0.11				0.015 ± 0.002
168.5 ± 0.2	117 ± 13		0	9 ± 1

E_0 (eV)	$2g^2_{\pi}$ (meV)	J	ℓ	$2g^2_{\pi}$ (meV)
173.80±0.13	105 ± 7	3		0.20 ±0.02
*178.03±0.13		2		0.07 ±0.01
195.3 ±0.3		2	0	7.5 ±0.5
206.10±0.16		3	0	2.40 ±0.20
237.05±0.20		3	0	2.60 ±0.20
244.64±0.21				0.70 ±0.10
264.95±0.24			0	2.20 ±0.20
270.97±0.25				0.40 ±0.10
274.50±0.25				0.02 ±0.01
291.96±0.28				0.03 ±0.01
299.21±0.29				0.70 ±0.10
310.60±0.15				1.00 ±0.10
324.37±0.16				0.02 ±0.005
325.34±0.16				0.028±0.005
328.70±0.17				0.14 ±0.02
362.20±0.19				0.30 ±0.02
374.50±0.20			0	6.40 ±0.20
385.83±0.21			0	10.70 ±0.70
392.70±0.22				0.02 ±0.02
420.00±0.24				1.14 ±0.10
426.93±0.25			0	5.10 ±0.40
434.78±0.25			0	2.10 ±0.20
*439.81±0.26				0.02 ±0.02
448.29±0.26			0	2.20 ±0.20
454.61±0.27				0.05 ±0.01
475.82±0.29				0.40 ±0.04
480.12±0.29				0.55 ±0.04
499.16±0.31				1.70 ±0.20
515.47±0.33				1.70 ±0.20
518.25±0.33				1.60 ±0.20
532.93±0.34				3.30 ±0.20
550.24±0.36				0.05 ±0.02
565.80±0.37				5.60 ±0.60
569.14±0.38				0.80 ±0.15
583.96±0.39				0.10 ±0.02
588.64±0.40				0.02 ±0.01
619.20±0.43				2.30 ±0.10
623.88±0.43				0.02 ±0.01
632.00±0.44				1.36 ±0.04
644.48±0.45				0.36 ±0.08
658.64±0.47				0.20 ±0.04
668.97±0.48				1.68 ±0.08
689.38±0.50				0.04 ±0.02
701.98±0.52				3.70 ±0.20
708.50±0.52				11.00 ±2.00
730.92±0.55				3.50 ±0.20
736.39±0.56				0.02 ±0.02
744.13±0.56				5.80 ±0.40
757.69±0.58				0.03 ±0.01
762.30±0.58				6.40 ±0.40
779.34±0.60				0.26 ±0.06
790.20±0.62				0.64 ±0.10

E_0 (eV)	$2gF_n$ (meV)	J	ℓ	$2gF_n^B$ (meV)
805.00±0.63				0.02 ±0.02
813.00±0.64				2.40 ±0.50
828.11±0.66				0.36 ±0.06
833.37±0.67				5.20 ±0.40
*839.35±0.68				0.02 ±0.02
851.83±0.70				0.34 ±0.04
866.71±0.71				0.04 ±0.01
889.58±0.74				0.50 ±0.10
901.35±0.75				0.75 ±0.10
914.87±0.77				0.74 ±0.06
927.15±0.78				0.04 ±0.01
942.86±0.80				1.40 ±0.10
954.89±0.82				4.50 ±0.40
960.59±0.83				0.86 ±0.10
987.30±0.86				0.04 ±0.01
1006.30±0.89				4.80 ±0.60
1029.50±0.92				0.50 ±0.08
1067.00±0.97				0.06 ±0.03
1069.50±0.97				0.09 ±0.04
1078.30±0.98				9.00 ±1.00
1088.30±1.00				0.04 ±0.01
1095.10±1.01				0.80 ±0.10
1115.20±1.03				4.40 ±0.60
1156.20±1.09				0.10 ±0.03
*1165.30±1.10				0.02 ±0.02
*1169.00±1.11				0.02 ±0.02
1172.50±1.12				1.20 ±0.10
1183.50±1.13				0.04 ±0.02
1195.90±1.15				0.02 ±0.02
1202.1 ±1.2				2.20 ±0.20
1213.7 ±1.2				2.90 ±0.40
1221.9 ±1.2				0.02 ±0.02
1227.1 ±1.2				0.40 ±0.05
1234.2 ±1.2				0.10 ±0.02
*1239.6 ±1.2				0.02 ±0.02
*1248.0 ±1.2				0.06 ±0.02
*1252.9 ±1.2				0.02 ±0.02
1256.6 ±1.2				0.62 ±0.10
*1262.7 ±1.2				0.02 ±0.02
1268.2 ±1.3				0.28 ±0.04
1278.2 ±1.3				0.52 ±0.08
1283.3 ±1.3				0.04 ±0.02
1287.7 ±1.3				0.06 ±0.02
1309.6 ±1.3				0.02 ±0.02
1314.8 ±1.3				0.16 ±0.05
1326.6 ±1.3				3.40 ±0.60
1346.1 ±1.4				0.05 ±0.02
1352.2 ±1.4				2.30 ±0.20
1364.6 ±1.4				0.65 ±0.10
1367.4 ±1.4				1.05 ±0.15
1377.1 ±1.4				0.56 ±0.15
1404.2 ±1.5				0.03 ±0.03

E_0 (eV)	$2g_f^n$ (meV)	J	ℓ	$2g_f^n$ (meV)
1410.7 $\pm$ 1.5				3.50 $\pm$ 0.50
1420.2 $\pm$ 1.5				3.20 $\pm$ 0.40
1435.8 $\pm$ 1.5				0.44 $\pm$ 0.05
1475.3 $\pm$ 1.6				0.08 $\pm$ 0.04
1490.3 $\pm$ 1.6				0.03 $\pm$ 0.02
1515.1 $\pm$ 1.6				4.80 $\pm$ 0.40
1535.6 $\pm$ 1.7				0.02 $\pm$ 0.02
1548.9 $\pm$ 1.7				6.60 $\pm$ 1.00
1558.1 $\pm$ 1.7				0.18 $\pm$ 0.08
1574.3 $\pm$ 1.7				1.80 $\pm$ 0.40
1576.6 $\pm$ 1.7				0.30 $\pm$ 0.20
1582.0 $\pm$ 1.7				0.82 $\pm$ 0.15
1600.3 $\pm$ 1.8				0.25 $\pm$ 0.05
1605.6 $\pm$ 1.8				0.08 $\pm$ 0.04
1617.2 $\pm$ 1.8				1.60 $\pm$ 0.20
1630.6 $\pm$ 1.8				0.04 $\pm$ 0.02
1642.5 $\pm$ 1.8				2.50 $\pm$ 0.30
1660.9 $\pm$ 1.9				1.90 $\pm$ 0.10
1675.9 $\pm$ 1.9				0.40 $\pm$ 0.05
1714.2 $\pm$ 2.0				0.03 $\pm$ 0.03
1723.0 $\pm$ 2.0				0.15 $\pm$ 0.05
*1728.9 $\pm$ 2.0				0.03 $\pm$ 0.03
1741.8 $\pm$ 2.0				4.20 $\pm$ 0.60
1768.0 $\pm$ 2.1				1.30 $\pm$ 0.15
1787.6 $\pm$ 2.1				1.35 $\pm$ 0.20
1795.9 $\pm$ 2.1				0.38 $\pm$ 0.08
1813.8 $\pm$ 2.1				0.04 $\pm$ 0.02
1825.6 $\pm$ 2.2				3.40 $\pm$ 0.60
1860.0 $\pm$ 2.2				0.20 $\pm$ 0.10
1865.0 $\pm$ 2.2				5.60 $\pm$ 0.60
1882.0 $\pm$ 2.3				0.20 $\pm$ 0.05
1895.0 $\pm$ 2.3				0.34 $\pm$ 0.10
1899.0 $\pm$ 2.3				0.20 $\pm$ 0.05
1912.0 $\pm$ 2.3				0.85 $\pm$ 0.10
1923.0 $\pm$ 2.3				1.35 $\pm$ 0.20
1940.0 $\pm$ 2.4				0.88 $\pm$ 0.06
1954.0 $\pm$ 2.4				1.40 $\pm$ 0.20
1965.0 $\pm$ 2.4				0.45 $\pm$ 0.10
1972.0 $\pm$ 2.4				2.20 $\pm$ 0.30
988.5 $\pm$ 2.5				0.92 $\pm$ 0.06
1997.0 $\pm$ 2.5				4.50 $\pm$ 0.50
2007.0 $\pm$ 1.0				0.12 $\pm$ 0.04
2015.0 $\pm$ 1.0				7.00 $\pm$ 0.50
2027.0 $\pm$ 1.0				0.04 $\pm$ 0.02
2042.0 $\pm$ 1.0				0.02 $\pm$ 0.02
2053.0 $\pm$ 1.0				2.00 $\pm$ 0.20
2068.0 $\pm$ 1.0				0.04 $\pm$ 0.02
2079.0 $\pm$ 1.0				1.80 $\pm$ 0.20
2092.0 $\pm$ 1.0				4.20 $\pm$ 0.40
2109.0 $\pm$ 1.0				0.30 $\pm$ 0.10
2121.0 $\pm$ 1.0				0.58 $\pm$ 0.12
*2133.0 $\pm$ 1.0				0.02 $\pm$ 0.02

E_{γ} (eV)	$2g_{\pi}^0$ (meV)	J	ℓ	$2g_{\pi}^0$ (meV)
2145.0 $\pm$ 1.0				2.10 $\pm$ 0.10
2188.0 $\pm$ 1.0				7.06 $\pm$ 0.50
2199.0 $\pm$ 1.0				0.80 $\pm$ 0.20
2204.0 $\pm$ 1.0				0.80 $\pm$ 0.20
2212.0 $\pm$ 1.0				0.40 $\pm$ 0.10
2231.0 $\pm$ 1.0				0.42 $\pm$ 0.10
2237.0 $\pm$ 1.0				0.36 $\pm$ 0.10
2245.0 $\pm$ 1.0				0.70 $\pm$ 0.10
2278.0 $\pm$ 2.0				4.60 $\pm$ 0.60
2285.0 $\pm$ 2.0				1.30 $\pm$ 0.50
2290.0 $\pm$ 2.0				1.00 $\pm$ 0.20
2303.0 $\pm$ 2.0				0.12 $\pm$ 0.05
2317.0 $\pm$ 2.0				0.10 $\pm$ 0.05
2336.0 $\pm$ 2.0				0.70 $\pm$ 0.10
2349.0 $\pm$ 2.0				1.50 $\pm$ 0.20
2363.0 $\pm$ 2.0				0.70 $\pm$ 0.10
2377.0 $\pm$ 2.0				0.08 $\pm$ 0.02
2389.0 $\pm$ 2.0				3.20 $\pm$ 0.20
2407.0 $\pm$ 2.0				2.90 $\pm$ 0.20
2423.0 $\pm$ 2.0				5.00 $\pm$ 0.40
2434.0 $\pm$ 2.0				0.08 $\pm$ 0.02
2446.0 $\pm$ 2.0				0.70 $\pm$ 0.10
2468.0 $\pm$ 2.0				1.00 $\pm$ 0.22
2475.0 $\pm$ 2.0				1.50 $\pm$ 0.50
2486.0 $\pm$ 2.0				0.10 $\pm$ 0.05
2495.0 $\pm$ 2.0				0.20 $\pm$ 0.05
2508.0 $\pm$ 2.0				0.20 $\pm$ 0.05
2517.0 $\pm$ 2.0				0.10 $\pm$ 0.05
2530.0 $\pm$ 2.0				1.40 $\pm$ 0.40
2538.0 $\pm$ 2.0				1.40 $\pm$ 0.40
2549.0 $\pm$ 2.0				0.56 $\pm$ 0.15
2566.0 $\pm$ 2.0				0.08 $\pm$ 0.02
2583.0 $\pm$ 2.0				1.50 $\pm$ 0.40
2600.0 $\pm$ 2.0				0.05 $\pm$ 0.02
2614.0 $\pm$ 2.0				0.07 $\pm$ 0.02
2632.0 $\pm$ 2.0				0.03 $\pm$ 0.03
2643.0 $\pm$ 2.0				1.50 $\pm$ 0.40
2655.0 $\pm$ 2.0				0.10 $\pm$ 0.10
2664.0 $\pm$ 2.0				0.18 $\pm$ 0.10
2671.0 $\pm$ 2.0				0.02 $\pm$ 0.02
2685.0 $\pm$ 2.0				1.04 $\pm$ 0.08
2693.0 $\pm$ 2.0				0.04 $\pm$ 0.02
2717.0 $\pm$ 2.0				1.50 $\pm$ 0.50
2730.0 $\pm$ 2.0				0.80 $\pm$ 0.20
2734.0 $\pm$ 2.0				0.40 $\pm$ 0.10
2753.0 $\pm$ 2.0				0.80 $\pm$ 0.20
2765.0 $\pm$ 2.0				0.80 $\pm$ 0.20
2773.0 $\pm$ 2.0				6.20 $\pm$ 0.60
2791.0 $\pm$ 2.0				0.16 $\pm$ 0.06
2806.0 $\pm$ 2.0				0.02 $\pm$ 0.02
2813.0 $\pm$ 2.0				2.20 $\pm$ 0.40
2825.0 $\pm$ 2.0				

E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	$2g\Gamma_n^0$ (meV)
2846.0 ± 2.0				1.00 ± 0.20
2859.0 ± 2.0				0.36 ± 0.10
2869.0 ± 2.0				0.03 ± 0.03
2893.0 ± 2.0				15.00 ± 5.00
2908.0 ± 2.0				0.30 ± 0.10
2919.0 ± 2.0				0.30 ± 0.10
2925.0 ± 2.0				0.05 ± 0.05
2930.0 ± 2.0				0.05 ± 0.05
2943.0 ± 2.0				6.40 ± 0.60
2967.0 ± 2.0				0.60 ± 0.10
2988.0 ± 2.0				0.65 ± 0.15
3002.0 ± 2.0				0.70 ± 0.05
3035.0 ± 2.0				0.15 ± 0.05
3053.0 ± 2.0				0.65 ± 0.20
3071.0 ± 2.0				0.35 ± 0.10
3090.0 ± 2.0				2.00 ± 0.40
3109.0 ± 2.0				0.15 ± 0.05
3128.0 ± 2.0				2.50 ± 0.50
3143.0 ± 2.0				1.50 ± 0.40
3162.0 ± 2.0				0.06 ± 0.06
3172.0 ± 2.0				3.00 ± 0.50
3190.0 ± 3.0				0.15 ± 0.05
3197.0 ± 3.0				0.20 ± 0.10
3204.0 ± 3.0				0.20 ± 0.10
3234.0 ± 3.0				1.00 ± 0.20
3244.0 ± 3.0				0.75 ± 0.20
3267.0 ± 3.0				7.00 ± 1.50
3296.0 ± 3.0				2.50 ± 0.50
3335.0 ± 3.0				0.15 ± 0.05
3348.0 ± 3.0				4.00 ± 0.80
3364.0 ± 3.0				1.00 ± 0.30
3375.0 ± 3.0				0.40 ± 0.10
3391.0 ± 3.0				0.40 ± 0.10
3405.0 ± 3.0				0.10 ± 0.05
3416.0 ± 3.0				0.14 ± 0.05
3432.0 ± 3.0				2.00 ± 0.40
3443.0 ± 3.0				1.00 ± 0.30
3468.0 ± 3.0				3.00 ± 0.50
3480.0 ± 3.0				0.90 ± 0.20
3497.0 ± 3.0				1.00 ± 0.30
3522.0 ± 3.0				2.60 ± 0.60
3534.0 ± 3.0				0.08 ± 0.05
3557.0 ± 3.0				2.00 ± 0.40
3569.0 ± 3.0				1.60 ± 0.40
3595.0 ± 3.0				0.60 ± 0.20
3613.0 ± 3.0				1.70 ± 0.40
3634.0 ± 3.0				1.60 ± 0.40
3658.0 ± 3.0				5.00 ± 1.00
3680.0 ± 3.0				2.00 ± 0.40
3701.0 ± 3.0				2.00 ± 0.40
3713.0 ± 3.0				0.70 ± 0.15
3726.0 ± 3.0				0.10 ± 0.05

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E_0 (eV)	$2g\Gamma_n$ (meV)	J	ℓ	$2g\Gamma_n^0$ (meV)
3732.0 $\pm$ 3.0				0.05 $\pm$ 0.05
3742.0 $\pm$ 3.0				0.10 $\pm$ 0.05
3754.0 $\pm$ 3.0				0.80 $\pm$ 0.30
3764.0 $\pm$ 3.0				0.05 $\pm$ 0.05
3786.0 $\pm$ 3.0				0.20 $\pm$ 0.10
3812.0 $\pm$ 3.0				5.00 $\pm$ 1.00
3821.0 $\pm$ 3.0				0.15 $\pm$ 0.05
3838.0 $\pm$ 3.0				0.10 $\pm$ 0.10
3844.0 $\pm$ 3.0				2.50 $\pm$ 0.50
3861.0 $\pm$ 3.0				13.00 $\pm$ 4.00
3874.0 $\pm$ 3.0				0.05 $\pm$ 0.05
3890.0 $\pm$ 3.0				3.00 $\pm$ 0.50
3914.0 $\pm$ 3.0				11.00 $\pm$ 3.00
3924.0 $\pm$ 3.0				1.50 $\pm$ 0.50
3937.0 $\pm$ 3.0				0.15 $\pm$ 0.05
3948.0 $\pm$ 3.0				4.00 $\pm$ 1.00
3972.0 $\pm$ 3.0				0.04 $\pm$ 0.04
4003.0 $\pm$ 4.0				18.00 $\pm$ 5.00

▪ Resonances most probably p-wave or spurious

129
53

THERMAL CROSS SECTIONS

[1.59×10^7 yr]

$$\begin{aligned}\sigma_\gamma &= 18 \pm 2 \text{ b [9 min } ^{130}\text{I}^*] \\ \sigma_\gamma &= 9 \pm 1 \text{ b [12.4 hr } ^{130}\text{I}^*] \\ \sigma_\gamma &= 27 \pm 3 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma = 36 \pm 4 \text{ b}$$

RESONANCE PARAMETERS

$$I^* = 7/2^+$$

$$S_n = 6456 \pm 12 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	$2g\Gamma_n^0$ (meV)
72.4 $\pm$ 0.5	13 $\pm$ 3	1.5 $\pm$ 0.3
97.0 $\pm$ 0.7	1.1 $\pm$ 0.5	0.11 $\pm$ 0.05
129 $\pm$ 1	3.4 $\pm$ 1.1	0.3 $\pm$ 0.1
148 $\pm$ 1	67 $\pm$ 25	5.5 $\pm$ 2.0
153 $\pm$ 2	20 $\pm$ 7	1.5 $\pm$ 0.5

130
53

THERMAL CROSS SECTIONS

[12.4 hr]

$$\sigma_\gamma = 18 \pm 3 \text{ b}$$

131
53
[8.041 day]

THERMAL CROSS SECTIONS

$$\sigma_T \sim 0.7 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
127	diffraction	ACR, A28, 663(72)	Atoji
126	activation	PRIVATE COMM.(71)	Elgart
127	activation	AKE, 15, 83(70)	Breitenhuber
127	activation	JNE, 24, 35(70)	Ryves
127	activation	CJP, 46, 2473(68)	Ricabarra
127	activation	DA, 27B, 919(66)	Kappe
129	activation	JCP, 44, 970(66)	Wilkey
125	activation	JIN, 27, 1727(65)	Narang
127	activation	NP, 71, 417(65)	Robertson
127	activation	AE, 19, 1210(65)	Stavisskii
125	activation	JIN, 26, 1625(64)	Bresesti
131	activation	ORNL-3468, 15(63)	Halperin
127	activation	NKA, 8, 437(63)	Jozeffowicz
129	σ_t	NSE, 17, 371(63)	Pattenden
125	activation	ACRH-15, 92(61)	Harper
127	pulsed n	NSE, 9, 132(61)	Meadows
129	σ_t	NSE, 8, 112(60)	Block
127	pile osci.	JNE, 12, 32(60)	Tattersall
129,130	activation	PIC-2, 16, 54(58)	Eastwood
127	activation	PR, 86, 937(58)	Grimeland
131	mass analys.	JIN, 5, 253(58)	Kennett
129,130	activation	CJC, 36, 1424(58)	Roy
129	activation	CJC, 34, 293(56)	Purkayastha
127	local osci.	PR, 83, 641(51)	Pomerance
127	diffraction	PR, 81, 527(51)	Shull
127	pile osci.	PPS/A, 63, 1175(50)	Colmer
127	pile osci.	PR, 80, 342(50)	Harris
130	activation	BNL-C-9, 70(49)	Yaffe

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
127	multiplicity	20-240	71KNOX, 785(71)	Cauvin
127	σ_γ (spectra)	0-50	PR-P-84, 62(59)	Lone
127	σ_t	168-4003	PR/8, 137, 547(65)	Garg
127	σ_t	20.5-169	NSE, 17, 371(63)	Pattenden
129	σ_t	72-153	NSE, 17, 371(63)	Pattenden
127	σ_γ (SI)	20-154	BAP, 5, 294(61)	Desjardins
127	σ_t	10.4	PR, 123, 629(61)	DuToit
129	σ_t	72-154	ORNL-2610, 22(58)	Block
129	σ_t	72-154	58GENEVA, 16, 150(58)	Harvey
127	σ_t	20-195	ORNL-2501, 26(58)	Slaughter
127	σ_t	20-92	AE, 1, 55(56)	Radkevich
127	σ_t	20-92	PR, 95, 476(54)	Seidl

⁵⁴Xe

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 24.5 \pm 1.0 \text{ b} \\ \bar{\sigma}_s &= 4.30 \pm 0.02 \text{ b} \\ a_{coh} &= 4.87 \pm 0.10 \text{ fm}\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (eV)	Γ (meV)	$2ag\Gamma_n$ (meV)	Γ_γ (meV)	$2ag\Gamma_n^0$ (meV)
9.89	128 ± 64	0.074 ± 0.013	127 ± 64	0.024 ± 0.004
86.56				0.024
100.17	280 ± 196	0.24 ± 0.10		0.024 ± 0.010
249.50				0.02
336.80		0.60 ± 0.30		0.0327 ± 0.016
339.00		0.50 ± 0.25		0.0272 ± 0.013
474.90		0.55 ± 0.39		0.0252 ± 0.0176
515.50				
517.40				
577.25	3000 ± 1500	13.0 ± 5.9		0.54 ± 0.24
640.60	700 ± 595	70 ± 35		2.8 ± 1.4
681.12		1.7 ± 0.9		0.065 ± 0.033
684.32		2.6 ± 0.8		0.099 ± 0.030
703.48		4.2 ± 0.9		0.158 ± 0.035
740.42		1.0 ± 0.7		0.0367 ± 0.0257
1114.6		7.0 ± 1.5		0.212 ± 0.047
1231.8		10.0 ± 4.0		0.285 ± 0.114
1322.7	650 ± 423	31.0 ± 4.0		0.852 ± 0.111
1372.9		4.0 ± 2.2		0.108 ± 0.059
1380.3		24.0 ± 4.8		0.646 ± 0.129
1384.2		6.0 ± 2.7		0.16 ± 0.07
1399.8		9.0 ± 2.5		0.241 ± 0.067
1544.2		8.0 ± 2.4		0.204 ± 0.061
1765.0		15.0 ± 3.6		0.357 ± 0.086
1776.2		6.0 ± 3.6		0.142 ± 0.085
1839.5		8.0 ± 3.6		0.186 ± 0.084
1891.0		14 ± 4		0.322 ± 0.081
1899.3		16.0 ± 4.0		0.367 ± 0.092
1936.6		6.0 ± 3.6		0.136 ± 0.082
1951.3		24 ± 4		0.543 ± 0.098
2131.2	790 ± 166	240 ± 12		5.20 ± 0.26
2211.3		38.0 ± 8.4		0.808 ± 0.178
2234.3		17.0 ± 5.4		0.360 ± 0.115
2262.0		4.0 ± 2.8		0.084 ± 0.059
2332.5		21.0 ± 5.9		0.435 ± 0.122
2454.8		28.0 ± 6.4		0.565 ± 0.130
2521.5		29.0 ± 8.7		0.577 ± 0.173
2533.7		19.0 ± 8.6		0.377 ± 0.170
2542.6		39.0 ± 8.6		0.773 ± 0.170
2597.0		5.0 ± 3.5		0.098 ± 0.069
2610.0		13.0 ± 7.8		0.254 ± 0.152
2625.9		18.0 ± 8.1		0.351 ± 0.158
2770.8		18.0 ± 9.0		0.342 ± 0.171
2848.7		71.0 ± 15.6		1.33 ± 0.29

⁵⁴Xe

E_0 (eV)	Γ (meV)	$2\alpha\Gamma_n$ (meV)	Γ_γ (meV)	$2\alpha\Gamma_n^0$ (meV)
2874.9	1150 $\pm$ 920	28.0 $\pm$ 8.4		0.522 $\pm$ 0.157
2905.5		25.0 $\pm$ 8.5		0.461 $\pm$ 0.157
2913.6		14.0 $\pm$ 7.7		0.259 $\pm$ 0.143
2963.1		82.0 $\pm$ 16.4		1.50 $\pm$ 0.30
2771.8		23.0 $\pm$ 9.2		0.422 $\pm$ 0.169
3125.5		36.0 $\pm$ 10.4		0.643 $\pm$ 0.290
3130.0		14.0 $\pm$ 9.8		0.250 $\pm$ 0.175
3158.0	1410 $\pm$ 1058			
3162.4		59 $\pm$ 12		1.05 $\pm$ 0.22
3207.8		144 $\pm$ 33		2.54 $\pm$ 0.58
3228.5		160 $\pm$ 240		2.81 $\pm$ 0.42
3236.1		39 $\pm$ 10		0.685 $\pm$ 0.171
3305.8		7 $\pm$ 6		0.122 $\pm$ 0.11
3339.4		21 $\pm$ 12		0.363 $\pm$ 0.200
3357.4	1820 $\pm$ 746	254 $\pm$ 25		4.38 $\pm$ 0.44
3481.4		87 $\pm$ 22		1.47 $\pm$ 0.37
3509.5		248 $\pm$ 30		4.19 $\pm$ 0.50
3530.5		59 $\pm$ 15		0.89 $\pm$ 0.25
3600.0		62 $\pm$ 155		1.03 $\pm$ 0.26
3610.5		101 $\pm$ 18		1.68 $\pm$ 0.30
3618.0		23 $\pm$ 14		0.38 $\pm$ 0.23
3651.6	5690 $\pm$ 683	52 $\pm$ 16		0.86 $\pm$ 0.26
3690.4		711 $\pm$ 53		11.7 $\pm$ 0.9
3757.6		21 $\pm$ 137		0.342
3774.0		79 $\pm$ 16		1.28 $\pm$ 0.26
3827.2		68 $\pm$ 22		1.1 $\pm$ 0.4
3867.9		55 $\pm$ 17		0.88 $\pm$ 0.26
3890.4		55 $\pm$ 17		0.88 $\pm$ 0.26
3929.0		100 $\pm$ 70		1.59 $\pm$ 1.11
3971.1		37 $\pm$ 18		0.59 $\pm$ 0.29

^a Possibly a doublet Xe-129 and Xe-128

¹²⁴
⁵⁴Xe

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 128 \pm 15 \text{ b } [^{125}\text{Xe}^{g.s.}]$$

$$\sigma_\gamma = 22.0 \pm 2.5 \text{ b } [55 \text{ sec } ^{125}\text{Xe}^m]$$

RESONANCE PROPERTIES

$$I_\gamma = 3600 \pm 500 \text{ b}$$

RESONANCE PARAMETERS

$$I'' = 0^a$$

$$\% \text{Abn} = 0.096$$

$$S_n = 7770 \pm 150 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
5.16 $\pm$ 0.06	7.6 $\pm$ 0.8	3.3 $\pm$ 0.3
251.6	266 $\pm$ 146	16.7 $\pm$ 9.2

There is a discrepancy of a factor of about 2 between the calculated and measured absorption resonance integral and thermal cross section.

¹²⁵
₅₄Xe
[10 hr]

THERMAL CROSS SECTIONS

$$\sigma_T < 5600 \text{ b}$$

¹²⁶
₅₄Xe

THERMAL CROSS SECTIONS

$$\sigma_T = 0.26 \pm 0.07 \text{ b (75 sec } ^{127}\text{Xe}^{\circ})$$

$$\sigma_T = 4.0 \pm 0.6 \text{ b (} ^{127}\text{Xe}^{\beta-\alpha})$$

RESONANCE PROPERTIES

$$I_T = 36.0 \pm 3.8 \text{ b}$$

RESONANCE PARAMETERS

$$I^{\circ} = 0^{\circ}$$

$$\Sigma \text{Abn} = 0.09$$

$$S_n = 7224 \pm 9 \text{ keV}$$

E_0 (eV)	Γ_n (meV)
459.64	1.30 ± 0.46

¹²⁸
₅₄Xe

THERMAL CROSS SECTIONS

$$\sigma_T = 0.36 \pm 0.07 \text{ b (8 day } ^{129}\text{Xe}^{\circ})$$

$$\sigma_T = 5 \pm 1 \text{ b (} ^{129}\text{Xe}^{\beta})$$

RESONANCE PROPERTIES

$$I_T^c = 12 \pm 3 \text{ b}$$

$$S_0 = 0.85^{+0.70}_{-0.35}$$

RESONANCE PARAMETERS

$$I^{\circ} = 0^{\circ}$$

$$\Sigma \text{Abn} = 1.92$$

$$S_n = 6905 \pm 5 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_n^0 (meV)
237.69	390 ± 78	320 ± 21	20.8 ± 1.4
370.78		45.6 ± 10.0	2.37 ± 0.52
554.54	3500 ± 210	151 ± 17	6.41 ± 0.71
715.04		3595 ± 144	134.4 ± 5.4
1365.0		167 ± 34	4.51 ± 0.90
1408.4		164 ± 66	4.37 ± 1.8
1609.9		391 ± 82	9.74 ± 2.05
2755.8		990 ± 25	18.9 ± 4.7
3441.3		2370 ± 403	40.4 ± 6.9

¹²⁹Xe
54

THERMAL CROSS SECTIONS

$$\sigma_T = 18 \pm 7 \text{ b}$$

RESONANCE PROPERTIES

$$I_T^c = 250 \pm 25 \text{ b}$$

$$\langle D \rangle = 32 \pm 3 \text{ eV}$$

RESONANCE PARAMETERS

$$I^* = 1/2^*$$

$$\Sigma A_{br} = 26.44$$

$$S_n = 9254.9 \pm 1.0 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_T (meV)	$2g\Gamma_n^0$ (meV)
9.44±0.06	120 ± 10	9.0± 0.4	[1]		114 ± 9	2.9 ±0.1
90.53	140 ± 30	4.8± 3.4			135 ±31	.50±0.35
92.3 ±0.3	202 ± 12	125 ± 7	1		119 ±12	13.0 ±0.7
125.84	413 ± 25	161 ± 8	0		91 ±26	14.3 ±0.7
162.81	201 ± 16	100 ± 5	1		134 ±16	19.2 ±1.0
185.68	215 ± 19	115 ± 7	1		138 ±19	8.46±0.51
228.14	150 ± 45	67.3± 5.4	1		105 ±45	4.45±0.36
244.48	180 ± 72	32.2± 2.4			148 ±73	2.04±0.15
341.52	33 ± 32	5.4± 1.2				0.29±0.07
374.74	234 ± 40	139 ± 7	1		142 ±40	22.3 ±1.1
379.29		5.7± 1.4				0.29±0.07
432.23	300 ± 63	225 ± 14	1		150 ±63	10.8 ±0.7
462.61	330 ± 46	304 ± 18	1		127 ±47	14.2 ±0.9
508.62	330 ± 92	69.2± 4.2	[0]		192 ±92	3.07±0.18
580.82	710 ± 57	779 ± 39	1		191 ±63	32.3 ±1.6
585.03	750 ± 90	367 ± 20	0			15.2 ±0.8
605.07	170 ± 85	113 ± 9	1			4.61±0.35
636.80	520 ± 94	548 ± 41	1		155 ±98	21.7 ±1.6
759.91		17.8± 3.9				0.64±0.14
777.31		24 ± 4				0.85±0.15
798.87	434 ± 60	529 ± 28	1		84 ±64	18.7 ±1.0
885.10		31.4± 4.4				1.05±0.15
908.63	1310 ± 92	612 ± 21	0			2.03±0.07
920.17		22 ± 4				0.72±0.14
933.14	150 ± 98	159 ± 10	1			5.18±0.34
966.76		39 ± 6				1.25±0.18
1028.9		40 ± 8				1.3 ±0.3
1053.5	410 ± 82	323 ± 16	1		194 ±83	9.94±0.50
1136.1	300 ± 150	163 ± 13				4.84±0.39
1186.0	800 ± 80	926 ± 42	1		183 ±86	26.9 ±1.2
1199.0	380 ± 91	372 ± 17	1		132 ±92	10.7 ±0.5
1234.2		106 ± 16				3.0 ±0.5
1296.1	480 ± 240	178 ± 15	[0]			4.9 ±0.4
1355.3	470 ± 94	548 ± 30	1		104 ±97	14.9 ±0.8
1413.7		110 ± 11				2.91±0.29
1469.6		129 ± 21				3.33±0.53
1505.2	860 ± 260	280 ± 24	0			7.22±0.61
1622.8		161 ± 19				4.0 ±0.5
1651.0		204 ± 25				5.02±0.60
1664.4	580 ± 200	360 ± 25				8.8 ±0.6

¹²⁹Xe
⁵⁶

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1714.8	120 ± 120	117 ± 19	[1]			2.83±0.45
1734.2	360 ± 210	344 ± 24	1			8.24±0.58
1766.6	600 ± 360	219 ± 24				5.18±0.57
1814.2	750 ± 130	851 ± 38	1			20.0 ±0.9
1907.3	1700 ± 340	454 ± 36	[0]			10.4 ±0.8
1921.4	460 ± 180	533 ± 32	1			12.2 ±0.7
2013.8	490 ± 200	522 ± 39	1			11.6 ±0.8
2037.8	950 ± 330	605 ± 39	[1]			13.4 ±0.9
2090.7	760 ± 170	926 ± 60	1			20.3 ±1.3
2274.5	660 ± 385	382 ± 38				8.01±0.80
2305.9	420 ± 400	272 ± 35				5.67±0.74
2346.4	2140 ± 815	333 ± 50				6.87±1.0
2410.8	220 ± 220	159 ± 24				3.23±0.49
2437.6	540 ± 430	412 ± 54				8.35±1.1
2468.3	700 ± 295	654 ± 49	1			13.2 ±1.0
2565.9	6500 ± 455	5370 ±204	1			106 ±4
2639.9	1330 ± 730	775 ±116				15.1 ±2.3
2932.7	1240 ± 680	454 ± 64				8.39±1.2
2996.0		208 ± 40				3.8 ±0.7
3089.6	850 ± 375	1005 ± 80	1			18.1 ±1.5
3214.7	1870 ± 450	1925 ±154	1			33.9 ±2.7
3298.7	1680 ±1000	552 ± 88	[0]			9.60±1.5
3320.4	150 ± 150	427 ± 60	1			7.41±1.04
3468.0	4540 ± 680	2045 ±154	[0]			34.8 ±2.6
3631.1	1480 ± 560	1310 ±118	1			21.8 ±2.0
3818.5	6240 ± 750	3085 ±230	0			49.9 ±3.7
4002.6	1100 ± 880	983 ±127				15.5 ±2.0
4022.3	1220 ± 490	1935 ±155	1			30.5 ±2.4
4082.3	1000 ± 700	1470 ±147				23.0 ±2.3

¹³⁶
₅₄Xe

THERMAL CROSS SECTIONS

$\sigma_f < 26 \text{ b}$
 $\sigma_f = 0.42 \pm 0.08 \text{ b (11.8 day } ^{131}\text{Xe}^*)$
 $\sigma_f = 6.0 \pm 1.1 \text{ b (} ^{131}\text{Xe}^*)$

RESONANCE PROPERTIES

$\Gamma_f^c < 14 \text{ b}$
 $S_0 = 2.1 \pm 0.7$

RESONANCE PARAMETERS

$J^\pi = 0^+$		$\chi A b_n = 4.08$		$S_n = 6605.6 \pm 3.3 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$		
430.19	275 ± 170	170 ± 17	8.1 ± 0.8		
941.37		50 ± 15	1.6 ± 0.5		
1484.1	2430 ± 243	2330 ± 120	60.4 ± 3.0		
2431.5	1100 ± 385	2110 ± 200	42.8 ± 4.1		
2577.5		527 ± 130	10.4 ± 2.5		
2614.9	2300 ± 1265	430 ± 110	8.38 ± 2.10		
2645.6		1675 ± 400	32.3 ± 7.8		
2980.4		2364 ± 260	14.0 ± 4.8		
3003.2		2154 ± 260	39.1 ± 4.7		
3257.3	2080 ± 707	1250 ± 875	22.1 ± 15.5		
3563.9		4654 ± 265	77.5 ± 7.8		

¹³¹Xe
₅₄

Thermal Cross Sections

$\sigma_T = 90 \pm 10 \text{ b}$

Resonance Properties

$I_X^c = 870 \pm 40 \text{ b}$

$\langle D \rangle = 55 \pm 7 \text{ eV}$

Resonance Parameters

$J^\pi = 3/2^+$		$\Sigma A_{br} = 21.18$		$S_n = 8936.1 \pm 1.0 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_\gamma \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$
14.4 ± 0.2	309	270 ± 11	2	93 ± 16	72 ± 3
46.0 ± 0.2	125	13.6 ± 0.7		114 ± 10	2.91 ± 0.10
75.6 ± 0.2	134 ± 16	13.0 ± 1.0	2	123 ± 16	1.58 ± 0.12
114.93	145 ± 15	39.3 ± 0.2	[2]	114 ± 15	3.66 ± 0.18
173.57	176 ± 28	27.9 ± 1.7	[1]	139 ± 28	2.39 ± 0.14
209.47	210 ± 53	104 ± 10	2	127 ± 52	7.2 ± 0.7
283.49	410 ± 55	245 ± 15	1		14.5 ± 0.9
302.49		10.8 ± 2.2			0.62 ± 0.13
362.60		5.7 ± 1.7			0.30 ± 0.09
426.84	370 ± 50	210 ± 10	[1]		10.2 ± 0.5
450.38	930 ± 65	973 ± 50	2		45.8 ± 2.3
495.08		12.7 ± 2.5			0.57 ± 0.11
557.59	210 ± 70	123 ± 6	[2]		5.19 ± 0.26
651.35		32.1 ± 8.3			1.26 ± 0.33
723.20	600 ± 85	330 ± 17	1		12.3 ± 0.6
736.07	585 ± 70	482 ± 26	2	200 ± 72	17.8 ± 0.8
855.21		117 ± 11	[2]		4.0 ± 0.4
976.31	610 ± 100	352 ± 18	1		11.2 ± 0.5
981.16		32.2 ± 6.4			1.02 ± 0.20
992.98		73.2 ± 11.0			2.31 ± 0.35
1034.4		118 ± 12			3.7 ± 0.4
1068.2	540 ± 115	326 ± 20	[1]		10.0 ± 0.6
1302.8	410 ± 165	354 ± 21	[2]		9.81 ± 0.59
*1334.2		70.8 ± 11.3			1.94 ± 0.31
1510.5	520 ± 210	333 ± 27			8.55 ± 0.68
1586.6		1275 ± 220			32.0 ± 5.4
1655.6	960 ± 220	614 ± 40	2		15.1 ± 1.0
1743.2		316 ± 28			7.6 ± 0.7
1844.6	960 ± 385	293 ± 35			6.8 ± 0.8
1871.1	1640 ± 150	1650 ± 66			38.1 ± 1.5
1957.2		330 ± 25			7.5 ± 0.6
1982.5	350 ± 210	482 ± 39	2		10.8 ± 0.9
1994.5	590 ± 355	355 ± 36			7.9 ± 0.8
2082.7	830 ± 455	355 ± 55			7.7 ± 0.9
2149.4	1360 ± 180	1400 ± 75	2		30.1 ± 1.5
2355.9	630 ± 250	855 ± 60	2		17.6 ± 1.2
2553.3	2200 ± 440	1465 ± 125	[1]		29.0 ± 2.5
3101.6	1290 ± 52	1000 ± 100			17.9 ± 1.8
3945.3	7360 ± 736	5240 ± 314	[1]		83.6 ± 5.0

* Isotopic assignment uncertain, possibly belongs to Xe-132.

¹³²₅₄Xe

THERMAL CROSS SECTIONS

$$\sigma_T = 0.025 \pm 0.005 \text{ b (2.26 day } ^{132}\text{Xe}^*)$$

$$\sigma_T = 0.36 \pm 0.07 \text{ b (5.27 day } ^{132}\text{Xe}^*)$$

RESONANCE PROPERTIES

$$I_\gamma^c = 0.8 \text{ b}$$

$$S_0 = 0.34$$

RESONANCE PARAMETERS

$I^a = 0^\circ$	$\%Abn = 26.89$	$S_n = 6453 \pm 9 \text{ keV}$
$E_0 \text{ (eV)}$	$\Gamma^a \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
643.3	2500 ± 150	2325 ± 120
3030.7	640 ± 255	91.6 ± 4.6
3853.9	2910 ± 495	20.1 ± 1.3
		34.6 ± 2.4

¹³³₅₄Xe

THERMAL CROSS SECTIONS

$$\sigma_T = 190 \pm 50 \text{ b}$$

¹³⁴₅₄Xe

THERMAL CROSS SECTIONS

$$\sigma_T = 0.003 \pm 0.001 \text{ b (15.6 min } ^{134}\text{Xe}^*)$$

$$\sigma_T = 0.250 \pm 0.020 \text{ b (} ^{134}\text{Xe}^*)$$

RESONANCE PROPERTIES

$$I_\gamma = 0.32 \text{ b}$$

RESONANCE PARAMETERS

$I^a = 0^\circ$	$\%Abn = 10.44$	$S_n = 6451 \pm 12 \text{ keV}$
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
1000.6	46 ± 7	1.4 ± 0.2

¹³⁵₅₄Xe
[9.17 hr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = (2.65 \pm 0.20) \times 10^6 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 7634 \text{ b}$$

RESONANCE PARAMETERS

$$S_n = 7992 \pm 11 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
0.084 ± 0.001	25.7 ± 0.3	90.7 ± 0.7	88.7 ± 1.0

¹³⁶₅₄Xe

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.16 \pm 0.03 \text{ b [3.9 min } ^{137}\text{Xe]}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Xe ¹³⁵	activation	PR-CMA-21,10(72)	Santry
Xe ^{124,126,132,134}	isom. ratio	YF,10,27(69)	Kardon
Xe ^{124,126,128,130}	activation	NP,A120,329(68)	Kondaiah
Xe ^{132,134,136}	activation	NP,A120,329(68)	Kondaiah
Xe ^{128,130,132}	activation	NSE,31,545(68)	Tilbury
Xe ^{124,126}	activation	DA,29,2167B(68)	Hinn
Xe	$\sigma_t \bar{\sigma}_s$	PR,148,1303(66)	Krohn
Xe ¹³²	activation	PRIVATE COMM.(65)	Eastwood
Xe ¹²⁶	activation	NP,73,91(65)	Winter
Xe ^{124,126,136}	activation	JIN,26,9(64)	Breستي
Xe ¹²⁵	mass separation	PR-CM-33,7(63)	Brown
Xe	diffraction	NB,65,COMP,211(63)	Burns
Xe ^{124,126,128}	mass separation	PRIVATE COMM.(63)	Eastwood
Xe ^{129,130,131}	mass separation	PRIVATE COMM.(63)	Eastwood
Xe ^{132,134,136}	mass separation	PRIVATE COMM.(63)	Eastwood
Xe	σ_t	JPR,24,21(63)	Genin
Xe ¹³⁵	mass separation	CJP,37,531(59)	Fickel
Xe ¹³³	mass separation	JIN,5,253(58)	Kennett
Xe ¹²⁴	activation	JAP,29,1373(58)	Tobin
Xe ¹³⁵	mass separation	SJA,3,1436(57)	Ivanov
Xe ¹³⁵	σ_t	PR,102,823(56)	Bernstein
Xe ¹³⁵	activation	JIN,2,271(56)	Freedman
Xe ¹³⁵	mass separation	CJP,33,640(55)	Petruska
Xe	σ_t	PR,80,20(50)	Harris
Xe,Xe ^{126,129,130}	mass separation	PR,80,296(50)	MacNamara
Xe ^{131,134,136}	mass separation	PR,80,296(50)	MacNamara
Xe ¹³⁶	activation	AECD-2274(48)	Way

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Xe ¹³¹	σ_y (spectra)	14.1	PR/C,3,1678(71)	Gelletly
Xe	$\sigma_t \bar{\sigma}_s$	5-4082	CEA-N-1149(69)	Ribon
Xe,Xe ^{129,136}	σ_t	5-126	PR,116,1516(59)	Mann
Xe ¹³⁵	σ_t	0-0.3	PR,115,1693(59)	Smith
Xe ¹³⁵	σ_t	0.012-0.20	PR,102,823(56)	Bernstein
Xe	σ_t	1.5-13.9	PR,89,904(53)	Harris

⁵⁵Cs

UNASSIGNED RESONANCES

E_0 (eV)	Γ_n (meV)
^a 42.3 ± 0.1	7 ± 2
^a 880 ± 20	700 ± 200

^a Belongs to either Cs-135 or Cs-137

¹³³
⁵⁵Cs

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 29.0 \pm 1.5 \text{ b} \\ \sigma_{\gamma} &= 2.5 \pm 0.2 \text{ b [2.9 hr } ^{133}\text{Cs}^*] \\ \sigma_{\text{coh}} &= 5.5 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 415 \pm 15 \text{ b} \\ R' &= 5.2 \pm 0.4 \text{ fm} \\ \langle D \rangle &= 20 \pm 2 \text{ eV} \\ S_0 &= 0.7 \pm 0.1 \\ S_1 &= 3.9 \pm 1.0\end{aligned}$$

RESONANCE PARAMETERS

$I^{\pi} = 7/2^{+}$		$\% \text{Abn} = 100$		$S_n = 6891.3 \pm 2.0 \text{ keV}$		
E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)	
5.90 ± 0.04	120 ± 20	5.4 ± 0.4	3	115 ± 20	2.2 ± 0.3	
22.6 ± 0.3	127 ± 40	6.6 ± 1.1	3	120 ± 40	1.4 ± 0.2	
47.8 ± 0.6	159 ± 60	19 ± 3	3	140 ± 60	2.8 ± 0.4	
83.1 ± 1.5		9 ± 3	4	(110 ± 30)	1.0 ± 0.3	
94.8 ± 1.8		19 ± 6	3	(110 ± 30)	2.0 ± 0.6	
126.1 ± 0.2		110 ± 11	4		9.8 ± 1.0	
142.2 ± 0.3		6.6 ± 1.2			0.55 ± 0.10	
145.9 ± 0.3		29 ± 2	4		2.4 ± 0.2	
181.5 ± 0.3					0.18 ± 0.05	
192.50 ± 0.15		0.28 ± 0.14			0.02 ± 0.01	
200.9 ± 0.4		31 ± 7	4		2.2 ± 0.5	
207.30 ± 0.17		2.9 ± 0.6			0.20 ± 0.04	
220.4 ± 0.4		24 ± 3	4		1.6 ± 0.2	
234.4 ± 0.4		430 ± 45	4		28 ± 3	
238.40 ± 0.20		13.8 ± 1.5			0.90 ± 0.10	
295.6 ± 0.5		100 ± 20	4		6 ± 1	
359.0 ± 0.5		42 ± 6	4		2.2 ± 0.3	
401.2 ± 0.5		260 ± 40			13 ± 2	
413.50 ± 0.23		58.9 ± 10.2			2.90 ± 0.50	
415.53 ± 0.24		4.1 ± 2.0			0.20 ± 0.10	
430.8 ± 0.5		64 ± 4			3.1 ± 0.2	
469.89 ± 0.28		102 ± 13			4.70 ± 0.60	
511.6 ± 0.6		125 ± 15			5.5 ± 0.6	
519.67 ± 0.33					4.70 ± 0.30	

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
560.30±0.37					3.30±0.20
568.39±0.38					0.80±0.04
585.52±0.39					7.00±1.00
622.59±0.43					0.04±0.04
646.28±0.46					2.00±0.10
684.44±0.50					0.10±0.04
712.31±0.53					0.12±0.04
726.61±0.54					4.40±0.40
738.00±0.56					0.04±0.04
762.87±0.59					2.80±0.20
795.72±0.62					10.80±1.00
807.56±0.64					0.40±0.08
821.00±0.65					0.06±0.06
832.71±0.67					0.20±0.06
863.92±0.71					6.20±0.40
872.34±0.72					0.66±0.06
906.57±0.76					3.50±0.20
914.11±0.77					0.08±0.04
917.16±0.77					0.08±0.06
970.48±0.84					0.20±0.10
986.44±0.86					1.20±0.40
994.15±0.87					2.50±0.60
1018.69±0.90					0.20±0.20
1021.38±0.91					5.30±1.00
1038.62±0.93					1.20±0.20
1069.63±0.97					1.60±0.24
1118.30±1.04					6.00±1.20
1134.91±1.06					3.40±0.70
1156.21±1.09					0.70±0.08
1176.99±1.12					2.00±0.30
1187.04±1.14					0.60±0.06
1239.7 ±0.6					6.60±1.20
1249.3 ±0.6					1.20±0.20
1267.6 ±0.6					10.00±2.00
1272.6 ±0.6					0.08±0.08
1280.1 ±0.6					5.00±1.00
1306.3 ±0.7					0.06±0.04
1312.8 ±0.7					0.06±0.04
1322.0 ±0.7					4.40±0.80
1329.3 ±0.7					4.00±0.80
1345.4 ±0.7					0.04±0.04
1389.8 ±0.7					1.00±0.10
1423.2 ±0.7					3.80±0.60
1429.1 ±0.8					0.32±0.10
1443.3 ±0.8					0.10±0.08
1453.1 ±0.8					5.40±1.00
1464.6 ±0.8					0.32±0.10
1480.9 ±0.8					0.14±0.08
1524.9 ±0.8					2.20±0.20
1533.1 ±0.8					0.44±0.10
1545.5 ±0.8					1.00±0.10
1583.8 ±0.9					0.10±0.10

¹³³
⁵⁵Cs

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1594.2 ±0.9					10.00±2.00
1616.3 ±0.9					3.00±0.60
1627.0 ±0.9					0.08±0.08
1664.6 ±0.9					2.20±0.20
1682.5 ±1.0					10.00±2.00
1705.5 ±1.0					3.00±0.40
1726.0 ±1.0					0.04±0.04
1734.8 ±1.0					1.20±0.12
1760.9 ±1.0					3.00±0.40
1809.6 ±1.1					0.80±0.20
1828.6 ±1.1					0.10±0.06
1843.0 ±1.1					0.12±0.06
1849.3 ±1.1					0.70±0.20
1853.7 ±1.1					0.30±0.20
1899.5 ±1.1					0.10±0.12
1915.5 ±1.2					0.30±0.20
1934.4 ±1.2					0.08±0.10
1954.0 ±1.2					2.00±0.20
2000.0 ±1.2					0.06±0.06
2051.0 ±1.0					0.70±0.20
2060.0 ±1.0					11.00±2.00
2090.0 ±1.0					0.10±0.10
2099.0 ±1.0					2.60±0.60
2114.0 ±1.0					0.04±0.04
2122.0 ±1.0					6.60±1.40
2133.0 ±1.0					0.10±0.10
2161.0 ±1.0					0.20±0.10
2172.0 ±1.0					0.50±0.10
2182.0 ±1.0					2.80±0.60
2197.0 ±1.0					1.00±0.20
2261.0 ±1.0					7.00±1.40
2280.0 ±2.0					4.80±1.00
2295.0 ±2.0					1.40±0.40
2312.0 ±2.0					4.60±1.00
2343.0 ±2.0					0.04±0.04
2352.0 ±2.0					0.04±0.04
2376.0 ±2.0					22.00±6.00
2387.0 ±2.0					0.20±0.20
2392.0 ±2.0					0.30±0.20
2429.0 ±2.0					4.00±0.80
2447.0 ±2.0					0.10±0.10
2458.0 ±2.0					0.04±0.04
2474.0 ±2.0					1.08±0.30
2492.0 ±2.0					0.10±0.10
2503.0 ±2.0					0.60±0.20
2524.0 ±2.0					0.04±0.04
2537.0 ±2.0					0.70±0.20
2561.0 ±2.0					2.40±0.60
2570.0 ±2.0					0.70±0.20
2591.0 ±2.0					0.30±0.10
2604.0 ±2.0					1.40±0.30
2623.0 ±2.0					0.10±0.10

¹³³
55 Cs

E ₀ (eV)	Γ (meV)	2g _n ⁰ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
2683.0 ±2.0		2.40±0.60			0.04±0.04
2705.0 ±2.0		11.00±2.00			0.04±0.04
2723.0 ±2.0		0.04±0.04			12.00±2.00
2733.0 ±2.0		0.10±0.10			5.20±1.00
2755.0 ±2.0		0.10±0.10			0.10±0.10
2777.0 ±2.0		0.04±0.04			0.04±0.04
2794.0 ±2.0		0.04±0.04			0.04±0.04
2838.0 ±2.0		3.60±1.00			2.70±0.60
2876.0 ±2.0		0.04±0.04			5.60±1.00
2892.0 ±2.0		1.80±0.40			1.60±0.40
2898.0 ±2.0		1.60±0.40			4.80±1.00
2910.0 ±2.0		0.70±0.20			0.30±0.10
2925.0 ±2.0		0.40±0.10			6.00±2.00
2943.0 ±2.0		0.60±0.20			20.00±4.00
2982.0 ±2.0		13.00±3.00			3.70±0.80
3007.0 ±2.0		4.60±1.00			1.80±0.40
3016.0 ±2.0		0.40±0.20			6.00±1.00
3071.0 ±2.0		1.00±0.20			26.00±6.00
3095.0 ±2.0		2.00±1.00			
3114.0 ±2.0					
3120.0 ±2.0					
3150.0 ±2.0					
3190.0 ±3.0					
3306.0 ±3.0					
3335.0 ±3.0					
3354.0 ±3.0					
3373.0 ±3.0					
3402.0 ±3.0					
3422.0 ±3.0					
3444.0 ±3.0					
3480.0 ±3.0					
3500.0 ±3.0					

¹³⁴
55 Cs
[2.06 yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 140 \pm 12 \text{ b}$$

¹³⁵
55 Cs
[2.3 × 10⁶ yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 8.7 \pm 0.5 \text{ b}$$

¹³⁶
⁵⁵Cs
[13 day]

THERMAL CROSS SECTIONS

$$\sigma_T^c = 1.3 \text{ b}$$

RESONANCE PROPERTIES

$$I_T^c = 76 \text{ b}$$

$$\langle \Gamma \rangle = 58 \pm 12 \text{ eV}$$

RESONANCE PARAMETERS

$$I^a = 5^-$$

$$S_n = 8276.4 \pm 3.1 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	$2g\Gamma_n^0$ (meV)
66.3 ± 0.5	50 ± 25	6.1 ± 3.1
135.7 ± 1.25	630 ± 125	54.1 ± 10.7
181.0 ± 1.8	4.3 ± 4.3	0.32 ± 0.32
187 ± 2	4.2 ± 4.2	0.31 ± 0.31
231 ± 3	81 ± 81	5.3 ± 5.3
274 ± 4	314 ± 314	19 ± 19
533 ± 10	808 ± 808	35 ± 35
633 ± 12	146 ± 146	58 ± 58
876 ± 20	1390 ± 1390	47 ± 47

¹³⁷
⁵⁵Cs
[30.1 yr]

THERMAL CROSS SECTIONS

$$\sigma_T = 0.110 \pm 0.033 \text{ b}$$

¹³⁷
⁵⁵Cs
[30.1 yr]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Cs ¹³³	diffraction	ZK,134,308(71)	Chadwik
Cs ¹³³	diffraction	ACR,A27,494(71)	Cox
Cs ¹³³	activation	JJN,30,349(68)	Sims
Cs ¹³³	pile osci.	66PAR15,1,479(66)	Carre
Cs ¹³³	diffraction	ACR,20,315(66)	Zivadinovic
Cs ¹³³	σ_t	BAP,10,12(65)+	Hickman
Cs ¹³³	isom. ratio	NP,60,241(64)	Bishop
Cs ¹³³	activation	JNE,13,141(61)	Brown
Cs ¹³³	activation	JTN,17,180(61)	Keisch
Cs ¹³³	activation	CJC,38,2528(60)	Baerg
Cs ¹³³	activation	KAPL-2000-121,33(60)	Fehr
Cs ¹³³	activation	NSE,8,378(60)	Lyon
Cs ¹³⁷	activation	JNE,12,16(60)	Stupegia
Cs ¹³³	pile osci.	JNE,12,32(60)	Tattersall
Cs ^{133,134}	mass separation	JIN,5,259(58)	Bayly
Cs ¹³³	mass separation	SBGENEVA,15,459(58)	Bidinosti
Cs ¹³⁵	σ_t	NRDC-107(58)	Cocking
Cs ^{134,135}	activation	PIC-2,16,54(58)	Eastwood
Cs ¹³³	pile osci.	PR,83,644(51)	Pomerance
Cs ¹³³	diffraction	PR,81,527(51)	Shull
Cs ¹³³	pile osci.	PR,80,342(50)	Harris
Cs ¹³⁷		BNL-C-9,89(49)	Engelkemeier
Cs ¹³⁵	activation	PR,75,1473(49)	Sugarman
Cs ¹³³	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Cs ¹³³	σ_r (spectra)	5.9-359	AERE-PR/NP,18,23(72)	Thomas
Cs ¹³⁶	σ_t	0.01-5000	PRIVATE COMM.(70)	Vertebnyi
Cs ¹³³	σ_t	1.7-1100	70HELSINKI,1,679(70)	Yung
Cs ^{135,137}	σ_t	42-700	70HELSINKI,1,679(70)	Yung
Cs ¹³³	σ_t	5.9-407	PRIVATE COMM.(69)	Yung
Cs ¹³³	σ_t	142-3500	PR/B,137,547(65)	Garg
Cs ¹³³	σ_t	22-530	PR,99,10(55)	Harvey
Cs ¹³³	σ_t	5.9	PR,93,1030(54)	Landon

⁵⁶Ba

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 1.2 \pm 0.1 \text{ b} \\ \sigma_p &= 4.3 \pm 1.0 \text{ b} \\ a_{coh} &= 5.30 \pm 0.15 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_y = 7.5 \pm 1.0 \text{ b}$$

UNASSIGNED RESONANCES

E_0 (eV)	$ag\Gamma_n$ (meV)	$ag\Gamma_n^0$ (meV)
1046	3.8	0.11
1065	2.3	0.07
1674	25	0.61
1700	5	0.12
1751	29	0.69
1866	8	0.185
1954	34.5	0.78
1977	4.7	0.106
1986	5.3	0.118

¹³⁰
₅₆ Ba

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.5 \pm 0.3 \text{ b [14.5 min } ^{131}\text{Ba}^*]$$
$$\sigma_{\gamma} = 11 \pm 3 \text{ b [11.6 day } ^{131}\text{Ba}^*]$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 150 \pm 30 \text{ b}$$
$$\langle D \rangle = 56 \pm 7 \text{ eV}$$
$$S_0 = 2.6 \pm 0.6$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\% \text{Abn} = 0.101$		$S_n = 7494 \pm 15 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
Bound level					
46.3 ± 0.1	35 ± 4	1/2	0	100	5.1 ± 0.6
57.9 ± 0.1	175 ± 20	1/2	0	120 ± 20	23.0 ± 2.6
136.2 ± 0.3	495 ± 100			75	42.5 ± 8.6
184.5 ± 0.4	200 ± 40			135	14.7 ± 2.9
287 ± 0.7	60		(1)	00	3.5
336	245			(1000)	13.4
358	6			(100)	0.3
380	1325 ± 150	1/2	0		68.0 ± 7.7
445	200 ± 50			130	9.5 ± 2.4
558	12			(100)	0.6
585	2600 ± 300	1/2	0		107 ± 12
698	335			(100)	12.7
713	70			(100)	2.6
744	550			(100)	20.2
837	1150			(100)	39.7
850	615			(100)	21.1
903	550 ± 50				18.3 ± 1.7
1098	200			(100)	6.0
1172	210			(100)	6.1
1250	6			(100)	0.2
1266	110			(100)	3.1
1416	900			(100)	23.9
1468	230			(100)	6.0
1482	130			(100)	3.4
1534	270			(100)	6.9
1576	300			(100)	7.6
1599	315			(100)	7.9
1685	260			(100)	6.3
1721	455			(100)	11.0
1784	400			(100)	9.5
1824	210			(100)	4.9
1934	1150			(100)	26.2
2095	800			(100)	17.5
2121	285			(100)	6.2
2155	4125			(100)	9.2

THERMAL CROSS SECTIONS

¹³²
₅₆ Ba

$$\sigma_{\gamma} = 8.5 \pm 1.0 \text{ b}$$
$$\sigma_{\gamma} = 0.68 \text{ b [39 hr } ^{133}\text{Ba}^*]$$

No resonances have been discovered in energy interval 3-1000 eV

¹³⁴
₅₆Ba

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.158 \pm 0.024 \text{ b [29 hr } ^{135}\text{Ba}^*]$$

$$\sigma_{\gamma} = 2.0 \pm 1.6 \text{ b [} ^{135}\text{Ba}^{9+}]$$

RESONANCE PROPERTIES

$$i_{\gamma}^c = 23 \pm 5 \text{ b}$$

$$\langle D \rangle = 255 \pm 75 \text{ eV}$$

$$S_0 = 0.25 \pm 0.13$$

RESONANCE PARAMETERS

$I^{\pi} = 0^+$		$\% \text{abn} = 2.42$		$S_n = 6975.2 \pm 2.6 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_{\gamma} \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$	
101.8 ± 0.3	230 ± 15	150 ± 10	80 ± 18	13.7 ± 0.9	
263 ± 1		0.7 ± 0.5		0.04 ± 0.03	
329 ± 1		2.1 ± 0.9		0.12 ± 0.05	
501 ± 1		48 ± 5		2.1 ± 0.2	
975 ± 1		65 ± 15		1.6 ± 0.2	
1226 ± 1		720 ± 100		20.5 ± 2.9	
1620 ± 1		300 ± 280		7.5 ± 7.0	
1892 ± 1		150 ± 130		3.5 ± 3.0	

¹³⁵₅₆Ba

THERMAL CROSS SECTIONS

$$\sigma_f = 0.0139 \pm 0.0007 \text{ b } [0.307 \text{ sec } ^{135}\text{Ba}^*]$$

$$\sigma_{\gamma} = 5.8 \pm 0.9 \text{ b } [^{135}\text{Ba}^* \pi]$$

RESONANCE PROPERTIES

$$I_{\gamma} = 100 \pm 50 \text{ b}$$

$$R_{\gamma} = 5.8 \pm 0.8 \text{ fm}$$

$$\langle D \rangle = 45 \pm 5 \text{ eV}$$

$$S_0 = 1.0 \pm 0.3$$

RESONANCE PARAMETERS

$$I^{\pi} = 3/2^{+} \quad \Gamma_{\text{abn}} = 6.59 \quad S_n = 9107.1 \pm 0.8 \text{ keV}$$

E ₀ (eV)	Γ (meV)	2gΓ _n (meV)	J	ℓ	Γ _γ (meV)	2gΓ _n ⁰ (meV)
Bound level						
24.4 ± 0.1	124 ± 5	10.7 ± 0.3	1	0	110 ± 5	2.17 ± 0.06
82.0 ± 0.6	253 ± 6	185 ± 10	2		105 ± 10	20.4 ± 101
86.8 ± 0.8	174 ± 6	74 ± 6	2		115 ± 7	7.9 ± 0.6
104.3 ± 0.8	270 ± 20	125 ± 10	2		106 ± 2	12.2 ± 1.0
219 ± 1		4.8 ± 1.0				0.32 ± 0.07
223 ± 1		40 ± 6	2			2.7 ± 0.4
243 ± 1		3.2 ± 1.2				0.21 ± 0.08
315 ± 1	390 ± 30	355 ± 30	2		106 ± 25	21.1 ± 1.8
378 ± 1	173 ± 20	96 ± 8	2		96 ± 22	5.4 ± 0.5
406 ± 1	300 ± 30	138 ± 12	1		116 ± 30	7.1 ± 0.6
434 ± 2	630 ± 60	610 ± 50	2			30.3 ± 2.5
467 ± 3		23 ± 3	2			1.1 ± 0.1
649 ± 3		90 ± 8	2			4.2 ± 0.4
651 ± 3		122 ± 12	1			4.8 ± 0.5
671 ± 3		132 ± 12	2			5.2 ± 0.5
722 ± 3		10 ± 6				0.4 ± 0.2
834 ± 3		52 ± 16				1.9 ± 0.6
882 ± 3	1300 ± 150	20 ± 10	2			0.7 ± 0.4
942 ± 3		1360 ± 120				45.8 ± 4.0
1031 ± 3		300 ± 60				9.8 ± 2.0
1157 ± 4		340 ± 80				10.6 ± 2.5
1202 ± 4		280 ± 80				8.2 ± 2.3
1280 ± 4		1110 ± 220				32 ± 6
1397 ± 4		320 ± 70				9 ± 2
1405 ± 4		1130 ± 300				30 ± 8
1629		330 ± 100				8.8 ± 2.7
1726						
1876						
2000						

¹³⁶
₅₆ Ba

THERMAL CROSS SECTIONS

$$\sigma_T = 0.010 \pm 0.001 \text{ b [2.6 min } ^{137}\text{Ba}^*]$$

$$\sigma_T = 0.4 \pm 0.4 \text{ b [} ^{137}\text{Ba}^*]$$

RESONANCE PROPERTIES

$$I_T^c = 1.3 \pm 0.3 \text{ b}$$

RESONANCE PARAMETERS

$I^n = 0^+$		%Abn = 7.81		$S_n = 6902.1 \pm 2.2 \text{ keV}$	
$E_0 \text{ (eV)}$		$\Gamma_n \text{ (meV)}$		$\Gamma_n^0 \text{ (meV)}$	
449 ± 1		2.9 ±	0.7	0.14 ±	0.03
511 ± 2		150 ±	30	6.7 ±	1.3
1644 ± 3		84 ±	21	6.6 ±	1.7
2156					
2319					
2468					
4708					
7310 ± 200		120000 ±	20000.	140 ±	23

¹³⁷
₅₆ Ba

THERMAL CROSS SECTIONS

$$\sigma_T = 5.1 \pm 0.1 \text{ b}$$

RESONANCE PROPERTIES

$$I_T^c = 4 \pm 1 \text{ b}$$

$$R^* = 5.8 \pm 0.8 \text{ fm}$$

$$\langle D \rangle = 230 \pm 65 \text{ eV}$$

$$S_0 = 0.33 \pm 0.17$$

RESONANCE PARAMETERS

$I^n = 3/2^+$		%Abn = 11.32		$S_n = 8611.3 \pm 0.8 \text{ keV}$	
$E_0 \text{ (eV)}$		$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$2g\Gamma_n^0 \text{ (meV)}$
126.9 ± 0.8			0.26 ± 0.14		0.023 ± 0.012
420 ± 2	750 ± 100		850 ± 70	2	41.5 ± 3.4
577 ± 2	680 ± 70		470 ± 40	1	19.6 ± 1.7
1053 ± 3			23 ± 15		0.71 ± 0.46
1099 ± 3			40 ± 32		1.2 ± 1.0
1199 ± 3			430 ± 260		12.4 ± 7.5
1350 ± 3			1200 ± 120		32.7 ± 3.3
1737 ± 3			780 ± 100		18.7 ± 2.4

¹³⁸₅₆Ba

THERMAL CROSS SECTIONS

$$\sigma_T = 0.35 \pm 0.15 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 0.2 \pm 0.1 \text{ b}$$

$$S_0 = 1.8 \pm 0.6$$

RESONANCE PARAMETERS

$$I'' = 0^*$$

$$\% \text{Abn} = 71.66$$

$$S_n = 4723.4 \pm 0.7 \text{ keV}$$

E_0 (keV)	Γ_n (eV)	ℓ	Γ_n^0 (eV)	E_0 (keV)	Γ_n (eV)	ℓ	Γ_n^0 (eV)
31.7±0.5	190 ± 20	0	1.07	^a 95	<30		
^a 32.5±0.5	28 ± 12			^a 96	<30		
^a 36.5±1.0	<20			105 ± 1.0	370 ± 35	0	1.140
39.8±1.0	100 ± 10	0	0.497	111.5±1.0	150 ± 70	(0)	0.449
51.0±1.0	275 ± 50	0	1.218	112.5±1.0	160 ± 80	0	0.447
^a 53.5±1.0	30 ± 25			^a 114 ± 1	125 ± 80		
62.5±1.0	130 ± 40	(0)	0.520	116 ± 1	650 ± 50	0	1.904
61.0±1.0	60 ± 40	(0)	0.245	118.5±1.0	120 ± 70	(0)	0.348
59.5±1.0	70 ± 30	(0)	0.281	^a 121 ± 1	180 ± 120		
55.5±1.0	50 ± 30	(0)	0.212	123 ± 1	250 ± 100	(0)	0.745
68.5±0.5	460 ± 40	0	1.751	124 ± 1	150 ± 75	(0)	0.443
^a 70.0±0.5	50 ± 40			^a 126 ± 1	60 ± 50		
73.5±0.5	130 ± 40	0	0.480	129 ± 1	500 ± 175	(0)	1.45
^a 76.5±1.0	50 ± 30			135.5±1	3300 ± 300	0	8.97
^a 79.3±0.5	160 ± 40	0	0.567	148.5±1	800 ± 200	0	2.08
^a 81.0±0.5	<30			155 ± 1	900 ± 200	(0)	2.29
^a 84	<30			170 ± 2	450 ± 100	(0)	1.09
^a 88	<30			174 ± 2	80 ± 50	(0)	0.192
^a 86.5	<30			189 ± 2	800 ± 400	(0)	1.84
^a 91	<30			192 ± 2	2050 ± 400	0	4.68
^a 94	<30						

* Resonances are questionable or their isotopic assignment uncertain, above 130 keV peaks may not be resolved

¹³⁹₅₆Ba
[83.3 min]

THERMAL CROSS SECTIONS

$$\sigma_T = 6 \pm 1 \text{ b}$$

¹⁴⁰₅₆Ba
[12.79 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 1.6 \pm 0.3 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 13.6 \pm 1.4 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ba	diffraction	ACR,828,956(72)	Jacobson
Ba ¹³⁸	activation	CJP,46,2473(68)	Ricabarra
Ba ¹³⁰	activation	NSE,31,545(68)	Tilbury
Ba ¹³⁵	activation	NYO-3664,6(68)	Winn
Ba ¹³⁶	isom. ratio	EN,14,228(67)	Foglio
Ba ¹⁴⁰	mass separation	ORNL-4164,1(67)	Halperin
Ba ^{136,138}	activation	NSE,22,373(65)	Kramer
Ba ¹³⁰	activation	NYO-10175(64)	Arino
Ba ¹³²	activation	JIN,25,1079(63)	Lyon
Ba ^{132,134}	activation	NP,41,372(63)	Mangal
Ba ^{132,134,136}	activation	NP,20,183(60)	Hans
Ba ^{130,138}	activation	NSE,8,378(60)	Lyon
Ba ¹⁴⁰	activation	SBGENEVA,16,54(58)	Eastwood
Ba ^{130,132}	cross section ratio	PR,101,149(56)	Beggs
Ba ^{134,135,136}	pile osci.	PR,88,412(52)	Pomerance
Ba ^{137,138}	pile osci.	PR,88,412(52)	Pomerance
Ba	pile osci.	PR,83,643(51)	Pomerance
Ba	pile osci.	PR,80,342(50)	Harris
Ba	pile osci.	PPS/A,63,1175(50)	Colmer
Ba ¹³⁹	mass separation	PR,76,617(49)	Yaffe
Ba ¹³⁹		AECD-2274(48)	Way
Ba ¹³²	activation	PR,72,1160(47)	Katcoff
Ba ¹³⁸	activation	PR,72,888(47)	Seren
Ba	absorption	PR,69,411(46)	Coltman

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Ba, Ba ¹³⁰	σ_T	20-2155	BAP,17,17(72)+	Berman
Ba ^{134,135,136,137}	σ_2	4-2000	NP,177,393(71)	VanDeVijver
Ba	σ_t	24-2066	NP/A,134,118(69)	Alves
Ba	$\sigma_T(\text{spectra})$	24.5-287	CZJ/B,19,901(69)	Becvar
Ba, Ba ^{130,132}	σ_t	3-1000	UFZ,14,227(69)	Vertebnyi
Ba	$\sigma_t \sigma_T \bar{\sigma}_s$	24-285	65ANTWERP,188(65)	Kim
Ba	$\sigma_T(SI)$	24-285	65ANTWERP,188(65)	Kim
Ba	$\sigma_T(\text{spectra})$	24-516	ZET,49,80(65)	Urbanec
Ba ¹³⁵	σ_T	24-318	64PARIS,673(64)	Bollinger
Ba, Ba ¹³⁶	σ_t	6000-192000	AP,14,387(61)	Bilpuch
Ba, Ba ¹³⁵	σ_t	24	PR,108,353(57)	Stolovy
Ba, Ba ¹³⁵	σ_t	24-515	PRIVATE COMM.(56)	Pilcher

¹³⁸
⁵⁷La

[1.1 × 10¹¹ yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma}^c = 172 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 413 \text{ b}$$

RESONANCE PARAMETERS

$$I^{\pi} = 5^{-}$$

$$\%Abn = 0.089$$

$$S_n = 8777.8 \pm 3.0 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
2.99±0.01	1.30± 0.05	95 ±6	0.75±0.03
21.0 ±0.1	4.2 ± 0.2		0.92±0.05
67.1 ±0.3	16 ± 1		1.9 ±0.1
90.2 ±0.4	19 ± 1		2.0 ±0.1
131.5 ±0.7	53 ± 3		4.6 ±0.3
220 ±1	140 ±15		9.5 ±1.0
240 ±2	310 ±30		20 ±2
261 ±2	357 ±35		22 ±2
307 ±3	630 ±50	36 ±3	36 ±3
356 ±3	230 ±40		12 ±2

THERMAL CROSS SECTIONS

$\sigma_f = 9.0 \pm 0.3$ b
 $\sigma_a = 9.3 \pm 0.7$ b
 $\sigma_{coh} = 8.3 \pm 0.3$ fm

RESONANCE PROPERTIES

$\Gamma_f = 12.2 \pm 0.6$ b
 $R_f = 4.9 \pm 0.3$ fm
 $\langle D \rangle = 240 \pm 10$ eV
 $S_0 = 0.6 \pm 0.2$
 $S_1 = 0.7 \pm 0.3$

RESONANCE PARAMETERS

$\chi^2/\text{dof} = 99.91$

$S_n = 5161.1 \pm 1.0$ keV

$I^\pi = 7/2^+$

E_0 (eV)	$2\sigma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2\sigma_n^0$ (meV)	g_n^0 (meV)	g_n^1 (meV)
-37.5		4		(56.5)	115		
0.734 ± 0.005	.000073 ± .00001					.000085 ± .00001	
72.17 ± 0.03	31.5 ± 1.0	3	1	45 ± 5	3.71 ± 0.12		
243.8 ± 0.2	0.21 ± 0.10		0	60 ± 4	0.014 ± 0.007		22
339.3 ± 0.2	0.32 ± 0.16				0.017 ± 0.009		10
617.1 ± 0.5	28 ± 2		[1]		1.12 ± 0.08		36
701.9 ± 0.3	7.4 ± 0.8				0.28 ± 0.03		
874.8 ± 0.4	20 ± 2				0.67 ± 0.07		
904.2 ± 0.4	7.6 ± 1.0				0.25 ± 0.03		
962.0 ± 0.4	15.9 ± 1.0				0.51 ± 0.03		
1179.8 ± 0.6	1860 ± 100	3	0		54.1 ± 2.9		
1207.5 ± 0.6	12.1 ± 1.8				0.35 ± 0.05		
1255.4 ± 0.6	19.4 ± 1.8				0.55 ± 0.06		
1425.4 ± 0.7	3.5 ± 1.0				0.093 ± 0.026		
1431.5 ± 0.7	5.2 ± 0.4				0.14 ± 0.01		
1634.8 ± 0.7	27 ± 2				0.67 ± 0.05		
1649.4 ± 0.9	16.8 ± 2.0				0.41 ± 0.04		
1824.4 ± 0.5	7.3 ± 4				0.17 ± 0.05		
1915 ± 0.6	14 ± 4				0.32 ± 0.09		
1969.5 ± 0.6	9.0 ± 1.0				0.20 ± 0.02		
2116.0 ± 0.7	3100 ± 300	3	0		67.3 ± 6.5		
2149.7 ± 0.7	1030 ± 100	4	0		22.2 ± 2.2		
2175.2 ± 0.7	20.2 ± 2.0				0.43 ± 0.04		
2379.5 ± 0.8	74 ± 8		[0]		1.52 ± 0.16		

E ₀ (eV)	2g _n ⁺ (neV)	J	ℓ	Γ _γ (neV)	2g _n ⁰ (neV)	g _n ¹ (neV)
2467.7 ± 0.8	920		[0]		18.5	± 2.4
2663.2 ± 0.9	59				1.14	± 0.15
2854.6 ± 1.0	410		[0]		7.7	± 0.9
2997.5 ± 1.1	12000	[4]	0		219	± 15
3286.5 ± 1.3	1840		0		32.1	± 3.5
3420.8 ± 1.4	17				0.29	± 0.07
3481.8 ± 1.4	14000	4	0		237.3	± 8.5
3726.0 ± 1.6	210		[0]		3.4	± 0.5
3749.5 ± 1.6	5140				83.9	± 6.5
4271.4 ± 1.9	63				0.96	± 0.15
4356.8 ± 2.0	4950				75.0	± 7.5
4611.5 ± 2.1	100				1.5	± 0.2
4646.0 ± 2.2	3510		[0]		51.5	± 5.3
4728.5 ± 2.2	120				1.7	± 0.3
4810.7 ± 2.3	140		[0]		2.0	± 0.3
5177.6 ± 2.6	117				1.6	± 0.2
5347.5 ± 2.7	1400		0		19.1	± 2.5
5517.4 ± 2.8	230		[0]		3.1	± 0.3
5627.3 ± 3.2	220				2.96	± 0.30
5839.5 ± 3.1	1200				15.7	± 0.5
5854.8 ± 3.1	160				2.1	± 1.0
5973.1 ± 3.2	140				1.8	± 0.4
6329.6 ± 3.5	360				5.0	± 0.8
6455.5 ± 3.6	100				1.3	± 0.5
6552.5 ± 3.6	4100	0			51.0	± 2.5
6852.5 ± 3.9	1750	0			21.6	± 2.5
6856.8 ± 4.0	3580	0			43.2	± 4.8
6982.9 ± 4.0	480		[1]		5.8	± 1.7
6983.0 ± 4.0	300		[1]		3.6	± 0.6
7047.2 ± 4.1	120				1.4	± 0.2
7087.9 ± 4.1	260				3.1	± 0.6
7128.9 ± 4.1	3180		0		37.7	± 5.9
7432.0 ± 4.3	260		[0]		3.0	± 0.7
7457.1 ± 4.4	2400				27.8	± 3.0
7541.6 ± 4.5	230		[1]		2.6	± 0.5
7894.2 ± 4.8	270				3.0	± 0.5
8020.6 ± 4.9	2000		[0]		22.3	± 3.4
8060.0 ± 5.0	360		0		4.0	± 0.9
8165.1 ± 5.1	220				5.0	± 0.6
8350.0 ± 5.2	455		[1]		2.4	± 0.9
8514.3 ± 5.4	5000		0		54.2	± 4.3

¹³⁹
⁵⁷La

E_0 (eV)	$2g_{\gamma}^n$ (meV)	J	ℓ	Γ_{γ} (meV)	$2g_{\gamma}^0$ (meV)	g_{γ}^1 (meV)
8661.4 $\pm$ 5.5	440 $\pm$ 100		[1]		4.7 $\pm$ 1.1	
8674.0 $\pm$ 5.5	160 $\pm$ 60				1.8 $\pm$ 0.6	
8812.3 $\pm$ 5.7	200 $\pm$ 30				2.14 $\pm$ 0.32	
8903.6 $\pm$ 5.8	7100 $\pm$ 600				75.3 $\pm$ 6.4	
9210.4 $\pm$ 6.1	100 $\pm$ 20				1.04 $\pm$ 0.21	
9285.7 $\pm$ 6.1	220 $\pm$ 20				2.3 $\pm$ 0.21	
9597.3 $\pm$ 6.4	100 $\pm$ 40				1.0 $\pm$ 0.4	
9662.0 $\pm$ 6.5	380 $\pm$ 60				3.9 $\pm$ 0.6	
9873.5 $\pm$ 6.7	1350 $\pm$ 180		[1]		13.6 $\pm$ 1.8	
9981.8 $\pm$ 6.8	4000 $\pm$ 400		0		40.0 $\pm$ 4.0	
10190 $\pm$ 10	4600 $\pm$ 400		0		45.5 $\pm$ 4.0	
10375 $\pm$ 10	700 $\pm$ 200		0		6.9 $\pm$ 2.0	

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.7 \pm 0.3 \text{ b}$$

¹⁴⁰
⁵⁷La
 [40.23 hr]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
La ¹³⁹	activation	JNE,25,129(71)	Ryves
La ¹³⁹	activation	JIN,30,1353(68)	Orvini
La ^{139,140}		ORNL-4155,16(67)	Gillette
La ^{139,140}	mass separation	JIN,29,584(67)	O'Brien
La ^{139,140}	mass separation	ORNL-3994,4(66)	O'Brien
La	diffraction	JCP,35,1950(61)	Atoji
La ¹³⁹	activation	NSE,8,378(60)	Lyon
La	pile osci.	AERE-R/R-2333(57)	Cummins
La	σ_t diffraction	PR,91,597(53)	Koehler
La	pile osci.	PR,88,412(52)	Pomerance
La	pile osci.	JPR,12,584(51)	Benoist
La	pile osci.	PR,83,641(51)	Pomerance
La	pile osci.	PR,80,342(50)	Harris
La ¹⁴⁰		JCP,17,421(49)	Katcoff
La ¹³⁹	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
La	σ_t	23-10218	CU-292(71)	Hacken
La	polarization	0.01-40	YF,10,47(69)	Ivanenko
La	σ_{γ} (spectra)	0.7	69STUDSVIK,105(69)	Kane
La	σ_t	72-31080	NP/A,123,561(69)	Morgenstern
La	σ_{γ} (spectra)	0.7-73	BAP,14,513(69)	Wasson
La	$\sigma_t \sigma_{\gamma}$ (spectra)	0.7-10352	PR,159,1050(67)	Shve
La	σ_t	72-36980	PRIVATE COMM.(66)	Garg
La ¹³⁸	σ_t	0.2-356	65ANTWERP,77(65)	Harvey
La ¹³⁸	σ_t	0.2-356	ORNL-3924,28(65)	Harvey
La ¹³⁸	$\sigma_t \sigma_{\gamma}$	21-357	PRIVATE COMM.(64)	Block
La	σ_t	72-9000	JPR,24,997(63)	Bianchi
La, La ¹³⁸	σ_t	0.7-73	ORNL-2718,26(59)	Block
La	σ_t	73	PR,108,353(57)	Stolovy

⁵⁸Ce

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.63 \pm 0.15 \text{ b} \\ \bar{\sigma}_s &= 4.7 \pm 0.3 \text{ b} \\ a_{coh} &= 4.82 \pm 0.06 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 3.0 \pm 0.8 \text{ b} \\ S_0 &= 1.0 \pm 0.5\end{aligned}$$

¹³⁶
⁵⁸Ce

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.95 \pm 0.25 \text{ b [34.4 hr } ^{137}\text{Ce}^*] \\ \sigma_{\gamma} &= 6.3 \pm 1.5 \text{ b [9 hr } ^{137}\text{Ce}^*]\end{aligned}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 70 \pm 7 \text{ b}$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\% \text{Abn} = 0.193$$

$$S_n = 7640 \pm \text{keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
66.3 ± 0.5	66 ± 25	8.1 ± 3.1
135.7 ± 1.25	630 ± 125	54.1 ± 10.7
181.0 ± 1.8	4.3 ± 4.3	0.32 ± 0.32
187.0 ± 2.0	4.2 ± 4.2	0.31 ± 0.31
232 ± 3	8.1 ± 8.1	5.3 ± 5.3
274 ± 4	314 ± 314	19 ± 19
533 ± 10	810 ± 810	35 ± 35
633 ± 12	1460 ± 1460	58 ± 58
876 ± 20	1390 ± 1390	47 ± 47

¹³⁸
⁵⁸Ce

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.015 \pm 0.005 \text{ b [55 sec } ^{139}\text{Ce}^*] \\ \sigma_{\gamma} &= 1.1 \pm 0.3 \text{ b [140 day } ^{139}\text{Ce}^*]\end{aligned}$$

¹⁴⁰
58 Ce

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 0.57 \pm 0.04 \text{ b} \\ \bar{\sigma}_s &= 4.0 \pm 0.6 \text{ b} \\ a_{coh} &= 4.7 \pm 0.1 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 0.47 \pm 0.05 \text{ b} \\ \langle D \rangle &\sim 3 \text{ keV} \\ S_0 &= 1.0 \pm 0.4\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\%Abn = 88.48$$

$$S_n = 5428.5 \pm 0.6 \text{ keV}$$

E_0 (eV)

22500

43000

56000

¹⁴¹
58 Ce
[32.53 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 29 \pm 3 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 0.48 \text{ b}$$

¹⁴²
58 Ce

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.95 \pm 0.05 \text{ b} \\ \bar{\sigma}_s &= 3.7 \pm 0.2 \text{ b} \\ a_{coh} &= 4.5 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 0.73 \pm 0.04 \text{ b} \\ \langle D \rangle &\sim 1 \text{ keV} \\ S_0 &= 1.2 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^{\circ}$$

$$\%Abn = 11.07$$

$$S_n = 5178 \pm 7 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
1290 $\pm$ 80	50300	1400
1640 $\pm$ 240	8000	200
2740 $\pm$ 250	16800	320
4380 $\pm$ 500		

¹⁴³
58 Ce

[33.0 hr]

THERMAL CROSS SECTIONS

$$\sigma_T = 6.0 \pm 0.7 \text{ b}$$

¹⁴⁴
58 Ce

[284.4 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 1.0 \pm 0.1 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 2.6 \pm 0.3 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ce ^{140,142}	σ_t	70HEL5INK1,651(70)	Vertebnyi
Ce ¹⁴²	activation	CJP,46,2473(68)	Ricabarra
Ce ^{140,142}	activation	JIN,29,2155(67)	Aistad
Ce	diffraction	AERE-R-4939(65)	Valentine
Ce ^{140,141}	activation	NSE,20,302(64)	Lantz
Ce ¹³⁶	isom. ratio	PR,129,769(63)	Keisch
Ce ¹⁴⁴	activation	NSE,13,289(62)	Lantz
Ce ¹³⁸	activation	PR,128,761(62)	Sehgal
Ce	diffraction	JCP,35,1950(61)	Atoji
Ce ¹⁴²	activation	NSE,8,378(60)	Lyon
Ce ¹³⁸	activation	PR,103,190(56)	Ketelle
Ce ¹⁴²	activation	CJC,34,1023(56)	Roy
Ce ¹⁴³	activation	CJC,34,238(56)	Roy
Ce ¹³⁶	activation	PR,100,169(55)	Brosi
Ce,Ce ^{140,142}	diffraction	PR,91,597(53)	Koehler
Ce ^{136,138,140,142}	pile osci.	PR,88,412(52)	Pomerance
Ce ¹³⁸	activation	PR,79,467(50)	Moses
Ce ^{140,142}	activation	JCP,17,421(49)	Katcoff
Ce ¹⁴²	activation	ZN,1,179(46)	Bothe

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Ce,Ce ^{136,138,140}	σ_t	0.066-5.0	UFZ,15,2050(70)	Vertebnyi
Ce ¹⁴²	σ_t	0.066-5.0	UFZ,15,2050(70)	Vertebnyi
Ce ^{140,142}	σ_t	1.4-60	AP,8,211(59)	Newson
Ce	σ_t	5-55	PR,102,1580(56)	Newson
Ce	σ_t	24-3200	PR,88,83(52)	Miller

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 11.5 \pm 0.3 \text{ b} \\ \sigma_T &= 3.9 \pm 0.5 \text{ b [14.6 min } ^{142}\text{Pr}^*] \\ \sigma_T &= 7.6 \pm 0.4 \text{ b [19.2 hr } ^{142}\text{Pr}^*] \\ \sigma_s &= 3.3 \pm 0.5 \text{ b} \\ \sigma_p &= 3.0 \pm 0.6 \text{ b} \\ r_{\text{coh}} &= 4.4 \pm 0.4 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 14.1 \pm 0.2 \text{ b} \\ R_T &= 4.9 \pm 0.5 \text{ fm} \\ \langle D \rangle &= 75 \pm 4 \text{ eV} \\ S_0 &= 1.72 \pm 0.25\end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 5/2^+$$

$$\chi_{\text{Abr}} = 100$$

$$S_n = 5843.8 \pm 0.9 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_T (meV)	$2g\Gamma_n^0$ (meV)
Bound level						
85.2 ± 0.2	91 ± 6	6.9 ± 0.5	2	0	83 ± 6	0.75 ± 0.05
112.4 ± 0.2		0.39 ± 0.07	2			0.037 ± 0.007
218.7 ± 0.3	1190 ± 120	1260 ± 130	3	0	71 ± 15	85 ± 8
235.2 ± 0.3	968 ± 100	1020 ± 100	3	0	93 ± 15	67 ± 7
359.5 ± 0.4	1280 ± 150	1420 ± 115	3	0	60 ± 10	75 ± 6
387.9 ± 0.4	150 ± 30	57 ± 6	[3]		82 ± 25	2.9 ± 0.3
415.0 ± 0.5		1.2 ± 0.4				0.06 ± 0.02
470.0 ± 0.5		3.4 ± 0.6				0.16 ± 0.03
519.4 ± 0.5	1080 ± 100	840 ± 80	2	0	80 ± 15	37 ± 4
635.8 ± 0.5	2612 ± 130	2920 ± 130	3	0	110 ± 30	116 ± 5
721.1 ± 1.0	2970 ± 150	2415 ± 125	2	0	70 ± 15	90 ± 5
845.2 ± 1.0	4730 ± 300	5430 ± 350	3	0	83 ± 15	187 ± 12
899.9 ± 1.0		6.9 ± 1.0				0.23 ± 0.03
931.3 ± 1.0		6.1 ± 1.8				0.20 ± 0.06
956.8 ± 1.0	3830 ± 190	3090 ± 185	2	0	107 ± 20	100 ± 6
1018.0 ± 1.0		2.6 ± 1.2				0.08 ± 0.04
1119.5 ± 1.0	1210 ± 200	1285 ± 100	3	0	110 ± 30	38.5 ± 3.0
1284.7 ± 1.0		6 ± 2				0.20 ± 0.07
1330.0 ± 1.0		5.5 ± 1.8				0.15 ± 0.05
1363.7 ± 1.0		107 ± 7		[1]		2.9 ± 0.2
1384.0 ± 1.5		11 ± 2				0.30 ± 0.05

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_γ (meV)	$2g\Gamma_n$ (meV)
1484.0 ± 1.5		5200 ± 385		0		135 ± 10
1528.8 ± 1.5		8 ± 2				0.20 ± 0.05
1537.0 ± 1.5		12 ± 4				0.3 ± 0.1
1672.0 ± 1.5		70 ± 15				1.7 ± 0.3
1715.4 ± 1.5		3440 ± 290	3	0		83 ± 7
1880.7 ± 1.5		170 ± 40	[2]			4 ± 1
2036.0 ± 1.5		180 ± 20				4.0 ± 0.5
2096.5 ± 1.5		7560 ± 165	[3]	0		165 ± 10
2132.0 ± 2.0		1090 ± 90	[3]	0		23.6 ± 2.0
2324.0 ± 2.0		15 ± 5				0.3 ± 0.1
2355.5 ± 1.5		97 ± 20				2.0 ± 0.4
2452.5 ± 2.0		1710 ± 100	3	0		34.5 ± 2.0
2498.0 ± 2.0		10 ± 5				0.2 ± 0.1
2575.0 ± 2		23 ± 5				0.45 ± 0.10
2805.0 ± 2.0		270 ± 25				5.3 ± 0.5
2706.0 ± 3.0		10 ± 5				0.2 ± 0.1
2789.0 ± 3.0		10 ± 5				0.2 ± 0.1
2834.5 ± 3.0		160 ± 16				3.0 ± 0.3
2926.0 ± 3.0		560 ± 50	[3]			10.3 ± 0.9
2943.5 ± 3.0		33 ± 11				0.6 ± 0.2
2975.0 ± 3.0		270 ± 60				5.0 ± 2.0
2998.0 ± 3.0		1315 ± 220	3	0		240 ± 40
3078.0 ± 3.0		17 ± 11				0.3 ± 0.2
3156.0 ± 3.0		500 ± 100	[2]	0		9 ± 2
3222.0 ± 3.0		24 ± 8				0.4 ± 0.1
3395.0 ± 3.0		160 ± 50		[1]		2.8 ± 0.8
3473.0 ± 3.0		940 ± 120	[3]	0		16.0 ± 2.0
3582.0 ± 3.0		450 ± 90				7.5 ± 1.5
3602.5 ± 3.0		7730 ± 1210	[2]	0		128 ± 20
3725.5 ± 3.5		55 ± 6				0.9 ± 0.1
3780.0 ± 3.5		8860 ± 615	3	0		144 ± 10
3901.0 ± 3.5		1820 ± 125				29.0 ± 2.0
3960.0 ± 3.0		32 ± 13				0.5 ± 0.2
4001.0 ± 3.0		650 ± 95	[2]			10.3 ± 1.5
4395.0 ± 4.0		245 ± 33				3.7 ± 0.5
4474.0 ± 4.0		220 ± 33				3.3 ± 0.5
4520.5 ± 4.0		930 ± 255	[3]	0		13.8 ± 3.8
4541.0 ± 4.0		5460 ± 675	[3]	0		81 ± 10
4583.0 ± 4.0		6100 ± 610	[2]	0		90 ± 9
4670.0 ± 4.0		1230 ± 140		0		18 ± 2
4973.0 ± 4.0		1015 ± 280				14.4 ± 4.0

E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)
5007.0 ± 4.0		495 ± 140				7 ± 2
5039.0 ± 5.0		170 ± 28		(11)		2.4 ± 0.4
5137.0 ± 5.0		1400 ± 180				
5245.0 ± 5.0		3435 ± 290	(3)	0		47.4 ± 4.0
5350.0 ± 5.0		620 ± 80		(1)		
5566.0 ± 5.0		11120 ± 700	(2)	0		149.0 ± 11.7
5643.0 ± 5.0		820 ± 100				11.0 ± 1.3
5729.0 ± 5.0		3410 ± 150	(3)	0		45 ± 2
5784 ± 6						0.3 ± 0.1
5802 ± 6						0.3 ± 0.1
5914 ± 6						6.0 ± 1
5954 ± 6						5.0 ± 0.5
5998 ± 7						0.3 ± 0.1
6073 ± 7						0.4 ± 0.1
6255 ± 7						5 ± 1
6286 ± 7						4 ± 1
6329 ± 7						5 ± 1
6456 ± 7						0.5 ± 0.3
6562 ± 8						6 ± 1
6711 ± 8						60 ± 15
6726 ± 8						40 ± 12
6779 ± 8						0.8 ± 0.4
6927 ± 8						5 ± 1
7076 ± 9						4.0 ± 1.0
7169 ± 9						50 ± 10
7221 ± 9						3.0 ± 0.5
7347 ± 9						100 ± 25
7391 ± 9						0.4 ± 0.2
7483 ± 9						4.0 ± 1.0
7558 ± 10						0.5 ± 0.2
7667 ± 10						6 ± 2
7593 ± 10						4 ± 2
7779 ± 10						44 ± 10
7830 ± 10						1.0 ± 0.2
7903 ± 10						5.0 ± 1
7960 ± 10						0.4 ± 0.2
8010 ± 10						0.8 ± 0.3
8062 ± 11						60 ± 15
8119 ± 11						1.0 ± 0.5
8229 ± 11						36 ± 8
8291 ± 11						0.5 ± 0.2

¹⁴¹₅₉Pr

E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)
8333 ± 11						2 ± 1
8387 ± 11						2 ± 1
8502 ± 11						3 ± 1
8555 ± 12						14 ± 2
8804 ± 12						90 ± 16
8925 ± 12						56 ± 20
9113 ± 12						36 ± 8
9258 ± 12						100 ± 25
9338 ± 12						112 ± 30
9443 ± 13						60 ± 15
9544 ± 13						160 ± 40
9557 ± 13						
9621 ± 13						10 ± 2
9792 ± 13						
9822 ± 13						
9899 ± 13						
10049 ± 13						50 ± 10

¹⁴²
⁵⁹Pr
[19.16 hr]

THERMAL CROSS SECTIONS

$$\sigma_T = 20 \pm 3 \text{ b}$$

¹⁴³
⁵⁹Pr
[13.58 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 89 \pm 10 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 190 \pm 25 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pr ¹⁴¹	isom. ratio	PR,173,1133(68)	Kern
Pr ¹⁴¹	isom. ratio	PL/B,24,400(67)	Kern
Pr ¹⁴¹	σ_t	NP/A,95,683(67)	Zimmerman
Pr ¹⁴¹	σ_t	BAP,10,12(65)	Hickman
Pr ¹⁴¹	activation	NSE,8,378(60)	Lyon
Pr ¹⁴³	activation	CJP,37,907(59)	Roy
Pr ¹⁴¹	pile osci.	AERE-R/R-2333(57)	Cummins
Pr ¹⁴²	activation	JCP,23,2108(55)	Smith
Pr ¹⁴¹	σ_t diffraction	PR,91,597(53)	Koehler
Pr ¹⁴¹	pile osci.	PR,83,641(51)	Pomerance
Pr ¹⁴¹	pile osci.	PR,79,11(50)	Harris
Pr ¹⁴¹	activation	PR,72,888(47)	Serota

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pr ¹⁴¹	σ_T (spectra)	85-635	69STUDSVIK,651(69)	Becvar
Pr ¹⁴¹	σ_t	85-5724	NP/A,123,561(69)	Morgenstern
Pr ¹⁴¹	σ_T (spectra)	0-957	BAP,14,514(69)	Mughabghab
Pr ¹⁴¹	σ_t	85-10049	PR,166,1234(68)	Lynchank
Pr ¹⁴¹	σ_T	85-1890	PRIVATE COMM.(64)	Block
Pr ¹⁴¹	$\sigma_t \bar{\sigma}_s \sigma_T$	50-942	ZET,47,43(64)	Wang
Pr ¹⁴¹	σ_t	85-1120	JPR,24,997(63)	Bianchi
Pr ¹⁴¹	σ_t	981-2940	CR,253,859(61)	Corge
Pr ¹⁴¹	σ_t	85-930	JPR,22,719(61)	Corge
Pr ¹⁴¹	σ_t	216-232	CR,252,3233(61)	Julien
Pr ¹⁴¹	activation		KAPL-2000-121,33(60)	Fehr
Pr ¹⁴¹	σ_t	85-364	PRIVATE COMM.(56)	Pilcher

⁶⁰Nd

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 50.5 \pm 2.0 \text{ b} \\ \bar{\sigma}_s &= 16 \pm 1 \text{ b} \\ \sigma_t &= 66.5 \pm 2.3 \text{ b} \\ \sigma_{pa} &= 4 \pm 1 \text{ b} \\ a_{coh} &= 7.2 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 45 \pm 5 \text{ b} \\ S_0 &= 2.8 \pm 0.4\end{aligned}$$

¹⁴²
⁶⁰Nd

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 18.7 \pm 0.7 \text{ b} \\ \bar{\sigma}_s &= 7.5 \pm 0.5 \text{ b} \\ \sigma_t &= 26.2 \pm 0.9 \text{ b} \\ a_{coh} &= 7.7 \pm 0.3 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 9 \pm 1 \text{ b} \\ \langle D \rangle &= 415 \pm 70 \text{ eV} \\ S_0 &= 1.4 \pm 0.4\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^+$$

$$\%Abn = 27.11$$

$$S_n = 6125.5 \pm 1.4 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
218.6 ± 0.2	0.90 ± 0.05	0.061 ± 0.004
235.0 ± 0.2	0.80 ± 0.05	0.052 ± 0.004
636.4 ± 0.6	1.50 ± 0.25	0.595 ± 0.010
956.8 ± 1.0	1.80 ± 0.40	0.582 ± 0.013
1119.5 ± 1.0	1.45 ± 0.30	0.043 ± 0.009
1485.0 ± 2.0	1.00 ± 0.25	0.026 ± 0.007
1687.0 ± 2.0	60 ± 10	1.46 ± 0.14
2528.5 ± 2.5	9700 ± 300	193.0 ± 5.1
2636.8 ± 3.0	20.0 ± 7.5	0.389 ± 0.146
2767.0 ± 3.0	62.5 ± 20.0	1.19 ± 0.38
4145 ± 5	5.5 ± 2.0	0.086 ± 0.031
4532 ± 5	7700 ± 350	121.7 ± 5.2
4948 ± 5	105 ± 20	1.50 ± 0.3
5426 ± 0	110 ± 15	1.49 ± 0.20
5491 ± 6	3500 ± 200	47.2 ± 2.7
5669 ± 6	110 ± 15	1.46 ± 0.20
5982 ± 6	1393 ± 75	18.0 ± 1.0
6927 ± 7	525 ± 150	6.31 ± 1.80
7246 ± 8	500 ± 150	5.86 ± 1.76
8261 ± 8	500 ± 150	5.50 ± 1.65

¹⁴²₆₀Nd

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
8423 ± 9	1900 ± 200	20.7 ± 2.18
8806 ± 9	500 ± 150	5.33 ± 1.60
9885 ± 10	11780 ± 1250	118.5 ± 12.6
10961 ± 12	10500 ± 1000	100.3 ± 9.6
13524 ± 15	4200 ± 1000	36.1 ± 8.6
13663 ± 15	89225 ± 9000	763.4 ± 77.0
15461 ± 15	12850 ± 1500	103.3 ± 12.0
16258 ± 20	54200 ± 5000	425.1 ± 39.2
17074 ± 20	2630 ± 500	20.1 ± 3.8
19365 ± 20	46500 ± 5000	334.1 ± 35.9
21250 ± 25	24380 ± 2500	167.3 ± 17.2
22090 ± 25	11978 ± 1250	80.6 ± 8.4
25137 ± 30	4200 ± 1000	26.5 ± 6.3
25905 ± 30	25670 ± 3000	159.5 ± 18.6
26702 ± 30	21050 ± 2500	128.8 ± 15.3
30570 ± 35	364650 ± 50000.	2086 ± 286
31050 ± 35	29000 ± 5000	164.6 ± 28.4

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 325 \pm 10 \text{ b} \\ \sigma_a &= 75 \pm 7 \text{ b} \\ \sigma_a &= 17.4 \pm 1.6 \text{ mb } [^{140}\text{Ce}^{0+}] \\ \sigma_c &= 400 \pm 13 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 140 \pm 30 \text{ b} \\ \langle I_{\gamma} \rangle &= 32 \pm 3 \text{ eV} \\ S_0 &= 3.1 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 7/2^{-}$$

$$S_n = 7817.4 \pm 0.9 \text{ keV}$$

$$\chi^2/\text{dof} = 12.17$$

E_0 (eV)	Γ (meV)	$2g_{\gamma}^n$ (meV)	J	ℓ	Γ_{γ} (meV)	$2g_{\gamma}^n$ (meV)	S_n
-6 ± 1			3	0	86 ± 15	88 ± 15	
55.33 ± 0.05	112 ± 10	41.3 ± 1.0	4	0	75 ± 10	5.54 ± 0.13	
127.4 ± 0.1	460 ± 25	340 ± 20	3	0	70 ± 10	30.1 ± 1.8	
135.5 ± 0.1	129 ± 14	56 ± 5	3	0	65 ± 14	4.01 ± 0.43	
158.9 ± 0.1	1054 ± 80	1100 ± 80	4	0	76 ± 3	87.3 ± 6.4	
179.5 ± 0.2	730 ± 30	575 ± 25	3	0	74 ± 5	42.9 ± 1.9	
188.6 ± 0.2	1454 ± 100	1350 ± 100	4	0	76 ± 4	196.1 ± 7.3	
305.2 ± 0.3	756 ± 40	770 ± 40	4	0	72 ± 5	44.0 ± 2.3	
324.4 ± 0.3	991 ± 40	818 ± 40	3	0	59 ± 7	45.0 ± 2.2	
337.2 ± 0.3	807 ± 60	750 ± 60	4	0	57 ± 4	40.8 ± 3.2	
350.4 ± 0.3	954 ± 40	770 ± 40	(3)	0	85 ± 5	41.2 ± 1.6	
401.3 ± 0.4	1200 ± 100	1088 ± 60	3	0	81 ± 4	53.9 ± 2.5	
408.0 ± 0.4	640 ± 30	500 ± 30	3	0	69 ± 4	24.8 ± 1.5	
446.3 ± 0.4	1860 ± 100	1960 ± 50	0	0	80 ± 5	92.8 ± 2.4	
506.8 ± 0.5	340 ± 30	20 ± 2	4	0	83 ± 11	0.9 ± 0.1	
523.3 ± 0.5	240 ± 25	70 ± 20	3	0	2.9 ± 0.8	16.8 ± 0.9	
555.6 ± 0.5	556 ± 20	5.9 ± 0.9	3	0	0.245 ± 0.036	2.9 ± 0.8	
576.2 ± 0.6	456 ± 20	420 ± 15	3	0	16.4 ± 0.6	16.4 ± 0.6	
657.6 ± 0.7	778.0 ± 0.8	340 ± 15	3	0	67 ± 5	12.8 ± 0.6	
708.3 ± 0.7		1300 ± 50	(4)	0	76 ± 5	46.6 ± 1.4	
803.3 ± 0.8		16.3 ± 1.5				0.575 ± 0.053	
816.4 ± 0.8		10.2 ± 1.0				0.372 ± 0.034	
839.8 ± 0.8	870 ± 40	810 ± 30	(4)		66 ± 5	27.9 ± 1.0	
852.6 ± 0.9		25.8 ± 1.3				0.884 ± 0.045	

¹⁴³₆₀Nd

E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)
871.6 $\pm$ 1.0		59.2 $\pm$ 3.8				1.90 $\pm$ 0.10
984.6 $\pm$ 1.0		500 $\pm$ 25			^a 65 $\pm$ 6	15.9 $\pm$ 0.8
1007.7 $\pm$ 1.0					^a 59 $\pm$ 2	
1027.4 $\pm$ 1.0		250 $\pm$ 10			^a 67 $\pm$ 5	8.00 $\pm$ 0.31
1082.4 $\pm$ 1.0		100 $\pm$ 10	(4)		80 $\pm$ 5	3.84 $\pm$ 0.30
1125.0 $\pm$ 1.0		500 $\pm$ 25			^a 60 $\pm$ 5	14.9 $\pm$ 0.8
1165.0 $\pm$ 2.0		31 $\pm$ 2				0.91 $\pm$ 0.06
1211.2 $\pm$ 2.0		1430 $\pm$ 70				41.1 $\pm$ 2.0
1263.0 $\pm$ 2.0		5478 $\pm$ 120			^a 75 $\pm$ 4	153.9 $\pm$ 3.4
1274.8 $\pm$ 2.0		1755 $\pm$ 70			^a 64 $\pm$ 6	49.17 $\pm$ 1.68
1307.8 $\pm$ 2.0		2200 $\pm$ 50			^a 78 $\pm$ 7	60.85 $\pm$ 1.38
1433.8 $\pm$ 1.5		980 $\pm$ 50			^a 58 $\pm$ 6	25.9 $\pm$ 1.3
1462.0 $\pm$ 2.0		179 $\pm$ 10			^a 65 $\pm$ 6	4.58 $\pm$ 0.26
1472.0 $\pm$ 2.0		754 $\pm$ 30			^a 64 $\pm$ 7	19.7 $\pm$ 0.8
1511.7 $\pm$ 1.5		255 $\pm$ 10			^a 73 $\pm$ 5	6.56 $\pm$ 0.26
1558.1 $\pm$ 1.5		668 $\pm$ 20			^a 80 $\pm$ 8	16.7 $\pm$ 0.5
1584.2 $\pm$ 1.5		1920 $\pm$ 100			^a 73 $\pm$ 7	48.2 $\pm$ 2.5
1653.8 $\pm$ 2.0		945 $\pm$ 30			^a 84 $\pm$ 8	23.2 $\pm$ 0.7
1688.5 $\pm$ 2.0		3390 $\pm$ 100			^a 73 $\pm$ 8	83.0 $\pm$ 2.5
1724.3 $\pm$ 2.0		790 $\pm$ 40			^a 68 $\pm$ 7	19.03 $\pm$ 0.96
1724.3 $\pm$ 2.0		790 $\pm$ 40				19.02 $\pm$ 0.96
1761.1 $\pm$ 2.0		1270 $\pm$ 60				30.26 $\pm$ 1.43
1850.0 $\pm$ 2.0		2000 $\pm$ 100			^a 62 $\pm$ 10	46.5 $\pm$ 2.3
1911.5 $\pm$ 2.0		1510 $\pm$ 80			^a 129 $\pm$ 12	34.5 $\pm$ 1.8
1963.8 $\pm$ 2.0		120 $\pm$ 20			^a 62.2 $\pm$ 8.2	2.71 $\pm$ 0.45
2004.7 $\pm$ 2.0						
2038.0 $\pm$ 2.0		1855 $\pm$ 80				41.4 $\pm$ 1.8
2129.1 $\pm$ 2.0		8400 $\pm$ 400				182.1 $\pm$ 8.7
2173.0 $\pm$ 2.0		1280 $\pm$ 60				27.5 $\pm$ 1.3
2224.6 $\pm$ 2.5		740 $\pm$ 40				15.7 $\pm$ 0.9
2282.7 $\pm$ 2.5		505 $\pm$ 30				10.6 $\pm$ 0.6
2348.7 $\pm$ 2.5		605 $\pm$ 40				12.5 $\pm$ 0.8
2432.1 $\pm$ 2.5		5600 $\pm$ 300				113.6 $\pm$ 6.1
2465.5 $\pm$ 2.5		1975 $\pm$ 100				39.8 $\pm$ 2.0
2631.7 $\pm$ 3.0		2840 $\pm$ 100				55.4 $\pm$ 2.0
2713.0 $\pm$ 3.0		720 $\pm$ 40				13.8 $\pm$ 0.8
2760.1 $\pm$ 3.0		6340 $\pm$ 300				120.7 $\pm$ 5.7
2819.8 $\pm$ 3.0		325 $\pm$ 30				6.1 $\pm$ 0.6
2872.6 $\pm$ 3.0		3270 $\pm$ 120				61.0 $\pm$ 2.2
2912.5 $\pm$ 3.0		1085 $\pm$ 60				20.1 $\pm$ 1.1
3041.0 $\pm$ 3.0		2830 $\pm$ 100				51.3 $\pm$ 1.8

E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	ℓ	Γ_γ (meV)	$2g_n^0$ (meV)
3070.8 ± 3.0		1035 ± 60				18.7 ± 1.1
3117.4 ± 3.0		555 ± 50				9.9 ± 0.9
3184.0 ± 3.0		2380 ± 100				42.2 ± 1.8
3195.0 ± 3.0		560 ± 50				9.9 ± 0.9
3232.1 ± 3.0		1570 ± 80				27.6 ± 1.4
3252.8 ± 3.5		1625 ± 90				28.3 ± 1.6
3384.0 ± 4.0		2300 ± 100				39.5 ± 1.7
3426.0 ± 4.0		215 ± 30				3.7 ± 0.5
3461.0 ± 4.0		975 ± 60				16.6 ± 1.0
3509.0 ± 4.0		1690 ± 100				28.5 ± 1.7
3566.0 ± 4.0		250 ± 50				4.2 ± 0.8
3623.0 ± 4.0		1670 ± 100				27.7 ± 1.7
3703.0 ± 4.0		2370 ± 120				39.0 ± 2.0
3715.0 ± 4.0		2060 ± 120				33.8 ± 2.0
3778.0 ± 4.0		440 ± 60				71.6 ± 1.0
3836.0 ± 4.0		225 ± 45				3.6 ± 0.7
3882.0 ± 4.0		1120 ± 80				18.0 ± 1.3
3954.0 ± 4.0		550 ± 60				8.8 ± 1.0
4017.0 ± 4.0		4230 ± 200				69.1 ± 3.2
4028.0 ± 4.0		1770 ± 120				27.9 ± 1.9
4059.0 ± 4.0		2340 ± 120				36.7 ± 1.9
4109.0 ± 5.0		215 ± 60				3.4 ± 0.9
4132.0 ± 5.0		970 ± 100				15.1 ± 1.6
4141.0 ± 5.0		910 ± 100				14.1 ± 1.6
4203.0 ± 5.0		6480 ± 300				100 ± 5
4243.0 ± 5.0		1240 ± 100				19.0 ± 1.5
4333.0 ± 5.0		3240 ± 150				49.2 ± 2.3
4385.0 ± 5.0		230 ± 50				3.5 ± 0.8
4415.0 ± 5.0		540 ± 75				8.1 ± 1.1
4473.0 ± 5.0		730 ± 90				10.9 ± 1.4
4516.0 ± 5.0		240 ± 60				3.6 ± 0.9
4555.0 ± 5.0		250 ± 50				3.7 ± 0.7
4596.0 ± 5.0		750 ± 100				11.1 ± 1.5
4607.0 ± 5.0		1160 ± 100				17.1 ± 1.5
4686.0 ± 5.0		2630 ± 150				38.4 ± 2.2
4743.0 ± 5.0		720 ± 70				10.5 ± 1.1
4838.0 ± 5.0		5450 ± 300				78.4 ± 4.3
4891.0 ± 5.0		6200 ± 300				88.7 ± 4.3
4987.0 ± 5.0		5070 ± 300				71.8 ± 4.3
5012.0 ± 5.0		1760 ± 180				25.1 ± 2.5
5128.0 ± 5.0		3400 ± 200				47.5 ± 2.7

¹⁴³₆₀Nd

E ₀ (eV)	Γ (meV)	2g _n ⁰ (meV)	J	ℓ	Γ _γ (meV)	2g _n ⁰ (meV)
5180.0 ± 5.0		8150 ± 400				113.2 ± 5.6
5235.0 ± 5.0		2350 ± 200				32.5 ± 2.8
5313.0 ± 6.0		950 ± 100				13.0 ± 1.4
5440.0 ± 6.0		5570 ± 250				75.5 ± 3.4
5503.0 ± 6.0		255 ± 80				3.4 ± 1.1

• 2g_n⁰

• 2g_n⁰Γ_γ/Γ

¹⁴⁴₆₀Nd
[2 × 10¹⁵ yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 3.6 \pm 0.3 \text{ b}$$

$$a_{\text{coh}} = 2.4 \pm 0.1 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 5.0 \pm 0.5 \text{ b}$$

$$\langle D \rangle = 540 \pm 65 \text{ eV}$$

$$S_0 = 3.9 \pm 1.0$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\% \text{Abn} = 23.85$$

$$S_n = 5760.4 \pm 1.6 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_{γ} (meV)	Γ_n^0 (meV)
373.8 ± 0.4	17500 ± 2000	16250 ± 500		841 ± 26
733.7 ± 0.8	750 ± 50	625 ± 30	78 ± 12	23.1 ± 1.1
1277.3 ± 1.5	36000 ± 3600	32300 ± 1000		903.6 ± 28.0
1628.0 ± 2.0	4480 ± 300	4330 ± 250	150 ± 80	107.5 ± 6.2
1975.0 ± 2.0	16580 ± 2000	15000 ± 750		346.9 ± 16.9
2762.0 ± 3.0		4030 ± 200		76.7 ± 3.8
3538.1 ± 4.0		15500 ± 750		267.3 ± 12.6
3749.0 ± 4.0		1360 ± 60		22.2 ± 1.0
4738.0 ± 5.0		275 ± 50		3.5 ± 0.7
4929 ± 5		24200 ± 1000		346 ± 15
5648 ± 6		3360 ± 200		44.7 ± 2.7
6106 ± 6		13000 ± 1000		166.4 ± 12.8
6788 ± 7		48000 ± 2500		582.6 ± 30.4
7048 ± 7		3443 ± 350		41.0 ± 4.1
7473 ± 8		5160 ± 500		59.7 ± 5.8
8186 ± 10		14315 ± 750		158.2 ± 8.3
8846 ± 10		3100 ± 500		33.0 ± 5.3
9372 ± 10		36300 ± 1750		375 ± 18
9735 ± 10		47850 ± 2500		485 ± 25
10712 ± 15		58500 ± 2500		565 ± 24
11244 ± 15		18530 ± 750		175 ± 7
11641 ± 15		15900 ± 1000		147 ± 9
12177 ± 15		4275 ± 750		39 ± 7
13242 ± 15		61800 ± 4000		537 ± 35
13577 ± 15		14130 ± 1000		121.3 ± 8.6
13997 ± 15		40950 ± 2500		346.1 ± 21.1
14480 ± 15		2870 ± 750		23.85 ± 6.2
15243 ± 15		2223 ± 750		18.0 ± 6.1
16317 ± 20		58660 ± 250		459.3 ± 19.6
16716 ± 20		26150 ± 1500		202.3 ± 11.6
16830 ± 20		33850 ± 2000		261.0 ± 15.5
17537 ± 20		10795 ± 1250		81.5 ± 9.4
18191 ± 20		8385 ± 1000		62.2 ± 7.4
18430 ± 20		40780 ± 2500		300.4 ± 18.4
19407 ± 20		28545 ± 2000		204.9 ± 14.4

¹⁴⁵
⁶⁰Nd

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 42 \pm 2 \text{ b}$$

$$\sigma_a < 0.1 \text{ mb}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 240 \pm 35 \text{ b}$$

$$\langle D \rangle = 19 \pm 2 \text{ eV}$$

$$S_0 = 4.2 \pm 0.5$$

RESONANCE PARAMETERS

$$I'' = 7/2^-$$

$$\% \text{Abn} = 8.30$$

$$S_n = 7565.4 \pm 0.9 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	ℓ	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
4.35±0.02	52 ± 5	1.2± 0.1	3		51 ± 5	0.57± 0.04
42.51±0.05	411 ± 15	310 ± 15	3		57 ± 2	47.6 ± 2.3
85.62±0.08		12.3± 0.9	4			1.33± 0.10
96.0 ±0.1	80 ± 10	5.1± 0.2	3	0	74 ±10	0.52± 0.02
102.95±0.10	188 ± 7	115 ± 5	3	0	47 ± 5	11.3 ± 0.5
103.45±0.10		39.0± 1.2	4	0	65 ±10	3.83± 0.12
147.1 ±0.2	115 ± 15	21.0± 1.5	3	0		1.73± 0.12
151.4 ±0.2	89 ± 8	14.7± 0.5	4	0		1.20± 0.04
169.7 ±0.2		3.0± 0.2	[4]			0.23± 0.02
189.2 ±0.2	75 ± 5	33 ± 2	3	0	38 ± 3	2.4 ± 0.2
232.6 ±0.2	101 ± 20	6.6± 0.4	4	0		0.43± 0.03
242.1 ±0.2	113 ± 6	70 ± 3	4	0	51 ± 4	4.5 ± 0.2
248.4 ±0.2		3.8± 0.4	3			0.24± 0.03
258.9 ±0.2	133 ± 6	100 ± 5	4	0	44 ± 3	6.2 ± 0.3
274.8 ±0.2	179 ± 9	147 ± 8	4	0	48 ± 3	8.9 ± 0.9
306.2 ±0.3		58 ± 12	[3]		35 ± 5	3.3 ± 0.7
311.1 ±0.3	385 ± 16	303 ± 15	[3]	0	39 ± 4	17.2 ± 0.9
318.5 ±0.3	80 ± 30	12.0± 1.0				0.67± 0.06
342.5 ±0.3	165 ± 30	58 ± 3	[4]			3.1 ± 0.2
376.6 ±0.3		11.2± 0.6				0.58± 0.03
390.5 ±0.4		46 ± 8	4			2.3 ± 0.4
397.7 ±0.4	125 ± 50	27 ± 2	3			1.35± 0.10
403.6 ±0.4	450 ± 50	220 ± 20	4			10.9 ± 1.0
406.2 ±0.4		130 ± 5				6.45± 0.24
445.8 ±0.4		200 ± 20			^a 51 ± 4	9.5 ± 1.0
464.6 ±0.5	840 ± 40	655 ± 35	[3]		58 ± 5	30.4 ± 1.6
487.1 ±0.5	340 ± 15	355 ± 15	[3]		58 ± 4	16.1 ± 0.7
497.2 ±0.5	500 ± 30	400 ± 20			^a 55 ± 4	17.9 ± 0.9
505.4 ±0.5	950 ± 90	770 ± 40			^a 50 ± 3	34.3 ± 1.8
516.6 ±0.5	250 ±100	21.2± 1.6				0.93± 0.07
541.5 ±0.5		585 ± 50			^a 57 ± 5	25.1 ± 2.2
568.6 ±0.6	1100 ±100	1190 ± 60			^a 54 ± 6	49.9 ± 2.5
590.8 ±0.6		12.6± 1.5				0.52± 0.06
605.7 ±0.7		8.5± 1.5				0.35± 0.06
638.9 ±0.6	482 ± 30	420 ± 20	(3)		62 ± 6	16.6 ± 0.8
647.8 ±0.6	276 ± 30	134 ± 5				5.26± 0.20
659.0 ±0.6		17.4± 4.0				0.68± 0.16
667.1 ±0.7		5.6± 2.0				0.22± 0.08

¹⁴⁵
⁶⁰Nd

E ₀ (eV)	Γ (meV)	2g _n ⁺ (meV)	J	ℓ	Γ _γ (meV)	2g _n ⁰ (meV)
688.8 ± 0.7	120 ± 60	34.0 ± 1.5				1.30 ± 0.06
695.5 ± 0.7	60 ± 30	61 ± 3				2.31 ± 0.11
709.0 ± 0.7		34 ± 3				1.28 ± 0.13
715.9 ± 0.7		60 ± 30				2.2 ± 1.1
756.3 ± 0.7		760 ± 50			55 ± 6	27.6 ± 1.8
762.5 ± 0.7	300 ± 25	290 ± 15				10.5 ± 0.5
785.7 ± 0.8		3.5 ± 0.6				0.13 ± 0.02
820.5 ± 0.8	165 ± 40	92 ± 4				3.2 ± 0.1
828.1 ± 0.8	375 ± 40	360 ± 15				12.5 ± 0.5
848.4 ± 0.8		2600 ± 300			97 ± 8	89.3 ± 10.4
880.8 ± 0.9		27 ± 2				0.91 ± 0.07
885.0 ± 0.9		50 ± 2			55 ± 6	1.68 ± 0.07
902.2 ± 0.9	590 ± 50	465 ± 20				15.5 ± 0.7
913.9 ± 0.9	870 ± 90	705 ± 30			57 ± 5	23.3 ± 1.0
919.7 ± 0.9		62 ± 6			(50)	2.0 ± 0.2
938.6 ± 0.9		66 ± 3				2.2 ± 0.1
945.4 ± 1.0		430 ± 25			49 ± 5	14.0 ± 0.7
972.6 ± 1.0		494 ± 20			61 ± 4	15.9 ± 0.6
977.7 ± 1.0	510 ± 60	360 ± 15			83 ± 7	11.5 ± 0.5
1007.4 ± 1.0	850 ± 100	360 ± 50				30.3 ± 1.6
1009.2 ± 1.0	910 ± 100	605 ± 30				19.0 ± 0.9
1052.5 ± 1.0	850 ± 90	560 ± 30				20.3 ± 0.9
1055.2 ± 1.0	350 ± 40	340 ± 15	[4]			10.5 ± 0.5
1093.2 ± 1.0	270 ± 60	260 ± 15			49 ± 8	7.9 ± 0.5
1117.1 ± 1.0	360 ± 50	270 ± 15				8.1 ± 0.5
1141.1 ± 1.0	1400 ± 150	1090 ± 50				32.3 ± 1.5
1163.6 ± 2.0		142 ± 14			(50)	4.2 ± 0.4
1192.5 ± 2.0		59.6 ± 3.0				1.7 ± 0.9
1194.5 ± 2.0		163 ± 10			56 ± 6	4.7 ± 0.3
1238.1 ± 2.0		138 ± 5			(50)	3.9 ± 0.1
1268.6 ± 2.0		69 ± 10				1.9 ± 0.3
1289.0 ± 2.0		385 ± 15				10.7 ± 0.4
1303.7 ± 2.0	900 ± 100	1060 ± 50	[4]		48 ± 5	29.4 ± 1.4
1313.0 ± 2.0		78 ± 8			(50)	1.3 ± 0.1
1328.8 ± 2.0		9.4 ± 3.4				2.6 ± 0.9
1357.7 ± 2.0		5.4 ± 3.6				0.15 ± 0.10
1379.0 ± 2.0	610 ± 60	465 ± 20			51 ± 6	12.5 ± 0.5
1397.0 ± 2.0		198 ± 3				0.53 ± 0.08
1403.0 ± 2.0	760 ± 80	760 ± 40			69 ± 8	20.3 ± 1.1
1430.0 ± 2.0	930 ± 100	800 ± 40	[3]		40 ± 7	21.2 ± 1.1
1448.0 ± 2.0		210 ± 10			63 ± 8	5.5 ± 0.3
1494.0 ± 2.0		87 ± 9			(50)	2.3 ± 0.2
1523.9 ± 1.5		405 ± 15				10.4 ± 0.4
1542.0 ± 1.5		360 ± 10				9.2 ± 0.3
1553.9 ± 1.5		210 ± 15				5.3 ± 0.4
1562.7 ± 1.5	445 ± 100	405 ± 20				10.3 ± 0.5
1575.6 ± 1.5	1630 ± 100	1745 ± 50				44.0 ± 1.3
1611.0 ± 1.5		350 ± 20				8.7 ± 0.5
1649.6 ± 1.5		130 ± 15				3.2 ± 0.4
1658.0 ± 2.0		1125 ± 50				27.6 ± 1.2
1675.4 ± 2.0	1240 ± 120	72 ± 7				1.8 ± 0.2
1689.4 ± 2.0		50 ± 5				1.2 ± 0.1

¹⁴⁵
₆₀Nd

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	π	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1707.6±2.0	1200 ±120	1205 ± 50				29.2 ± 1.2
1727.0±2.0		455 ± 20				10.9 ± 0.5
1791.0±2.0		810 ± 40				19.1 ± 1.0
1797.4±2.0	2100 ±200	2850 ± 80				67.2 ± 1.9
1806.7±2.0	3900 ±120	500 ± 30				11.8 ± 0.7
1816.2±2.0		1010 ± 50				23.7 ± 1.2
1851.5±2.0	2600 ±200	2320 ±100				53.9 ± 2.3
1887.0±2.0	1540 ±150	1190 ± 50				27.4 ± 1.2
1900.3±2.0		1600 ±100				3.7 ± 0.2
1910.5±2.0	650 ±150	500 ±250				11.4 ± 0.6
1917.4±2.0	1180 ±150	1020 ± 50				23.3 ± 1.1
1924.9±2.0	410 ±150	530 ± 25				12.1 ± 0.6
1947.0±2.0		123 ± 10				2.8 ± 0.2
1986.0±2.0	1810 ±200	1490 ± 60				33.4 ± 1.3
1998.0±2.0		197 ± 10				4.4 ± 0.2
2022.5±2.0		2365 ±100				52.6 ± 2.2
2068.1±2.0		525 ± 25				11.5 ± 0.5
2101.0±2.0		55 ± 15				1.2 ± 0.3
2132.6±2.0		620 ± 40				13.4 ± 0.9
2143.4±2.0		325 ± 25				7.0 ± 0.5
2157.2±2.0		390 ± 20				8.4 ± 0.4
2183.6±2.0		89 ± 15				1.9 ± 0.3
2192.6±2.0		1520 ± 80				32.5 ± 1.7
2225.4±2.5		500 ± 25				10.6 ± 0.5
2267.0±2.5		114 ± 15				2.4 ± 0.3
2283.3±2.5		495 ± 30				10.4 ± 0.6
2294.4±2.5		620 ± 35				12.9 ± 0.7
2329.2±2.5		470 ± 30				9.7 ± 0.6
2345.3±2.5		805 ± 40				16.6 ± 0.8
2396.4±2.5		630 ± 40				12.9 ± 0.8
2421.5±2.5		680 ± 40				13.8 ± 0.8
2443.1±2.5		440 ± 30				8.3 ± 0.6
2465.6±2.5		3160 ±100				63.6 ± 2.0
2485.6±2.5		90 ± 20				1.8 ± 0.4
2511.1±2.5		2525 ±100				50.4 ± 2.0
2541.7±3.0		3490 ±150				69.2 ± 3.0
2569.7±3.0		2385 ±120				47.0 ± 2.4
2604.0±3.0		560 ± 60				11.0 ± 1.2
2683.2±3.0		410 ± 45				7.9 ± 0.9
2735.4±3.0		420 ± 50				8.0 ± 1.0
2744.4±3.0		620 ± 60				11.8 ± 1.1
2754.0±3.0		600 ± 60				11.4 ± 1.1
2781.4±3.0		5660 ±400				107 ± 8
2788.8±3.0		3190 ±300				60.4 ± 5.7
2840.8±3.0		4625 ±250				86.8 ± 4.7
2882.1±3.0		2700 ±150				50.2 ± 2.7
2891.8±3.0		1095 ±100				20.4 ± 1.9
2916.8±3.0		940 ±100				17.4 ± 1.9
2930.6±3.0		7640 ±300				141.1 ± 5.5
2993.3±3.0		1360 ±100				24.9 ± 1.8
3021.8±3.0		3100 ±150				56.3 ± 2.7
3047.0±3.0		1230 ±100				22.3 ± 1.8

¹⁴⁵
₆₀Nd

E ₀ (eV)	Γ (meV)	2g _h ⁺ (meV)	J	ℓ	Γ _γ (meV)	2g _h ⁰ (meV)
3064.2±3.0		415 ± 60				7.5 ± 1.1
3074.0±3.0		950 ± 30				1.7 ± 5.4
3108.5±3.0		480 ± 50				8.6 ± 0.9
3118.3±3.0		1620 ± 80				29.0 ± 1.4
3166.1±3.0		1500 ± 75				26.7 ± 1.3
3219.4±3.0		910 ± 60				16.0 ± 1.1
3241.8±3.5		880 ± 100				15.5 ± 1.7
3252.0±3.5		1980 ± 120				34.7 ± 2.1
3287.5±3.5		2200 ± 100				38.4 ± 1.7
3306.0±3.5		950 ± 80				16.5 ± 1.4
3327.0±4.0		1100 ± 30				1.9 ± 0.5
3347.0±4.0		30 ± 15				0.52± 0.6
3369.0±4.0		460 ± 45				7.9 ± 0.8
3405.0±4.0		3600 ± 100				61.7 ± 1.7
3453.0±4.0		810 ± 60				13.8 ± 1.0
3477.0±4.0		1480 ± 80				25.1 ± 1.4
3515.0±4.0		1580 ± 100				28.3 ± 1.7
3528.0±4.0		1500 ± 120				25.3 ± 2.0
3591.0±4.0		560 ± 60				9.3 ± 1.0
3608.0±4.0		580 ± 60				9.7 ± 1.0
3662.0±4.0		1510 ± 150				25.0 ± 2.5
3681.0±4.0		1500 ± 100				24.7 ± 1.7
3697.0±4.0		550 ± 60				9.0 ± 1.0
3744.0±4.0		3270 ± 120				53.4 ± 2.0
3795.0±4.0		1450 ± 100				23.5 ± 1.6
3817.0±4.0		1770 ± 120				28.6 ± 1.9
3855.0±4.0		1010 ± 100				16.3 ± 1.6
3873.0±4.0		7440 ± 200				119.6 ± 3.2
3903.0±4.0		520 ± 60				8.3 ± 1.0
3956.0±4.0		5030 ± 250				80.0 ± 4.0
3981.0±4.0		8170 ± 400				129.5 ± 6.3
4004.0±4.0		3060 ± 200				48.4 ± 3.2
4067.0±4.0		2000 ± 150				31.3 ± 2.4
4118.0±5.0		570 ± 90				8.9 ± 1.4
4167.0±5.0		440 ± 60				6.8 ± 0.9
4209.0±5.0		1230 ± 120				19.0 ± 1.9
4228.0±5.0		900 ± 100				13.8 ± 1.5
4245.0±5.0		3770 ± 150				57.9 ± 2.3
4263.0±5.0		420 ± 60				6.4 ± 0.9
4307.0±5.0		3460 ± 150				52.7 ± 2.3
4344.0±5.0		2000 ± 120				30.3 ± 1.0
4365.0±5.0		1950 ± 150				29.5 ± 2.3
4414.0±5.0		60 ± 40				0.9 ± 0.6
4439.0±5.0		1400 ± 100				21.0 ± 1.5
4493.0±5.0		1400 ± 100				20.9 ± 1.5
4525.0±5.0		1500 ± 100				22.3 ± 1.5
4562.0±5.0		440 ± 60				6.5 ± 0.9
4613.0±5.0		1700 ± 100				2.5 ± 1.5
4637.0±5.0		520 ± 60				7.6 ± 0.9

• 2g_h⁺ γ

¹⁴⁶Nd
60

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 1.4 \pm 0.1 \text{ b}$$

$$a_{\text{coh}} = 8.7 \pm 0.2 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 3.2 \pm 0.5 \text{ b}$$

$$\langle D \rangle = 210 \pm 25 \text{ eV}$$

$$S_0 = 2.3 \pm 0.6$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+} \quad \chi_{\text{Abn}} = 17.22 \quad S_n = 5302.3 \pm 2.8 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_{γ} (meV)	Γ_0^{γ} (meV)
359.5 ± 0.3	99 ± 9	44 ± 3	55 ± 8	2.3 ± 0.1
625.0 ± 0.6		5.0 ± 0.3		0.25 ± 0.02
723.4 ± 0.8		10.5 ± 0.3		0.40 ± 0.01
809.5 ± 1.0	1135 ± 100	1080 ± 100	55 ± 8	38.2 ± 3.5
953.0 ± 2.0		5.0 ± 0.5		0.16 ± 0.02
1168.0 ± 2.0		12750 ± 1000		373 ± 29
1504.4 ± 3.0		3000 ± 100		77.4 ± 2.6
1819.0 ± 4.0		1560 ± 50		36.6 ± 1.2
2032.0 ± 3.0		3880 ± 200		82.4 ± 4.4
2599.0 ± 3.0		32600 ± 500		639.5 ± 9.8
2770.0 ± 3.0		65 ± 20		1.2 ± 0.3
2982 ± 6		3580 ± 200		64.7 ± 3.7
3250 ± 5		2190 ± 200		38.4 ± 3.5
3656 ± 5		25675 ± 790		424.6 ± 12.4
3969 ± 4		4910 ± 200		77.9 ± 3.2
4000 ± 4		12300 ± 400		194.5 ± 6.3
4033 ± 4		420 ± 60		6.6 ± 0.9
4047 ± 4		320 ± 60		5.0 ± 0.9
5075 ± 10		3490 ± 150		49.0 ± 2.1
5191 ± 10		2640 ± 150		36.6 ± 2.1
5457 ± 10		6370 ± 250		86.7 ± 3.4
6382 ± 7		10400 ± 900		130.0 ± 6.2
6631 ± 7		14500 ± 790		177.9 ± 9.2
7037 ± 7		2860 ± 150		34.1 ± 1.8
7914 ± 8		3610 ± 200		30.6 ± 2.2
8501 ± 10		2315 ± 225		25.1 ± 2.5
9313 ± 10		5135 ± 600		53.2 ± 6.2
9724 ± 10		2100 ± 250		21.3 ± 2.5
9868 ± 10		19480 ± 1000		196.1 ± 100.1
10757 ± 10		27325 ± 1500		263.5 ± 14.5
10857 ± 15		5730 ± 500		55.0 ± 4.8
11526 ± 15		2330 ± 300		21.7 ± 2.8
12548 ± 15		1700 ± 300		15.2 ± 2.2
12657 ± 15		2680 ± 350		23.8 ± 3.1
13203 ± 15		2050 ± 300		17.8 ± 2.6
13434 ± 15		3120 ± 350		26.9 ± 3.0
13567 ± 15		44650 ± 1500		383.3 ± 12.9
14227 ± 15		4300 ± 500		36.0 ± 4.2

¹⁴⁶Nd
60

E ₀ (eV)	Γ (meV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)
14495 ± 15		8250 ± 750		68.5 ± 6.3
15362 ± 20		1800 ± 400		14.5 ± 3.2
16267 ± 20		10880 ± 1000		85.3 ± 7.8
16375 ± 20		1930 ± 400		15.1 ± 3.1
17050 ± 20		13800 ± 1250		106.5 ± 9.6
17323 ± 20		13955 ± 1250		106.5 ± 9.5

¹⁴⁸Nd
60

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.5 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 19 \pm 1 \text{ b}$$

$$\langle D \rangle = 72 \pm 6 \text{ eV}$$

$$S_0 = 3.0 \pm 0.6$$

RESONANCE PARAMETERS

I ⁿ = 0 ⁺		S _n = 5068 ± 11 keV	
E ₀ (eV)	Γ (meV)	Γ _n (meV)	Γ _γ (meV)
94.9 ± 0.1		0.53 ± 0.05	0.054 ± 0.005
155.4 ± 0.1	1720 ± 200	1550 ± 200	148.4 ± 16.0
172.4 ± 0.2		0.41 ± 0.03	0.03 ± 0.002
184.5 ± 0.2		0.065 ± 0.05	0.050 ± 0.002
252.9 ± 0.2		0.4 ± 0.1	0.025 ± 0.005
287.5 ± 0.3	3220 ± 200	3160 ± 200	184.5 ± 11.8
398.3 ± 0.4		380 ± 30	58 ± 6
514.0 ± 0.5		1.9 ± 0.3	65 ± 10
628.5 ± 0.6		0.85 ± 0.25	19.0 ± 1.5
714.9 ± 0.8	2424 ± 60	2350 ± 50	0.084 ± 0.011
779.3 ± 0.8		7.5 ± 1.5	0.034 ± 0.010
871.9 ± 0.9		260 ± 60	87.9 ± 1.4
905.0 ± 0.9		6.9 ± 0.5	0.27 ± 0.05
1054.1 ± 1.0		2530 ± 150	8.8 ± 2.0
1176.2 ± 1.2		2650 ± 150	0.23 ± 0.02
1208.8 ± 2.0		36.4 ± 2.5	77.3 ± 4.3
1244.0 ± 2.0		8.0 ± 0.5	77.3 ± 4.6
1344.3 ± 1.5		3.3 ± 1.0	1.05 ± 0.072
1388.0 ± 2.0		1815 ± 110	0.23 ± 0.02
1533.5 ± 1.5		3690 ± 150	0.90 ± 0.03
1793.7 ± 2.0		112.5 ± 7.5	49.6 ± 3.0
2028.3 ± 2.0		505 ± 25	0.24 ± 0.04
2177.7 ± 2.0		5875 ± 250	94.4 ± 3.8
2376.9 ± 2.0		3400 ± 150	2.7 ± 0.2
2429.5 ± 2.0		2050 ± 150	11.2 ± 0.6
			125.9 ± 5.4
			69.7 ± 3.1
			41.6 ± 3.1

¹⁴⁸₆₀Nd

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
2562.3± 2.0		9000 ±1000		178 ±20
2784.8± 3.0		1410 ± 50		22.9 ± 1.0
2990.0± 3.0		2170 ± 100		39.7 ± 1.8
3485.0± 3.0		665 ± 30		11.3 ± 0.5
3814.0± 4.0		430 ± 30		7.0 ± 0.5
3892.0± 4.0		19150 ± 750		307.0 ±12.0
4077.0± 4.0		17545 ± 400		196.5 ± 6.3
4271.0± 5.0		7200 ± 400		110.2 ± 6.1
4423.0± 5.0		1490 ± 75		22.4 ± 1.1
4655.0± 5.0		4865 ± 250		71.3 ± 3.7
4694.0± 5.0		900 ± 50		13.1 ± 0.7
4840.0± 5.0		45.0 ± 7.5		0.65 ± 0.11
5179.0± 5.0		45.0 ± 7.5		0.65 ± 0.11
5293.0± 6.0		3775 ± 150		51.9 ± 2.0
5464.0± 6.0		1590 ± 150		21.5 ± 1.0
5676.0± 6.0		1030 ± 75		13.7 ± 1.0
5792.0± 6.0		255 ± 90		3.35 ± 1.18
6088.0± 6.0		5355 ± 250		68.5 ± 3.2
6491.0± 6.0		495 ± 100		6.1 ± 1.2
6644.0± 6.0		3670 ± 150		45.0 ± 1.8
7062.0± 7.0		14090 ± 500		167.7 ± 6.0
7302.0± 7.0		4000 ± 200		46.8 ± 2.3
7378.0± 7.0		2805 ± 200		32.7 ± 2.3
7671.0± 8.0		14000 ± 500		160 ± 6
8646 ± 9		24250 ±1000		260.8 ±10.8
8774 ± 9		7000 ± 350		74.7 ± 3.7
9049 ± 9		8300 ± 400		87.3 ± 4.2
9390 ± 9		4760 ± 350		49.1 ± 3.6
9600 ±10		1710 ± 250		17.5 ± 2.5
9676 ±10		3210 ± 300		32.6 ± 3.1
9973 ±10		3695 ± 300		37.0 ± 3.0
10081 ±10		2250 ± 250		22.4 ± 2.5
10279 ±10		2005 ± 250		19.8 ± 2.5
10409 ±11		3440 ± 300		33.7 ± 2.9
10852 ±10		9275 ± 500		89.0 ± 4.8
10905 ±12		4780 ± 500		45.8 ± 4.8
11125 ±12		1550 ± 300		14.7 ± 2.8
11347 ±12		2600 ± 300		24.4 ± 2.8
11462 ±12		5350 ± 500		50.0 ± 4.7
11924 ±12		3130 ± 300		28.7 ± 2.7

THERMAL CROSS SECTIONS

$$\sigma_T = 1.2 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 14 \pm 2 \text{ b}$$

$$\langle 0 \rangle = 120 \pm 8 \text{ eV}$$

$$S_0 = 3.2 \pm 0.6$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\chi_{\text{Abr}} = 5.62$$

$$S_n = 5309 \pm 8 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
78.8 ± 0.1	70 ± 10	18.4 ± 0.5	52 ± 10	2.09 ± 0.06
265.9 ± 0.2		0.40 ± 0.05		0.025 ± 0.003
313.2 ± 0.3	491 ± 18	425 ± 15	66 ± 10	24.0 ± 0.8
459.0 ± 0.5		1.50 ± 0.25		0.70 ± 0.01
486.0 ± 0.5	1074 ± 55	1000 ± 50	74 ± 11	41.7 ± 2.3
662.7 ± 0.7		17.8 ± 0.75		0.69 ± 0.03
769.2 ± 0.7	570 ± 20	486 ± 15	84 ± 13	17.5 ± 0.5
953.5 ± 1.0		6.1 ± 0.8		0.20 ± 0.02
1032.2 ± 1.0	1622 ± 55	1540 ± 50	82 ± 12	47.9 ± 1.5
1150.6 ± 1.0		8.25 ± 0.5		0.24 ± 0.02
1331.0 ± 2.0	715 ± 100	485 ± 25		13.3 ± 0.7
1468.0 ± 2.0		1250 ± 50		32.6 ± 1.4
1713.4 ± 2.0		2125 ± 100		51.3 ± 2.4
1771.0 ± 2.0		1900 ± 100		45.1 ± 2.4
1861.9 ± 2.0		300 ± 100		7.0 ± 1.3
2326.7 ± 2.5	310 ± 100	278 ± 15		5.8 ± 0.3
2521.5 ± 2.5		1300 ± 50		25.9 ± 1.0
2619.9 ± 3.0	420 ± 150	340 ± 15	80 ± 151	6.5 ± 0.3
2730.2 ± 3.0		11300 ± 500		216 ± 10
2849.9 ± 3.0		3500 ± 150		65.5 ± 2.8
3178.5 ± 3.0		565 ± 25		10.0 ± 0.4
3296.2 ± 3.5		12.5 ± 5.0		0.22 ± 0.09
3444.0 ± 4.0		898 ± 30		15.3 ± 0.5
3502.0 ± 4.0		4080 ± 100		68.9 ± 1.7
3820.0 ± 4.0		7045 ± 150		114.0 ± 2.4
3986.0 ± 4.0		250 ± 15		4.0 ± 0.3
4254 ± 5		845 ± 40		13.0 ± 0.6
4337 ± 5		3.3 ± 1.0		0.49 ± 0.15
4465 ± 5		1738 ± 50		26.0 ± 0.7
4651 ± 5		2310 ± 100		33.9 ± 1.5
4753 ± 5		215 ± 20		3.1 ± 0.3
4934 ± 5		428 ± 40		6.1 ± 0.6
4962 ± 5		330 ± 20		4.7 ± 0.3
5043 ± 5		550 ± 30		7.7 ± 0.4
5141 ± 5		110 ± 40		1.5 ± 0.5
5185 ± 5		113 ± 40		1.5 ± 0.5
5331 ± 6		2080 ± 100		28.5 ± 1.4
5468 ± 6		4350 ± 150		58.8 ± 2.0
5657 ± 6		113 ± 15		1.5 ± 0.2

¹⁵⁰Nd
60

E ₀ (eV)	Γ (meV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)
5856 ± 6		12200 ± 2000		158 ± 26
6123 ± 6		9965 ± 450		127 ± 6
6329 ± 6		8980 ± 600		113 ± 8
6699 ± 7		855 ± 150		10.5 ± 1.8
6800 ± 7		465 ± 150		5.6 ± 1.8
6853 ± 7		3425 ± 300		41.4 ± 3.6
7060 ± 7		1255 ± 250		14.9 ± 3.0
7158 ± 7		5575 ± 500		65.9 ± 5.9
7404 ± 7		500 ± 150		5.8 ± 1.7
7533 ± 7		14000 ± 750		161.3 ± 8.6
7589 ± 8		34600 ± 1250		397.2 ± 14.4
7660 ± 8		960 ± 300		11.0 ± 3.4
7824 ± 8		3990 ± 500		45.1 ± 5.7
8082 ± 8		8640 ± 600		96.1 ± 6.7
8166 ± 8		7275 ± 600		80.5 ± 6.6
8284 ± 8		7370 ± 600		81.0 ± 6.6
8438 ± 8		565 ± 150		61.5 ± 1.6
8743 ± 9		10315 ± 300		110.3 ± 3.2
8953 ± 9		16715 ± 500		176.7 ± 5.3
9175 ± 9		450 ± 100		4.7 ± 1.0
9303 ± 9		12385 ± 500		128.4 ± 5.4
9529 ± 10		6900 ± 300		70.7 ± 3.1
9906 ± 10		3190 ± 300		32.0 ± 3.0
10010 ± 10		2725 ± 300		27.2 ± 3.0
10315 ± 10		3400 ± 400		33.5 ± 3.9
10389 ± 10		25165 ± 750		246.9 ± 7.4
10998 ± 10		3110 ± 400		29.7 ± 3.8
11147 ± 10		5340 ± 500		50.6 ± 4.7
11262 ± 15		3850 ± 400		36.3 ± 3.8
11647 ± 15		7050 ± 500		65.4 ± 4.5
11932 ± 15		2400 ± 300		22.0 ± 2.7
12119 ± 15		12320 ± 750		111.9 ± 6.8
12456 ± 15		1430 ± 300		12.8 ± 2.7
12747 ± 15		2355 ± 400		20.9 ± 3.5
13083 ± 15		10410 ± 500		91.1 ± 4.4
13312 ± 15		2260 ± 300		19.6 ± 2.6
13378 ± 15		25185 ± 1000		217.7 ± 8.6
13537 ± 15		2565 ± 500		22.0 ± 4.2
13844 ± 15		1130 ± 200		9.6 ± 1.7

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Nd	σ_y	NIM,86,83(70)	Malik
Nd ^{143,145}	σ_a	NP/A,141,193(70)	Okamoto
Nd ¹⁴³	σ_a	PL/B,26,662(68)-	Beg
Nd ¹⁴²⁻¹⁴⁵	activation	JIN,30,697(68)	Cabell
Nd ^{146,148,150}	activation	JIN,29,2155(67)	Alstad
Nd ¹⁴³	σ_a	YF,1,252(65)	Andreev
Nd ¹⁴⁸	activation	ANS,7,270(64)	Ruiz
Nd ^{143,145}	σ_a	PL,1,289(62)	Cheifetz
Nd ^{143,145}	pile osci.	JNE,12,32(60)	Tattersall
Nd ¹⁵⁰	activation	NP,12,261(59)	Sehgal
Nd,Nd ¹⁴³	σ_t	JNE,7,199(58)	Hay
Nd ¹⁴⁵	σ_t	NRDC-103(58)	Hay
Nd,Nd ^{142,144,146}	diffraction	PR,91,597(53)	Koehler
Nd ^{143,145}	mass analys.	PR,90,447(53)	Walker
Nd	pile osci.	CEA-137(52)	Ailloud
Nd	pile osci.	JPR,13,171(52)	Ailloud
Nd ^{142-146,148,150}	pile osci.	PR,88,412(52)	Pomerance
Nd	diffraction	PR,91,597(53)	Koehler
Nd	pile osci.	PR,80,342(50)	Harris
Nd ^{143,145}	mass analys.	PR,76,300(49)	Hess
Nd	σ_t	PR,71,556(47)	Sturm
Nd ¹⁴⁶	activation	ZN,1,179(46)	Bothe

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Nd ¹⁴³	σ_γ (spectra)	55-845	PR/C,5,2030(72)	Stolovy
Nd ¹⁴⁵	σ_γ (spectra)	4.3-663	PR/C,5,2030(72)	Stolovy
Nd ¹⁴³	σ_γ (spectra)	55-446	NP/A,185,229(72)	Weigmann
Nd ¹⁴³	σ_γ (spectra)	0-658	71KNOX,785(71)	Cauvin
Nd ¹⁴⁵	σ_γ (spectra)	4.3-405	71KNOX,785(71)	Cauvin
Nd ¹⁴³	σ_γ	55-2004	71KNOX(71)	Rohr
Nd ¹⁴⁵	σ_γ	43-1494	71KNOX(71)	Rohr
Nd ¹⁴²	σ_t	218-31050	CEA-N-1459(71)	Tellier
Nd ¹⁴³	σ_t	55-5503	CEA-N-1459(71)	Tellier
Nd ¹⁴⁴	σ_t	373-19407	CEA-N-1459(71)	Tellier
Nd ¹⁴⁵	σ_t	42.5-4637	CEA-N-1459(71)	Tellier
Nd ¹⁴⁶	σ_t	350-31036	CEA-N-1459(71)	Tellier
Nd ¹⁴⁸	σ_t	94.9-23046	CEA-N-1459(71)	Tellier
Nd ¹⁵⁰	σ_t	78.2-24730	CEA-N-1459(71)	Tellier
Nd ¹⁴³	σ_a	4.4-102	NP/A,154,177(70)	Kvitek
Nd ¹⁴⁵	σ_a	0-705	NP/A,154,177(70)	Kvitek
Nd	$\sigma_c \sigma_\gamma$	4-945	NP/A,134,118(69)	Alves
Nd	σ_γ	4.3-566	JNE,23,369(69)	Migneco
Nd ¹⁴²	$\sigma_c \sigma_\gamma$	1685-9987	YF,8,639(68)	Karzhavina
Nd ¹⁴³	$\sigma_c \sigma_\gamma$	55.4-840	YF,8,639(68)	Karzhavina
Nd ¹⁴⁴	$\sigma_c \sigma_\gamma$	374-13540	YF,8,639(68)	Karzhavina
Nd ¹⁴⁵	$\sigma_c \sigma_\gamma$	42.6-1010	YF,8,639(68)	Karzhavina
Nd ¹⁴⁶	$\sigma_c \sigma_\gamma$	361-6723	YF,8,639(68)	Karzhavina
Nd ¹⁴⁸	$\sigma_c \sigma_\gamma$	155-8781	YF,8,639(68)	Karzhavina
Nd ¹⁵⁰	$\sigma_c \sigma_\gamma$	78.9-3843	YF,8,639(68)	Karzhavina
Nd	$\sigma_c \sigma_\gamma$	4.3-128	JPR,24,999(63)	Bianchi
Nd	$\sigma_c \sigma_\gamma$	4.4-193	BAP,7,288(62)+	Amram
Nd	σ_γ	4.4-193	ANL-6589(62)+	Carpenter
Nd	σ_t	0.01-10	JNE,7,199(58)	Hay
Nd ¹⁴³	σ_t	56-190	PRIVATE COMM.(56)	Stolovy
Nd ¹⁴⁵	σ_t	4.4-96	PRIVATE COMM.(56)	Stolovy

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 8400 \pm 1680 \text{ b}$$

¹⁴⁶₆₁Pm
[5.53 yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 181 \pm 7 \text{ b} \\ \sigma_{\gamma} &= 96.0 \pm 1.8 \text{ b [5.37 day } ^{148}\text{Pm}^{\text{a}}] \\ \sigma_{\gamma} &= 85 \pm 5 \text{ b [41.3 day } ^{148}\text{Pm}^{\text{a}}] \\ \sigma_{\text{t}} &= 205 \pm 7 \text{ b}\end{aligned}$$

¹⁴⁷₆₁Pm
[2.62 yr]

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 1274 \pm 66 \text{ b [5.37 day } ^{148}\text{Pm}^{\text{a}}] \\ I_{\gamma} &= 1026 \pm 280 \text{ b [41.3 day } ^{148}\text{Pm}^{\text{a}}] \\ \langle D \rangle &= 6.8 \pm 1.5 \text{ eV} \\ S_0 &= 3.1 \pm 0.8\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\text{a}} = 7/2^{\text{a}}$$

$$S_n = 5900 \pm 10 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
-1.8		(80)	1.95
5.36 ± 0.01	34.3 ± 1.9	70 ± 6	14.8 ± 0.8
6.57 ± 0.01	1.8 ± 0.2	79 ± 8	0.69 ± 0.08
6.92 ± 0.01	4.6 ± 0.3	64 ± 6	1.74 ± 0.10
15.11 ± 0.05	1.2 ± 0.1	63 ± 8	0.31 ± 0.02
19.5 ± 0.1	4.20 ± 0.18		0.95 ± 0.04
29.2 ± 0.1	1.7 ± 0.3		0.31 ± 0.06
35.4 ± 0.1	0.42 ± 0.12		0.07 ± 0.02
38.1 ± 0.1	24.7 ± 1.9		4.0 ± 0.3
39.9 ± 0.1	15.8 ± 1.3		2.5 ± 0.2
45.6 ± 0.2	24.3 ± 2.0		3.6 ± 0.3
48.1 ± 0.2	18.7 ± 1.0		2.7 ± 0.2
52.3 ± 0.2	2.2 ± 0.2		0.30 ± 0.03
55.7 ± 0.2	1.5 ± 0.6		0.20 ± 0.08
65.4 ± 0.2	54.2 ± 4.9		6.7 ± 0.6
82.5 ± 0.2	27.2 ± 3.6		3.0 ± 0.4
85.4 ± 0.2	30.5 ± 4.6		3.3 ± 0.5
95.2 ± 0.3	24.4 ± 4.9		2.5 ± 0.5
99.5 ± 0.3	36.9 ± 5.0		3.7 ± 0.5
115.1 ± 0.3	64.4 ± 10.7		6.0 ± 1.0
131.1 ± 0.3	183.2 ± 34.4		16.0 ± 3.0
140.5 ± 0.5	2.4 ± 1.6		0.3 ± 0.2
144.6 ± 0.5	10.6 ± 8.4		0.9 ± 0.7
147.9 ± 0.5	94.8 ± 12.2		7.8 ± 1.0
153.9 ± 0.5	49.6 ± 12.4		4.0 ± 1.0
173.2 ± 0.7	322 ± 53		24.5 ± 4.0

¹⁴⁷₆₁Pm

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
178.8 ±0.7	16.0 ± 6.7		1.2 ±0.5
188.9 ±0.7	118 ±26		8.6 ±1.9
192.2 ±0.7	121 ±25		8.7 ±1.8
208.4 ±0.8	137 ±33		9.5 ±2.3
211.2 ±0.8	132 ±32		9.1 ±2.2
220.3 ±1.0	107 ±30		7.2 ±2.0
230.3 ±1.0	100 ±27		6.6 ±1.8
239.1 ±1.0	230 ±60		14.9 ±3.9
247.9 ±1.0	38 ±17		2.4 ±1.1
275.3 ±1.2	141 ±41		8.5 ±2.5
284.0 ±1.2	163 ±46		9.7 ±2.7
297.0 ±1.5	59 ±19		3.4 ±1.1
316.5 ±1.5	125 ±32		7.0 ±1.8

^{148m}₆₁Pm

[41.3 day]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 22000 \pm 2500 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 3600 \pm 2400 \text{ b}$$

RESONANCE PARAMETERS

$$S_n = 7266 \pm 10 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
0.169	81 ±4	0.588 ±0.032	79.6 ±4	1.43 ±0.08

^{148g}₆₁Pm

[5.37 day]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 2000 \pm 1000 \text{ b}$$

¹⁴⁹₆₁Pm

[53.1 hr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 1400 \pm 300 \text{ b}$$

¹⁵¹₆₁Pm

[28.4 hr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma < 700 \text{ b}$$

61-2

D/2

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pm ¹⁴⁷	σ_t	NSE, 43, 58(71)	Codding
Pm ¹⁴⁷	σ_t	KAPL-3974(71)	Kirouac
Pm ¹⁴⁷	activation	CJP, 49, 108(71)	Mowatt
Pm ¹⁴⁷	activation	JIN, 32, 3433(70)	Cabell
Pm ¹⁴⁷	σ_t	68WASH, 2, 687(68)	Kirouac
Pm ^{149, 151}	depletion	68WASH, 2, 1291(68)	Mowatt
Pm ^{147, 148, 148M}	mass spectrometry	JIN, 29, 2147(67)	Fenner
Pm ¹⁴⁶	activation	JIN, 29, 2117(67)	Pinajian
Pm ¹⁴⁹	activation	AE, 19, 188(65)	Kondurov
Pm ^{149G, 148M}	mass spectrometry	PR-CM-35, 102(63)	Mathews
Pm ^{147, 148G, 148M}	activation	NSE, 12, 519(62)	Schuman
Pm ¹⁴⁷	activation	62VIENNA, 239(62)	Stoughton
Pm ¹⁴⁷	mass spectrometry	58GENEVA, 15, 459(58)	Bidinosti
Pm ¹⁴⁷	σ_t	58GENEVA, 16, 150(58)	Harvey
Pm ¹⁴⁷	mass spectrometry	AE, 3, 11(57)	Gorshkov
Pm ¹⁴⁷	activation	PR, 72, 85(47)	Parker

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pm ¹⁴⁷	σ_t	0.01-250	NSE, 43, 58(71)	Codding
Pm ¹⁴⁷	σ_t	0-317	KAPL-3974(71)	Kirouac
Pm ¹⁴⁸	σ_t	0.17-7.5	KAPL-3974(71)	Kirouac
Pm ¹⁴⁷	σ_t	5.4-316	RPI-328-171, 29(69)	Eiland
Pm ¹⁴⁸	σ_t	0.17-7.5	PRIVATE COMM. (69)	Kirouac
Pm ¹⁴⁷	σ_t	0.01-192	68WASH, 2, 687(68)	Kirouac
Pm ¹⁴⁷	σ_t	1.0-50.3	ORNL-2610, 22(58)	Block
Pm ¹⁴⁷	σ_t	1.0-50.3	58GENEVA, 16, 150(58)	Harvey

⁶²Sm

THERMAL CROSS SECTIONS

$$\sigma_T = 5800 \pm 100 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 1400 \pm 200 \text{ b}$$

$$S_0 = 3.2 \pm 0.4$$

¹⁴⁴₆₂Sm

THERMAL CROSS SECTIONS

$$\sigma_T \sim 0.7 \text{ b}$$

¹⁴⁵₆₂Sm

[340 day]

THERMAL CROSS SECTIONS

$$\sigma_T \sim 110 \text{ b}$$

¹⁴⁷₆₂Sm

THERMAL CROSS SECTIONS

$$\sigma_T = 64 \pm 5 \text{ b}$$

$$\sigma_s = 11 \pm 7 \text{ b}$$

$$\sigma_a = 0.18 \pm 0.02 \text{ mb [} ^{144}\text{Nd}^{0+} \text{]}$$

$$\sigma_a = 0.57 \pm 0.04 \text{ mb [} ^{144}\text{Nd}^{2+} \text{]}$$

$$\sigma_c = 75 \pm 6 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 714 \pm 50 \text{ b}$$

$$\langle D \rangle = 7.4 \pm 0.7 \text{ eV}$$

$$S_0 = 4.6 \pm 0.4$$

RESONANCE PARAMETERS

$$I^n = 7/2^-$$

$$\% \text{Abn} = 15.0$$

$$S_n = 8140.2 \pm 1.2 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_a (meV)
-2.0			(66)	2.97	
3.42 ± 0.02	1.15 ± 0.03	3	66 ± 3	0.62 ± 0.02	2.5 ± 0.3
18.30 ± 0.05	79 ± 1	4	78 ± 5	18.5 ± 0.2	0.36 ± 0.01
27.7 ± 0.1	6.0 ± 0.3	3		1.15 ± 0.06	0.36 ± 0.06
29.9 ± 0.1	13.0 ± 0.5	3	61 ± 16	2.38 ± 0.09	0.52 ± 0.05
32.1 ± 0.1	44.0 ± 1.2	4	78 ± 26	7.77 ± 0.21	0.26 ± 0.02
39.7 ± 0.1	82.6 ± 1.8	4		13.1 ± 0.29	0.27 ± 0.02
40.6 ± 0.1	4.4 ± 0.2	3		0.69 ± 0.03	

¹⁴⁷₆₂Sm

E ₀ (eV)	2g _π ⁰ (meV)	J	Γ _γ (meV)	2g _π ⁰ (meV)	Γ _α (meV)
49.3 ± 0.2	17.0 ± 0.6	3	41 ± 9	2.42 ± 0.09	0.15 ± 0.06
57.9 ± 0.2	37.6 ± 0.8	4		4.94 ± 0.11	0.43 ± 0.05
65.2 ± 0.2	6.0 ± 1.2			0.74 ± 0.15	
65.4 ± 0.2	4.0 ± 0.8	4		0.50 ± 0.10	
76.4 ± 0.2	16.3 ± 0.6	4		1.86 ± 0.07	0.05 ± 0.05
80.0 ± 0.3	2.8 ± 0.3	4		0.31 ± 0.03	0.33 ± 0.03
83.4 ± 0.3	66.2 ± 3.0	3		7.25 ± 0.33	2.3 ± 0.1
94.9 ± 0.3	17 ± 4			1.76 ± 0.41	
99.5 ± 0.3	242 ± 12			24.3 ± 1.2	0.14 ± 0.07
103.1 ± 0.3	166 ± 10	3		16.3 ± 1.0	1.2 ± 0.2
107.2 ± 0.3	44.0 ± 1.4	4		4.25 ± 0.14	0.57 ± 0.27
123.9 ± 0.3	162 ± 4	3		14.6 ± 0.4	0.94 ± 0.09
140.5 ± 0.4	77 ± 2			6.5 ± 0.2	
143.6 ± 0.4	2.0 ± 0.2			0.17 ± 0.02	
151.7 ± 0.4	140 ± 5			11.4 ± 0.4	0.68 ± 0.034
161.0 ± 0.4	51 ± 3			4.0 ± 0.2	0.58 ± 0.02
162.4 ± 0.4	12 ± 2			0.94 ± 0.16	
163.8 ± 0.4	88 ± 10	4		6.9 ± 0.8	0.58 ± 0.02
172.0 ± 0.4	14 ± 1	4		1.1 ± 0.8	
180.0 ± 0.4	3.3 ± 0.6	3		0.25 ± 0.05	
185.0 ± 0.4	328 ± 16			24.1 ± 1.2	10 ± 6
191.3 ± 0.5	10.8 ± 1.4			0.78 ± 0.10	
193.5 ± 0.5	2.6 ± 0.6			0.19 ± 0.04	
198.3 ± 0.5	8.4 ± 0.9			0.60 ± 0.06	
206.0 ± 0.6	200 ± 10			13.9 ± 0.7	
221.8 ± 0.6	115 ± 5			7.72 ± 0.34	
226.0 ± 0.6	190 ± 20			12.6 ± 1.3	
229.0 ± 0.6	2.5 ± 0.4			0.17 ± 0.03	
240.9 ± 0.6	10.0 ± 2.0			0.64 ± 0.13	
241.8 ± 0.6	14.2 ± 0.2			0.31 ± 0.01	
248.3 ± 0.7	145 ± 7			9.20 ± 0.44	
257.5 ± 0.7	90 ± 10			5.6 ± 0.6	
264.3 ± 0.7	68 ± 6			4.2 ± 0.4	
267.3 ± 0.7	192 ± 6			11.7 ± 0.4	
271.8 ± 0.7	82 ± 4			4.97 ± 0.24	
275.1 ± 0.7	14 ± 2			0.84 ± 0.12	
284.1 ± 0.8	22 ± 2			1.3 ± 0.1	
291.0 ± 0.8	40 ± 3			2.3 ± 0.2	
308.0 ± 0.8	5.0 ± 1.2			0.28 ± 0.07	
312.0 ± 0.8	12 ± 4			0.88 ± 0.23	
321.0 ± 0.8	7 ± 2			0.39 ± 0.11	
331.5	70 ± 4			3.8 ± 0.2	
336.6	66 ± 4			3.6 ± 0.2	
341.4	76 ± 12			4.1 ± 0.7	
351.0	52 ± 6			2.8 ± 0.3	
360.4	300 ± 30			15.8 ± 1.6	
363.0	21 ± 10			1.1 ± 0.5	
380.4	400 ± 20			20.5 ± 1.0	
383.8	112 ± 10			5.71 ± 0.51	
392.4	120 ± 10			6.06 ± 0.51	
398.5	86 ± 10			4.3 ± 0.5	
400.5	90 ± 10			4.5 ± 0.5	

$^{147}_{62}\text{Sm}$

E_0 (eV)	$2g^2_{\gamma}$ (meV)	J	Γ_{γ} (meV)	$2g^2_{\beta}$ (meV)	Γ_{β} (meV)
406.5	28 ± 6			1.4 ± 0.3	
413.8	52 ± 8			2.6 ± 0.4	
420.0	200 ± 30			9.76 ± 1.46	
423.7	50 ± 20			2.42 ± 0.97	
437.8	180 ± 30			8.60 ± 1.43	
441.7	36 ± 10			1.71 ± 0.48	
460.7	118 ± 20			5.5 ± 0.9	
464.8	62 ± 16			2.9 ± 0.7	
478.1	136 ± 20			6.2 ± 0.9	
481.8	186 ± 20			8.5 ± 0.9	
488.9	114 ± 16			5.2 ± 0.7	
498.5	130 ± 30			5.8 ± 1.3	
501.7	244 ± 40			10.9 ± 1.8	
516	440 ± 40			19.4 ± 1.8	
532	88 ± 20			3.8 ± 0.9	
535	84 ± 40			3.6 ± 1.7	
541	520 ± 80			22.4 ± 3.4	
549	224 ± 40			9.6 ± 1.7	
556	700 ± 100			29.7 ± 4.2	
562	200 ± 40			8.4 ± 1.7	
567	210 ± 40			8.8 ± 1.7	
570	32 ± 20			1.34 ± 0.84	
577	132 ± 30			5.5 ± 1.2	
583	154 ± 30			6.4 ± 1.2	
591	86 ± 30			3.5 ± 1.2	
600	170 ± 40			6.9 ± 1.6	
609	169 ± 40			6.6 ± 1.6	
617	124 ± 50			5.0 ± 2.0	
621	460 ± 100			18.5 ± 4.0	
626	184 ± 40			7.4 ± 1.6	
636	46 ± 20			1.8 ± 0.8	
648	104 ± 40			4.1 ± 1.6	
653	224 ± 80			8.8 ± 3.1	
656	76 ± 40			3.0 ± 1.6	
663	76 ± 40			3.0 ± 1.6	
673	74 ± 40			2.9 ± 1.5	
682	178 ± 60			6.8 ± 2.3	
687	224 ± 80			8.5 ± 3.1	
692	52 ± 40			2.0 ± 1.5	
701	94 ± 40			3.6 ± 1.5	
718	164 ± 60			6.1 ± 2.2	
722	102 ± 60			3.8 ± 2.2	
733	324 ± 100			12.0 ± 3.7	
738	366 ± 100			13.5 ± 3.7	
749	124 ± 60			4.5 ± 2.2	
757	314 ± 100			11.4 ± 3.6	
763	368 ± 120			13.3 ± 4.3	
769	870 ± 200			31 ± 7	
800	144 ± 60			5.1 ± 2.1	
812	580 ± 160			20 ± 6	
825	440 ± 120			15 ± 4	
840	210 ± 60			7 ± 2	

¹⁴⁷₆₂Sm

E_0 (eV)	$2g_0^2$ (meV)	J	Γ_γ (meV)	$2g_0^2$ (meV)	Γ_n (meV)
859	2200 ± 400			75 ± 14	
880	680 ± 160			23 ± 5	
901	830 ± 160			28 ± 5	
928	350 ± 160			11.5 ± 5.3	
936	760 ± 300			23 ± 10	
940	960 ± 400			31 ± 13	
949	540 ± 200			18 ± 6	
967	220 ± 80			7.1 ± 2.6	
989	560 ± 200			18 ± 6	
996	280 ± 100			9 ± 3	
1034	830 ± 300			26 ± 9	
1046	380 ± 140			12 ± 4	
1058	740 ± 200			23 ± 6	
1069	780 ± 200			24 ± 6	
1077	190 ± 100			6 ± 3	
1090	880 ± 200			27 ± 6	
1109	640 ± 200			19 ± 6	
1120	1140 ± 300			34 ± 9	
1137	670 ± 300			20 ± 9	
1161	250 ± 100			7 ± 3	

¹⁴⁸₆₂Sm

THERMAL CROSS SECTIONS

$$\sigma_T = 2.7 \pm 0.6 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 27 \pm 14 \text{ b}$$

¹⁴⁹₆₂Sm

Thermal Cross Sections

$\sigma_f = 41000 \pm 2000$ b
 $\sigma_a = 5.23 \pm 0.17$ mb (¹⁴⁹Sm⁰⁺)
 $\sigma_n = 38.7 \pm 0.5$ mb (¹⁴⁹Sm²⁺)

Resonance Properties

$I_{\gamma}^* = 3103$ b
 $\langle E \rangle = 2.3 \pm 0.3$ eV
 $S_0 = 5.1 \pm 0.9$

Resonance Parameters

$I^* = 7/2^+$		$\Sigma \sigma_{\text{br}} = 13.8$		$S_n = 7985.2 \pm 0.8$ keV	
E_0 (eV)	$2\sigma_{\text{br}}^0$ (eV)	J	Γ_{γ} (meV)	$2\sigma_{\text{br}}^0$ (meV)	Γ_n (meV)
-0.285		3		1.83	
0.0976 ± 0.003	0.600 ± 0.009	4	60.5 ± 0.6	1.92 ± 0.03	.060 ± 0.025
0.872 ± 0.003	0.835 ± 0.045	4	59.7 ± 1.0	0.894 ± 0.045	0.04 ± 0.007
4.95 ± 0.03	2.50 ± 0.25	4	66.7 ± 3.0	1.13 ± 0.11	0.043 ± 0.009
6.44 ± 0.05	0.63 ± 0.28	3		0.25 ± 0.11	0.072 ± 0.015
8.95 ± 0.07	9.4 ± 1.6	4	60.3 ± 6.0	3.13 ± 0.54	0.042 ± 0.006
12.05 ± 0.08	1.4 ± 0.2	3		0.41 ± 0.06	0.22 ± 0.05
14.9 ± 0.1	5.9 ± 0.5	4		1.52 ± 0.13	0.060 ± 0.015
15.9 ± 0.1	0.30 ± 0.04	3		0.08 ± 0.01	
17.1 ± 0.1	2.8 ± 0.4	4		0.68 ± 0.01	0.054 ± 0.030
23.2 ± 0.1	1.2 ± 0.2	4		0.25 ± 0.04	
24.6 ± 0.1	0.36 ± 0.07			0.07 ± 0.01	
25.2 ± 0.1	15 ± 3	3		2.99 ± 0.60	0.23 ± 0.30
26.1 ± 0.1	4.4 ± 0.5	4		0.86 ± 0.10	
27.9 ± 0.1	0.30 ± 0.06	3		0.06 ± 0.01	
29.8 ± 0.1	4.7 ± 1.6	3		0.06 ± 0.29	
30.7 ± 0.1	10 ± 3	4		1.80 ± 0.54	0.28 ± 0.06
33.9 ± 0.1	6.7 ± 1.0	4		1.15 ± 0.17	0.13 ± 0.07
40.2 ± 0.1	23.6 ± 2.8	3		3.72 ± 0.44	1.0 ± 0.1
41.3 ± 0.1	42.5 ± 3.8	3		6.63 ± 0.59	0.67 ± 0.09
44.3 ± 0.1	90 ± 27	4		13.5 ± 4.1	
45.1 ± 0.2	23 ± 6	4		3.42 ± 0.89	0.03 ± 0.03
49.5 ± 0.2	10 ± 3	3		1.42 ± 0.43	
50.5 ± 0.2	2.2 ± 0.4	(4)		0.31 ± 0.06	
51.6 ± 0.2	41 ± 4	4		5.71 ± 0.56	0.11 ± 0.06
57.4 ± 0.2	37.6 ± 4.6	4		4.96 ± 0.61	
59.8 ± 0.2	70 ± 7	4		9.1 ± 0.9	
60.9 ± 0.2	2.3 ± 0.6	3		0.29 ± 0.08	
62.1 ± 0.2	50 ± 5	4		6.34 ± 0.63	
64.8 ± 0.2	65 ± 7	4		8.07 ± 0.87	
68.2 ± 0.2	28.2 ± 5.2	4		3.41 ± 0.63	
70.7 ± 0.2	82.4 ± 14.6	3		9.80 ± 1.74	
73.0 ± 0.2	134.4 ± 25.4	4		15.73 ± 2.97	
74.7 ± 0.2	29 ± 6	(4)		3.36 ± 0.69	
75.3 ± 0.2	27 ± 5	3		3.11 ± 0.58	
76.9 ± 0.9	4.5 ± 0.8			0.51 ± 0.09	
83.8 ± 0.2	20 ± 5			2.19 ± 0.55	

¹⁴⁹₆₂Sm

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	Γ_a (meV)
87.7 ±0.3	22 ± 4			2.35 ±0.43	
90.5 ±0.3	75 ±11			7.88 ±1.6	
92.1 ±0.3	57 ±17			5.94 ±1.77	
*95.6 ±0.3	(130)			(13.3)	
*96.3 ±0.3					
96.1 ±0.3	(22)			(2.2)	
99.5 ±0.3	(12)			1.2	
101.6 ±0.3	2.8 ± 0.5			0.28 ±0.05	
104.7 ±0.3	20 ± 4	[4]		1.95 ±0.39	
107.0 ±0.3	12 ± 2			1.2 ±0.2	
109.2 ±0.3	16 ± 2	[4]		1.5 ±0.3	
111.2 ±0.3	13 ± 2			1.2 ±0.2	
115.3 ±0.3	10 ± 2	[3]		0.93 ±0.20	
117.0 ±0.3	3.2 ± 1.2			0.28 ±0.11	
119.4 ±0.3	19 ± 4			1.7 ±0.4	
121.7 ±0.3	1.7 ± 0.8			0.15 ±0.07	
125.4 ±0.3	33 ± 8	[3]		2.9 ±0.7	
127.1 ±0.3	2.6 ± 0.4			0.23 ±0.04	
129.9 ±0.3	4.7 ± 0.6	3		0.42 ±0.05	
134.3 ±0.4	180 ±60	[3]		15 ±5	
140.2 ±0.4	1.7 ± 0.3	[3]		0.14 ±0.03	
144.2 ±0.4	31 ± 6			2.6 ±0.5	
*145.7 ±0.4	(160)			(13)	
*146.9 ±0.4					
149.5 ±0.4	8.6 ± 1.4			0.62 ±0.12	
154.7 ±0.4	54 ±16			4.3 ±1.3	
157.5 ±0.4	19 ± 4			1.5 ±0.3	
158.7 ±0.4	4.0 ± 0.5			3.2 ±0.4	
168.3 ±0.5	20 ± 4			1.5 ±0.3	
173.5 ±0.5	(3.6)			(0.27)	
174.7 ±0.5	(3.6)			(0.27)	
177.8 ±0.5	(70)			(5.3)	
179.9 ±0.5	(70)			(5.3)	
185.4 ±0.5	52 ±48			3.8 ±3.5	
188.0 ±0.5	44 ±26			3.2 ±1.9	
192.9 ±0.5	12 ± 3			0.87 ±0.22	
195.0 ±0.5	2.2 ± 0.4			0.16 ±0.03	
197.4 ±0.5	20 ± 6			1.4 ±0.4	
201.1 ±0.6	(8.0)			(0.56)	
203.7 ±0.6	44 ±26			3.1 ±1.8	
210.9 ±0.6	10 ± 2			0.69 ±0.14	
214.7 ±0.6	17 ± 5			1.2 ±0.3	
218.2 ±0.6	9 ± 2			0.61 ±0.14	
225.6 ±0.6	31 ±10			2.1 ±0.7	
228.2 ±0.6	25 ± 0			1.6 ±0.5	
230.1 ±0.6	52 ±30			3.4 ±2.0	
234.0 ±0.6	8 ± 3			0.5 ±0.2	
239.4 ±0.6	(8.0)			(0.52)	
240.1 ±0.7	14 ± 3			0.9 ±0.2	
244.3 ±0.7	30 ±11			1.9 ±0.7	
248.7 ±0.7	18 ± 5			1.1 ±0.3	

* Doublet.

¹⁵⁰₆₂Sm

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 102 \pm 5 \text{ b}$$

$$\sigma_t = 133 \pm 8 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 310 \pm 15 \text{ b}$$

$$\langle D \rangle = 68 \pm 10 \text{ eV}$$

$$S_0 = 3.6 \pm 0.3$$

RESONANCE PARAMETERS

$$I^{\circ} = 0^{\circ}$$

$$\lambda_{\text{Abn}} = 7.4$$

$$S_n = 5596 \pm 1 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_{γ} (meV)	Γ_n^0 (meV)
-3.2		(60)	3.97
20.7	46.9 ± 1.5	60 ± 6	10.3 ± 0.3
48.1	18.1 ± 0.6		2.61 ± 0.09
111.4	13.9 ± 1.3		1.32 ± 0.12
139.9	5.2 ± 1.1		0.44 ± 0.09
216.5	14.9 ± 2.5		1.0 ± 0.2
266.9	730 ± 30		45 ± 2
311.9	317 ± 20		18 ± 1
380.2	1228 ± 70		63 ± 3.6
463.7	410 ± 50		19 ± 2
502	139 ± 25		6.2 ± 1
556	597 ± 60		25.3 ± 2.5
721	258 ± 45		10 ± 2
735	970 ± 100		36 ± 4
832	1470 ± 150		51 ± 5
943	1015 ± 150		33 ± 5
1023	242 ± 80		7.6 ± 2.5
1168	1970 ± 200		58 ± 6
1225	810 ± 200		23 ± 6
1356	1220 ± 150		33 ± 4
1409	2935 ± 350		78 ± 9
1512	550 ± 200		14 ± 5
1563	785 ± 260		20 ± 7

¹⁵¹
₆₂Sm
[93 yr]

THERMAL CROSS SECTIONS

$$\sigma_T = 15000 \pm 1800 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 3300 \pm 700 \text{ b}$$

$$\langle D \rangle = 1.3 \pm 0.2 \text{ eV}$$

$$S_0 = 4.0 \pm 1.8$$

RESONANCE PARAMETERS

$$J^\pi = 7/2^-$$

$$S_n = 8258 \pm 1 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	Γ_T (meV)	$2g\Gamma_n^0$ (meV)
-0.015 ± 0.015	120 ± 20			0.26 ± 0.03
1.103 ± 0.002	80 ± 5	0.68 ± 0.04	79.3 ± 5	0.65 ± 0.04
1.711 ± 0.004	60 ± 11	0.29 ± 0.026	59.7 ± 11	0.22 ± 0.02
2.047 ± 0.003	69 ± 10	0.52 ± 0.03	68.5 ± 10	0.36 ± 0.02
4.10 ± 0.02		0.57 ± 0.1		0.28 ± 0.05
4.19 ± 0.02		0.43 ± 0.14		0.21 ± 0.07
5.33 ± 0.05		0.46 ± 0.23		0.20 ± 0.1
6.44 ± 0.03		4.9 ± 0.5		1.84 ± 0.2
10.49 ± 0.05		12.6 ± 1.6		3.9 ± 0.5
11.33 ± 0.06		5.05 ± 1.4		1.5 ± 0.4
12.75 ± 0.08		2.5 ± 1.4		0.7 ± 0.4

¹⁵²
₆₂Sm

THERMAL CROSS SECTIONS

$$\sigma_T = 206 \pm 6 \text{ b}$$

$$a_{coh} = -5.0 \pm 0.6 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 3000 \pm 200 \text{ b}$$

$$R_T = 8.2 \pm 0.7 \text{ fm}$$

$$\langle D \rangle = 51.8 \pm 4.3 \text{ eV}$$

$$S_0 = 2.2 \pm 0.4$$

RESONANCE PARAMETERS

$$J^\pi = 0^+$$

$$ZAbn = 26.7$$

$$S_n = 5867.0 \pm 0.4 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_T (meV)	Γ_n^0 (meV)
8.047 ± 0.007	195 ± 5	130 ± 5	68 ± 7	45.8 ± 1.8
62.20 ± 0.06		4 ± 2	(65)	0.51 ± 0.25
87.70 ± 0.09	270 ± 19	205 ± 18	65 ± 25	21.9 ± 2
154.1 ± 0.2	235 ± 15	142 ± 18		11.4 ± 1.5
185.2 ± 0.2	70 ± 10	19 ± 2	51 ± 10	1.4 ± 0.15

¹⁵²₆₂Sm

E_x (eV)	Γ (meV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
237.2 ± 0.2	510 ± 34	420 ± 30		27 ± 2
314.7 ± 0.3	230 ± 22	135 ± 20		7.6 ± 1.1
327.2 ± 0.3	290 ± 25	205 ± 20		11.3 ± 1.1
385.1 ± 0.4	85 ± 7	40 ± 6		2.04 ± 0.3
415.8 ± 0.4	115 ± 8	57 ± 5		2.80 ± 0.25
505.9 ± 0.5	279 ± 4	195 ± 15		8.7 ± 0.7
587.1 ± 0.5	240 ± 20	159 ± 16		6.6 ± 0.7
641.9 ± 0.5	455 ± 30	380 ± 20		15.0 ± 0.8
768.7 ± 0.6	585 ± 35	490 ± 25		17.7 ± 0.9
775.4 ± 0.6	2350 ± 150	2300 ± 150		8.3 ± 5
792.5 ± 0.6	175 ± 10	115 ± 8		4.1 ± 0.3
852.9 ± 0.4	475 ± 25	395 ± 30		13.5 ± 1
928.7 ± 0.4		6 ± 3		0.2 ± 0.1
952.3 ± 0.4	490 ± 20	410 ± 30		13.3 ± 1
986.4 ± 0.5	270 ± 20	205 ± 22		6.5 ± 0.7
1047.6 ± 0.6	300 ± 20	220 ± 25		6.8 ± 0.8
1081.8 ± 0.7		33 ± 5		1.0 ± 0.15
1113.2 ± 0.8		30 ± 4		1.14 ± 0.12
1228.1 ± 0.6		414 ± 28		11.8 ± 0.8
1239.5 ± 0.6		510 ± 32		14.5 ± 0.9
1314.4 ± 0.6		250 ± 22	73 ± 25	6.8 ± 0.6
1402.4 ± 0.7		1120 ± 75		30 ± 2
1427.2 ± 0.7		1250 ± 115		33 ± 3
1501.9 ± 0.8		97 ± 12		2.5 ± 0.3
1541.3 ± 0.8		389 ± 76		9.9 ± 2.0
1600.6 ± 0.9		320 ± 48		8.0 ± 1.2
1691.8 ± 0.5		1110 ± 85		27 ± 2
1730.0 ± 0.6		140 ± 50		3.4 ± 1.2
1750.3 ± 0.6		8.4 ± 8.4		0.2 ± 0.2
1806.9 ± 0.6		100 ± 40		2.4 ± 0.9
1875.6 ± 0.6		8.6 ± 4.3		0.2 ± 0.1
1954.8 ± 0.7		390 ± 50		8.8 ± 1.1
1987.0 ± 1.0		13 ± 10		0.3 ± 0.2
2046.6 ± 0.7		27 ± 9		0.6 ± 0.2
2121.5 ± 0.7		850 ± 92		18.5 ± 2.0
2196.7 ± 0.8		9 ± 5		0.2 ± 0.1
2237.1 ± 0.8		280 ± 38		5.9 ± 0.8
2310.5 ± 0.9		270 ± 38		5.6 ± 0.8
2367.8 ± 0.9		200 ± 30		4.1 ± 0.6
2392.5 ± 0.9		180 ± 30		3.7 ± 0.6
2456.3 ± 1.0		400 ± 40		8.1 ± 0.8
2490.0 ± 1.0		10 ± 5		0.2 ± 0.1
2522.0 ± 1.0		45 ± 20		0.9 ± 0.4
2582.6 ± 1.0		150 ± 30		3.0 ± 0.6
2648.5 ± 1.1		2265 ± 210		44 ± 4
2656.9 ± 1.1		1190 ± 155		23 ± 3
2695.8 ± 1.1		410 ± 60		7.9 ± 1.2
2854.0 ± 2.0		32 ± 11		0.6 ± 0.2
2912.1 ± 1.1		1350 ± 160		25 ± 3
2925.0 ± 1.2		60 ± 22		1.1 ± 0.4
2966.6 ± 1.2		460 ± 170		8.4 ± 1.3
2985.5 ± 1.2		1200 ± 165		22 ± 3

¹⁵²
₆₂Sm

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
3030.7 ±1.2		610 ± 85		11.1 ±1.5
3104.0 ±2.0		180 ± 40		3.2 ±0.7
3157.9 ±1.3		490 ± 62		8.7 ±1.1
3258.7 ±1.3		550 ± 70		9.6 ±1.2
3288.2 ±1.3		1090 ±120		19.0 ±2.1
3315.5 ±1.4		120 ± 30		2.1 ±0.5
3433.5 ±1.4		1145 ±120		19.5 ±2.0
3464.0 ±1.4		450 ± 70		7.6 ±1.2
3512.0 ±1.5		682 ± 90		11.5 ±1.5
3537.8 ±1.5		2440 ±300		41 ±5
3609.4 ±1.6		130 ± 40		2.2 ±0.7
3665.0 ±1.6		2300 ±240		38 ±4
3826.6 ±1.6		300 ± 40		4.8 ±0.6
3925.7 ±1.7		690 ± 90		11.0 ±1.4
4028.4 ±1.7		380 ± 50		6.0 ±0.8
4075.5 ±1.8		220 ± 50		3.4 ±0.8
4101.5 ±1.8		762 ±100		11.9 ±1.6
4172.6 ±1.9		4070 ±390		63 ±6
4215.3 ±1.9		570 ± 80		8.8 ±1.2
4320.3 ±1.9		1010 ±130		15.4 ±2.0
4405.0 ±2.0		60 ± 27		0.9 ±0.4
4523.0 ±2.0		410 ± 60		6.1 ±0.9
4557.0 ±2.0		380 ± 60		5.6 ±0.9
4590.0 ±2.0		280 ± 47		4.1 ±0.7
4651.0 ±2.0		560 ± 60		8.2 ±0.9
4668.0 ±2.0		1570 ±140		23 ±2
4725.0 ±2.0		68 ± 28		1.0 ±0.4
4777.0 ±2.0		510 ± 70		7.4 ±1.0
4923.0 ±2.0		760 ±115		10.8 ±1.6
4946.0 ±3.0		390 ± 63		5.5 ±0.9
4985.0 ±3.0		1625 ±215		23 ±3
5073.0 ±3.0		2140 ±285		30 ±4
5100.0 ±3.0		270 ± 70		3.8 ±1.0

¹⁵⁴
⁶²Sm

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 5.5 \pm 1.1 \text{ b}$$

$$a_{\text{coh}} = 8.0 \pm 1.0 \text{ fm}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 30 \pm 10 \text{ b}$$

$$R_{\gamma}^c = 8.2 \pm 0.7 \text{ fm}$$

$$\langle D \rangle = 115 \pm 14 \text{ eV}$$

$$S_0 = 1.8 \pm 0.5$$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$		$\chi_{\text{Abn}} = 22.8$		$S_n = 5814.0 \pm 2.0 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$\Gamma_c \text{ (meV)}$	$\Gamma_{\gamma} \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$	
93.01 ± 0.09	210 ± 20	139 ± 19	71 ± 28	14.4 ± 2	
161.1 ± 0.2	230 ± 19	157 ± 21	73 ± 28	9.7 ± 1.3	
341.5 ± 0.3	80 ± 15	15 ± 3	65 ± 15	0.81 ± 0.16	
457.3 ± 0.4	250 ± 15	100 ± 20	90 ± 25	7.48 ± 0.94	
617.8 ± 0.5	260 ± 20	175 ± 18	85 ± 27	7.04 ± 0.7	
704.7 ± 0.5	840 ± 50	760 ± 55		28.6 ± 2	
828.7 ± 0.4	3200 ± 150	3100 ± 200		108 ± 7	
1075.5 ± 0.5		14.5 ± 2.5		0.44 ± 0.08	
1181.5 ± 0.6	155 ± 23	72 ± 4	83 ± 23	2.10 ± 0.12	
1282.9 ± 0.7	610 ± 30	510 ± 35	100 ± 46	14.2 ± 1.0	
1472.1 ± 0.8	820 ± 40	710 ± 40		18.5 ± 1.0	
1556 ± 1	2080 ± 100	1980 ± 120		50 ± 3	
1647 ± 1	3100 ± 105	3020 ± 80		74 ± 2	
1734.0 ± 0.5		80 ± 13		1.9 ± 0.3	
1768.8 ± 0.6	670 ± 25	570 ± 24	100 ± 35	13.6 ± 0.6	
1847.8 ± 0.6	1650 ± 78	1590 ± 85		37 ± 2	
2056.5 ± 0.7		150 ± 30		3.31 ± 0.66	
2106.9 ± 0.7	2550 ± 90	2450 ± 140		53 ± 3	
2452.2 ± 0.8	1400 ± 70	1320 ± 135		26.7 ± 2.7	
2492 ± 0.9		56 ± 10		1.1 ± 0.2	
2529.5 ± 1.0		2565 ± 755		51 ± 15	
2834.1 ± 1.0		192 ± 32		3.6 ± 0.6	
2862.7 ± 1.1		70 ± 11		1.3 ± 0.2	
2987.8 ± 1.2		1420 ± 165		26 ± 3	
3046.8 ± 1.2		1435 ± 165		26 ± 3	
3540.7 ± 1.4		180 ± 80		3.0 ± 1.3	
4060.5 ± 1.7		590 ± 85		9.3 ± 1.3	
4213.0 ± 1.8		3375 ± 520		52 ± 8	
4415.0 ± 2.0		3790 ± 530		57 ± 8	
4550.0 ± 2.0		420 ± 67		6.2 ± 1.0	
4757.0 ± 2.0		2280 ± 275		33 ± 4	
4920.0 ± 2.0		1825 ± 210		26 ± 3	
5075.0 ± 3.0		1230 ± 170		17.3 ± 2.4	

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Sm ^{147,148}	mass spectrometry	JMS,6,435(71)	Dobrozensky
Sm ^{147,149}	σ_a	NP/A,141,193(70)-	Macfarlane
Sm ^{147,149}	σ_a	NP/A,141,193(70)	Okamoto
Sm ¹⁴⁸	σ_c	JPJ,26,225(69)	Asami
Sm ¹⁴⁸	σ_f	PHY,40,567(69)	Reddingius
Sm ¹⁴⁸	mass spectrometry	AAEC/TM-443(68)	Whittim
Sm ¹⁴⁷	local osci.	KE,10,25(67)	Albert
Sm ¹⁴⁷	mass spectrometry	JIN,29,2147(67)	Fenner
Sm ¹⁴⁷	mass spectrometry	NSE,28,139(67)	Forman
Sm ^{147,149}	σ_a	PL/B,24,142(67)	Oakey
Sm ¹⁴⁹	σ_a	YF,1,252(65)	Andreev
Sm ¹⁴⁹	σ_a	BAP,10,724(65)	Beg
Sm ¹⁵¹	pile osci.	NUK,6,245(64)	Sokolowski
Sm ¹⁵²	σ_c	NSE,17,371(63)	Pattenden
Sm ¹⁵²	σ_c	NSE,12,63(62)	Bernabei
Sm ^{147,149}	activation	JIN,24,749(62)	Cabell
Sm ¹⁴⁹	σ_a	PL,1,289(62)	Cheifetz
Sm ^{144,145}	activation	PR,127,1665(62)	Macfarlane
Sm ^{149,150}	mass spectrometry	PR,127,943(62)	Nurmia
Sm ^{147,152}	pulsed n	JIN,17,6(61)	Aitken
Sm ^{149,151}	pile osci.	NSE,9,132(61)	Meadows
Sm ^{149,151}	pile osci.	JNE,12,32(60)	Tattersall
Sm ^{149,151}	mass spectrometry	AERE-R/R-2516(59)	Jovitt
Sm ¹⁴⁹	mass spectrometry	58GENEVA,15,446(58)	Anikina
Sm ¹⁵²	mass spectrometry	58GENEVA,15,459(58)	Bidinosti
Sm ^{149,152}	σ_c	NRDC-104(58)	Pattenden
Sm ^{149,152}	σ_c	53GENEVA,16,44(58)	Pattenden
Sm ^{149,152}	mass spectrometry	JNE,4,33(57)	Aitken
Sm ^{149,152}	pile osci.	AERE-R/R-2333(57)	Cummins
Sm ^{149,151}	mass spectrometry	THESES(56)	Walker
Sm ^{152,154}	mass spectrometry	CJC,33,830(55)	Melaika
Sm ^{152,154}	σ_s diffraction	PR,91,597(53)	Koehler
Sm ^{152,154}	local osci.	PR,83,641(51)	Pomerance
Sm ^{152,154}	pile osci.	PR,80,342(50)	Harris
Sm ^{152,154}	activation	PR,72,888(47)	Seren
Sm ¹⁵²	activation	ZN,1,179(46)	Bothe
Sm ¹⁵²	σ_c	PR,49,453(36)	Mitchell
Sm ¹⁵²	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Sm ¹⁴⁷	σ_f	18.3-423	YF,15,401(72)	Karzhavina
Sm ¹⁴⁹	σ_f	15.8-249	YF,15,401(72)	Karzhavina
Sm ¹⁵²	$\sigma_c \sigma_f(SI)$	8.0-5100	PRIVATE COMM.(72)	Rahn
Sm ¹⁵⁴	$\sigma_c \sigma_f(SI)$	93.0-5075	PRIVATE COMM.(72)	Rahn
Sm ¹⁴⁷	multiplicity	18-185	71KNOX,2,785(71)	Cauvin
Sm ¹⁴⁹	multiplicity	5-185	71KNOX,2,785(71)	Cauvin
Sm ¹⁴⁷	σ_c	3.4-249	NSE,43,58(71)	Codding

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Sm ¹⁴⁷	σ_t	0.01-1161	71KNOX, 2, 673(71)+	Eiland
Sm ¹⁵⁰	σ_t	0.01-1563	71KNOX, 2, 673(71)+	Eiland
Sm ¹⁴⁷	$\sigma_t \sigma_\gamma$	18.3-423	JINR-P3-5655(71)	Karzhavina
Sm ¹⁴⁹	$\sigma_t \sigma_\gamma$	15.8-249	JINR-P3-5655(71)	Karzhavina
Sm ¹⁴⁷	σ_γ	3.4-123	JINR-P3-6092(71)	Karzhavina
Sm ¹⁴⁹	σ_γ	4.93-64.7	JINR-P3-6092(71)	Karzhavina
Sm ¹⁴⁹		0.098-34	BAP, 15, 1667(70)+	Becvar
Sm ¹⁴⁷	σ_a	3.4-183	NP/A, 154, 177(70)	Kvitek
Sm ¹⁴⁹	σ_a	0.098-100	NP/A, 154, 177(70)	Kvitek
Sm ¹⁴⁷	σ_a	3.4-184	JINR-P3-5553(70)	Wilhem
Sm ¹⁴⁹	σ_t	0.098	JPJ, 26, 225(69)	Asami
Sm ¹⁴⁹	σ_t	0.097-0.87	CNAEM-52(68)	Akyuz
Sm ¹⁴⁹	σ_γ	thermal	NP/A, 97, 187(67)	Dakowski
Sm ¹⁴⁷	σ_t	0.098-0.87	PRIVATE COMM. (67)	Ertek
Sm ¹⁴⁹	$\bar{\sigma}_s$	3.4-18.3	NP/A, 97, 657(67)	Poortmans
Sm ¹⁴⁹	$\bar{\sigma}_s$	0.098-0.87	NP/A, 97, 657(67)	Poortmans
Sm ¹⁴⁹	σ_a	0.004-0.1	NP, 82, 331(66)	Poortmans
Sm ¹⁵²	σ_t	0.86-4.9	AE, 16, 523(64)	Begzhanov
Sm ¹⁴⁷	σ_t	8.0	NSL, 12, 63(62)	Bernabei
Sm ¹⁴⁹	σ_γ	3.4-39.9	ANL-6589(62)+	Carpenter
Sm ¹⁴⁷	σ_γ	0.86-45	ANL-6589(62)+	Carpenter
Sm ¹⁴⁷	σ_a	3.4-27	PL, 1, 289(62)	Cheifetz
Sm ¹⁴⁹	σ_a	thermal	PL, 1, 289(62)	Cheifetz
Sm ¹⁴⁹	σ_a	thermal	PR, 127, 1665(62)	Macfarlane
Sm ¹⁴⁹	polarization	0.098-8.9	PR, 128, 1287(62)	Marshak
Sm ¹⁴⁹	σ_t	0.098-0.87	58GENEVA, 16, 44(58)	Pattenden
Sm ¹⁴⁷	σ_t	3.4	AERE-NP/M, 87(58)	Pattenden
Sm ¹⁵²	σ_t	8.0	CJP, 39, 1193(61)	Chrien
Sm ¹⁵²	ratio	8.0	CJP, 39, 1184(61)	Walker
Sm ¹⁴⁹	σ_t	4-50	PRIVATE COMM. (59)	Pilcher
Sm ¹⁵²	σ_t	0.098-17.0	PR, 109, 1219(58)	Marshak
Sm ¹⁴⁷	σ_t	8.0	PRIVATE COMM. (58)	Simpson
Sm ¹⁴⁹	$\sigma_\gamma \bar{\sigma}_s$	3.4-161	NP, 5, 294(58)	Bovey
Sm ¹⁴⁹	$\sigma_\gamma \bar{\sigma}_s$	5.0-182	NP, 5, 294(58)	Bovey
Sm ¹⁵⁰	$\sigma_\gamma \bar{\sigma}_s$	21-48	NP, 5, 294(58)	Bovey
Sm ¹⁵²	$\sigma_\gamma \bar{\sigma}_s$	8-174	NP, 5, 294(58)	Bovey
Sm ¹⁴⁷	σ_t	0.89-12	BAP, 2, 218(57)+	Harvey
Sm ¹⁴⁷	σ_t	18.3-95	BAP, 2, 42(57)+	Simpson
Sm ¹⁴⁹	σ_t	12-95	BAP, 2, 42(57)+	Simpson
Sm ¹⁵⁰	σ_t	20-44	BAP, 2, 42(57)+	Simpson
Sm ¹⁴⁹	polarization	0.094	PR, 95, 105(54)	Roberts
Sm ¹⁴⁷	σ_t	3.4-19.1	PR, 96, 1014(54)	Sailor
Sm ¹⁴⁹	σ_t	0.098-17.2	PR, 96, 1014(54)	Sailor
Sm ¹⁵⁰	σ_t	21	PR, 96, 1014(54)	Sailor
Sm ¹⁵²	σ_t	8.2	PR, 96, 1014(54)	Sailor
Sm	$\bar{\sigma}_s$	0.098	CJP, 31, 432(53)	Brockhouse
Sm	σ_t	0.098	PR, 71, 757(47)	Sturm
Sm	σ_t	0.098	PR, 70, 557(46)	Borst

⁶³Eu

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 4600 \pm 100 \text{ b} \\ \sigma_s &= 8.0 \pm 1.0 \text{ b} \\ \sigma_{p^{\text{sc}}} &= 4.5 \text{ b} \\ a_{\text{coh}} &= 6.2 \pm 0.3 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 2430 \pm 200 \text{ b} \\ R' &= 8.8 \pm 0.4 \text{ fm} \\ S_0 &= 3.1 \pm 0.3 \\ S_1 &= 0.8 \pm 0.4\end{aligned}$$

¹⁵¹
⁶³Eu

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 9200 \pm 100 \text{ b} \\ \sigma_T &= 4.0 \pm 2.0 \text{ b (96 min } ^{152}\text{Eu}^{m2}) \\ \sigma_T &= 3300 \pm 200 \text{ b (9.3 hr } ^{152}\text{Eu}^{m1}) \\ \sigma_T &= 5900 \pm 200 \text{ b (12.4 yr } ^{152}\text{Eu}^g) \\ \sigma_a &= 0.009 \pm 0.002 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 3300 \pm 300 \text{ b} \\ R' &= 8.8 \pm 0.4 \text{ fm} \\ \langle D \rangle &= 0.7 \pm 0.2 \text{ eV} \\ S_0 &= 3.7 \pm 0.5 \\ S_1 &= 1.0 \pm 0.8\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$\lambda_{\text{Abn}} = 47.8$$

$$S_n = 6305.2 \pm 0.5 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
-0.00361		3	95.7	0.125 ± 0.005
0.321 ± 0.001	0.0833 ± 0.0023	3	79.5 ± 2	0.147 ± 0.004
0.461 ± 0.001	0.777 ± 0.021	3	87 ± 2	1.145 ± 0.030
1.055 ± 0.003	0.219 ± 0.005	3	85 ± 3	0.214 ± 0.005
1.832 ± 0.01	0.0338 ± 0.0081			0.025 ± 0.006
2.717 ± 0.005	0.24 ± 0.02		93 ± 3	0.145 ± 0.009
3.366 ± 0.006	1.83 ± 0.09	2	93 ± 3	1.00 ± 0.05
3.710 ± 0.006	0.79 ± 0.04		93 ± 3	0.41 ± 0.02
4.78 ± 0.01	0.15 ± 0.02			0.07 ± 0.01
5.38 ± 0.02	0.17 ± 0.02		108 ± 12	0.075 ± 0.007
5.98 ± 0.01	0.34 ± 0.05		100 ± 15	0.14 ± 0.02
7.05 ± 0.02	0.53 ± 0.53			0.02 ± 0.02
7.29 ± 0.02	2.19 ± 0.24		88 ± 12	0.81 ± 0.09
7.44 ± 0.02	1.88 ± 0.22		85 ± 9	0.69 ± 0.08
9.07 ± 0.02	1.02 ± 0.10		104 ± 12	0.34 ± 0.034
10.47 ± 0.03	1.97 ± 0.10		91 ± 9	0.61 ± 0.03

¹⁵¹
₆₃Eu

E_0 (eV)	$2g^2_{\gamma}$ (meV)	J	Γ_{γ} (meV)	$2g^2_{\gamma}$ (meV)
10.94 ± 0.03	0.66 ± 0.07		98 ± 11	0.20 ± 0.02
11.23 ± 0.04				
12.23 ± 0.04	0.93 ± 0.07		88 ± 9	0.266 ± 0.019
12.65 ± 0.04	2.38 ± 0.16		88 ± 7	0.57 ± 0.05
13.66 ± 0.05	0.44 ± 0.07		115 ± 12	0.12 ± 0.02
14.76 ± 0.05	1.92 ± 0.08		76 ± 9	0.50 ± 0.02
15.18 ± 0.05	2.10 ± 0.20		79 ± 9	0.54 ± 0.05
17.75 ± 0.06	1.35 ± 0.08		104 ± 11	0.32 ± 0.02
19.70 ± 0.07	4.98 ± 0.39		133 ± 18	1.14 ± 0.09
21.0 ± 0.07				
21.3 ± 0.07				
21.69 ± 0.07	1.94 ± 0.19		82 ± 12	0.42 ± 0.04
22.21 ± 0.08	2.83 ± 0.38		66 ± 15	0.60 ± 0.08
22.75 ± 0.08	1.53 ± 0.10		89 ± 9	0.32 ± 0.02
24.25 ± 0.09				
24.58 ± 0.09	7.93 ± 0.54		99 ± 9	1.60 ± 0.11
25.17 ± 0.11	0.60 ± 0.20			0.12 ± 0.04
25.60 ± 0.11	0.51 ± 0.21		89 ± 17	0.10 ± 0.04
26.22 ± 0.12				
26.72 ± 0.12	7.03 ± 0.62		78 ± 9	1.36 ± 0.12
27.43 ± 0.12	0.63 ± 0.11		97 ± 8	0.12 ± 0.02
27.75 ± 0.12				
28.09 ± 0.12	0.32 ± 0.11		90 ± 15	0.06 ± 0.02
29.23 ± 0.05	4.54 ± 0.32		79 ± 11	0.54 ± 0.06
30.22 ± 0.06	3.62 ± 0.36		86 ± 6	0.66 ± 0.06
30.61 ± 0.06	0.67 ± 0.11		99 ± 14	0.12 ± 0.02
31.59 ± 0.06	1.69 ± 0.11		97 ± 7	0.30 ± 0.02
32.65 ± 0.06				
33.51 ± 0.06	0.46 ± 0.12			0.08 ± 0.02
33.88 ± 0.06				
34.57 ± 0.06	0.35 ± 0.12			0.06 ± 0.02
35.05 ± 0.07	3.20 ± 0.36		90 ± 8	0.54 ± 0.06
36.09 ± 0.07	5.05 ± 0.36		78 ± 7	0.84 ± 0.06
37.01 ± 0.07	5.60 ± 0.37		78 ± 89	0.52 ± 0.06
37.78 ± 0.07	3.44 ± 0.25		92 ± 8	0.56 ± 0.04
39.20 ± 0.07	1.00 ± 0.38			0.16 ± 0.06
39.37 ± 0.07	4.02 ± 0.63		79 ± 9	0.64 ± 0.10
39.94 ± 0.08	1.26 ± 0.13		79 ± 9	0.20 ± 0.02
40.42 ± 0.08				
41.35 ± 0.08	27.01 ± 2.96		80 ± 12	4.20 ± 0.46
42.12 ± 0.09	1.04 ± 0.39			0.16 ± 0.06
43.19 ± 0.09	5.65 ± 0.39		84 ± 9	0.86 ± 0.06
44.43 ± 0.09	3.60 ± 0.40		89 ± 8	0.54 ± 0.06
45.42 ± 0.10	1.42 ± 0.27		99 ± 18	0.21 ± 0.04
46.41 ± 0.10	10.36 ± 3.00		85 ± 19	1.52 ± 0.44
47.04 ± 0.11	17.01 ± 2.06		99 ± 12	2.48 ± 0.30
48.75 ± 0.13				
49.23 ± 0.14				
50.04 ± 0.15	0.99 ± 0.42			0.14 ± 0.06
50.58 ± 0.12	23.04 ± 1.99		102 ± 10	3.24 ± 0.28
51.61 ± 0.12				

¹⁵¹
₆₃Eu

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
52.41 ± 0.12	4.05 ± 1.31			0.56 ± 0.14
52.70 ± 0.12	4.79 ± 1.02		80 ± 15	0.66 ± 0.14
53.25 ± 0.13	0.88 ± 0.15			0.12 ± 0.02
53.94 ± 0.14	4.55 ± 0.29		88 ± 10	0.62 ± 0.04
54.90 ± 0.14				
55.26 ± 0.07	3.87 ± 0.30		96 ± 8	0.52 ± 0.04
56.18 ± 0.07	3.45 ± 0.30		98 ± 9	0.46 ± 0.04
57.36 ± 0.07	18.93 ± 1.67		83 ± 8	2.50 ± 0.22
58.85 ± 0.08	6.44 ± 0.61		108 ± 11	0.84 ± 0.08
60.85 ± 0.08	5.77 ± 0.62		96 ± 8	0.74 ± 0.08
62.41 ± 0.08	3.95 ± 0.47		86 ± 7	0.50 ± 0.06
63.91 ± 0.09	2.56 ± 0.48		100 ± 10	0.32 ± 0.06
67.91 ± 0.10	18.00 ± 0.82		100 ± 9	2.18 ± 0.10
69.09 ± 0.10	1.00 ± 0.33			0.12 ± 0.04
70.75 ± 0.10	4.54 ± 0.67		78 ± 10	0.54 ± 0.08
71.41 ± 0.10	6.08 ± 0.68		84 ± 9	0.72 ± 0.08
72.41 ± 0.11	2.21 ± 0.34		93 ± 10	0.26 ± 0.04
73.33 ± 0.11	1.20 ± 0.34			0.14 ± 0.04
74.16 ± 0.11	1.50 ± 0.31			0.17 ± 0.036
75.76 ± 0.11	4.18 ± 0.52		90 ± 10	0.48 ± 0.06
77.45 ± 0.12	8.80 ± 0.53		98 ± 9	1.00 ± 0.06
78.05 ± 0.12	0.53 ± 0.35			0.06 ± 0.06
78.66 ± 0.12	17.03 ± 1.60		73 ± 8	1.92 ± 0.18
79.51 ± 0.12	5.53 ± 0.71		64 ± 13	0.62 ± 0.08
80.23 ± 0.12	8.24 ± 1.08		81 ± 9	0.92 ± 0.12
81.08 ± 0.13	23.95 ± 1.98		101 ± 12	2.66 ± 0.22
83.07 ± 0.13	3.28 ± 0.37		95 ± 10	0.36 ± 0.04
84.00 ± 0.13	14.85 ± 0.73		99 ± 12	1.62 ± 0.08
85.67 ± 0.14	4.81 ± 0.56		84 ± 18	0.52 ± 0.06
87.70 ± 0.14	1.31 ± 0.38			0.14 ± 0.04
88.63 ± 0.14	1.13 ± 0.38			0.12 ± 0.04
89.34 ± 0.15	14.56 ± 0.76		104 ± 13	1.54 ± 0.08
90.18 ± 0.15	4.94 ± 0.60		85 ± 14	0.52 ± 0.06
91.13 ± 0.15	4.77 ± 0.57		94 ± 10	0.50 ± 0.06
93.36 ± 0.15	28.02 ± 1.93		112 ± 13	2.9 ± 0.2
96.29 ± 0.16	18.45 ± 1.96		112 ± 14	1.88 ± 0.20
97.70 ± 0.16	1.98 ± 0.40			0.20 ± 0.04
98.61 ± 0.16	15.49 ± 0.99		108 ± 13	1.56 ± 0.10

^{152g}
₆₃Eu
[4.8 yr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 2300 \pm 1000 \text{ b}$$

¹⁵³
₆₃Eu

THERMAL CROSS SECTIONS

$$\sigma_y = 390 \pm 30 \text{ b}$$

$$\bar{\sigma}_a = 8.0 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 1635 \pm 200 \text{ b}$$

$$R^\gamma = 8.8 \pm 0.4 \text{ fm}$$

$$\langle D \rangle = 1.3 \pm 0.2 \text{ eV}$$

$$S_0 = 2.5 \pm 0.2$$

$$S_1 = 0.6 \pm 0.4$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$\% \text{Abn} = 52.2$$

$$S_n = 6438 \pm 10 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1.728±0.005	0.057±0.003	3	93 ± 5	0.043 ±0.0026
2.457±0.005	1.30 ±0.02		91 ± 2	0.830 ±0.011
3.293±0.006	0.92 ±0.18		96 ± 3	0.505 ±0.1
3.942±0.006	1.10 ±0.03		97 ± 2	0.555 ±0.015
4.75 ±0.01	0.061±0.014			0.037 ±0.008
6.16 ±0.02	0.68 ±0.03		119 ±10	0.272 ±0.014
8.86 ±0.02	3.72 ±0.18		104 ± 5	1.25 ±0.06
11.62 ±0.03	3.92 ±0.24		96 ±10	1.15 ±0.07
12.45 ±0.04	0.16 ±0.01		90 ±25	0.046 ±0.002
13.22 ±0.04	0.32 ±0.06			0.089 ±0.016
15.26 ±0.04	0.42 ±0.06			0.108 ±0.015
16.33 ±0.05	0.030±0.014			0.0075±0.0035
16.73 ±0.05	1.47 ±0.17		89 ±15	0.36 ±0.042
17.60 ±0.06	0.59 ±0.42			0.14 ±0.10
18.01 ±0.06	4.71 ±0.38		92 ±15	1.11 ±0.09
18.73 ±0.07	3.25 ±0.39		100 ±10	0.75 ±0.09
20.02 ±0.07	9.80 ±0.58		100 ±15	2.19 ±0.13
22.54 ±0.08	3.04 ±0.38		84 ±12	0.64 ±0.08
23.66 ±0.09	2.72 ±0.34		87 ±12	0.56 ±0.07
26.2 ±0.2	0.30 ±0.08			0.059 ±0.016
28.63 ±0.12	1.82 ±0.11		78 ±15	0.34 ±0.02
29.90 ±0.05	0.30 ±0.11			0.055 ±0.02
31.21 ±0.06	2.35 ±0.22		118 ±13	0.42 ±0.04
32.45 ±0.06	0.28 ±0.11			0.049 ±0.02
33.05 ±0.06				
34.53 ±0.06	5.17 ±0.59		90 ±12	0.88 ±0.10
36.62 ±0.07	4.24 ±0.61		106 ±14	0.70 ±0.10
37.76 ±0.07	4.42 ±0.61		94 ±12	0.72 ±0.10
38.30 ±0.07	5.94 ±0.37		81 ±11	0.96 ±0.06
41.15 ±0.08	1.48 ±0.08		69 ±20	0.23 ±0.013
42.15 ±0.09	4.80 ±0.58		77 ±14	0.74 ±0.09
43.16 ±0.09	3.15 ±0.39		96 ± 8	0.48 ±0.06
44.82 ±0.09	0.70 ±0.10			0.105 ±0.015
45.79 ±0.10	1.35 ±0.14		99 ±15	0.20 ±0.02
47.11 ±0.11	2.06 ±0.14		94 ±11	0.30 ±0.02
47.93 ±0.11	6.23 ±0.42			0.90 ±0.06

¹⁵³
₆₃Eu

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
49.30 ± 0.11	0.14 ± 0.14			0.02 ± 0.02
49.50 ± 0.11	0.28 ± 0.14			0.04 ± 0.02
50.00 ± 0.12	2.97 ± 0.28		92 ± 7	0.42 ± 0.04
50.74 ± 0.12	7.41 ± 0.57		113 ± 14	1.04 ± 0.08
52.31 ± 0.13	12.15 ± 0.87		108 ± 15	1.68 ± 0.12
53.07 ± 0.14	2.77 ± 0.44		119 ± 14	0.38 ± 0.06
54.29 ± 0.14	12.38 ± 0.74			1.68 ± 0.10
55.19 ± 0.07	0.26 ± 0.11		95 ± 20	0.035 ± 0.015
55.57 ± 0.07	1.94 ± 0.15			0.26 ± 0.02
58.40 ± 0.08				
58.97 ± 0.08	1.23 ± 0.15		85 ± 8	0.16 ± 0.02
59.72 ± 0.08	2.78 ± 0.31		102 ± 15	0.36 ± 0.04
60.92 ± 0.08	32.00 ± 2.03		78 ± 13	4.10 ± 0.26
62.55 ± 0.08	5.22 ± 0.63		105 ± 13	0.66 ± 0.08
63.70 ± 0.09	7.34 ± 0.80		93 ± 20	0.92 ± 0.10
64.09 ± 0.09	13.92 ± 0.96		116 ± 15	1.74 ± 0.12
65.25 ± 0.09				
65.90 ± 0.09				
66.94 ± 0.09	3.76 ± 0.65		86 ± 17	0.46 ± 0.08
68.15 ± 0.09	5.12 ± 0.66		87 ± 12	0.62 ± 0.08
70.04 ± 0.10	3.01 ± 0.34		100 ± 14	0.36 ± 0.04
71.35 ± 0.10	1.18 ± 0.17			0.14 ± 0.02
73.68 ± 0.11	0.34 ± 0.17			0.04 ± 0.02
75.47 ± 0.11	0.52 ± 0.35			0.06 ± 0.04
76.93 ± 0.11	14.38 ± 0.53		106 ± 13	1.64 ± 0.06
80.29 ± 0.12	4.84 ± 0.54		103 ± 19	0.54 ± 0.06
81.24 ± 0.13	3.97 ± 0.54		96 ± 14	0.44 ± 0.06
82.99 ± 0.13	3.64 ± 0.55		86 ± 9	0.40 ± 0.06
84.00 ± 0.13	0.73 ± 0.55			0.08 ± 0.06
86.99 ± 0.14	12.31 ± 0.56		68 ± 7	1.32 ± 0.06
87.70 ± 0.14	4.87 ± 0.37		105 ± 16	0.52 ± 0.04
89.34 ± 0.15	1.32 ± 0.38			0.14 ± 0.04
90.75 ± 0.15	4.19 ± 0.38		79 ± 13	0.44 ± 0.04
92.01 ± 0.15				
92.80 ± 0.15	2.31 ± 1.15			0.24 ± 0.12
93.26 ± 0.15	41.91 ± 4.06		88 ± 20	4.34 ± 0.42
94.76 ± 0.15	0.78 ± 0.39			0.08 ± 0.04
95.15 ± 0.15	2.34 ± 0.20			0.24 ± 0.02
96.86 ± 0.16	2.95 ± 0.98			0.30 ± 0.10
97.10 ± 0.16	26.01 ± 5.91		99 ± 15	2.64 ± 0.60

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 1500 \pm 400 \text{ b}$$

¹⁵⁴
₆₃Eu
[16 yr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 4040 \pm 125 \text{ b}$$

¹⁵⁵
₆₃Eu
[4.65 yr]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Eu ¹⁵¹	σ_a activation	NP/R,172,489(71)	Poortmans
Eu ¹⁵¹	activation	JNE,25,129(71)	Ryves
Eu ¹⁵⁵	depletion	CJP,48,1933(70)	Movatt
Eu ¹⁵³	$\bar{\sigma}_s$	70HELSINKI,1,651(70)	Vertebnyi
Eu, Eu ¹⁵¹	local osci.	KE,10,25(67)	Albert
Eu ^{151,153}	activation	JIN,29,2671(67)	Sias
Eu	σ_a	YF,1,252(65)	Andreev
Eu	σ_c	PRIVATE COMM.(65)	Ohno
Eu ¹⁵¹	isom. ratio	PR/B,137,763(65)	Takahashi
Eu ¹⁵¹	isom. ratio	PR,129,769(63)	Keisch
Eu	diffraction	PR,126,2262(62)	Arnold
Eu	diffraction	PR,127,120(62)	Nereson
Eu	diffraction	PR,124,1848(61)	Arnold
Eu	σ_c	ADP,7,50(61)	Hohne
Eu	pulsed n	NSE,9,132(61)	Meadows
Eu ¹⁵¹	activation	NP,20,163(60)	Hans
Eu, Eu ^{151,153}	pile osci.	JNE,12,32(60)	Tattersall
Eu ¹⁵¹	isom. ratio	KAPL-2000-8,D-16(59)-	Johnson
Eu ¹⁵¹	isom. ratio	KAPL-2000-8,D-16(59)	Moore
Eu, Eu ^{151,153}	σ_c	58GENEVA,16,44(58)	Pattenden
Eu	pile osci.	AERE-R/M-100(57)	Cummins
Eu	$\bar{\sigma}_s$	CJP,31,432(53)	Brockhouse
Eu	local osci.	CA,83,641(51)	Pomerance
Eu ¹⁵¹⁻¹⁵⁵	mass spectrometry	PR,75,1500(49)	Hayden
Eu ¹⁵¹	activation	PR,72,888(47)	Seren
Eu	σ_c	PR,71,757(47)	Sturm

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Eu ¹⁵¹	σ_t	1.05-98.6	PRIVATE COMM.(72)	Rahn
Eu ¹⁵³	σ_t	1.73-97.6	PRIVATE COMM.(72)	Rahn
Eu	σ_t	thermal	NP/A,172,489(71)	Poortmans
Eu ¹⁵¹	σ_f	0.025-3.4	NP/A,172,489(71)	Poortmans
Eu ¹⁵¹	σ_t	0.32-109.9	PRIVATE COMM.(70)	Vertebnyi
Eu ¹⁵³	σ_t	0.457-659	PRIVATE COMM.(70)	Vertebnyi
Eu ¹⁵¹	polarization	0.025-3.4	PR/B,134,68(64)	Stolovy
Eu ¹⁵³	polarization	2.4	PR/B,134,68(64)	Stolovy
Eu	σ_t	thermal	NDP,7,50(61)	Hohne
Eu ¹⁵¹	σ_t	0.32-0.46	NSA,10,169(61)	Tassen
Eu ¹⁵¹	σ_t	1.055-8.06	PR,114,1577(59)	Domanic
Eu ¹⁵³	σ_t	1.73-8.87	PR,114,1577(59)	Domanic
Eu ¹⁵³	σ_t	0.457	SBGENEVA,16,44(58)	Pattenden
Eu ¹⁵¹	σ_t	1.055-9.0	ORNL-2204,33(56)	Harvey
Eu ¹⁵³	σ_t	1.76-11.7	ORNL-2204,33(56)	Harvey
Eu ¹⁵¹	σ_t	2.717-3.710	BAP,1,347(55)	Landon
Eu ¹⁵³	σ_t	2.456-3.944	BAP,1,347(55)	Landon
Eu ¹⁵¹	σ_t	4.85-27.0	PRIVATE COMM.(56)	Zimmerman
Eu ¹⁵³	σ_t	4.81-24.1	PRIVATE COMM.(56)	Zimmerman
Eu	σ_t	4.8-15.2	PR,99,10(55)	Harvey
Eu	σ_t	thermal	PR,98,1162(55)	Holt
Eu	σ_t	0.025-1.056	PR,98,1267(55)	Landon
Eu	σ_t	0.327-19.5	PR,96,1014(54)	Sailor
Eu	σ_t	0.025-19.5	PR,93,1292(54)	Sailor
Eu ¹⁵¹	σ_f	0.025-7.4	PR,95,453(54)	Wood
Eu	σ_t	thermal	PR,71,757(47)	Sturm
Eu	σ_t	0.025-0.54	PR,70,557(46)	Borst

⁶⁴Gd

THERMAL CROSS SECTIONS

$$\sigma_y = 49000 \pm 1000 \text{ b}$$

$$a_{coh} = 15 \pm 2 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 390 \pm 10 \text{ b}$$

$$S_0 = 2.0 \pm 0.4$$

¹⁵²₆₄Gd

THERMAL CROSS SECTIONS

$$\sigma_y = 1100 \pm 100 \text{ b}$$

$$\sigma_a = 7 \text{ mb}$$

RESONANCE PROPERTIES

$$I_\gamma = 3000 \pm 300 \text{ b}$$

$$\langle D \rangle = 15 \pm 2 \text{ eV}$$

$$S_0 = 4.6 \pm 1.8$$

RESONANCE PARAMETERS

$$I^n = 0^*$$

$$\%Abn = 0.2$$

$$S_n = 6487 \pm 8 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
3.31±0.04	0.018± 0.006		0.010±0.003
8.00±0.06	0.92 ± 0.03		0.03 ±0.01
12.35±0.07	2.2 ± 0.2		0.62 ±0.06
21.2 ±0.2	0.69 ± 0.23		0.15 ±0.05
36.86±0.05	83.8 ± 6.7	56 ±12	13.8 ±1.0
39.3 ±0.1	38.9 ± 3.1	58 ±17	6.2 ±0.5
42.7 ±0.1	3.1 ± 0.6		0.47 ±0.09
74.3 ±0.2	55.2 ±12.9		6.4 ±1.5
85.1 ±0.2	3.6 ± 0.5		0.39 ±0.06
92.4 ±0.2	160 ±37		16.6 ±3.8
100.0 ±0.4	90		0.9
124.0 ±0.4	7.5		0.7
140 ±0.4	124 ±15	46 ±24	10.5 ±1.3
185.2 ±0.6	105 ±30	62 ±40	7.7 ±2.2
202 ±1	200 ±43		14 ±3
223 ±1	300 ±90		20 ±6
231 ±1	100 ±40		6.6 ±2.6
238 ±1			
252 ±1.5			
293 ±1.5			

There is a discrepancy between the measured and the calculated absorption resonance integrals.

¹⁵²Gd
64

THERMAL CROSS SECTIONS

$$\sigma_T = 85 \pm 12 \text{ b}$$
$$\sigma_T = 0.049 \pm 0.015 \text{ b [31 ms } ^{155}\text{Gd}^*]$$

RESONANCE PROPERTIES

$$I_1^c = 215 \pm 20 \text{ b}$$
$$\langle I_0 \rangle = 15.5 \pm 2.3 \text{ eV}$$
$$S_0 = 2.0 \pm 0.4$$

RESONANCE PARAMETERS

$$\chi^2_{\text{abn}} = 2.2$$
$$S_n = 6446 \pm 6 \text{ keV}$$

$I^n = 0^+$	E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
	9.41 $\pm$ 0.04	0.030 $\pm$ 0.003		0.010 $\pm$ 0.03
	11.58 $\pm$ 0.02	0.34 $\pm$ 0.10		0.11 $\pm$ 0.02
	22.33 $\pm$ 0.06	11.5 $\pm$ 1.0		2.4 $\pm$ 0.2
	47.07 $\pm$ 0.07	3.2 $\pm$ 0.4		0.47 $\pm$ 0.06
	49.50 $\pm$ 0.07	1.8 $\pm$ 0.2		0.26 $\pm$ 0.03
	65.06 $\pm$ 0.05	24 $\pm$ 3	57 $\pm$ 15	2.98 $\pm$ 0.37
	76.12 $\pm$ 0.08	1.1 $\pm$ 0.3		0.13 $\pm$ 0.03
	100.7 $\pm$ 0.1	32 $\pm$ 4	80 $\pm$ 15	3.2 $\pm$ 0.4
	105.6 $\pm$ 0.1	4.8 $\pm$ 0.3		0.47 $\pm$ 0.03
	124.0 $\pm$ 0.2	124 $\pm$ 17	85 $\pm$ 10	11.1 $\pm$ 1.5
	139.2 $\pm$ 0.2	124 $\pm$ 16	91 $\pm$ 10	10.5 $\pm$ 1.4
	148.43 $\pm$ 0.2	38 $\pm$ 5		3.1 $\pm$ 0.4
	164.5 $\pm$ 0.2	105 $\pm$ 7	73 $\pm$ 9	8.2 $\pm$ 0.6
	170.4 $\pm$ 0.2	5.0 $\pm$ 1.5		0.38 $\pm$ 0.12
	201.6 $\pm$ 0.2	11.7 $\pm$ 2.5		0.82 $\pm$ 0.18
	211.0 $\pm$ 0.2	35 $\pm$ 5		2.4 $\pm$ 0.3
	224.0 $\pm$ 0.2	20 $\pm$ 3		1.34 $\pm$ 0.20
	252.8 $\pm$ 0.2	12 $\pm$ 2		0.76 $\pm$ 0.13
	257.5 $\pm$ 0.2	34 $\pm$ 5		2.1 $\pm$ 0.3
	269.2 $\pm$ 0.2	28 $\pm$ 4		1.7 $\pm$ 0.2
	331.7 $\pm$ 0.3	14 $\pm$ 2		0.76 $\pm$ 0.11
	333.8 $\pm$ 0.3	13.5 $\pm$ 3.0		0.74 $\pm$ 0.16
	364.8 $\pm$ 0.4	7.0 $\pm$ 4.0		0.37 $\pm$ 0.21
	396.5 $\pm$ 0.4	95 $\pm$ 8	65 $\pm$ 10	4.8 $\pm$ 0.4
	407.6 $\pm$ 0.4	45 $\pm$ 9		2.2 $\pm$ 0.5
	444.7 $\pm$ 0.3	120 $\pm$ 15	76 $\pm$ 11	5.7 $\pm$ 0.7
	447.1 $\pm$ 0.3	94 $\pm$ 8	69 $\pm$ 9	4.5 $\pm$ 0.4
	468.0 $\pm$ 0.3	125 $\pm$ 15	86 $\pm$ 9	5.8 $\pm$ 0.7
	486.2 $\pm$ 0.3	69 $\pm$ 10	75 $\pm$ 15	3.1 $\pm$ 0.5
	511.5 $\pm$ 0.3	91 $\pm$ 12	83 $\pm$ 13	4.0 $\pm$ 0.5
	516.0 $\pm$ 0.3	50 $\pm$ 7	80 $\pm$ 15	2.2 $\pm$ 0.3
	551.8 $\pm$ 0.4	55 $\pm$ 7	85 $\pm$ 15	2.3 $\pm$ 0.3
	589.8 $\pm$ 0.4	152 $\pm$ 20	115 $\pm$ 30	6.3 $\pm$ 0.8
	625.5 $\pm$ 0.4	240 $\pm$ 35	80 $\pm$ 10	9.6 $\pm$ 1.4
	640.3 $\pm$ 0.4	61 $\pm$ 14	90 $\pm$ 15	2.4 $\pm$ 0.5
	684.7 $\pm$ 0.5	55 $\pm$ 10		2.1 $\pm$ 0.3
	774.0 $\pm$ 0.6	148 $\pm$ 12	105 $\pm$ 15	5.3 $\pm$ 0.4
	795.0 $\pm$ 0.6	35 $\pm$ 8		1.2 $\pm$ 0.3

¹⁵⁴
₆₄Gd

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
808.7 $\pm$ 0.6	195 $\pm$ 30	95 $\pm$ 15	6.9 $\pm$ 1.1
811.9 $\pm$ 0.6	75 $\pm$ 20		2.6 $\pm$ 0.7
836.3 $\pm$ 0.3	540 $\pm$ 70	104 $\pm$ 15	18.7 $\pm$ 2.4
845.3 $\pm$ 0.3	370 $\pm$ 50	96 $\pm$ 15	12.7 $\pm$ 1.7
859.0 $\pm$ 0.4	265 $\pm$ 40	97 $\pm$ 15	9.0 $\pm$ 1.4
897.4 $\pm$ 0.4	310 $\pm$ 40	92 $\pm$ 12	10.3 $\pm$ 1.3
910.8 $\pm$ 0.4	63 $\pm$ 9	84 $\pm$ 13	2.1 $\pm$ 0.3
916.9 $\pm$ 0.4	405 $\pm$ 50	98 $\pm$ 10	13.4 $\pm$ 1.6
966.7 $\pm$ 0.4	275 $\pm$ 40	105 $\pm$ 10	8.5 $\pm$ 1.3
985.5 $\pm$ 0.4	157 $\pm$ 28	83 $\pm$ 14	5.0 $\pm$ 0.9

¹⁵⁵
₆₄Gd

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 61000 \pm 500 \text{ b} \\ \sigma_c &= 60 \text{ b} \\ \sigma_s &< 0.007 \text{ mb [} ^{152}\text{Sm}^{0+} \text{]} \\ \sigma_a &= 0.015 \pm 0.002 \text{ mb [} ^{152}\text{Sm}^{2+} \text{]} \\ \sigma_a &= 0.067 \pm 0.005 \text{ mb [} ^{152}\text{Sm}^{4+} \text{]}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 1550 \pm 50 \text{ b} \\ R^I &= 6.7 \pm 1.5 \text{ fm} \\ \langle D \rangle &= 1.8 \pm 0.3 \text{ eV} \\ S_0 &= 2.3 \pm 0.2\end{aligned}$$

RESONANCE PARAMETERS

$1^\pi = 3/2^-$ $\% \text{Abn} = 14.9$ $S_n = 8535.4 \pm 0.8 \text{ keV}$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
0.0268 $\pm$ 0.0002	108 $\pm$ 1	0.130 $\pm$ 0.002	2	108 $\pm$ 1	0.794 $\pm$ 0.012
2.008 $\pm$ 0.010		0.280 $\pm$ 0.003	1	110 $\pm$ 1	0.198 $\pm$ 0.002
2.568 $\pm$ 0.013		2.18 $\pm$ 0.02	1	111 $\pm$ 1	1.36 $\pm$ 0.01
3.616 $\pm$ 0.006		0.033 $\pm$ 0.002		130 $\pm$ 17	0.017 $\pm$ 0.001
6.30 $\pm$ 0.02		2.50 $\pm$ 0.15	2		0.996 $\pm$ 0.060
7.75 $\pm$ 0.01		1.30 $\pm$ 0.05	2	125 $\pm$ 4	0.467 $\pm$ 0.018
10.01 $\pm$ 0.01		0.22 $\pm$ 0.02	2		0.070 $\pm$ 0.006
11.53 $\pm$ 0.01		0.47 $\pm$ 0.03	1		0.14 $\pm$ 0.01
11.99 $\pm$ 0.01		1.20 $\pm$ 0.05	2		0.35 $\pm$ 0.01
14.51 $\pm$ 0.01		2.4 $\pm$ 0.2		103 $\pm$ 10	0.63 $\pm$ 0.05
17.77 $\pm$ 0.02		0.48 $\pm$ 0.03	2	120 $\pm$ 25	0.11 $\pm$ 0.01
19.92 $\pm$ 0.02		5.4 $\pm$ 0.4	2	104 $\pm$ 16	1.21 $\pm$ 0.09
21.03 $\pm$ 0.04		19.0 $\pm$ 1.2	2	98 $\pm$ 6	4.14 $\pm$ 0.26
23.67 $\pm$ 0.04		3.9 $\pm$ 0.1	2	120 $\pm$ 15	0.80 $\pm$ 0.02
27.57 $\pm$ 0.05		0.84 $\pm$ 0.02	1	125 $\pm$ 20	0.16 $\pm$ 0.04
29.58 $\pm$ 0.05		5.0 $\pm$ 0.4	2	108 $\pm$ 22	0.92 $\pm$ 0.07
30.10 $\pm$ 0.06		13 $\pm$ 3	2	100 $\pm$ 11	2.4 $\pm$ 0.5

¹⁵⁵Gd
64

E ₀ (eV)	Γ (meV)	2g _{1/2} ⁿ (meV)	J	Γ _γ (meV)	2g _{1/2} ⁿ (meV)
31.72 ± 0.06		1.40 ± 0.04	2	118 ± 20	0.25 ± 0.07
33.14 ± 0.07		1.2 ± 0.3			0.21 ± 0.05
33.51 ± 0.07		1.2 ± 0.3		115 ± 35	0.21 ± 0.05
34.83 ± 0.07		4.6 ± 0.3	1	152 ± 23	0.78 ± 0.05
35.47 ± 0.07		2.30 ± 0.12	2	118 ± 23	0.39 ± 0.02
37.12 ± 0.08		6.3 ± 0.2	2	101 ± 20	1.03 ± 0.03
39.00 ± 0.08		1.3 ± 0.2	2	118 ± 26	0.21 ± 0.03
43.92 ± 0.10		13 ± 1	1	136 ± 9	1.96 ± 0.15
46.10 ± 0.10		2.8 ± 0.2		126 ± 20	0.41 ± 0.03
46.87 ± 0.10		6.7 ± 0.3		100 ± 12	0.98 ± 0.04
47.73 ± 0.11		0.49 ± 0.04			0.071 ± 0.006
51.38 ± 0.11		14.0 ± 0.7	1		1.95 ± 0.10
52.13 ± 0.12		14.6 ± 0.5	1	115 ± 39	2.02 ± 0.07
53.03 ± 0.08		1.70 ± 0.06			0.23 ± 0.01
53.74 ± 0.08		9.6 ± 0.7	2	92 ± 20	1.31 ± 0.10
56.22 ± 0.08		2.7 ± 0.2	2	120 ± 18	0.36 ± 0.03
59.32 ± 0.09		8.3 ± 0.2	2	129 ± 19	1.08 ± 0.03
62.84 ± 0.09		10.0 ± 0.4	2	90 ± 15	1.26 ± 0.05
64.09 ± 0.10		0.32 ± 0.04			0.040 ± 0.005
65.20 ± 0.11		1.0 ± 0.2			0.12 ± 0.03
69.0 ± 0.1		7.9 ± 0.3	1		0.95 ± 0.04
77.0 ± 0.1		2.0 ± 0.1			0.23 ± 0.01
77.8 ± 0.1		0.90 ± 0.05			0.102 ± 0.005
78.8 ± 0.1		5.3 ± 0.5			0.60 ± 0.06
80.05 ± 0.12		0.39 ± 0.14			0.044 ± 0.016
80.9 ± 0.1		1.8 ± 0.2			0.20 ± 0.02
84.2 ± 0.1		6.9 ± 0.2			0.75 ± 0.02
85.0 ± 0.1		2.3 ± 0.1			0.25 ± 0.01
90.5 ± 0.1		1.60 ± 0.06			0.168 ± 0.006
92.5 ± 0.2		2.7 ± 0.3			0.28 ± 0.03
92.8 ± 0.2		3.9 ± 0.4			0.40 ± 0.04
94.10 ± 0.2		0.68 ± 0.05			0.070 ± 0.005
95.7 ± 0.2		4.8 ± 0.3			0.49 ± 0.03
96.4 ± 0.2		4.7 ± 0.3			0.48 ± 0.03
98.3 ± 0.2		13.0 ± 0.4			1.31 ± 0.04
101.4 ± 0.2		1.6 ± 0.2			0.16 ± 0.02
102.1 ± 0.1		3.4 ± 0.3			0.34 ± 0.03
104.4 ± 0.1		1.3 ± 0.2			0.13 ± 0.02
105.9 ± 0.1		6.8 ± 0.8			0.66 ± 0.06
107.1 ± 0.1		4.6 ± 0.4			0.45 ± 0.04
109.6 ± 0.1		7.8 ± 0.6			0.75 ± 0.06
112.4 ± 0.1		3.5 ± 0.3			0.33 ± 0.03
113.8 ± 0.2		11.3 ± 1.5		84 ± 10	1.07 ± 0.14
116.5 ± 0.2		19 ± 3		67 ± 12	1.78 ± 0.28
118.6 ± 0.2		13.0 ± 1.7			1.20 ± 0.16
123.4 ± 0.2		2.5 ± 0.2			0.23 ± 0.02
124.4 ± 0.2		27.0 ± 4.3			2.4 ± 0.4
126.0 ± 0.2		8.3 ± 0.9			0.74 ± 0.08
128.6 ± 0.2		15.4 ± 2.1			1.37 ± 0.19
129.8 ± 0.2		1.4 ± 0.2			0.12 ± 0.02
130.8 ± 0.2		3.2 ± 0.5			0.28 ± 0.05
		36.4 ± 5.7			3.18 ± 0.50

¹⁵⁵
₆₄Gd

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
133.0 ±0.2		2.8 ± 0.4			0.24 ±0.04
133.8 ±0.2		2.9 ± 0.5			0.25 ±0.04
134.7 ±0.2		1.1 ± 0.2			0.10 ±0.02
137.8 ±0.2		16.0 ± 1.5			1.4 ±0.1
140.9 ±0.2		1.3 ± 0.2			0.11 ±0.02
145.6 ±0.2		7.7 ± 0.7			0.64 ±0.06
146.9 ±0.2		4.7 ± 0.6			0.39 ±0.05
148.2 ±0.3		3.5 ± 0.5			0.29 ±0.04
149.6 ±0.2		25.0 ± 7.2			2.04 ±0.59
150.1 ±0.2		31 ±11			2.5 ±0.9
152.2 ±0.2		5.9 ± 0.5			0.48 ±0.04
154.0 ±0.2		1.4 ± 0.2			0.11 ±0.02
156.3 ±0.2		9.6 ± 0.8			0.77 ±0.06
160.1 ±0.2		13.0 ± 1.3			1.03 ±0.10
161.6 ±0.2		22.0 ± 2.5			1.73 ±0.20
168.3 ±0.2		22.6 ± 2.4			1.74 ±0.18
170.3 ±0.2		10.8 ± 1.5			0.83 ±0.12
171.4 ±0.2		11.5 ± 1.6			0.88 ±0.12
173.5 ±0.2		41 ± 6		110 ±29	3.11 ±0.46
175.5 ±0.2		2.6 ± 0.3			0.20 ±0.02
178.0 ±0.2		7.3 ± 0.7			0.55 ±0.05
180.3 ±0.3		10.5 ± 1.1			0.78 ±0.08
183.3 ±0.3		8.0 ± 0.8			0.59 ±0.06

¹⁵⁶Gd
64

THERMAL CROSS SECTIONS

$$\sigma_T = 1.5 \pm 1.2 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_T &= 95 \pm 5 \text{ b} \\ R^T &= 8.1 \pm 0.7 \text{ fm} \\ \langle D \rangle &= 47 \pm 4 \text{ eV} \\ S_0 &= 1.8 \pm 0.6 \end{aligned}$$

RESONANCE PARAMETERS

$$I^* = 0^+$$

$$\% \text{Abn} = 20.6$$

$$S_n = 6359.8 \pm 0.6 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_T (meV)	Γ_n^0 (meV)
33.23 $\pm$ 0.04	14.6 $\pm$ 2.0	90 $\pm$ 10	2.53 $\pm$ 0.35
151.2 $\pm$ 0.4	41.7 $\pm$ 4.9		3.4 $\pm$ 0.4
198.1 $\pm$ 0.5	270 $\pm$ 32		19.2 $\pm$ 2.3
201.6 $\pm$ 0.5	17 $\pm$ 6		1.2 $\pm$ 0.4
202.1 $\pm$ 2.6	266 $\pm$ 35.00		18.7 $\pm$ 2.500
244.0 $\pm$ 0.7	3.1 $\pm$ 0.5		0.20 $\pm$ 0.03
340 $\pm$ 1	20 $\pm$ 3		1.1 $\pm$ 0.2
377 $\pm$ 1	225 $\pm$ 23		11.6 $\pm$ 1.2
461 $\pm$ 1	117 $\pm$ 34		5.5 $\pm$ 1.6
477.0 $\pm$ 1.0	110 $\pm$ 13		5.04 $\pm$ 0.56
515.0 $\pm$ 1.5	120 $\pm$ 40		5.29 $\pm$ 1.76
707 $\pm$ 2	420		15.8
714 $\pm$ 2	420		15.7
732 $\pm$ 2	325 $\pm$ 108	70 $\pm$ 14	12.0 $\pm$ 4.0
796 $\pm$ 2.5	93 $\pm$ 31		3.3 $\pm$ 1.1
823 $\pm$ 3	1000 $\pm$ 290	94 $\pm$ 15	35 $\pm$ 10
845 $\pm$ 3	350 $\pm$ 115	97 $\pm$ 15	12.0 $\pm$ 4.0
856 $\pm$ 3	21 $\pm$ 3		0.72 $\pm$ 0.10
900 $\pm$ 3	390 $\pm$ 150	79 $\pm$ 16	13.0 $\pm$ 5.0
982 $\pm$ 4	185 $\pm$ 56		5.9 $\pm$ 1.8
1035 $\pm$ 4	30 $\pm$ 6		0.94 $\pm$ 0.19
1054 $\pm$ 4	49 $\pm$ 10		1.5 $\pm$ 0.3
1094 $\pm$ 4	15 $\pm$ 3		0.45 $\pm$ 0.09
1143 $\pm$ 4.5	913 $\pm$ 203		27 $\pm$ 6
1185 $\pm$ 5	230 $\pm$ 70		6.7 $\pm$ 2.0
1239 $\pm$ 5			
1254 $\pm$ 5			
1318 $\pm$ 6	58		1.6
1339 $\pm$ 6	59		1.6
1392 $\pm$ 6	172 $\pm$ 41		4.6 $\pm$ 1.1
1427 $\pm$ 6	204 $\pm$ 53		5.4 $\pm$ 1.4

¹⁵⁷
⁶⁴Gd

THERMAL CROSS SECTIONS

$\sigma_{\gamma} = 254000 \pm 2000$ b
 $\bar{\sigma}_{\gamma}^c = 1011$ b
 $\sigma_n < 0.5$ mb [¹⁵⁴Sm⁰⁺]
 $\sigma_n < 0.05$ mb [¹⁵⁴Sm²⁺]

RESONANCE PROPERTIES

$I_{\gamma}^c = 730 \pm 20$ b
 $R_1^1 = 4.9 \pm 1.3$ fm
 $\langle D \rangle = 5.6 \pm 0.7$ eV
 $S_0 = 2.3 \pm 0.2$

RESONANCE PARAMETERS

$I'' = 3/2^-$

$\chi_{\text{Abn}} = 15.7$

$S_n = 7936.8 \pm 0.8$ keV

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
0.0314 ± 0.002	0.59 ± 0.01		106 ± 1	3.33 ± 0.06
2.825 ± 0.015	0.431 ± 0.004		97 ± 1	0.256 ± 0.003
16.24 ± 0.03	0.3 ± 0.1			0.074 ± 0.025
16.77 ± 0.06	16.0 ± 1.0	2	77 ± 5	3.9 ± 0.3
20.56 ± 0.04	13.8 ± 1.0	2	88 ± 5	3.04 ± 0.02
21.65 ± 0.04	0.47 ± 0.06		114 ± 23	0.10 ± 0.01
23.33 ± 0.04	0.59 ± 0.05		122 ± 31	0.12 ± 0.01
25.40 ± 0.04	2.3 ± 0.1	1	85 ± 13	0.46 ± 0.02
40.17 ± 0.09	0.98 ± 0.04		110 ± 20	0.16 ± 0.06
44.22 ± 0.10	11.2 ± 0.6	2	91 ± 8	1.68 ± 0.09
48.80 ± 0.11	30.0 ± 1.8	2	90 ± 4	4.3 ± 0.3
58.38 ± 0.08	35 ± 3	1	100 ± 5	4.6 ± 0.4
66.65 ± 0.15	11.0 ± 0.7	1	67 ± 12	1.35 ± 0.09
81.48 ± 0.15	15.0 ± 0.9	1	108 ± 35	1.66 ± 0.10
82.30 ± 0.15	7.7 ± 0.5			0.85 ± 0.06
87.46 ± 0.15	12.7 ± 0.8	2	128 ± 18	1.36 ± 0.09
96.59 ± 0.15	15.2 ± 0.8	2		1.55 ± 0.08
100.2 ± 0.1	35 ± 3	1	84 ± 19	3.5 ± 0.3
105.3 ± 0.1	43 ± 8	2	70 ± 10	4.2 ± 0.8
107.7 ± 0.1	7.0 ± 0.8			0.68 ± 0.08
110.5 ± 0.1	53 ± 8		85 ± 10	5.04 ± 0.08
115.4 ± 0.1	24 ± 2		112 ± 24	2.2 ± 0.2
121.0 ± 0.1	165 ± 15	1	87 ± 6	15.0 ± 1.4
138.7 ± 0.2	62 ± 15	2	86 ± 20	5.3 ± 1.3
139.3 ± 0.2	7.5 ± 0.8			0.64 ± 0.07
143.7 ± 0.2	75.0 ± 10.0	2		6.26 ± 0.83
148.4 ± 0.2	18.0 ± 3.6	1		1.48 ± 0.30
156.8 ± 0.2	24.7 ± 1.8			1.97 ± 0.14
165.5 ± 0.2	25.7 ± 1.8	2	100 ± 30	2.00 ± 0.14
168.6 ± 0.2	2.5 ± 0.4			0.19 ± 0.03
169.5 ± 0.2	4.1 ± 0.3			0.31 ± 0.02
171.4 ± 0.3	30 ± 5	1		2.29 ± 0.38
178.7 ± 0.3	20.0 ± 1.0	2	145 ± 47	1.50 ± 0.08
184.9 ± 0.3	22.0 ± 1.3	2		1.62 ± 0.10
191.4 ± 0.4	21.0 ± 2.0			1.52 ± 0.15

¹⁵⁷
64 Gd

E ₀ (eV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
195.6 ±0.3	57 ± 7	2	106 ±46	4.1 ±0.5
204.2 ±0.4	8.0 ± 0.9			0.56 ±0.06
206.9 ±0.4	1.7 ± 0.3			0.12 ±0.02
208.9 ±0.4	140 ±20			9.69 ±1.38
218.4 ±0.4	6.7 ± 0.6			0.45 ±0.04
222.4 ±0.4	5.0 ± 3.0			0.34 ±0.20
229.7 ±0.4	10.0 ± 1.2			0.66 ±0.08
240.9 ±0.5	190 ±20			12.2 ±1.3
244.6 ±0.5	3.3 ± 1.1			0.21 ±0.07
248.2 ±0.5	12.0 ± 1.2			0.76 ±0.08
250.2 ±0.6	4.3 ± 0.6			0.27 ±0.04
255.0 ±0.6	2.7 ± 0.5			0.17 ±0.03
260.1 ±0.6	16.1 ± 1.6			1.0 ±0.1
265.8 ±0.6	8.0 ± 0.8			0.49 ±0.05
268.2 ±0.7	13.1 ± 1.8			0.80 ±0.11
281.8 ±0.7	47 ± 8			2.8 ±0.5
287.6 ±0.7	17.0 ± 1.7			1.0 ±0.1
290.8 ±0.7	49 ± 7			2.9 ±0.4
293.7 ±0.8	46 ± 7			2.7 ±0.4
300.9 ±0.8	40 ±10			2.3 ±0.6
306.4 ±0.8	3.5 ± 0.5			0.2 ±0.03

¹⁵⁸
64 Gd

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.5 \pm 0.5 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_{\gamma}^c &= 61 \pm 6 \text{ b} \\ R_{\gamma}^c &= 6.5 \pm 1.0 \text{ fm} \\ \langle D \rangle &= 86 \pm 4 \text{ eV} \\ S_0 &= 1.5 \pm 0.2 \end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\chi_{\text{Abn}} = 24.7$$

$$S_n = 7930.7 \pm 3.3 \text{ keV}$$

E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)
22.30 ± 0.02	6.0 ± 0.6	96 ± 10	1.27 ± 0.13
101.1 ± 0.1	1.0 ± 0.2		0.10 ± 0.02
242.7 ± 0.2	60 ± 10	105 ± 12	3.9 ± 0.6
277.2 ± 0.2	18 ± 2		1.1 ± 0.1
344.8 ± 0.3	155 ± 15	93 ± 8	8.35 ± 0.81
409.1 ± 0.4	265 ± 20	100 ± 10	13.1 ± 1.0
503.3 ± 0.3	270 ± 20	105 ± 10	12.0 ± 0.9
588.5 ± 0.3	56 ± 6	112 ± 14	2.3 ± 0.3
692.9 ± 0.4	750 ± 100	95 ± 10	28.5 ± 3.8
847.3 ± 0.5	1600 ± 200	107 ± 12	55.0 ± 6.9

¹⁵⁸
⁶⁴Gd

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
869.3 ± 0.5	3.3±	1.6	0.11± 0.05
917.1 ± 0.3	460 ± 30	83 ± 10	15.2 ± 1.0
1059.0 ± 0.4	270 ± 20	70 ± 15	8.3 ± 0.8
1219.9 ± 0.5	900 ± 100	110 ± 14	25.8 ± 2.9
1294.7 ± 0.3	490 ± 60	112 ± 12	13.6 ± 1.7
1351.3 ± 0.3	25 ± 15		
1427.6 ± 0.3	660 ± 50	108 ± 14	17.5 ± 1.3
1458.8 ± 0.3	1070 ± 80	135 ± 30	28.0 ± 2.1
1584.4 ± 0.3	360 ± 40	93 ± 10	9.0 ± 1.0
1740 ± 1	3.0±	1.5	0.72± 0.04
1776 ± 0.4	480 ± 50	128 ± 14	11.4 ± 1.2
1876.1 ± 0.4	265 ± 55	102 ± 10	6.1 ± 1.3
1944.7 ± 0.5	650 ± 120	99 ± 10	14.7 ± 2.7
1990.6 ± 0.5	610 ± 120	107 ± 13	13.7 ± 2.7
2113 ± 2	8.9±	4.0	0.19± 0.09
2243.4 ± 0.6	165 ± 35	85 ± 17	3.48± 0.74
2317.3 ± 0.6	650 ± 80	155 ± 25	13.5 ± 1.7
2361 ± 2	7.6±	4.0	0.16± 0.08
2386.7 ± 0.6	111.5±	90	22.8 ± 1.8
2564.3 ± 0.7	350 ± 100	135 ± 18	6.9 ± 2.0
2585.4 ± 0.7	80 ± 15	70 ± 20	1.57± 0.30
2654.4 ± 0.8	225 ± 30	95 ± 17	4.36± 0.58
2795.7 ± 0.8	605 ± 30	130 ± 25	11.4 ± 0.6
2868.8 ± 0.8	4200 ± 600		78.4 ± 11.2
2933.8 ± 0.9	790 ± 40	91 ± 13	14.6 ± 0.7
3071 ± 3	42 ± 15		0.75± 0.27
3094.2 ± 0.9	65 ± 25		1.2 ± 0.5
3165.1 ± 1.0	220 ± 30		3.91± 0.53
3325 ± 3	16 ± 8		0.28± 0.14
3479.3 ± 1.1	3400 ± 600		57.6 ± 10.2
3535 ± 3	21 ± 12		0.35± 0.20
3586.2 ± 1.2	770 ± 100		12.9 ± 1.7
3624.1 ± 1.2	40 ± 20		0.66± 0.33
3684.0 ± 3.0	24 ± 12		0.40± 0.20
3768.1 ± 1.3	2950 ± 300		48.1 ± 4.9
3937.0 ± 1.4	1500 ± 240		23.9 ± 3.8
3982.7 ± 1.4	4000 ± 800		63.4 ± 12.7
4180.4 ± 1.5	570 ± 40		8.8 ± 0.6
4223.0 ± 4.0	30 ± 15		0.46± 0.23
4299.9 ± 1.5	445 ± 80		6.8 ± 1.2
4468.0 ± 4.0	55 ± 20		0.82± 0.30
4501.2 ± 1.7	360 ± 70		5.4 ± 1.0
4621.0 ± 1.7	2050 ± 300		30.2 ± 4.4
4796.2 ± 1.8	1650 ± 200		23.8 ± 2.9
4894.0 ± 1.9	420 ± 80		6.0 ± 1.1
4985.3 ± 1.9	1100 ± 250		15.6 ± 3.5
5029.8 ± 2.0	100 ± 50		1.4 ± 0.7
5113.0 ± 2.0	50 ± 30		0.70± 0.42
5196.1 ± 2.1	30 ± 20		0.42± 0.28
5334.2 ± 2.2	360 ± 160		4.9 ± 2.2
5414.0 ± 2.2	910 ± 230		12.4 ± 3.1
5611.2 ± 2.3	6200 ± 1500		82.8 ± 20.0

¹⁵⁸
₆₄ Gd

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
5680.9 ± 2.4	1900 ± 500		25.2 ± 6.6
5759.1 ± 2.4	1600 ± 400		21.1 ± 5.3
5993.4 ± 2.6	1500 ± 300		19.4 ± 3.9
6112.1 ± 2.6	125 ± 50		1.6 ± 0.6
6194.0 ± 2.7	770 ± 195		9.8 ± 2.5
6343.5 ± 2.8	2050 ± 500		25.7 ± 6.3
6376.8 ± 2.8	2300 ± 600		28.8 ± 7.5
6782.9 ± 3.1	700 ± 200		8.5 ± 2.4
6807.4 ± 3.1	350 ± 150		4.2 ± 1.8
6878.8 ± 3.1	100 ± 50		1.2 ± 0.6
7266.2 ± 3.4	100 ± 50		1.2 ± 0.6
7445.8 ± 3.5	250 ± 70		2.9 ± 0.8
7548.9 ± 3.6	270 ± 80		3.1 ± 0.9
7610.4 ± 3.6	2950 ± 750		33.8 ± 8.6
7676.3 ± 3.8	5500 ± 1400		62.8 ± 16.0
7854.2 ± 3.8	1650 ± 450		18.6 ± 5.1
7936.9 ± 3.9	600 ± 200		6.7 ± 2.3
8010.9 ± 3.9	300 ± 200		3.4 ± 2.2
8235.5 ± 4.1	1550 ± 400		17.0 ± 4.4
8288.9 ± 4.1	650 ± 200		7.1 ± 2.2
8368.0 ± 4.2	3700 ± 900		40.5 ± 9.8
8660.5 ± 4.7	850 ± 210		9.1 ± 2.2
8740.5 ± 4.5	6200 ± 1550		66.3 ± 16.6
8867.2 ± 4.6	1250 ± 300		13.3 ± 3.2
9362.6 ± 5.0	5800 ± 1500		59.9 ± 15.5
9437.5 ± 5.0	135 ± 80		1.4 ± 0.8
9513.3 ± 5.1	2100 ± 500		21.5 ± 5.1
9626.0 ± 5.2	2500 ± 630		25.5 ± 6.4
9767.3 ± 5.3	550 ± 250		5.6 ± 2.5
9949.5 ± 5.4	580 ± 260		5.8 ± 2.6
9979.8 ± 5.6	140 ± 80		1.4 ± 0.8

¹⁶⁰Gd
₆₄

Thermal Cross Sections

$$\sigma_T = 0.77 \pm 0.02 \text{ b (3.7 min } ^{161}\text{Gd)}$$

$$\sigma_{\text{con}} = 9.15 \pm 0.05 \text{ fm}$$

Resonance Properties

$$I^{\pi} = 7.0 \pm 1.0 \text{ b}$$

$$R^{\dagger} = 6.8 \pm 0.8 \text{ fm}$$

$$\langle D \rangle = 170 \pm 20 \text{ eV}$$

$$S_0 = 1.8 \pm 0.4$$

Resonance Parameters

$$I^{\pi} = 0^+$$

$$\chi_{\text{Bn}} = 21.7$$

$$S_n = 5633 \pm 10 \text{ keV}$$

E_0 (eV)	$g^{\dagger}_n$ (meV)	Γ_{γ} (meV)	$g^{\dagger}_n$ (meV)
222.0 ± 0.1	50 ± 5.0	120 ± 17	3.3 ± 0.3
421.9 ± 0.5	1.5 ± 0.7		0.07 ± 0.03
447.9 ± 0.5	15 ± 6		0.71 ± 0.28
478.9 ± 0.5	34 ± 37	125 ± 15	15.8 ± 1.7
571.8 ± 0.3	6.0 ± 1.0		0.25 ± 0.04
707.5 ± 1.0	3.8 ± 2.0		0.14 ± 0.08
752.6 ± 0.5	4.9 ± 1.1		0.18 ± 0.04
904.9 ± 0.3	3500 ± 360	105 ± 15	116.6 ± 12.0
984 ± 4	4.4 ± 0.9		0.14 ± 0.03
1240.9 ± 0.5	3050 ± 360	91 ± 14	85 ± 14
1417.9 ± 0.3	880 ± 100	100 ± 15	23.4 ± 2.7
1695 ± 7	10 ± 4		0.24 ± 0.10
1808.4 ± 0.4	7000 ± 450		164.6 ± 10.6
1828.9 ± 1.2	200 ± 100		4.7 ± 2.3
1954.8 ± 0.5	250 ± 40		5.6 ± 0.9
2268.9 ± 0.6	1450 ± 100		30.4 ± 2.1
2396.3 ± 0.7	5500 ± 750		112.3 ± 15.3
2516.9 ± 0.7	4535 ± 500		89.7 ± 20.0
2640.2 ± 0.8	3200 ± 800		62.3 ± 15.6
2813.3 ± 0.9	510 ± 120		9.6 ± 2.3
3454.7 ± 1.1	200 ± 100		3.4 ± 1.7
3717.9 ± 1.2	1400 ± 300		22.9 ± 4.9
3870.2 ± 1.3	1300 ± 300		20.9 ± 4.8
3931.6 ± 1.4	550 ± 130		8.8 ± 2.1
4517.8 ± 1.7	6100 ± 1500		90.8 ± 22.3
5018.3 ± 2.1	2000 ± 500		28.2 ± 7.1
5251.9 ± 2.1	1200 ± 300		16.6 ± 4.1
5836.5 ± 2.4	1950 ± 500		25.5 ± 6.6
5927.9 ± 2.5	3500 ± 600		45.6 ± 7.8
6390.8 ± 2.8	2550 ± 650		31.9 ± 8.1
6504.2 ± 2.9	11500 ± 2500		142.6 ± 31.0
6792.1 ± 3.1	6300 ± 1600		76.4 ± 19.4
6832.1 ± 3.1	1480 ± 500		17.9 ± 6.1
6900.7 ± 3.2	400 ± 250		4.8 ± 3.0
7303.6 ± 3.4	1950 ± 500		22.8 ± 5.9
7379.4 ± 3.5	5600 ± 1400		65.2 ± 16.3
7691.0 ± 3.7	4300 ± 1100		49.0 ± 12.5

¹⁶⁰
₆₄Gd

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
7840.9±3.8	3100 ± 750		35.0 ± 8.5
8305.5±4.2	3200 ± 750		35.1 ± 8.2
8465.3±4.3	2500 ± 600		27.1 ± 6.5
8693.7±4.4	2700 ± 650		29.0 ± 7.0
9095.6±4.5	3700 ± 900		38.6 ± 9.4
9518.4±5.1	2400 ± 600		24.6 ± 6.2
9662.4±5.2	2200 ± 550		22.4 ± 5.6

¹⁶¹
₆₄Gd
[3.7 min]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 31000 \pm 12000 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Gd ¹⁶⁰	diffraction	PR/B,5,997(72)	Moon
Gd ^{152,158}	activation	JIN,34,2699(72)	Steinnes
Gd ^{154,156}	mass spectrometry	JMS,6,435(71)	Dobrozemsky
Gd ¹⁵⁴	isom. ratio	DA/B,31,7511(71)	Kime
Gd ¹⁶¹	activation	NP/A,142,834(70)	Chang
Gd ¹⁵⁵	σ_a	NP/A,129,571(69)	Beg
Gd ^{155,157}	σ_t	PRIVATE COMM.(68)	Ohno
Gd	local osci.	ZFK-132,18(67)	Fahrman
Gd ^{154,156}	mass spectrometry	AE,22,133(67)	Grishanin
Gd ¹⁶¹	activation	PR,153,1310(67)	Wahlgren
Gd ¹⁵⁶	mass spectrometry	APA,23,64(66)	Lugmair
Gd ^{152,154,155,157}	σ_a	YF,1,252(65)	Andreev
Gd ^{154,156}	mass spectrometry	ORNL-3832,7(65)	Lantz
Gd	σ_t	RSI,36,887(65)	Rustad
Gd	σ_t pile osci.	NUK,6,245(64)	Sokolowski
Gd	diffraction	JAP,35,1045(64)	Hill
Gd ^{158,160}	activation	NP,41,372(63)	Mangal
Gd ^{155,157}	alpha emission	PL,1,289(62)	Cheifetz
Gd ^{155,157}	σ_a (spectra)	IZV,26,1118(62)	Groshev
Gd	pulsed n	NSE,9,132(61)	Meadows
Gd ¹⁵⁸	activation	NSE,8,378(60)	Lyon
Gd ^{155,157}	σ_t	NSE,8,183(60)	Moller
Gd,Gd ^{155,157}	pile osci.	AERE-R/R-2516(59)	Jovitt
Gd ^{155,157}	mass spectrometry	PR,115,424(59)	Low
Gd,Gd ^{155,157}	σ_t	58GENEVA,16,44(58)	Pattenden
Gd	pile osci.	AERE-R/R-2459(58)	Tattersall
Gd	pile osci.	AERE-R/M-100(57)	Cummins
Gd	local osci.	PR,83,641(51)	Pomerance
Gd	pile osci.	PP5/A,63,1175(50)	Colmer
Gd	pile osci.	PR,80,342(50)	Harris
Gd ^{155,157}	mass spectrometry	PR,79,271(50)	Inghram
Gd ^{158,160}	activation	PR,75,1276(49)	Butement
Gd ¹⁶⁰	activation	ANL-4237,64(49)	Der Mateosian
Gd ^{155,157}	mass spectrometry	PR,71,745(47)	Lapp
Gd ¹⁵⁸	activation	PR,72,888(47)	Seren
Gd	σ_t	PR,71,757(47)	Sturm

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Gd ¹⁵⁴	σ_t	11.6-986	BAP,17,580(72)+	Rahn
Gd ¹⁵⁸	σ_t	22.3-9980	BAP,17,580(72)+	Rahn
Gd ¹⁶⁰	σ_t	222-9852	BAP,17,580(72)+	Rahn
Gd	$\bar{\sigma}_s \sigma_\gamma$ (spectra)	2-241	NP/A,145,549(70)	Asghar
Gd ¹⁵⁵	$\bar{\sigma}_s \sigma_\gamma$ (spectra)	2-93	NP/A,145,549(70)	Asghar
Gd ¹⁵⁷	$\bar{\sigma}_s \sigma_\gamma$ (spectra)	16-241	NP/A,145,549(70)	Asghar
Gd ¹⁵⁵	σ_γ (spectra)	0.03-62.9	ZET,58,456(70)	Danelyan
Gd ¹⁵⁷	σ_γ (spectra)	0.03-146	ZET,58,456(70)	Danelyan
Gd	σ_γ	1000-750000	NP/A,146,337(70)	Friesenhahn
Gd ¹⁵⁵	$\sigma_t \sigma_\gamma \sigma_\gamma$ (SI)	3-183	NP/A,146,337(70)	Friesenhahn
Gd ¹⁵⁷	$\sigma_t \sigma_\gamma \sigma_\gamma$ (SI)	3-184	NP/A,146,337(70)	Friesenhahn
Gd	σ_t	6.3-48.7	NP/A,132,129(69)	Julien
Gd ¹⁵²	$\sigma_t \sigma_\gamma$	8-293	YF,9,897(69)	Karzhavina
Gd ¹⁵⁴	$\sigma_t \sigma_\gamma$	11-224	YF,9,897(69)	Karzhavina
Gd ¹⁵⁵	$\sigma_t \sigma_\gamma$	6.3-183	YF,9,897(69)	Karzhavina
Gd ¹⁵⁶	$\sigma_t \sigma_\gamma$	33-1094	YF,9,897(69)	Karzhavina
Gd ¹⁵⁷	$\sigma_t \sigma_\gamma$	16-306	YF,9,897(69)	Karzhavina
Gd ¹⁵⁸	$\sigma_t \sigma_\gamma$	22-2338	YF,9,897(69)	Karzhavina
Gd ¹⁶⁰	$\sigma_t \sigma_\gamma$	222-2656	YF,9,897(69)	Karzhavina
Gd	σ_t	2-2680	PR,180,1130(69)	Mughabghab
Gd ¹⁵⁵	σ_t	2-69	PR,180,1130(69)	Mughabghab
Gd ¹⁵⁶	σ_t	33-846	PR,180,1130(69)	Mughabghab
Gd ¹⁵⁷	σ_t	0.2-185	PR,180,1130(69)	Mughabghab
Gd ¹⁵⁸	σ_t	22-917	PR,180,1130(69)	Mughabghab
Gd ¹⁶⁰	σ_t	223-2680	PR,180,1130(69)	Mughabghab
Gd ¹⁵⁵	σ_t	0.03-85	CEA-N-1149(69)	Ribon
Gd ¹⁵⁷	σ_t	0.03-248	CEA-N-1149(69)	Ribon
Gd ¹⁵²	σ_t	3.3-93.5	UFZ,14,517(69)	Vertebnyi
Gd ¹⁵⁴	σ_t	9.4-148	UFZ,14,517(69)	Vertebnyi
Gd ¹⁵²	σ_t	3.3-93.5	UFZ,13,2083(68)	Vertebnyi
Gd ¹⁵⁴	σ_t	9.4-148	UFZ,13,2083(68)	Vertebnyi
Gd	$\bar{\sigma}_s$	17.1	NP/A,97,657(67)	Poortmans
Gd	polarization	0.03-2.8	PR/B,138,1361(65)	Shore
Gd ¹⁵⁵	σ_t	2-70	BAP,9,433(64)+	Mughabghab
Gd ¹⁵⁶	σ_t	33-350	BAP,9,433(64)+	Mughabghab
Gd ¹⁵⁷	σ_t	2.8-160	BAP,9,433(64)+	Mughabghab
Gd ¹⁵⁸	σ_t	22.2	BAP,9,433(64)+	Mughabghab
Gd	polarization	0.03-6.3	PR/B,134,68(64)	Stolovy
Gd ¹⁵⁵	σ_γ	2-44	ANL-6589(62)	Carpenter
Gd	σ_t	0.033	AP,7,50(61)	Hohne
Gd ^{155,157}	σ_γ (spectra)	0.025	60KINGSTON,573(60)	Bartholomew
Gd ¹⁵⁵	σ_t	0.027	NSE,8,183(60)	Moller
Gd ¹⁵⁷	σ_t	0.031	NSE,8,183(60)	Moller
Gd	$\sigma_\gamma \bar{\sigma}_s$	6.4-81	NP,5,294(58)	Bovey
Gd, Gd ^{155,157}	σ_t	2.1-49	BAP,2,42(57)	Simpson
Gd, Gd ^{155,157}	σ_t	2.1-49	100-16373(57)	Simpson
Gd	σ_t	0-0.2	PR,72,585(47)	Brill
Gd	σ_t		FR,71,757(47)	Sturm
Gd	σ_t	0.044	FR,70,557(46)	Borst

¹⁵⁹
⁶⁵Tb

THERMAL CROSS SECTIONS

$\sigma_y = 25.5 \pm 1.1$ b
 $\sigma_s = 20 \pm 2$ b
 $\sigma_{pa}^c = 20$ b
 $a_{coh} = 7.56 \pm 0.20$ fm

RESONANCE PROPERTIES

$I_\gamma = 430 \pm 40$ b
 $R_\gamma = 8.3 \pm 0.8$ fm
 $\langle D \rangle = 4.2 \pm 0.6$ eV
 $S_0 = 1.2 \pm 0.3$

RESONANCE PARAMETERS

$I^n = 3/2^+$		$\%abn = 100$		$S_n = 6381.8 \pm 1.4$ keV	
E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
3.35±0.01	80 ±10	0.42 ±0.04	2	80 ±10	0.23 ±0.03
4.99±0.02		0.061±0.006	1		0.027±0.003
11.14±0.04	95 ± 6	9.8 ±0.4	2	87 ± 6	2.9 ±0.1
14.38±0.06		0.20 ±0.05			0.054±0.013
21.2 ±0.2		2.1 ±0.2			0.46 ±0.05
24.5 ±0.2	95 ±10	5.5 ±0.4	2	91 ±10	1.11 ±0.08
27.6 ±0.2		0.92 ±0.10			0.175±0.019
33.5 ±0.2	80 ± 8	3.5 ±0.4		76 ± 8	0.60 ±0.08
43.7 ±0.3	99 ± 4	6.0 ±0.2	2	94 ± 4	0.91 ±0.04
46.2 ±0.3	100 ± 4	13.9 ±0.6	2	89 ± 4	2.00 ±0.15
50.4 ±0.4		2.6 ±0.6			0.37 ±0.09
51.6 ±0.2		1.08 ±0.14			0.15 ±0.02
54.3 ±0.4		0.6 ±0.1			0.081±0.01
57.3 ±0.3		1.32 ±0.14			0.176±0.019
58.7 ±0.5		1.7 ±0.3			0.22 ±0.04
64.9 ±0.6	99 ± 7	11.6 ±0.8	2	90 ± 7	1.44 ±0.09
66.8 ±0.3		2.4 ±0.2			0.29 ±0.03
74.0 ±0.7	106 ± 5	16 ±1		90 ± 5	1.86 ±0.01
76.4 ±0.7	85 ± 4	6.4 ±0.6	1	76 ± 4	0.75 ±0.08
77.5 ±0.7	88 ± 7	7.2 ±0.7	1	78 ± 7	0.083±0.008
88.8 ±0.5		3.6 ±0.4			0.38 ±0.04
90.8 ±1.0		7.9 ±0.8			0.83 ±0.08
97.5 ±1.0	122 ± 6	29.3 ±1.5	1	93 ± 5	3.50 ±0.15
108.7 ±1.0	138 ± 8	27 ±2	1	102 ± 7	2.6 ±0.2
113.3 ±1.0	146 ± 4	42.0 ±1.5	1	90 ± 3	4.00 ±0.15

Note- Resonance parameters contribute 340 b to the absorption resonance integral.

¹⁶⁰
⁶⁵Tb
[72.3 day]

THERMAL CROSS SECTIONS

$\sigma_y = 525 \pm 100$ b

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Tb ¹⁵⁹	diffraction	JP/C,5,2887(72)	Toffield
Tb ¹⁵⁹	σ_t	AKE,16,49(70)	Knorr
Tb ¹⁵⁹	σ_γ	NIM,86,83(70)	Malik
Tb ¹⁵⁹	activation	70HELSINKI,2,589(70)	Ricabarra
Tb ¹⁵⁹	activation	JIN,29,2155(67)	Alstad
Tb ¹⁵⁹	diffraction	PR,131,1518(63)	Felcher
Tb ¹⁵⁹	diffraction	JCP,35,1950(61)	Atoji
Tb ¹⁶⁰	activation	JCP,25,502(56)	Smith
Tb ¹⁵⁹	pile osci.	PR,83,641(51)	Pomerance
Tb ¹⁵⁹	activation	ZN,1,179(46)	Bothe

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Tb ¹⁵⁹	σ_t	3.3	PRIVATE COMM.(71)	Cansoy
Tb ¹⁵⁹	$\bar{\sigma}_s \sigma_\gamma$	24-113	65ANTWERP,65(65)	Asghar
Tb ¹⁵⁹	polarization	3.3-11.1	PHY,30,713(64)	Postma
Tb ¹⁵⁹	$\sigma_t \bar{\sigma}_s \sigma_\gamma$	3.3-90.6	ZET,47,43(64)	Wang
Tb ¹⁵⁹	σ_t	3.3-156	PR,99,10(55)	Harvey
Tb ¹⁵⁹	σ_t	3.3-11.4	PR,96,1014(54)	Sailor

⁶⁶Dy

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 930 \pm 20 \text{ b} \\ \sigma_s &= 100 \pm 10 \text{ b} \\ \sigma_{pa}^c &= 28 \text{ b} \\ \sigma_t &= 1030 \pm 25 \text{ b} \\ a_{coh} &= 16.9 \pm 0.4 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 1600 \pm 100 \text{ b} \\ S_0 &= 2.0 \pm 0.5\end{aligned}$$

¹⁵⁶
⁶⁶Dy
[2 × 10⁴ yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 33 \pm 3 \text{ b} \\ \sigma_a &< 9 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$I_T = 960 \pm 80 \text{ b}$$

RESONANCE PARAMETERS

$$I'' = 0^+$$

$$\% \text{Abr} = 0.06$$

$$S_n = 6975 \pm 7 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)	E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
2.15 ± 0.02	0.20	0.14	36.0 ± 0.3	~9.0	~1.5
15.2 ± 0.1	4.6 ± 0.7	1.2 ± 0.2	46.9 ± 0.5	~14.0	~2.0
17.4 ± 0.1	0.32 ± 0.20	0.08 ± 0.05	52 ± 0.6	~16	~2.0
19.6 ± 0.1	9.0 ± 2.0	2.1 ± 0.5	66.6 ± 0.6	~54	~6.5
24.5 ± 0.2	~2.4	~0.48	85.5 ± 1.2	~15	~1.7
29.3 ± 0.3	~8.7	~1.6	90.9 ± 1.4	~42	~4.0

¹⁵⁸
₆₆ Dy

THERMAL CROSS SECTIONS

$$\sigma_T = 43 \pm 6 \text{ b}$$
$$\sigma_a < 6 \text{ mb}$$

RESONANCE PROPERTIES

$$I_\gamma = 120 \pm 20 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\chi_{\text{Abn}} = 0.10$$

$$S_n = 6826 \pm 6 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
^a 38 ± 1	~22	~3.6
45.6 ± 0.5	~39	~5.7
^a 86.0 ± 1.5	~81	~8.7

^a Isotopic identification uncertain

^a Isotopic identification uncertain, level may belong to Dy-161

¹⁶⁰
₆₆ Dy

THERMAL CROSS SECTIONS

$$\sigma_T = 61 \pm 6 \text{ b}$$
$$\sigma_a < 0.3 \text{ mb}$$
$$a_{\text{coh}} = 6.7 \pm 0.4 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 1160 \pm 130 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\chi_{\text{Abn}} = 2.3$$

$$S_n = 6451.1 \pm 2.0 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
1.88 ± 0.02	0.4 ± 0.2	100 ± 20	0.30 ± 0.15
10.4 ± 0.1	19.3 ± 3.0	100 ± 20	5.9 ± 0.9
20.5 ± 0.1	~25		~5.6
85.0 ± 1.3	~93		~10

¹⁶¹₆₆Dy

THERMAL CROSS SECTIONS

$\sigma_{\gamma} = 585 \pm 30$ b
 $\bar{\sigma}_a = 22 \pm 1$ b
 $\sigma_a < 0.03$ mb
 $a_{coh} = 10.3 \pm 0.4$ fm

RESONANCE PROPERTIES

$I_{\gamma} = 1060 \pm 80$ b
 $R_{\gamma} = 8.9 \pm 0.8$ fm
 $\langle D \rangle = 2.9 \pm 0.3$ eV
 $S_0 = 1.9 \pm 0.2$

RESONANCE PARAMETERS

$I^{\pi} = 5/2^{+}$		%Abrn = 18.9		$S_n = 8194.9 \pm 2.5$ keV	
E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)	
-2.38			(110)	13.6	
2.72±0.02	0.65± 0.07	3		0.39 ±0.04	
3.68±0.03	1.78± 0.18	2		0.928± .009	
4.34±0.05	1.0 ± 0.2	2		0.48 ±0.10	
7.74±0.12	0.60± 0.12	3		0.22 ±0.04	
10.40±0.19	1.3 ± 0.3	3		0.40 ±0.09	
10.88±0.20	0.4 ± 0.1	3		0.12 ±0.03	
12.65±0.20	0.13± 0.0	2		0.037±0.006	
14.32±0.20	5.6 ± 0.6			1.48 ±0.16	
16.8 ±0.3	7.7 ± 1.3			1.88 ±0.32	
18.5 ±0.3	8.0 ± 0.9			1.86 ±0.21	
20.23±0.08	1.0 ± 0.2			0.22 ±0.04	
25.08±0.12	1.2 ± 0.1			0.24 ±0.02	
28.84±0.14	2.7 ± 0.2			0.50 ±0.04	
29.73±0.14	0.74± 0.11			0.14 ±0.02	
35.50±0.19	3.0 ± 0.4			0.50 ±0.07	
37.64±0.21	11.2 ± 1.6			1.83 ±0.03	
38.38±0.21	11.4 ± 1.6			1.84 ±0.26	
43.02±0.26	13.0 ± 2.0		150 ±30	1.98 ±0.30	
44.85±0.30	12.0 ± 1.1		93 ±22	1.79 ±0.16	
50.8 ±0.4	7.9 ± 2.0			1.11 ±0.28	
51.8 ±0.4	10.5 ± 2.0			1.46 ±0.28	
54.9 ±0.4	10.2 ± 1.3			1.38 ±0.18	
59.1 ±0.5	12.1 ± 1.1			1.57 ±0.14	
61.1 ±0.5	7.2 ± 0.8			0.92 ±0.10	
63.3 ±0.5	5.0 ± 0.7			0.62 ±0.09	
66.4 ±0.5	1.3 ± 0.6			0.16 ±0.07	
72.3 ±0.6	6.5 ± 0.8			0.76 ±0.09	
76.5 ±0.6	7.4 ± 0.7			0.84 ±0.08	
79.4 ±0.7	0.5 ± 0.1			0.06 ±0.01	
81.8 ±0.7	3.6 ± 0.4			0.40 ±0.04	
84.6 ±0.7	12.9 ± 1.5			1.4 ±0.2	
88.3 ±0.8	11.3 ± 1.4			1.2 ±0.2	
92.5 ±0.8	12.0 ± 3.0			1.25 ±0.31	
94.4 ±0.8	4.9 ± 1.5			0.5 ±0.2	

¹⁶¹₆₆Dy

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
100.7 ± 1.0	17.1 ± 3.1			1.7 ± 0.3
104.5 ± 1.0	9.2 ± 1.5			0.9 ± 0.1
109.9 ± 1.1	10.9 ± 2.2			1.0 ± 0.2
111.9 ± 1.1	11.0 ± 2.2			1.0 ± 0.2
117.0 ± 1.2	11.1 ± 2.8			4.6 ± 2.3
119.7 ± 1.2	11.3 ± 2.8			1.03 ± 0.26
123.7 ± 1.2	76 ± 19			6.8 ± 1.0
130.4 ± 1.4	6.8 ± 1.6			0.6 ± 0.1
137.6 ± 1.5	22.3 ± 4.4			1.9 ± 0.4

¹⁶²₆₆Dy

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 180 \pm 20 \text{ b} \\ \sigma_s &= 2.5 \pm 0.8 \text{ b} \\ a_{\text{coh}} &= -1.4 \pm 0.5 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 2730 \pm 270 \text{ b} \\ R_\gamma &= 8.3 \pm 0.5 \text{ fm} \\ \langle D \rangle &= 72 \pm 10 \text{ eV} \\ S_0 &= 2.0 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\% \text{Abn} = 25.5$$

$$S_n = 6271.7 \pm 1.3 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
5.45 ± 0.02	20.8 ± 1.7	155 ± 30	9.10 ± 0.72
*5.80 ± 0.01	5.8 ± 0.01		2.40 ± 0.04
70.55 ± 0.13	110 ± 30		4.14 ± 0.27
72.10 ± 0.14	180 ± 50		2.12 ± 0.28
116.4 ± 1.2	6.9 ± 1.1		0.64 ± 0.10
206.1 ± 2.7	23 ± 4		1.6 ± 0.3
267 ± 5	580 ± 70		35.5 ± 4.3
354 ± 6	24.5 ± 6.1		1.3 ± 0.3
409 ± 7	85 ± 15		4.2 ± 0.8
526 ± 11	92 ± 23		4.0 ± 1.0
625 ± 14	1410 ± 280		56.3 ± 11.3
683 ± 17	420 ± 160		17.0 ± 6.0
711 ± 17	266 ± 100		10.0 ± 4.0
764 ± 19	850 ± 250		30.8 ± 6.2
861 ± 23	2550 ± 500		86.9 ± 17.0

* Isotopic assignment uncertain.

¹⁶³
⁶⁶Dy

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 130 \pm 10 \text{ b} \\ \bar{\sigma}_{\gamma} &= 9.7 \pm 0.4 \text{ b} \\ \sigma_a &< 0.02 \text{ mb} \\ \sigma_t &= 140 \pm 10 \text{ b} \\ a_{\text{coh}} &= 5.0 \pm 0.4 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 1680 \pm 150 \text{ b} \\ R' &= 8.7 \pm 0.7 \text{ fm} \\ S_0 &= 1.9 \pm 0.2\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 5/2^{-}$$

$$\% \text{Abn} = 24.9$$

$$S_n = 7654.7 \pm 1.3 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
-0.517			(100)	0.047
1.713 $\pm$ 0.004	1.68 $\pm$ 0.01	2	101.9 $\pm$ 0.8	1.28 $\pm$ 0.01
16.23 $\pm$ 0.03	20.6 $\pm$ 0.8	3	107 $\pm$ 15	5.11 $\pm$ 0.20
19.65 $\pm$ 0.03	0.95 $\pm$ 0.08	3		0.21 $\pm$ 0.02
35.79 $\pm$ 0.04	6.4 $\pm$ 1.0	2		
50.27 $\pm$ 0.06	3.5 $\pm$ 0.4	3		0.49 $\pm$ 0.06
55.85 $\pm$ 0.08	28 $\pm$ 2	3	125 $\pm$ 12	3.75 $\pm$ 0.27
58.97 $\pm$ 0.08	80 $\pm$ 6	2	100 $\pm$ 10	10.4 $\pm$ 0.8
66.11 $\pm$ 0.10	8.8 $\pm$ 0.8	3		0.98 $\pm$ 0.10
*71.3		2		
*72.3		3		
75.48 $\pm$ 0.10	2.4 $\pm$ 0.2	2		0.28 $\pm$ 0.02
78.99 $\pm$ 0.13	14 $\pm$ 2	2		1.56 $\pm$ 0.23
86.30 $\pm$ 0.14	1.30 $\pm$ 0.36	3		0.14 $\pm$ 0.01
94.08 $\pm$ 0.08	20 $\pm$ 2	3		2.06 $\pm$ 0.21
105.88 $\pm$ 0.10	62 $\pm$ 8	3	120 $\pm$ 25	6.03 $\pm$ 0.78
107.18 $\pm$ 0.18	28 $\pm$ 4	2	90 $\pm$ 20	2.70 $\pm$ 0.39
120.33 $\pm$ 0.12	9.8 $\pm$ 1.0	3		0.89 $\pm$ 0.09
126.58 $\pm$ 0.13	17.8 $\pm$ 3.0	3		1.58 $\pm$ 0.27
127.46 $\pm$ 0.13	13.2 $\pm$ 2.0			1.17 $\pm$ 0.18
135.31 $\pm$ 0.14	5.6 $\pm$ 0.6	3		0.48 $\pm$ 0.05
143.38 $\pm$ 0.15	15.4 $\pm$ 1.8	2		1.29 $\pm$ 0.15
144.97 $\pm$ 0.15	46 $\pm$ 6	2	85 $\pm$ 20	3.82 $\pm$ 0.50
155.02 $\pm$ 0.17	86 $\pm$ 8	2	85 $\pm$ 20	6.91 $\pm$ 0.64
163.81 $\pm$ 0.19	12.4 $\pm$ 1.4	3		0.97 $\pm$ 0.11
177.18 $\pm$ 0.21	4.0 $\pm$ 0.8	3		0.30 $\pm$ 0.06
185.09 $\pm$ 0.22	5.2 $\pm$ 1.0	3		0.38 $\pm$ 0.07
188.95 $\pm$ 0.23	3.4 $\pm$ 0.6	2		0.25 $\pm$ 0.04
202.90 $\pm$ 0.25	17.8 $\pm$ 3.0	2		1.25 $\pm$ 0.21
205.26 $\pm$ 0.26	54 $\pm$ 6	3	110 $\pm$ 20	3.77 $\pm$ 0.42
213.74 $\pm$ 0.27	6.8 $\pm$ 1.0	3		0.47 $\pm$ 0.07
224.15 $\pm$ 0.30	200 $\pm$ 24	2	140 $\pm$ 50	13.36 $\pm$ 1.60
233.54 $\pm$ 0.32	7.2 $\pm$ 1.0	3		0.47 $\pm$ 0.07
250.55 $\pm$ 0.18	18.2 $\pm$ 2.2	3		1.15 $\pm$ 0.14
261.13 $\pm$ 0.19	106 $\pm$ 12	3	110 $\pm$ 20	6.56 $\pm$ 0.74

¹⁶³
⁶⁶Dy

E ₀ (eV)	2g _n ⁰ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
266.01 ±0.19	134 ±16	3	125 ±25	6.19 ±0.98
274.17 ±0.20	30.6 ± 3.6	2		1.85 ±0.22
281.06 ±0.21	31.0 ± 4.0	3		1.85 ±0.24
286.85 ±0.22	128 ±18	2	105 ±40	7.53 ±1.06
297.77 ±0.23	88 ± 6	2		5.10 ±0.35
306.91 ±0.46	1.8 ± 1.0			1.03 ±0.06
323.06 ±0.25	280 ±40	[3]	130 ±30	15.58 ±2.23
324.55 ±0.26	264 ±40	[3]	100 ±30	14.65 ±2.22
326.93 ±0.26	35 ± 7			1.94 ±0.39
329.73 ±0.26	17.2 ± 3.6	[3]		0.95 ±0.20
342.86 ±0.28	22.8 ± 2.0	[2]	100 ±25	1.23 ±0.11
348.32 ±0.29	420 ±36	[2]		22.50 ±1.93
368.64 ±0.31	172 ±20	[3]	120 ±25	8.96 ±1.04
374.96 ±0.32	3.8 ± 1.4			0.20 ±0.07
382.16 ±0.33	5.2 ± 1.6	[3]		0.27 ±0.08
387.01 ±0.33	24.4 ± 3.6			1.24 ±0.18
390.44 ±0.34	54 ± 8	[2]	90 ±20	2.73 ±0.41
400.34 ±0.35	28 ± 6	[3]		1.40 ±0.30
403.15 ±0.35	3.4 ± 1.6	[3]		0.17 ±0.08
411.08 ±0.37	540 ±60	[3]	155 ±30	26.63 ±2.96
420.56 ±0.38	2.6 ± 1.0			0.13 ±0.05
429.38 ±0.38	46 ± 6		70 ±20	2.22 ±0.29
454.84 ±0.43	94 ±12		150 ±30	4.41 ±0.56
459.21 ±0.43	30 ± 6			1.40 ±0.28
465.32 ±0.44	22 ± 4		150 ±30	1.02 ±0.19
479.10 ±0.46	72 ±10			3.29 ±0.46
483.55 ±0.47	80 ±10		120 ±25	3.64 ±0.46
504.59 ±0.25	118 ±14		80 ±20	5.25 ±0.62
516.34 ±0.26	30 ± 6			1.32 ±0.26
519.83 ±0.26	22 ± 4			0.97 ±0.18
533.18 ±0.27	200 ±30		130 ±30	8.66 ±1.30
542.22 ±0.28	240 ±40		135 ±30	10.31 ±1.72
564.29 ±0.29	62 ± 8		85 ±25	2.61 ±0.34
569.02 ±0.30	122 ±16		150 ±30	5.11 ±0.67
580.79 ±0.31	88 ±12		130 ±30	3.65 ±0.50
594.52 ±0.52	98 ±14			4.02 ±0.57
601.25 ±0.32	146 ±20		130 ±30	5.95 ±0.82
615.71 ±0.34	70 ±12		75 ±20	2.82 ±0.48
620.77 ±0.34	100 ±16		110 ±25	4.01 ±0.64
632.10 ±0.35	210 ±36		125 ±30	8.35 ±1.43
637.17 ±0.35	158 ±28		135 ±30	6.26 ±1.11
641.96 ±0.36	162 ±28		100 ±30	6.39 ±1.11
644.76 ±0.36	124 ±20		150 ±40	4.88 ±0.79
652.20 ±0.47	5.0 ± 2.4			0.20 ±0.09
660.40 ±0.48	19.0 ± 5.0			0.74 ±0.20
686.95 ±0.39	24 ± 6			0.92 ±0.23
695.71 ±0.40	158 ±24		115 ±30	5.99 ±0.91
709.78 ±0.53	8 ± 4			0.30 ±0.15
712.49 ±0.42	76 ±12		95 ±30	2.85 ±0.45
721.32 ±0.43	88 ±12		75 ±25	3.28 ±0.46
732.05 ±0.44	19.2 ± 5.0			0.71 ±0.19
736.14 ±0.56	19.6 ± 5.0			0.72 ±0.18

¹⁶³
₆₆ Dy

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
741.69 ± 0.44	22 ± 6		85 ± 30	0.81 ± 0.22
747.15 ± 0.57	5.2 ± 2.4			0.19 ± 0.09
756.05 ± 0.46	52 ± 6			1.89 ± 0.22
764.30 ± 0.60	17.6 ± 8.0			0.64 ± 0.29
769.93 ± 0.60	6.2 ± 3.0			0.22 ± 0.11
776.55 ± 0.61	28 ± 6			1.00 ± 0.22
794.40 ± 0.63	54 ± 12			1.92 ± 0.43
809.51 ± 0.51	260 ± 60			9.14 ± 2.11
812.29 ± 0.51	50 ± 16			1.75 ± 0.56
823.04 ± 0.52	48 ± 16			1.67 ± 0.56
830.86 ± 0.53	84 ± 18			2.91 ± 0.62
846.62 ± 0.69	12.6 ± 7.0			0.43 ± 0.24
851.16 ± 0.54	158 ± 32			5.42 ± 1.10
857.75 ± 0.70	60 ± 16			2.05 ± 0.55
864.92 ± 0.56	52 ± 16			1.77 ± 0.54
873.91 ± 0.57	120 ± 28			4.06 ± 0.95
899.65 ± 0.30	180 ± 40			6.00 ± 1.33
918.71 ± 0.31	88 ± 10			2.90 ± 0.33
929.79 ± 0.31	206 ± 50			6.76 ± 1.64
935.75 ± 0.80	38 ± 20			1.24 ± 0.65
939.49 ± 0.32	260 ± 80			8.48 ± 2.61
949.67 ± 0.32	136 ± 36			4.41 ± 1.17
957.75 ± 0.83	36 ± 12			1.16 ± 0.39
967.35 ± 0.84	48 ± 16			1.54 ± 0.51
972.84 ± 0.34	230 ± 60			7.37 ± 1.92
980.52 ± 0.86	13.2 ± 8.0			0.42 ± 0.26
996.60 ± 0.88	54 ± 18			1.71 ± 0.57

▪ Masked by Dy-162 resonances.

¹⁶⁴
₆₆Dy

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 2700 \pm 75 \text{ b} \\ \sigma_T &= 1700 \pm 250 \text{ b [75.4 sec } ^{165}\text{Dy}^*] \\ \sigma_T &= 1000 \pm 150 \text{ b [2.35 hr } ^{165}\text{Dy}^*] \\ \bar{\sigma}_s &= 347 \pm 30 \text{ b} \\ a_{coh} &= 49.4 \pm 0.5 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 377 \pm 44 \text{ b} \\ R_\gamma &= 7.7 \pm 0.8 \text{ fm} \\ \langle D \rangle &= 200 \pm 40 \text{ eV} \\ S_0 &= 1.2 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		$\chi A b n = 28.2$		$S_n = 5715.4 \pm 1.4 \text{ keV}$	
$E_0 \text{ (eV)}$		$\Gamma_n \text{ (meV)}$	$\Gamma_\gamma \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$	
-1.89 ± 0.04			55 ± 3	41 ± 1	
145.4 ± 1.5		868 ± 40	[60]	72.0 ± 3.3	
450 ± 9		45 ± 11		2.1 ± 0.5	
534 ± 11		51 ± 12		2.2 ± 0.5	
855 ± 23		500 ± 180		17 ± 7	
1053 ± 31		31 ± 11		1.0 ± 0.4	
1190 ± 38		480 ± 160		14 ± 4	
1316 ± 44		820 ± 330		23 ± 9	

¹⁶⁵
₆₆Dy
[2.35 hr]

THERMAL CROSS SECTIONS

$$\sigma_T = 3900 \pm 300 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 22000 \pm 3000 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Dy ^{156,158,164,165}	activation	PRIVATE COMM.(72)	Aistad
Dy ¹⁶⁰⁻¹⁶³	mass spectrometry	JMS,6,435(71)	Dobrozemsky
Dy	σ_t	AKE,16,49(70)	Knorr
Dy ¹⁶¹⁻¹⁶⁴		70HELSINKI,1,651(70)	Vertebnyi
Dy ¹⁶⁰⁻¹⁶⁴	σ_t diffraction	PR,174,1553(68)	Child
Dy ¹⁶⁴	activation	68WASH,2,1263(68)-	Fabry
Dy ¹⁶⁴	activation	KE,10,307(67)	Albert
Dy ¹⁶²	σ_γ (spectra)	PR,154,1146(67)	Schult
Dy	σ_t	66PARIS,1,61(66)	Brunner
Dy ¹⁶⁰⁻¹⁶⁴	reactivity	NSE,25,12(66)	Scoville
Dy	σ_t	PRIVATE COMM.(65)	Ohno
Dy ¹⁶¹⁻¹⁶³	σ_t	AE,16,56(64)	Danelyan
Dy ¹⁶⁴	activation	NF,36,542(62)	Mangal
Dy	pulsed n	NSF,9,132(61)	Meadows
Dy ¹⁶⁴	activation	NSF,11,369(61)	Sher
Dy ^{158,164}	activation	NP,12,261(59)	Sehgal
Dy ^{160,161,163,164}	pile osci.	BAP,3,337(58)	House
Dy	pile osci.	AERE-R/M-100(57)	Cummins
Dy ¹⁶⁴	ratio	ZN/A,9,115(54)	Weber
Dy	$\bar{\sigma}_s$	CJP,31,432(53)	Brockhouse
Dy	pile osci.	PR,63,641(51)	Pomerance
Dy ¹⁶⁵	activation	PR,76,1256(49)	Ketelle
Dy ¹⁶⁴	activation	ANL-4010,55(47)	Goldhaber
Dy ¹⁶⁴	activation	PR,72,888(47)	Seren
Dy ¹⁶⁴	activation, ratio	ZN,1,190(46)	Flammersfeld
Dy	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Dy ¹⁶²	$\sigma_t \sigma_\gamma(SI)$	5.45-72.1	PRIVATE COMM.(73)	Liou
Dy ¹⁶³	$\sigma_t \sigma_\gamma(SI)$	1.71-997	PRIVATE COMM.(73)	Liou
Dy ¹⁶³	$\sigma_\gamma(\text{spectra})$	16.2-204	ZET,62,425(72)	Danelyan
Dy ¹⁶³	$\sigma_\gamma(\text{spectra})$	16.2-299	72BUD,214(72)	Mughabghab
Dy ¹⁶³	$\sigma_\gamma(\text{spectra})$	16.2-299	BAP,17,580(72)	Slaughter
Dy ¹⁶¹	polarization	2.72-18.5	ZN/A,26,334(71)	Brunhart
Dy ¹⁶³	polarization	1.71-16.25	ZN/A,26,334(71)	Brunhart
Dy ¹⁶¹	polarization	12.65-16.7	BAP,16,518(71)	Rorer
Dy ¹⁶³	$\sigma_\gamma(\text{spectra})$	1.7-323	BAP,15,549(70)	Mughabghab
Dy ¹⁶¹	σ_t	2.7-138	PR/C,1,1850(70)	Mughabghab
Dy ¹⁶²	σ_t	5.4-861	PR/C,1,1850(70)	Mughabghab
Dy ¹⁶³	σ_t	1.7-224	PR/C,1,1850(70)	Mughabghab
Dy ¹⁶⁴	σ_t	145-1316	PR/C,1,1850(70)	Mughabghab
Dy ¹⁶³	$\sigma_\gamma(\text{spectra})$	16-142	69STUDSVIK,663(69)	Danelyan
Dy ¹⁶⁰	σ_t	1.8-85	UFZ,14,1810(69)	Vertebnyi
Dy ¹⁵⁹	σ_t	38-271	UFZ,14,1810(69)	Vertebnyi
Dy ¹⁵⁸	σ_t	38-271	UFZ,13,2083(68)	Vertebnyi
Dy ¹⁶⁰	σ_t	1.8-85	UFZ,13,2083(68)	Vertebnyi
Dy	σ_t	1.7	EIR-123(67)	Brunner
Dy ¹⁶³	σ_t	1.7	66PARIS,1,61(66)	Brunner
Dy ¹⁶³	σ_s	1.7	NP,62,641(65)	Ceulemans
Dy ¹⁶¹	σ_t	0.022-1	AE,16,56(64)	Danelyan
Dy ¹⁶²	σ_t	0.022-1	AE,16,56(64)	Danelyan
Dy ¹⁶³	σ_t	0.022-1	AE,16,56(64)	Danelyan
Dy ¹⁶¹	σ_t	2.72-73.5	BAP,9,433(64)	Mughabghab
Dy ¹⁶²	σ_t	5.36-663	BAP,9,433(64)	Mughabghab
Dy ¹⁶³	σ_t	1.71-94.0	BAP,9,433(64)	Mughabghab
Dy ¹⁶⁴	σ_t	145.5	BAP,9,433(64)	Mughabghab
Dy ¹⁶³	σ_t	1.7	BAP,7,305(62)	Brunhart
Dy ¹⁶⁴	σ_t	0.001-1.0	NSE,11,369(61)	Sher
Dy ¹⁶¹	σ_t	2.7-63.5	BAP,2,42(57)+	Zimmerman
Dy ¹⁶²	σ_t	5.4-645	BAP,2,42(57)+	Zimmerman
Dy ¹⁶³	σ_t	1.7-94	BAP,2,42(57)+	Zimmerman
Dy ¹⁶⁴	σ_t	146	BAP,2,42(57)+	Zimmerman
Dy	σ_t	2.7-38	PRIVATE COMM.(56)	Pilcher
Dy	σ_t	0-19.5	PR,96,1014(54)	Sailor

¹⁶⁵₆₇Ho

THERMAL CROSS SECTIONS

$\sigma_T = 66.5 \pm 3.3$ b
 $\sigma_T = 3.5 \pm 0.5$ b (1200 yr ¹⁶⁶Ho)
 $\sigma_T = 63.0 \pm 3.3$ b (27.2 hr ¹⁶⁶Ho)
 $\bar{\sigma}_s = 9.4 \pm 0.2$ b
 $\sigma_a < 0.02$ mb
 $\sigma_{pa} = 23.5$ b
 $a_{coh} = 8.5 \pm 0.2$ fm

RESONANCE PROPERTIES

$I_\gamma = 700 \pm 20$ b
 $R_\gamma = 7.6 \pm 0.5$ fm
 $\langle D \rangle = 2.7 \pm 0.5$ eV
 $S_0 = 1.8 \pm 0.2$
 $S_1 = 1.6 \pm 0.3$

RESONANCE PARAMETERS

$I^\pi = 7/2^-$		$\%Abn = 100$		$S_n = 6242.7 \pm 0.6$ keV	
E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)	
Bound level					
3.92 ± 0.01	2.4 ± 0.1	4	85 ± 2	1.21 ± 0.005	
8.16 ± 0.02	1.64 ± 0.01	3		0.057 ± 0.004	
12.75 ± 0.05	11.8 ± 0.4	4		3.30 ± 0.11	
18.20 ± 0.05	0.84 ± 0.05	3		0.20 ± 0.01	
21.12 ± 0.05	0.63 ± 0.02	4		0.137 ± 0.004	
35.50 ± 0.05	6.3 ± 0.3	3	73.6 ± 3.5	1.06 ± 0.05	
37.30 ± 0.05	0.58 ± 0.02	3		0.095 ± 0.003	
39.65 ± 0.05	20 ± 2	4	88 ± 4	3.18 ± 0.32	
47.70 ± 0.05	24.3 ± 0.4	3	77 ± 3	3.52 ± 0.06	
51.60 ± 0.05	50.5 ± 0.7	3	85 ± 2	7.03 ± 0.10	
54.40 ± 0.05	3.0 ± 0.2	4		0.41 ± 0.03	
64.0 ± 0.1	21.0 ± 1.0	4	70 ± 4	2.63 ± 0.13	
68.80 ± 0.06	1.1 ± 0.1	[4]	65 ± 12	0.13 ± 0.01	
71.8 ± 0.1	20 ± 2	4	74 ± 4	2.36 ± 0.24	
80.0 ± 0.1	1.8 ± 0.1	4		0.20 ± 0.01	
83.8 ± 0.1	15.2 ± 1.0	4	67 ± 4	1.66 ± 0.11	
84.8 ± 0.1	4.9 ± 0.3	3		0.53 ± 0.03	
85.8 ± 0.1	32.7 ± 2.0	3		3.53 ± 0.22	
93.6 ± 0.1	83 ± 2	4	77 ± 2	8.6 ± 0.2	
101.9 ± 0.1	21.5 ± 0.3	4	74 ± 3	2.13 ± 0.03	
106.3 ± 0.1	8.8 ± 0.4	4		0.85 ± 0.04	
117.9 ± 0.1	11.7 ± 0.5		75 ± 6	1.08 ± 0.05	
120.6 ± 0.1	5.4 ± 0.4			0.49 ± 0.04	
124.8 ± 0.1	39.7 ± 1.4	4	74 ± 4	3.55 ± 0.13	
126.8 ± 0.1	18 ± 2		85 ± 15	1.6 ± 0.2	
128.4 ± 0.1	28 ± 4	3	65 ± 5	2.5 ± 0.4	
139.0 ± 0.1	0.28 ± 0.02			0.024 ± 0.002	
141.3 ± 0.1	1.50 ± 0.03			0.126 ± 0.003	
149.3 ± 0.1	2.8 ± 0.1			0.23 ± 0.01	
151.0 ± 0.1	37.1 ± 1.5	3	72 ± 3	3.02 ± 0.12	

$^{165}_{67}\text{Ho}$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
152.4 $\pm$ 0.1	1.5 $\pm$ 0.1			1.2 $\pm$ 0.01
163.2 $\pm$ 0.1	3.9 $\pm$ 0.2			0.31 $\pm$ 0.02
164.3 $\pm$ 0.1	16.4 $\pm$ 0.9	[4]		1.28 $\pm$ 0.07
169.7 $\pm$ 0.1	20.3 $\pm$ 0.5	[4]	60 $\pm$ 3	1.56 $\pm$ 0.04
174.6 $\pm$ 0.1	4.8 $\pm$ 0.3			0.36 $\pm$ 0.02
180.9 $\pm$ 0.1	34.8 $\pm$ 0.7	[4]		2.56 $\pm$ 0.05
187.9 $\pm$ 0.1	1.0 $\pm$ 0.2			0.07 $\pm$ 0.02
188.8 $\pm$ 0.1	18.7 $\pm$ 0.7		75 $\pm$ 5	1.36 $\pm$ 0.05
192.6 $\pm$ 0.1	9.3 $\pm$ 0.5			0.67 $\pm$ 0.04
194.7 $\pm$ 0.1	0.7 $\pm$ 0.1			0.05 $\pm$ 0.01
195.3 $\pm$ 0.1	3.3 $\pm$ 0.3			0.24 $\pm$ 0.02
202.3 $\pm$ 0.2	80 $\pm$ 5	[4]	76 $\pm$ 3	5.6 $\pm$ 0.4
204.9 $\pm$ 0.9	10.6 $\pm$ 0.6			0.74 $\pm$ 0.04
214.7 $\pm$ 0.2	53.0 $\pm$ 1.4	(3)	75 $\pm$ 3	3.62 $\pm$ 0.10
220.7 $\pm$ 0.2	29.0 $\pm$ 2.0		90 $\pm$ 10	1.95 $\pm$ 0.14
225.9 $\pm$ 0.2	0.9 $\pm$ 0.1			0.06 $\pm$ 0.01
230.0 $\pm$ 0.2	10.4 $\pm$ 0.5			0.69 $\pm$ 0.03
232.7 $\pm$ 0.2	8.4 $\pm$ 0.3			0.55 $\pm$ 0.02
235.9 $\pm$ 0.2	1.3 $\pm$ 0.2			0.085 $\pm$ 0.013
239.5 $\pm$ 0.2	30.0 $\pm$ 2.0	[4]	84 $\pm$ 5	1.94 $\pm$ 0.13
254.5 $\pm$ 0.2	137.0 $\pm$ 5.0			8.59 $\pm$ 0.31
261.1 $\pm$ 0.2	35.4 $\pm$ 2.0		77 $\pm$ 10	2.19 $\pm$ 0.12
264.9 $\pm$ 0.2	2.0 $\pm$ 0.3			0.12 $\pm$ 0.02
272.6 $\pm$ 0.2	6.8 $\pm$ 2.0			0.41 $\pm$ 0.12
274.1 $\pm$ 0.2	25.5 $\pm$ 1.5			1.54 $\pm$ 0.09
277.0 $\pm$ 0.2	14.0 $\pm$ 0.7			0.84 $\pm$ 0.04
280.9 $\pm$ 0.2	17.0 $\pm$ 0.8			1.01 $\pm$ 0.05
287.6 $\pm$ 0.3	11.2 $\pm$ 0.5			0.66 $\pm$ 0.03
290.9 $\pm$ 0.3	7.7 $\pm$ 0.5			0.45 $\pm$ 0.03
291.6 $\pm$ 0.3	19.3 $\pm$ 1.2			1.13 $\pm$ 0.07
297.0 $\pm$ 0.3	12.2 $\pm$ 0.6			7.08 $\pm$ 0.04
300.1 $\pm$ 0.3	112 $\pm$ 6			6.46 $\pm$ 0.35
306.6 $\pm$ 0.3	5.0 $\pm$ 0.2			0.34 $\pm$ 0.01
313.0 $\pm$ 0.3	15.7 $\pm$ 0.9			0.89 $\pm$ 0.05
320.0 $\pm$ 0.3	15.2 $\pm$ 0.7			0.85 $\pm$ 0.04
323.8 $\pm$ 0.3	59 $\pm$ 3			3.3 $\pm$ 0.2
327.6 $\pm$ 0.3	5.6 $\pm$ 0.2			0.31 $\pm$ 0.01
329.1 $\pm$ 0.3	2.9 $\pm$ 0.2			0.16 $\pm$ 0.01
331.4 $\pm$ 0.3	26.8 $\pm$ 3.0			1.47 $\pm$ 0.16
332.2 $\pm$ 0.3	25.0 $\pm$ 2.0			1.37 $\pm$ 0.11
339.6 $\pm$ 0.3	193.0 $\pm$ 8.0			10.5 $\pm$ 0.4
341.8 $\pm$ 0.3	14.6 $\pm$ 0.8			0.79 $\pm$ 0.04
350.2 $\pm$ 0.3	63.5 $\pm$ 4.5			3.39 $\pm$ 0.24
351.5 $\pm$ 0.3	135.0 $\pm$ 9.6			7.20 $\pm$ 0.48
351.3 $\pm$ 0.3	10.0 $\pm$ 2.0			0.53 $\pm$ 0.11
354.0 $\pm$ 0.3	28.8 $\pm$ 2.0			1.53 $\pm$ 0.11
358.9 $\pm$ 0.3	6.9 $\pm$ 0.3			0.35 $\pm$ 0.01
366.6 $\pm$ 0.3	27.1 $\pm$ 1.0			1.42 $\pm$ 0.05
371.0 $\pm$ 0.3	0.90 $\pm$ 0.20			0.07 $\pm$ 0.01
374.7 $\pm$ 0.3	63.8 $\pm$ 3.0			3.30 $\pm$ 0.15
375.1 $\pm$ 0.3	1.0 $\pm$ 0.2			0.05 $\pm$ 0.01
379.6 $\pm$ 0.3	1.7 $\pm$ 0.2			0.087 $\pm$ 0.010

¹⁶⁵
₆₇Ho

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
384.6 ±0.3	111.0 ± 6.0			5.66 ±0.31
386.0 ±0.4	22.3 ± 1.8			1.14 ±0.09
388.8 ±0.4	0.6 ± 0.2			0.03 ±0.01
401.2 ±0.4	12.4 ± 0.5			0.52 ±0.03
405.2 ±0.4	124.0 ± 7.0			6.16 ±0.35
407.8 ±0.4	0.60± 0.20			0.03 ±0.01
409.7 ±0.4	0.60± 0.20			0.03 ±0.01
413.5 ±0.4	6.4 ± 0.4			0.31 ±0.02
415.0 ±0.4	37.3 ± 2.0			1.63 ±0.10
416.7 ±0.4	37.1 ± 2.0			1.82 ±0.10
422.6 ±0.4	28.2 ± 1.2			1.37 ±0.06
430.3 ±0.4	213 ±10			10.3 ±0.5
433.7 ±0.4	14.0 ± 0.5			0.67 ±0.02
436.3 ±0.4	32.2 ± 1.8			1.54 ±0.09
438.3 ±0.4	38.7 ± 2.0			1.85 ±0.10
443.0 ±0.4	39.3 ± 2.0			1.87 ±0.10
445.8 ±0.4	3.0 ± 0.2			0.14 ±0.01
450.8 ±0.4	96.6 ± 5.0			4.55 ±0.24
454.7 ±0.4	14.1 ± 0.5			0.66 ±0.02
461.2 ±0.4	8.7 ± 0.3			0.41 ±0.01
464.9 ±0.4	1.0 ± 0.2			0.046±0.009
467.5 ±0.4	1.0 ± 0.2			0.046±0.009
475.1 ±0.4	4.0 ± 1.0			0.18 ±0.05
479.6 ±0.4	0.6 ± 0.2			0.03 ±0.01
485.4 ±0.5	14.1 ± 0.6			0.64 ±0.03
487.6 ±0.5	25.5 ± 1.2			1.15 ±0.05
494.1 ±0.5	7.0 ± 2.0			0.32 ±0.09
495.2 ±0.5	75.9 ± 5.0			3.4 ±0.2
505.8 ±0.8	2.6 ± 0.3			0.12 ±0.01
511.1 ±0.5	165.0 ±10.0			7.30 ±0.44
515.1 ±0.5	108.0 ± 7.0			4.76 ±0.3
520.1 ±0.5	20.9 ± 1.2			0.91 ±0.05
521.8 ±0.5	54.4 ± 5.0			2.38 ±0.22
528.5 ±0.5	88.0 ± 5.0			3.83 ±0.22
534.4 ±0.5	52.5 ± 4.0			2.27 ±0.17
536.0 ±0.5	1.7 ± 0.3			0.072±0.013
538.9 ±0.5	37.5 ± 2.5			1.62 ±0.11
541.0 ±0.5	38.6 ± 2.5			1.66 ±0.11
543.4 ±0.5	22.3 ± 1.0			0.96 ±0.04
552.5 ±0.6	19.8 ± 0.8			0.84 ±0.03
555.1 ±0.6	74.0 ± 4.0			3.14 ±0.17
559.1 ±0.6	43.2 ± 2.0			1.83 ±0.08
560.6 ±0.6	10.0 ± 0.5			0.42 ±0.02
563.5 ±0.6	45.2 ± 2.0			1.90 ±0.08
570.0 ±0.6	66.3 ± 4.0			2.77 ±0.17
578.3 ±0.6	31.9 ± 1.5			1.33 ±0.06
581.4 ±0.6	2.0 ± 0.5			0.083±0.02
584.6 ±0.6	126.0 ± 8.0			5.21 ±0.33
590.3 ±0.6	218.0 ±50.0			8.97 ±2.05
592.2 ±0.6	37.1 ± 2.0			1.52 ±0.08
596.5 ±0.6	2.0 ± 0.5			0.092±0.020
605.6 ±0.6	29.4 ± 1.0			1.20 ±0.04

¹⁶⁵
₆₇Ho

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
607.0 ± 0.6	3.0 ± 1.0			0.12 ± 0.04
612.9 ± 0.6	10.2 ± 0.6			0.41 ± 0.02
620.5 ± 0.6	33.8 ± 1.5			1.36 ± 0.06
621.8 ± 0.6	2.0 ± 0.5			0.08 ± 0.02
626.4 ± 0.6	0.8 ± 0.2			0.03 ± 0.01
632.7 ± 0.6	4.9 ± 0.5			0.19 ± 0.02
634.8 ± 0.6	9.8 ± 0.5			0.39 ± 0.02
644.2 ± 0.6	273.0 ± 15.0			10.76 ± 0.59
646.1 ± 0.6	36.9 ± 3.0			1.45 ± 0.12
653.2 ± 0.7	13.0 ± 0.6			0.51 ± 0.02
655.5 ± 0.7	1.0 ± 0.2			0.04 ± 0.01
661.1 ± 0.7	1.0 ± 0.2			0.04 ± 0.01
672.7 ± 0.7	1.5 ± 0.2			0.06 ± 0.01
677.3 ± 0.7	32.5 ± 1.2			1.25 ± 0.05
679.9 ± 0.7	107.0 ± 7.0			4.10 ± 0.27
681.5 ± 0.7	3.3 ± 0.4			0.13 ± 0.02
694.9 ± 0.7	40.5 ± 2.0			1.54 ± 0.08
698.4 ± 0.7	35.6 ± 1.5			1.35 ± 0.06
708.4 ± 0.7	57.7 ± 4.0			2.17 ± 0.15
710.1 ± 0.7	155.0 ± 12.0			5.82 ± 0.45
714.0 ± 0.7	24.2 ± 1.2			0.91 ± 0.05
723.0 ± 0.7	122.0 ± 8.0			4.54 ± 0.30
728.3 ± 0.7	19.0 ± 0.9			0.70 ± 0.03
735.7 ± 0.7	4.8 ± 0.6			0.18 ± 0.02
737.2 ± 0.7	56.5 ± 4.0			2.1 ± 0.2
744.3 ± 0.7	25.1 ± 1.2			0.92 ± 0.04
746.2 ± 0.7	39.1 ± 1.5			1.43 ± 0.06
756.2 ± 0.8	19.6 ± 1.0			0.71 ± 0.04
758.2 ± 0.8	25.5 ± 1.0			0.93 ± 0.04
767.5 ± 0.8	7.5 ± 0.4			0.27 ± 0.01
770.2 ± 0.8	30.3 ± 1.2			1.09 ± 0.04
774.8 ± 0.8	13.0 ± 1.0			0.47 ± 0.04
776.6 ± 0.8	120.0 ± 10.0			4.31 ± 0.36
779.5 ± 0.8	58.4 ± 3.0			2.09 ± 0.11
785.7 ± 0.8	56.0 ± 2.5			1.20 ± 0.09
794.2 ± 0.8	103 ± 7.0			3.66 ± 0.25
797.3 ± 0.8	51.7 ± 2.5			1.83 ± 0.09
799.2 ± 0.8	7.8 ± 0.7			0.28 ± 0.03
800.1 ± 0.8	5.0 ± 1.0			0.18 ± 0.04
803.4 ± 0.8	28.7 ± 1.2			1.01 ± 0.04
818.7 ± 0.8	10.8 ± 0.7			0.38 ± 0.02
823.5 ± 0.8	16.2 ± 0.9			0.56 ± 0.03
828.8 ± 0.8	31.5 ± 1.2			1.09 ± 0.04
830.8 ± 0.8	34.6 ± 1.5			1.20 ± 0.05
835.5 ± 0.8	7.2 ± 0.7			0.25 ± 0.02
837.5 ± 0.8	1.8 ± 0.5			0.062 ± 0.017
844.0 ± 0.8	49.7 ± 2.5			1.71 ± 0.09
848.8 ± 0.9	50.5 ± 2.5			1.73 ± 0.09
853.9 ± 0.9	6.0 ± 0.6			0.21 ± 0.02
856.0 ± 0.9	9.3 ± 0.6			0.32 ± 0.02
861.5 ± 0.9	8.9 ± 0.6			0.30 ± 0.02
863.5 ± 0.9	7.0 ± 0.6			0.24 ± 0.02

¹⁶⁵₆₇Ho

E ₀ (eV)	2g _n ⁰ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
868.1 ± 0.9	143.0 ± 9.0			4.85 ± 0.31
874.9 ± 0.9	8.5 ± 1.0			0.29 ± 0.03
876.5 ± 0.9	21.7 ± 1.2			0.73 ± 0.04
889.4 ± 0.9	38.8 ± 1.2			1.30 ± 0.04
893.4 ± 0.9	89.3 ± 4.0			2.99 ± 0.13
895.6 ± 0.9	5.0 ± 0.6			0.17 ± 0.02
900.7 ± 0.9	69.3 ± 2.5			2.31 ± 0.08
907.0 ± 0.9	3.8 ± 1.0			0.13 ± 0.03
908.1 ± 0.9	36.1 ± 1.8			1.20 ± 0.06
915.8 ± 0.9	50.2 ± 2.0			1.66 ± 0.07
919.0 ± 0.9	7.9 ± 0.6			0.26 ± 0.02
927.7 ± 0.9	58.1 ± 2.0			1.91 ± 0.07
930.3 ± 0.9	35.1 ± 1.2			1.15 ± 0.04
935.2 ± 0.9	18.5 ± 0.8			0.61 ± 0.03
936.7 ± 0.9	86.6 ± 5.0			2.63 ± 0.16
942.8 ± 0.9	29.6 ± 1.2			0.96 ± 0.04
947.3 ± 0.9	14.9 ± 0.7			0.48 ± 0.02
956.8 ± 0.9	46.7 ± 1.3			1.51 ± 0.04
960.6 ± 1.0	67.3 ± 2.5			2.17 ± 0.08
962.0 ± 1.0	4.9 ± 0.8			0.16 ± 0.03
969.1 ± 1.0	9.5 ± 0.8			0.31 ± 0.03
970.7 ± 1.0	15.2 ± 0.8			0.49 ± 0.03
979.1 ± 1.0	141.0 ± 6.0			4.51 ± 0.19
983.6 ± 1.0	21.3 ± 1.0			0.68 ± 0.03
990.5 ± 1.0	21.3 ± 1.0			0.68 ± 0.03
994.1 ± 1.0	2.5 ± 0.4			0.08 ± 0.01
1007.3 ± 1.0	7.0 ± 0.6			0.22 ± 0.01
1008.8 ± 1.0	4.0 ± 0.3			0.13 ± 0.01
1016.8 ± 1.0	67.3 ± 2.5			2.11 ± 0.08
1026.4 ± 1.0	10.2 ± 0.8			0.32 ± 0.03
1029.1 ± 1.0	81.1 ± 5.0			2.52 ± 0.16
1033.6 ± 1.0	42.7 ± 2.0			1.32 ± 0.06
1040.4 ± 1.0	10.0 ± 0.8			0.31 ± 0.03
1044.4 ± 1.0	117.0 ± 6.0			3.62 ± 0.19
1049.3 ± 1.0	36.7 ± 2.0			1.13 ± 0.06
1053.2 ± 1.0	32.9 ± 2.0			1.01 ± 0.06
1055.2 ± 1.0	14.8 ± 10.0			0.46 ± 0.31
1066.1 ± 1.0	105.0 ± 6.0			3.22 ± 0.18
1072.5 ± 1.0	304.0 ± 15.0			9.28 ± 0.46
1084.7 ± 1.0	11.2 ± 1.0			0.34 ± 0.03
1089.1 ± 1.0	86.2 ± 4.0			2.61 ± 0.12
1093.4 ± 1.0	72.6 ± 4.0			2.20 ± 0.12
1106.1 ± 1.0	5.0 ± 0.5			0.15 ± 0.02
1107.2 ± 1.0	30.4 ± 2.5			0.91 ± 0.08
1111.4 ± 1.0	87.5 ± 4.5			2.62 ± 0.13
1113.2 ± 1.0	91.0 ± 4.0			2.72 ± 0.12
1124.5 ± 1.0	105.0 ± 6.0			3.13 ± 0.18
1126.4 ± 1.0	170.0 ± 10.0			5.06 ± 0.30
1139.9 ± 1.0	17.0 ± 2.0			0.50 ± 0.06
1141.4 ± 1.0	76.8 ± 3.5			2.27 ± 0.10
1143.3 ± 1.0	29.8 ± 1.5			0.88 ± 0.04
1148.2 ± 1.0	30.9 ± 1.5			0.91 ± 0.04

¹⁶⁵Ho
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E_p (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_0^0$ (meV)
1159.2 $\pm$ 1.0	13.1 $\pm$ 1.0			0.39 $\pm$ 0.03
1162.4 $\pm$ 1.0	196.0 $\pm$ 10.6			5.75 $\pm$ 0.29
1168.4 $\pm$ 1.0	196.0 $\pm$ 10			5.73 $\pm$ 0.29
1178.5 $\pm$ 1.0	47.0 $\pm$ 2.0			1.37 $\pm$ 0.06
1180.6 $\pm$ 1.0	16.8 $\pm$ 1.0			0.49 $\pm$ 0.03
1186.0 $\pm$ 1.0	13.3 $\pm$ 1.8			0.39 $\pm$ 0.05
1187.6 $\pm$ 1.0	105.0 $\pm$ 5.0			3.05 $\pm$ 0.15
1191.1 $\pm$ 1.0	74.3 $\pm$ 4.0			2.15 $\pm$ 0.12
1199.1 $\pm$ 1.0	7.1 $\pm$ 1.0			0.21 $\pm$ 0.03
1203.6 $\pm$ 1.0	63.4 $\pm$ 4.0			1.83 $\pm$ 0.12
1206.0 $\pm$ 1.0	440.0 $\pm$ 25.0			12.67 $\pm$ 0.72
1217.6 $\pm$ 1.0	172.0 $\pm$ 10.0			4.93 $\pm$ 0.29
1226.8 $\pm$ 1.0	28.8 $\pm$ 1.5			0.82 $\pm$ 0.04
1232.7 $\pm$ 1.0	27.6 $\pm$ 1.5			0.79 $\pm$ 0.04

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ho ¹⁶⁵	σ_t	70HELSINKI,1,651(70)	Vertebnyi
Ho ¹⁶⁵	activation	JIN,30,15(68)	Nethavay
Ho ¹⁶⁵	σ_y (spectra)	PR,155,1265(67)	Motz
Ho ¹⁶⁵	σ_t	NP/A,95,663(67)	Zimmerman
Ho ¹⁶⁵	σ_y	YF,1,252(65)	Andreev
Ho ¹⁶⁵	$\bar{\sigma}_s$	PR/B,136,1285(64)	Schermer
Ho ¹⁶⁵	activation	PRIVATE COMM.(62)	Keisch
Ho ¹⁶⁵	σ_t	PRIVATE COMM.(61)	Schermer
Ho ¹⁶⁵	diffraction	PR,110,37(58)	Koehler
Ho ¹⁶⁵	pile osci.	PR,83,641(51)	Pomerance
Ho ¹⁶⁵	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Ho	multiplicity	8-39	JINR-P3-6092(71)	Karzhavina
Ho ¹⁶⁵	σ_t	5-1700	CEA-N-1338(71)	Tellier
Ho ¹⁶⁵	σ_t	5-1700	71KNOX,2,680(71)	Tellier
Ho	σ_y (spectra)	18-86	NP/A,151,569(70)	Poenitz
Ho	$\sigma_y \bar{\sigma}_s$	8-261	NP,108,535(68)	Asghar
Ho	polarization	21-150	JINR-P3-3208(67)	Alfimenkov
Ho	σ_y (spectra)	3.92-39.5	BAP,12,106(67)	Bhat
Ho	polarization	0-55	YF,3,55(66)	Alfimenkov
Ho	$\sigma_t \sigma_y \sigma_y(SI)$	3.9-510	JINR-P-2593(66)	Karzhavina
Ho	$\sigma_y \bar{\sigma}_s$	8-214	65ANTWERP,65(65)	Asghar
Ho	polarization	18-21	PR/B,137,1484(65)	Brunhart
Ho	polarization	3.9-12.8	PR,126,979(62)	Postma
Ho	polarization	3.9	PR,127,1124(62)	Sailor
Ho	σ_t	3.9-130	PR,99,10(55)	Harvey
Ho	σ_t	3.9-39	PR,96,1014(54)	Sailor
Ho	σ_t	3.9-39	PR,32,656(53)	Foote

⁶⁸Er

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 162 \pm 8 \text{ b} \\ \bar{\sigma}_s &= 11.0 \pm 0.8 \text{ b} \\ \sigma_{ps} &= 26 \pm 3 \text{ b} \\ a_{coh} &= 7.9 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 740 \pm 10 \text{ b} \\ R' &= 8.3 \pm 0.8 \text{ fm}\end{aligned}$$

¹⁶²
⁶⁸Er

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 19 \pm 2 \text{ b} \\ \bar{\sigma}_s &= 3.8 \pm 2.0 \text{ b} \\ \sigma_a &< 11 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 480 \pm 50 \text{ b} \\ R' &= 8.1 \pm 0.9 \text{ fm} \\ \langle D \rangle &= 6.9 \pm 1.2 \text{ eV} \\ S_0 &= 2.1 \pm 0.5\end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 0^+$$

$$\%Abn \leq 0.14$$

$$S_n = 6907 \pm 10 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
5.48 ± 0.08	0.32 ± 0.03	0.14 ± 0.01
7.60 ± 0.12	0.7 ± 0.1	0.25 ± 0.04
14.7 ± 0.1	4.1 ± 0.3	1.37 ± 0.08
20.3 ± 0.1	8.3 ± 0.8	1.84 ± 0.18
34.8 ± 0.1	5.0 ± 0.5	0.87 ± 0.09
43.2 ± 0.3	2.2 ± 0.2	0.33 ± 0.03
46.0 ± 0.1	19.5 ± 1.5	2.88 ± 0.22
51.4 ± 0.3	48 ± 6	6.69 ± 0.84
57.4 ± 0.1	30 ± 3	3.94 ± 0.40
112.1 ± 1.1	12.7 ± 1.1	1.2 ± 0.1
127.0 ± 1.3	29.3 ± 5.6	2.6 ± 0.5
142.6 ± 1.6	14.3 ± 2.4	1.0 ± 0.2
158.5 ± 1.8	93 ± 25	7.4 ± 2.0
187.8 ± 2.3	41 ± 14	3.0 ± 1.0
210.2 ± 2.8	128 ± 37	8.8 ± 2.6
228.5 ± 3.2	54 ± 15	3.6 ± 1.0

¹⁶⁴₆₈Er

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 13 \pm 2 \text{ b} \\ \bar{\sigma}_{\text{a}} &= 12.1 \pm 0.7 \text{ b} \\ \sigma_{\text{e}} &< 1.2 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 105 \pm 10 \text{ b} \\ R^{\dagger} &= 7.8 \pm 0.8 \text{ fm} \\ \langle D \rangle &= 20 \pm 3 \text{ eV} \\ S_0 &= 1.4 \pm 0.3\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{abn} = 1.6$$

$$S_n = 6650.1 \pm 0.7 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
Bound level		
7.90 $\pm$ 0.02	0.65 $\pm$ 0.08	0.23 $\pm$ 0.03
30.5 $\pm$ 0.1	3.9 $\pm$ 0.4	0.71 $\pm$ 0.07
49.6 $\pm$ 0.2	4.0 $\pm$ 1.0	0.57 $\pm$ 0.14
53.8 $\pm$ 0.4	2.3 $\pm$ 0.2	0.31 $\pm$ 0.06
56.61 $\pm$ 0.09	6.6 $\pm$ 0.5	0.88 $\pm$ 0.07
108.59 $\pm$ 0.06	48 $\pm$ 6	4.61 $\pm$ 0.58
130.96 $\pm$ 0.08	100 $\pm$ 10	8.74 $\pm$ 0.87
136.95 $\pm$ 0.09	12 $\pm$ 3	1.03 $\pm$ 0.26
160.73 $\pm$ 0.18	60 $\pm$ 8	4.73 $\pm$ 0.63
194.63 $\pm$ 0.14	69.0 $\pm$ 8.0	4.95 $\pm$ 0.57
214.97 $\pm$ 0.17	31 $\pm$ 6	2.1 $\pm$ 0.4
225.43 $\pm$ 0.18	75 $\pm$ 10	5.00 $\pm$ 0.67
302 $\pm$ 2	170 $\pm$ 70	9.8 $\pm$ 4.0
317 $\pm$ 2	240 $\pm$ 80	13.6 $\pm$ 4.5
419.95 $\pm$ 0.25	270 $\pm$ 30	13.0 $\pm$ 1.5
611.57 $\pm$ 0.24	174 $\pm$ 35	7.04 $\pm$ 1.4
654.24 $\pm$ 0.46	78 $\pm$ 25	3.1 $\pm$ 1.0
750.22 $\pm$ 0.56	140 $\pm$ 40	5.15 $\pm$ 1.5

¹⁶⁶Er
68

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 15 \pm 2 \text{ b } [2.27 \text{ sec } ^{167}\text{Er}^*] \\ \sigma_T &= 20 \pm 2 \text{ b } [^{167}\text{Er}^*] \\ \sigma_T &= 5 \pm 3 \text{ b} \\ \bar{\sigma}_s &= 19.1 \pm 1.0 \text{ b} \\ \sigma_a &< 0.07 \text{ mb} \\ a_{coh}^c &= 12.3 \pm 0.6 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 100 \pm 20 \text{ b} \\ R^c &= 7.7 \pm 0.9 \text{ fm} \\ \langle D \rangle &= 38 \pm 3 \text{ eV} \\ S_0 &= 1.6 \pm 0.2\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\% \text{Abn} = 33.4$$

$$S_n = 6436.3 \pm 0.5 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
Bound level			
15.55 ± 0.04	2.15 ± 0.15	94 ± 6	0.55 ± 0.04
73.79 ± 0.07	65 ± 4	75 ± 10	7.6 ± 0.5
81.74 ± 0.08	9.5 ± 0.5	80 ± 10	1.05 ± 0.06
110.63 ± 0.08	0.063 ± 0.035		0.006 ± 0.003
154.15 ± 0.21	7.0 ± 0.3	89 ± 12	0.56 ± 0.02
243.59 ± 0.21	25 ± 2	100 ± 20	1.60 ± 0.13
301.15 ± 0.29	195 ± 12	105 ± 15	11.2 ± 0.7
315.97 ± 0.30	320 ± 20	110 ± 25	17.8 ± 1.1
352.23 ± 0.36	84 ± 7.0		4.48 ± 0.37
388.46 ± 0.42	185 ± 15		9.4 ± 0.8
457.88 ± 0.19	1.5 ± 1.0		0.07 ± 0.05
509.04 ± 0.32	53 ± 5		2.4 ± 0.2
535.32 ± 0.34	54 ± 5	96 ± 20	2.3 ± 0.2
594.84 ± 0.40	710 ± 70		29.0 ± 3.0
601.1 ± 1.0	4.2 ± 2.5		0.17 ± 0.10
642.2 ± 0.5	44 ± 6		1.8 ± 0.2
708.3 ± 1.3	2.8 ± 1.2		0.11 ± 0.05
747.3 ± 0.6	85 ± 10		3.1 ± 0.4
772.8 ± 0.6	39 ± 5		1.4 ± 0.2
794.5 ± 0.6	115 ± 12		4.1 ± 0.4
849.0 ± 0.3	950 ± 70		33.0 ± 2.4
873.1 ± 0.9	6.6 ± 2.2		0.22 ± 0.08
905.0 ± 0.4	500 ± 50		16.7 ± 1.7
923.9 ± 1.0	2.4 ± 1.2		0.08 ± 0.04
973.9 ± 1.1	2.6 ± 1.3		0.08 ± 0.04
1025.1 ± 0.5	225 ± 25		7.0 ± 0.8
1036.9 ± 1.2	7.9 ± 3.2		0.25 ± 0.10
1056.8 ± 0.5	155 ± 16		4.8 ± 0.5
1137.2 ± 0.5	80 ± 10		2.4 ± 0.3
1171.0 ± 0.5	300 ± 25		8.8 ± 0.7
1183.7 ± 0.5	500 ± 35		14.8 ± 1.0
1259.5 ± 0.6	175 ± 16		4.9 ± 0.45

¹⁶⁶
68 Er

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
1325.0 $\pm$ 1.7	4.7 $\pm$ 3.1		0.13 $\pm$ 0.09
1339.7 $\pm$ 0.6	66 $\pm$ 8		1.8 $\pm$ 0.2
1367.3 $\pm$ 0.7	990 $\pm$ 70		27.0 $\pm$ 2.0
1431.3 $\pm$ 1.9	7.6 $\pm$ 5.0		0.2 $\pm$ 0.1
1458.6 $\pm$ 0.8	91 $\pm$ 11		2.4 $\pm$ 0.3
1502.3 $\pm$ 0.8			
1545.6 $\pm$ 2.1	2.9 $\pm$ 2.0		0.07 $\pm$ 0.05
1556.2 $\pm$ 0.9	290 $\pm$ 28		7.4 $\pm$ 0.7
1618.1 $\pm$ 2.3	6.7 $\pm$ 3.6		0.17 $\pm$ 0.09
1640.5 $\pm$ 0.9	140 $\pm$ 20		3.5 $\pm$ 0.5
1678.9 $\pm$ 2.4	3.6 $\pm$ 2.5		0.09 $\pm$ 0.06
1757.8 $\pm$ 0.5	195 $\pm$ 22		4.7 $\pm$ 0.5
1785.7 $\pm$ 0.6	360 $\pm$ 45		8.5 $\pm$ 1.1
1809.6 $\pm$ 0.6	160 $\pm$ 25		3.8 $\pm$ 0.6
1831.9 $\pm$ 0.6	103 $\pm$ 15		2.4 $\pm$ 0.4
1846.4 $\pm$ 0.6	625 $\pm$ 70		14.5 $\pm$ 1.6
1906.5 $\pm$ 2.9	10 $\pm$ 7		0.23 $\pm$ 0.16
1940.2 $\pm$ 0.6	165 $\pm$ 20		3.8 $\pm$ 0.45
1987.7 $\pm$ 0.6	54 $\pm$ 8		1.2 $\pm$ 0.2
2027.5 $\pm$ 0.7	33 $\pm$ 7		0.73 $\pm$ 0.16
2069.0 $\pm$ 3.3	8.1 $\pm$ 4.5		0.18 $\pm$ 0.10
2121.6 $\pm$ 0.7	455 $\pm$ 70		9.9 $\pm$ 1.5
2128.9 $\pm$ 0.7	650 $\pm$ 100		16.0 $\pm$ 2.2
2174.5 $\pm$ 0.7	220 $\pm$ 25		4.7 $\pm$ 0.5
2197.5 $\pm$ 0.7	225 $\pm$ 35		4.8 $\pm$ 0.8
2245.4 $\pm$ 0.7	385 $\pm$ 45		8.1 $\pm$ 1.0
2269.5 $\pm$ 0.7	240 $\pm$ 35		5.0 $\pm$ 0.7
2334.4 $\pm$ 0.8	56 $\pm$ 10		1.2 $\pm$ 0.2
2401.4 $\pm$ 0.8	750 $\pm$ 90		15.0 $\pm$ 1.8
2463.2 $\pm$ 0.9	89 $\pm$ 14		1.8 $\pm$ 0.3
2476.2 $\pm$ 0.9	690 $\pm$ 80		14.0 $\pm$ 1.6
2514.0 $\pm$ 0.9	365 $\pm$ 50		7.3 $\pm$ 1.0
2548.5 $\pm$ 4.5	12 $\pm$ 8		0.24 $\pm$ 0.16
2569.0 $\pm$ 0.9	990 $\pm$ 110		19.5 $\pm$ 2.2
2594.9 $\pm$ 0.9	74 $\pm$ 15		1.5 $\pm$ 0.3
2656.4 $\pm$ 0.9	1200 $\pm$ 100		23.0 $\pm$ 2.0
2659.6 $\pm$ 3.8	935 $\pm$ 150		18.1 $\pm$ 2.9
2669.6 $\pm$ 4.9	5.0 $\pm$ 3.6		0.10 $\pm$ 0.07
2736.0 $\pm$ 1.0	910 $\pm$ 90		17.4 $\pm$ 1.7
2785.5 $\pm$ 1.0	870 $\pm$ 100		16.5 $\pm$ 1.9
2803.2 $\pm$ 1.1	42 $\pm$ 10		0.8 $\pm$ 0.2
2829.6 $\pm$ 1.1	1600 $\pm$ 240		30 $\pm$ 5
2850.2 $\pm$ 1.1	30 $\pm$ 12		0.56 $\pm$ 0.23
2890.1 $\pm$ 1.1	550 $\pm$ 65		10.0 $\pm$ 1.2
2931.8 $\pm$ 1.1	260 $\pm$ 40		4.8 $\pm$ 0.7
2950.3 $\pm$ 1.1	36 $\pm$ 18		0.66 $\pm$ 0.33
2955.3 $\pm$ 2.2	198 $\pm$ 45		3.6 $\pm$ 0.8
2984.5 $\pm$ 1.1	170 $\pm$ 25		3.1 $\pm$ 0.5
3147.0 $\pm$ 1.2	184 $\pm$ 28		3.3 $\pm$ 0.5
3214.9 $\pm$ 1.2	435 $\pm$ 50		7.7 $\pm$ 0.9
3280.7 $\pm$ 1.3	370 $\pm$ 45		6.5 $\pm$ 0.8
3340.8 $\pm$ 1.3	400 $\pm$ 65		6.9 $\pm$ 1.1

¹⁶⁶
₆₈Er

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
3351.4 ±1.3	605 ± 90		10.5 ±1.6
3378.7 ±1.3	880 ±110		15.0 ±2.0
3415.4 ±1.3	600 ± 70		10.3 ±1.2
3519.4 ±1.4	1030 ±140		17.4 ±2.4
3541.0 ±1.5	745 ±110		12.5 ±1.9
3600.9 ±1.5	255 ± 45		4.3 ±0.8
3615.9 ±1.5	220 ± 50		3.7 ±0.8
3630.6 ±1.5	120 ± 30		2.0 ±0.5
3755.0 ±1.6	810 ±100		13.0 ±1.6
3790.7 ±1.6	124 ± 28		2.0 ±0.5
3841.5 ±1.6	815 ±130		13.0 ±2.0
3851.3 ±1.6	1350 ±220		22.0 ±3.8
3895.0 ±1.6	420 ± 70		6.1 ±1.1
3982.1 ±1.7	730 ±100		11.6 ±1.6
4110.9 ±1.8	93 ± 40		1.5 ±0.6
4169.3 ±1.9	480 ± 70		7.4 ±1.1
4233.5 ±1.9	278 ± 45		4.3 ±0.7
4306.1 ±1.9	484 ± 65		7.4 ±1.0
4349.0 ±2.0	490 ± 65		7.4 ±1.0
4422.5 ±2.0	235 ± 80		3.5 ±1.2
4488.7 ±2.1	69 ± 35		1.0 ±0.5
4652.6 ±2.2	440 ± 70		6.5 ±1.0
4688.6 ±2.2	99 ± 50		1.5 ±0.7
4759.7 ±2.3	66 ± 35		0.96 ±0.51
4857.9 ±2.3	365 ± 80		5.2 ±1.2
4902.2 ±2.4	1500 ±250		21.0 ±4.0
4936.4 ±2.4	1300 ±220		19.0 ±3.0
4985.4 ±2.4	1500 ±240		21.0 ±3.4
5036.4 ±2.5	200 ± 70		2.8 ±1.0
5140.8 ±2.5	370 ± 80		5.2 ±1.1
5314.4 ±2.6	920 ±150		12.6 ±2.1
5416.6 ±2.7	650 ±120		8.8 ±1.6
5449.5 ±2.7	110 ± 55		1.5 ±0.8
5561.3 ±2.8	510 ± 80		6.8 ±1.1
5609.9 ±2.9	395 ± 70		5.3 ±0.9
5729.6 ±3.0	1200 ±200		16.0 ±2.6
5780.4 ±3.0	160 ± 70		2.1 ±0.9
5800.0 ±3.0	1450 ±260		19.0 ±3.4
5845.7 ±3.1	2200 ±400		29.0 ±5.0
5944.8	430 ±110		5.6 ±1.4
6022.4 ±3.2	480 ±140		6.2 ±1.8
6111.4 ±3.3	1100 ±180		14.0 ±2.3
6274.8 ±3.3	620 ±120		7.8 ±1.5
6303.8 ±3.4	640 ±120		8.1 ±1.5
6348.5 ±3.5	670 ±120		8.4 ±1.5
6428.9 ±3.5	730 ±130		9.1 ±1.6
6475.0 ±3.6	465 ± 70		5.8 ±0.9
6543.3 ±3.6	2400 ±600		30.0 ±7.4
6556.0 ±3.6	2000 ±500		25.0 ±6.0
6601.7 ±3.7	375 ±180		4.6 ±2.2
6701.9 ±3.8	750 ±200		9.2 ±2.4
6770.5 ±3.8	890 ±180		11.0 ±2.2

¹⁶⁶
68 Er

E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)
7017.2 ±4.0	610 ±170		7.3 ±2.0
7057.6 ±4.1	150 ± 60		1.8 ±0.7
7193.5 ±4.2	170 ± 70		2.0 ±0.8
7222.8 ±4.2	620 ±150		7.3 ±1.8
7273.5 ±4.3	320 ± 90		3.8 ±1.1
7354.8 ±4.3	1550 ±300		18.0 ±3.5
7385.1 ±4.4	1800 ±360		21.0 ±4.0
7477.2 ±4.4	920 ±160		10.6 ±1.9
7593.6 ±4.5	1550 ±250		18.0 ±3.0
7636.8 ±4.6	400 ±140		4.6 ±1.6
7705.8 ±4.6	800 ±250		9.1 ±2.9
7829.9 ±4.7	410 ±170		4.6 ±1.9
7969.3 ±4.9	1200 ±280		13.4 ±3.1
8013.3 ±4.9	1400 ±320		15.6 ±3.6
8132.4 ±5.0	2700 ±450		30.0 ±5.0
8285.1 ±5.2	1450 ±300		16.0 ±3.3
8399.8 ±5.3	1900 ±350		21.0 ±3.8
8458.1 ±5.3	4300 ±700		47.0 ±7.6
8680.7 ±5.5	2950 ±600		32.0 ±6.4
8835.0 ±5.7	5700 ±800		61.0 ±8.5
9075.6 ±5.9	1500 ±400		16.0 ±4.0
9195.1 ±6.1	2500 ±500		26.0 ±5.0
9274.8 ±6.2	420 ±180		4.4 ±1.9
9373.4 ±6.2	770 ±300		8.0 ±3.0
9429.6 ±6.2	1650 ±350		17.0 ±3.6
9486.2 ±6.3	2150 ±450		22.0 ±5.0

Thermal Cross Sections

$\sigma_f = 670 \pm 30$ b
 $\sigma_a = 7.9 \pm 0.8$ b
 $\sigma_{sc} < 0.07$ mb

Resonance Properties

$I_f = 2970 \pm 70$ b
 $R_f = 9.9 \pm 0.9$ fm
 $\langle D \rangle = 4.0 \pm 0.2$ eV
 $S_0 = 1.8 \pm 0.2$

Resonance Parameters

$I^{\pi} = 7/2^{+}$ $\chi R_{br} = 22.9$ $S_n = 7771.4 \pm 0.5$ keV

E_0 (eV)	$2\sigma_f^n$ (meV)	J	Γ_f (meV)	$2\sigma_f^n$ (meV)
0.460 $\pm$ 0.002	0.314 $\pm$ 0.005	4	88 $\pm$ 1	0.460 $\pm$ 0.010
0.584 $\pm$ 0.002	0.224 $\pm$ 0.004	3	86.3 $\pm$ 1.0	0.290 $\pm$ 0.005
5.98 $\pm$ 0.02	17.7 $\pm$ 1.0	3	83 $\pm$ 5	
7.95 $\pm$ 0.02	0.22 $\pm$ 0.02	3	84 $\pm$ 9	0.078 $\pm$ 0.008
9.37 $\pm$ 0.03	7.0 $\pm$ 0.4	4		2.29 $\pm$ 0.13
20.23 $\pm$ 0.05	5.2 $\pm$ 0.2	4	87 $\pm$ 12	1.16 $\pm$ 0.04
22.02 $\pm$ 0.06	1.14 $\pm$ 0.06	3	92 $\pm$ 17	0.243 $\pm$ 0.013
26.64 $\pm$ 0.04	83.0 $\pm$ 3.0	3	93 $\pm$ 14	16.1 $\pm$ 0.6
27.42 $\pm$ 0.08	11.8 $\pm$ 0.8	4	98 $\pm$ 15	2.30 $\pm$ 0.16
32.88 $\pm$ 0.04	7.6 $\pm$ 0.4	4	88 $\pm$ 8	1.33 $\pm$ 0.07
37.59 $\pm$ 0.05	8.0 $\pm$ 0.4	4	82 $\pm$ 8	1.30 $\pm$ 0.07
39.43 $\pm$ 0.06	7.8 $\pm$ 0.4	3	92 $\pm$ 9	1.24 $\pm$ 0.06
42.23 $\pm$ 0.06	3.4 $\pm$ 0.2	3	100 $\pm$ 12	0.52 $\pm$ 0.03
50.19 $\pm$ 0.08	7.8 $\pm$ 0.4	4	80 $\pm$ 7	1.10 $\pm$ 0.06
53.60 $\pm$ 0.09	54.0 $\pm$ 6.0	4	97 $\pm$ 12	7.38 $\pm$ 0.82
59.96 $\pm$ 0.05	13.0 $\pm$ 0.4	3	92 $\pm$ 8	1.68 $\pm$ 0.05
62.07 $\pm$ 0.05	6.4 $\pm$ 0.4			0.81 $\pm$ 0.05
62.78 $\pm$ 0.09	6.2 $\pm$ 0.4			0.78 $\pm$ 0.05
69.43 $\pm$ 0.06	2.6 $\pm$ 0.2	4		0.31 $\pm$ 0.02
74.37 $\pm$ 0.07	6.4 $\pm$ 0.8	[4]		0.74 $\pm$ 0.09
75.77 $\pm$ 0.07	1.18 $\pm$ 0.08	[4]		0.14 $\pm$ 0.01
79.29 $\pm$ 0.08	10 $\pm$ 1	3		1.12 $\pm$ 0.11
85.42 $\pm$ 0.09	1.24 $\pm$ 0.10	3		0.13 $\pm$ 0.01
91.2 $\pm$ 0.1	3.4 $\pm$ 0.2	4		1.97 $\pm$ 0.23
94.8 $\pm$ 0.1	19.2 $\pm$ 2.2	4	86 $\pm$ 16	0.098 $\pm$ 0.010
97.5 $\pm$ 0.1	0.96 $\pm$ 0.16			0.024 $\pm$ 0.016
98.2 $\pm$ 0.2	0.24 $\pm$ 0.16			4.3 $\pm$ 0.4
107.6 $\pm$ 0.2	45 $\pm$ 5	3	82 $\pm$ 8	0.13 $\pm$ 0.01
112.9 $\pm$ 0.1	1.4 $\pm$ 0.1			0.32 $\pm$ 0.02
115.6 $\pm$ 0.2	3.4 $\pm$ 0.2			0.034 $\pm$ 0.014
128.3 $\pm$ 0.2	0.38 $\pm$ 0.16			8.5 $\pm$ 0.4
131.6 $\pm$ 0.2	97 $\pm$ 5	4	120 $\pm$ 20	1.34 $\pm$ 0.09
142.3 $\pm$ 0.2	16 $\pm$ 1	4		0.15 $\pm$ 0.03
142.9 $\pm$ 0.2	1.8 $\pm$ 0.3			0.16 $\pm$ 0.01
150.5 $\pm$ 0.2	1.94 $\pm$ 0.16			0.048 $\pm$ 0.020
153.18 $\pm$ 0.27	0.60 $\pm$ 0.24			

¹⁶⁷
₆₈Er

E ₀ (eV)	2g _n ⁺ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
157.8 ±0.2	56 ± 4	3	75 ±16	4.5 ±0.3
159.4 ±0.2	6.4 ± 0.8			0.51 ±0.06
162.2 ±0.2	26 ± 2			2.04 ±0.16
165.1 ±0.2	20.0 ± 2.0			1.56 ±0.16
166.8 ±0.2	47 ± 5	84 ±15 85 ±18		3.6 ±0.4
168.5 ±0.2	48 ± 5			3.7 ±0.4
176.8 ±0.1	8.2 ± 0.8			0.62 ±0.06
178.5 ±0.1	33.5 ± 2.1			2.50 ±0.16
184.7 ±0.1	16 ± 1	[4]		1.18 ±0.07
191.3 ±0.2	26 ± 2			1.90 ±0.15
196.0 ±0.2	72 ± 4			5.2 ±0.3
209.9 ±0.2	38 ± 3		93 ±10	2.6 ±0.2
217.2 ±0.2	9.7 ± 0.6			0.66 ±0.04
223.3 ±0.2	6.4 ± 0.6			0.23 ±0.04
228.7 ±0.2	47 ± 4			3.1 ±0.3
230.1 ±0.2	4.2 ± 1.0			0.28 ±0.07
235.5 ±0.2	25 ± 2			1.63 ±0.13
237.9 ±0.2	28 ± 2			1.82 ±0.13
238.7 ±0.2	8.6 ± 2.0			0.56 ±0.13
247.3 ±0.2	10.8 ± 1.4	[4]		0.69 ±0.09
249.2 ±0.2	18 ± 2		93 ±12	1.13 ±0.13
258.2 ±0.2	68 ± 6			4.4 ±0.4
263.3 ±0.3	25.0 ± 2.6			1.54 ±0.16
274.5 ±0.3	22 ± 2		90 ±20 95 ±24	4.8 ±0.6
279.9 ±0.3	80 ±10			1.33 ±0.12
282.5 ±0.3	120 ±14			7.13 ±0.83
288.8 ±0.3	9.2 ± 1.4			0.54 ±0.08
297.6 ±0.3	2.2 ± 0.6			0.13 ±0.03
304.7 ±0.4	0.8 ± 0.6			0.05 ±0.03
306.2 ±0.3	2.4 ± 0.6			0.14 ±0.03
309.5 ±0.3	27.0 ± 2.8	89 ±22		1.53 ±0.16
314.2 ±0.3	6.6 ± 2.0			0.37 ±0.11
319.4 ±0.3	39 ± 4			2.2 ±0.2
327.2 ±0.3	24.0 ± 2.4			1.33 ±0.13
330.0 ±0.3	5.0 ± 1.6	[4]	88 ±20 91 ±16	0.28 ±0.09
331.6 ±0.3	88 ±10			4.8 ±0.6
335.1 ±0.3	68 ± 6			3.7 ±0.33
343.3 ±0.2	43 ± 4		86 ±18 92 ±20	2.3 ±0.22
346.5 ±0.4	64 ± 6	[4]		3.42 ±0.3
349.7 ±0.4	6.5 ± 1.2			0.35 ±0.06
355.5 ±0.4	4.2 ± 1.0			0.22 ±0.05
359.1 ±0.4	96 ± 6		90 ±14 83 ±16	5.0 ±0.3
363.7 ±0.4	35.0 ± 3.2	[4]		1.82 ±0.17
368.3 ±0.4	2.7 ± 0.6			0.14 ±0.03
371.2 ±0.4	4.6 ± 1.6			0.24 ±0.05
373.5 ±0.4	11 ± 1			0.57 ±0.06
376.6 ±0.4	23 ± 3	[3]		1.4 ±0.2
381.8 ±0.4	5 ± 1.2		82 ±10	0.26 ±0.06
384.3 ±0.4	98 ± 8			4.98 ±0.41
387.6 ±0.4	2 ± 1			0.10 ±0.05
393.5 ±0.4	2.6 ± 1.0			0.13 ±0.05
396.6 ±0.4				

¹⁶⁷
₆₈Er

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
399.6 ±0.4	53 ± 5	[4]	82 ±12	2.65 ±0.25
408.0 ±0.5	17 ± 2.4			0.82 ±0.12
411.7 ±0.5	12 ± 2			0.58 ±0.10
414.6 ±0.6	1.4 ± 0.8			0.07 ±0.04
418.8 ±0.2	2.8 ± 0.8		66 ±20	0.14 ±0.04
422.7 ±0.2	30 ± 4			1.5 ±0.2
429.0 ±0.2	35 ± 4			1.7 ±0.2
433.9 ±0.3	6.8 ± 2.6			0.33 ±0.13
437.2 ±0.3	71 ± 8		92 ±22	3.4 ±0.4
442.2 ±0.3	6 ± 2			0.29 ±0.10
446.6 ±0.3	89 ± 9			4.2 ±0.4
450.4 ±0.3	114 ±12			5.2 ±0.5
455.8 ±0.3	37 ± 3	[3]	88 ±10	1.73 ±0.14
462.0 ±0.3	8.4 ± 1.6			0.39 ±0.07
466.6 ±0.3	52 ± 5			2.4 ±0.2
473.6 ±0.3	94 ± 8			4.3 ±0.4
485.4 ±0.3	112 ±12	[4]	145 ±25	5.1 ±0.5
497.3 ±0.3	164 ±30			7.4 ±1.4
498.8 ±0.3	90 ±18			4.0 ±0.8
505.9 ±0.3	64 ±10			2.8 ±0.4
508.1 ±0.3	46 ± 8			2.0 ±0.36
515.4 ±0.3	11 ± 2			0.48 ±0.09
518.9 ±0.3	8.4 ± 2.0			0.37 ±0.09
522.2 ±0.3	4.4 ± 2.4			0.19 ±0.11
528.3 ±0.3	214 ±40			9.3 ±1.8
531.5 ±0.3	13.2 ± 3.2			0.57 ±0.14
533.1 ±0.3	7.2 ± 2.0			0.31 ±0.009
542.3 ±0.4	74 ± 6			3.2 ±0.3
550.2 ±0.4	20.6 ± 4.0			0.88 ±0.17
555.0 ±0.4	20 ± 6			0.85 ±0.26
556.8 ±0.4	82 ±12			3.5 ±0.5
562.8 ±0.4	43.6 ±10.0			1.84 ±0.42
571.5 ±0.4	124 ±20			5.2 ±0.8
575.5 ±0.4	63 ±10			2.6 ±0.4
581.0 ±0.4	7.2 ± 3.6			0.30 ±0.15
590.1 ±0.4	140 ±16			5.76 ±0.66
612.7 ±0.4	85 ± 8		94 ±28 93 ±20	3.43 ±0.32
629.9 ±0.4	17.2 ± 3.6			0.69 ±0.15
636.9 ±0.4	104 ±10			4.1 ±0.4
648.5 ±0.5	8.4 ± 3.4			0.33 ±0.14
652.5 ±0.5	108 ±12			4.2 ±0.48
665.8 ±0.47	42 ± 6			1.6 ±0.2
677.9 ±0.5	54 ± 8			2.1 ±0.3
693.1 ±0.5	20 ± 5			0.76 ±0.19
708.9 ±0.5	53 ± 6			2.0 ±0.23
712.0 ±0.5	9.8 ± 4.0			0.37 ±0.15
723.0 ±0.5	38 ± 6			1.41 ±0.23
726.2 ±0.5	27 ± 5			1.0 ±0.19
729.5 ±0.5	110 ±14			4.1 ±0.52
737.1 ±0.6	28 ± 8			1.03 ±0.29
741.5 ±0.6	42 ± 6			1.54 ±0.22
750.4 ±0.6	12.8 ± 6.4			0.47 ±0.24

¹⁶⁷
₆₈Er

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
753.2 ±0.6	34 ± 8			1.24 ±0.29
757.2 ±0.6	19 ± 4			0.69 ±0.15
772.8 ±0.6	160 ±40			5.8 ±1.5
776.4 ±0.6	370 ±60			13.3 ±2.2
784.7 ±0.6	12 ± 4			0.42 ±0.14
790.8 ±0.6	70 ±12			2.5 ±0.4
800.0 ±0.6	60 ±10			2.1 ±0.4
803.1 ±0.6	14.4 ± 4.0			0.51 ±0.14
808.1 ±0.6	67 ±10			2.4 ±0.36
811.2 ±0.6	6 ± 2			0.21 ±0.07
816.4 ±0.6	73 ±10			2.6 ±0.36
820.9 ±0.3	86 ±12			3.0 ±0.4
823.9 ±0.3	8 ± 2			0.28 ±0.07
838.2 ±0.3	80 ± 8			2.8 ±0.28
852.4 ±0.3	32 ±10			1.09 ±0.34
855.1 ±0.3	76 ±10			2.6 ±0.34
865.1 ±0.4	86 ±12			3.0 ±0.4
883.5 ±0.4	40 ± 6			1.35 ±0.20
886.6 ±0.4	19 ± 6			0.64 ±0.20
888.6 ±0.4	44 ±10			1.48 ±0.34
896.2 ±0.4	310 ±32			10.4 ±1.1
914.0 ±0.4	162 ±20			5.4 ±0.7
918.6 ±0.4	62 ±10			2.0 ±0.3
930.09 ±0.39	48 ± 6			1.6 ±0.02
935.8 ±0.4	126 ±22			4.1 ±0.7
939.5 ±0.4	112 ±20			3.7 ±0.7
944.6 ±0.4	18.2 ± 5.6			0.59 ±0.18
950.59 ±0.40	46 ±10			1.49 ±0.33
956.23 ±0.40	24 ± 4			0.78 ±0.13
959.0 ±0.4	5.4 ± 3.0			0.17 ±0.10
961.8 ±0.4	30 ±10			0.97 ±0.32
966.0 ±0.4	16 ± 5			0.51 ±0.16
968.5 ±0.4	15 ± 4			0.48 ±0.13
972.6 ±0.4	76 ± 8			2.4 ±0.3
984.3 ±0.4	220 ±28			7.1 ±0.9
991.5 ±0.4	14 ± 4			0.44 ±0.13
995.8 ±0.4	19 ± 7			0.61 ±0.22
998.8 ±0.4	194 ±28			6.1 ±0.9
1014.0 ±0.4	92 ±12			2.9 ±0.4
1018.4 ±0.5	26 ± 8			0.81 ±0.25
1022.0 ±0.5	420 ±80			13.1 ±2.5
1035.5 ±0.5	29 ± 7			0.90 ±0.22
1047.5 ±0.5	35 ± 8			1.08 ±0.25
1065.8 ±0.5	12 ± 6			0.37 ±0.18
1068.9 ±0.5	50 ±12			1.53 ±0.37
1073.9 ±0.5	120 ±18			3.7 ±0.56
1091.0 ±0.5	28 ±12			0.85 ±0.36
1101.4 ±0.5	37 ± 9			1.11 ±0.27
1108.4 ±0.5	52 ±12			1.56 ±0.36
1115.0 ±0.5	74 ±14			2.2 ±0.42
1123.7 ±0.5	102 ±16			3.0 ±0.48
1129.9 ±0.5	11.4 ± 5.6			0.34 ±0.17

¹⁶⁷
₆₈Er

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1138.8 ±0.5	26 ±12			0.77 ±0.36
1144.1 ±0.5	42 ±10			1.24 ±0.30
1159.0 ±0.6	57 ±14			1.68 ±0.41
1163.9 ±0.6	16 ± 8			0.46 ±0.23
1166.1 ±0.6	19 ± 9			0.55 ±0.27
1173.7 ±0.6	17 ± 7			0.49 ±0.21
1193.2 ±0.6	34 ± 6			0.98 ±0.18
1201.1 ±0.6	25 ± 5			0.70 ±0.15
1206.8 ±0.6	192 ±24			5.5 ±0.7
1219.5 ±0.6	90 ±20			2.6 ±0.6
1223.6 ±0.6	66 ±18			1.9 ±0.52
1226.6 ±0.6	248 ±48			7.1 ±1.4
1230.1 ±0.6	14.4 ± 7.2			0.41 ±0.21
1234.2 ±0.6	15 ± 7.6			0.43 ±0.22
1237.8 ±0.6	20 ± 4			0.57 ±0.12
1243.8 ±0.6	17.4 ± 8.8			0.49 ±0.25
1248.3 ±0.6	18.4 ± 6.0			0.52 ±0.17
1252.2 ±0.6	56 ±14			1.58 ±0.40
1254.6 ±0.6	62 ±16			1.75 ±0.45
1265.6 ±0.6	20 ± 4			0.56 ±0.11
1269.3 ±0.7	100 ±16			2.8 ±0.5
1273.7 ±0.7	46 ±12			1.23 ±0.34
1279.9 ±0.7	138 ±34			3.9 ±0.96
1284.5 ±0.7	569 ±90			15.6 ±2.6
1289.2 ±0.7	36 ±16			1.0 ±0.45
1293.0 ±0.7	34 ±16			0.95 ±0.45
1299.4 ±0.7	16 ± 8			0.44 ±0.22
1303.9 ±0.7	112 ±22			3.1 ±0.61
1314.9 ±0.7	60 ±18			1.65 ±0.50
1318.8 ±0.7	30 ±12			0.83 ±0.33
1324.1 ±0.7	26 ±12			0.71 ±0.33
1326.7 ±0.7	73 ±16			2.0 ±0.44
1336.0 ±0.7	50 ±10			1.37 ±0.28
1350.8 ±0.7	140 ±28			3.80 ±0.76
1361.7 ±0.7	80 ±24			1.16 ±0.66
1372.1 ±0.7	32 ±12			0.86 ±0.33
1379.1 ±0.7	63 ±16			1.7 ±0.43
1388.2 ±0.7	320 ±64			8.6 ±1.7
1399.6 ±0.7	212 ±36			5.7 ±0.96
1407.5 ±0.7	24 ±12			0.64 ±0.32
1415.0 ±0.7	62 ±24			1.65 ±0.64
1419.7 ±0.8	58 ±20			1.54 ±0.53
1425.2 ±0.8	104 ±24			2.8 ±0.64
1432.6 ±0.8	64 ±16			1.69 ±0.42
1439.3 ±0.8	240 ±44			6.3 ±1.2
1442.8 ±0.8	19 ±10			0.50 ±0.27
1456.4 ±0.8	90 ±20			2.4 ±0.52
1462.9 ±0.8	54 ±20			1.41 ±0.53
1471.3 ±0.8	212 ±46			5.5 ±1.2
1482.0 ±0.8	74 ±22			1.9 ±0.57
1485.9 ±0.8	34 ±12			0.88 ±0.31
1493.6 ±0.8	40 ±20			1.04 ±0.52

¹⁶⁷
₆₈Er

E ₀ (eV)	2g _n ⁺ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
1495.9 ±0.8	94 ±30			2.4 ±0.8
1507.9 ±0.8	70 ±22			1.8 ±0.6
1517.5 ±0.8	240 ±50			6.2 ±1.3
1524.0 ±0.8	120 ±30			3.1 ±0.76
1528.1 ±0.8	42 ±18			1.07 ±0.46
1538.8 ±0.8	270 ±40			6.9 ±1.0
1544.6 ±0.8	300 ±50			7.6 ±1.3
1552.9 ±0.8	340 ±60			8.6 ±1.5
1563.8 ±0.8	42 ±18			1.1 ±0.5
1568.5 ±0.9	240 ±56			6.1 ±1.4
1571.5 ±0.9	60 ±30			1.5 ±0.8
1581.7 ±0.9	48 ±16			1.2 ±0.4
1591.2 ±0.9	106 ±24			2.7 ±0.6
1607.0 ±0.9	50 ±12			1.3 ±0.3
1611.4 ±0.9	88 ±20			2.2 ±0.5
1622.1 ±0.9	86 ±24			2.1 ±0.6
1637.3 ±0.9	34 ±16			0.84 ±0.40
1641.9 ±0.9	260 ±70			6.4 ±1.7
1652.8 ±0.9	42 ±18			1.0 ±0.4
1658.8 ±0.9	610 ±96			15.0 ±2.4
1675.8 ±1.0	194 ±50			4.3 ±1.2
1680.0 ±0.5	220 ±60			5.4 ±1.5
1686.4 ±0.5	52 ±22			1.3 ±0.5

¹⁶⁸
₆₈Er

THERMAL CROSS SECTIONS

$\sigma_{\gamma} = 1.95 \pm 0.05$ b
 $\bar{\sigma}_{\gamma} = 15.0 \pm 0.8$ b
 $\sigma_a < 0.09$ mb
 $\sigma_{coh} = 10.9 \pm 0.5$ fm

RESONANCE PROPERTIES

$l_{\gamma} = 36 \pm 7$ b
 $R_{\gamma} = 6.6 \pm 0.8$ fm
 $\langle D \rangle = 94 \pm 10$ eV
 $S_0 = 1.5 \pm 0.2$
 $S_1 = 0.70 \pm 0.20$

RESONANCE PARAMETERS

$I^{\pi} = 0^+$ $\chi^2_{Rdn} = 27.0$ $S_n = 6003.14 \pm 0.32$ keV

E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)
Bound level			
79.70 ± 0.12	41.0 ± 2.0	80 ± 10	4.58 ± 0.22
139.6 ± 0.1	±0.11 ± 0.04		0.093 ± 0.003
145.7 ± 0.1	±0.061 ± 0.050		0.005 ± 0.004

$^{168}_{68}\text{Er}$

E_β (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
174.3 $\pm$ 0.2	$^{*}0.15 \pm 0.07$		0.011 $\pm$ 0.005
188.9 $\pm$ 0.2	76.0 $\pm$ 4.0	86 $\pm$ 12	5.53 $\pm$ 0.29
244.4 $\pm$ 0.4	550 $\pm$ 30	90 $\pm$ 15	35.0 $\pm$ 4.0
296.7 $\pm$ 0.4	$^{*}0.29 \pm 0.16$		0.017 $\pm$ 0.009
312.6 $\pm$ 0.3	160 $\pm$ 20	95 $\pm$ 15	9.05 $\pm$ 1.13
335.5 $\pm$ 0.4	$^{*}0.84 \pm 0.55$		0.046 $\pm$ 0.030
410.82 $\pm$ 0.3	2.0 $\pm$ 0.7		0.10 $\pm$ 0.04
446.0 $\pm$ 0.3	2.3 $\pm$ 0.8		0.11 $\pm$ 0.04
527.4 $\pm$ 0.3	845 $\pm$ 60		36.6 $\pm$ 2.6
587.4 $\pm$ 0.5	$^{*}0.49 \pm 0.40$		0.020 $\pm$ 0.17
691.5 $\pm$ 0.6	$^{*}1.0 \pm 0.6$		0.04 $\pm$ 0.02
765.3 $\pm$ 0.6	76 $\pm$ 9		2.8 $\pm$ 0.3
830.4 $\pm$ 1.3	1020 $\pm$ 100		35.0 $\pm$ 3.5
985.7 $\pm$ 1.1	2.0 $\pm$ 1.2		0.064 $\pm$ 0.038
990.61 $\pm$ 1.1	2.5 $\pm$ 1.4		0.079 $\pm$ 0.044
1005.8 $\pm$ 0.5	400 $\pm$ 50		12.61 $\pm$ 1.58
1022.4 $\pm$ 1.2	$^{*}1.7 \pm 1.2$		0.053 $\pm$ 0.038
1093.9 $\pm$ 0.5	1000 $\pm$ 70		30.0 $\pm$ 2.1
1106.1 $\pm$ 1.3	$^{*}3.9 \pm 2.0$		0.12 $\pm$ 0.06
1131.7 $\pm$ 0.5	205 $\pm$ 25		6.1 $\pm$ 0.7
1193.2 $\pm$ 1.5	$^{*}2.2 \pm 1.5$		0.064 $\pm$ 0.043
1207.7 $\pm$ 1.5	$^{*}2.6 \pm 1.6$		0.075 $\pm$ 0.046
1342.8 $\pm$ 1.8	8.9 $\pm$ 4.0		0.24 $\pm$ 0.11
1356.3 $\pm$ 0.7	320 $\pm$ 32		8.70 $\pm$ 0.87
1449.6 $\pm$ 0.8	950 $\pm$ 80		24.95 $\pm$ 2.10
1626.1 $\pm$ 0.9	100 $\pm$ 14		2.50 $\pm$ 0.35
1636.4 $\pm$ 2.3	$^{*}4.4 \pm 2.4$		0.11 $\pm$ 0.06
1681.3 $\pm$ 2.4	$^{*}3.0 \pm 2.4$		0.073 $\pm$ 0.059
1713.9 $\pm$ 0.5	66 $\pm$ 13		1.6 $\pm$ 0.3
1810.7 $\pm$ 0.5	230 $\pm$ 30		5.4 $\pm$ 0.7
1894.4 $\pm$ 0.6	515 $\pm$ 55		11.8 $\pm$ 1.3
1937.3 $\pm$ 1.2	1450 $\pm$ 150		33.0 $\pm$ 3.4
2100.6 $\pm$ 3.4	$^{*}8.2 \pm 4.1$		0.18 $\pm$ 0.09
2151.9 $\pm$ 0.7	305 $\pm$ 40		6.60 $\pm$ 0.86
2204.3 $\pm$ 0.7	435 $\pm$ 50		9.3 $\pm$ 1.1
2325.9 $\pm$ 3.9	$^{*}4.3 \pm 3.4$		0.089 $\pm$ 0.070
2364.1 $\pm$ 0.8	1550 $\pm$ 160		32.0 $\pm$ 3.3
2456.6 $\pm$ 4.3	$^{*}5.3 \pm 4.0$		0.11 $\pm$ 0.08
2472.4 $\pm$ 0.9	110 $\pm$ 20		2.2 $\pm$ 0.4
2544.0 $\pm$ 4.5	29 $\pm$ 10		0.58 $\pm$ 0.20
2671.4 $\pm$ 1.0	1150 $\pm$ 200		22.0 $\pm$ 3.9
2682.7 $\pm$ 1.0	2300 $\pm$ 350		44.0 $\pm$ 6.8
2814.2 $\pm$ 1.0	145 $\pm$ 40		2.7 $\pm$ 0.8
2862.6 $\pm$ 5.4	32 $\pm$ 14		0.60 $\pm$ 0.26
2900.5 $\pm$ 5.5	$^{*}21 \pm 12$		0.39 $\pm$ 0.22
2970.6 $\pm$ 1.1	315 $\pm$ 70		5.8 $\pm$ 1.3
3027.4 $\pm$ 1.2	14 $\pm$ 9		0.25 $\pm$ 0.16
3095.3 $\pm$ 1.2	650 $\pm$ 85		11.7 $\pm$ 1.5
3165.8 $\pm$ 1.2	215 $\pm$ 45		3.8 $\pm$ 0.8
3202.8 $\pm$ 6.3	$^{*}8.5 \pm 5.0$		0.15 $\pm$ 0.09
3304.1 $\pm$ 1.3	3000 $\pm$ 350		52.0 $\pm$ 6.1
3467.2 $\pm$ 1.4	215 $\pm$ 70		3.7 $\pm$ 1.2

¹⁶⁸
⁶⁸Er

E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ² (meV)
3588.4 ± 1.5	220 ± 55		3.7 ± 0.9
3648.7 ± 1.5	170 ± 45		2.8 ± 0.8
3678.3 ± 1.6	4000 ± 500		66 ± 8
3751.6 ± 4.0	22 ± 16		0.47 ± 0.26
3809.9 ± 1.6	340 ± 70		5.5 ± 1.1
3849.9 ± 4.2	14 ± 8		0.23 ± 0.13
3997.7 ± 1.7	110 ± 35		1.7 ± 0.6
4100.1 ± 7.2	2820 ± 300		44.0 ± 4.7
4127.0 ± 4.7	13 ± 10		0.20 ± 0.16
4154.6 ± 1.8	3900 ± 360		61.0 ± 5.6
4284.3 ± 4.9	61.0 ± 32.0		0.93 ± 0.49
4326.5 ± 1.9	1550 ± 160		24.0 ± 2.4
4389.5 ± 2.0	1630 ± 200		25.0 ± 3.0
4476.8 ± 5.3	14 ± 10		0.21 ± 0.15
4515.6 ± 2.1	435 ± 80		6.5 ± 1.2
4643.6 ± 5.6	49 ± 26		0.72 ± 0.38
4671.1 ± 2.2	740 ± 100		10.8 ± 1.5
4819.9 ± 5.9	22 ± 10		0.32 ± 0.15
4885.8 ± 2.3	1520 ± 170		22.0 ± 2.4
5138.2 ± 2.5	755 ± 100		10.5 ± 1.4
5326.4 ± 2.7	770 ± 100		10.6 ± 1.4
5449.5 ± 2.8	2000 ± 350		27.0 ± 4.70
5463.3 ± 2.8	370 ± 140		5.0 ± 1.9
5703.0 ± 3.0	1700 ± 200		23.0 ± 2.7
5756.5 ± 3.0	3200 ± 350		42.0 ± 4.6
5968.4 ± 3.2	1560 ± 220		20.0 ± 2.8
6080.4 ± 3.3	580 ± 200		7.4 ± 2.6
6249.3 ± 3.4	6100 ± 700		77.0 ± 8.9
6428.9 ± 3.5	580 ± 150		7.2 ± 1.9
6528.8 ± 3.6	620 ± 200		7.7 ± 2.5
6565.1 ± 3.6	730 ± 250		9.0 ± 3.1
6627.4 ± 3.7	920 ± 280		11.3 ± 3.4
6759.1 ± 3.8	1920 ± 300		23.0 ± 3.7
6859.0 ± 3.9	1250 ± 400		15.1 ± 4.8
7017.2 ± 4.0	1450 ± 200		17.3 ± 2.4
7231.2 ± 4.2	2900 ± 350		34 ± 4.1
7441.9 ± 4.4	3850 ± 480		45.0 ± 5.6
7593.6 ± 4.5	760 ± 300		9.7 ± 3.5
7625.4 ± 4.6	720 ± 360		6.3 ± 4.1
7780.4 ± 4.7	600 ± 200		6.8 ± 2.3
8157.6 ± 5.1	1500 ± 300		16.6 ± 3.3
8378.8 ± 5.3	4700 ± 700		51.0 ± 7.7
8702.9 ± 5.6	5000 ± 900		64 ± 10
8877.7 ± 5.7	2150 ± 800		23.0 ± 8.5
8900.7 ± 5.8	650 ± 330		6.9 ± 3.5
9117.2 ± 6.0	4750 ± 900		50 ± 9.4
9156.0 ± 6.0	1500 ± 550		15.7 ± 5.8
9392.1 ± 6.2	890 ± 450		9.2 ± 4.7
9614.0 ± 6.4	1150 ± 350		11.7 ± 3.6
9731.2 ± 6.6	2400 ± 550		24.0 ± 5.6
9823.8 ± 6.7	7700 ± 1200		78 ± 12
10093 ± 7	1000 ± 250		10.0 ± 2.5

¹⁶⁸Er
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E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)
10159 ± 7	1150 ± 300		11.4 ± 3.0
10272 ± 7	1750 ± 550		17.3 ± 5.4
10423 ± 7	1650 ± 500		16.2 ± 4.9
10789 ± 8	10000 ± 1600		96 ± 16
11167 ± 8	3600 ± 750		34 ± 7
11232 ± 8	4700 ± 1000		44.0 ± 9.4
11497 ± 9	4650 ± 700		42.0 ± 6.5
11807 ± 9	1500 ± 700		13.8 ± 6.4
12048 ± 9	2000 ± 800		18.2 ± 7.3
12533 ± 10	2300 ± 1000		21.0 ± 8.9
12846 ± 10	3550 ± 800		31.0 ± 7.0
13150 ± 11	1800 ± 800		15.7 ± 7.0
13351 ± 6	930 ± 460		8.1 ± 4.0
13614 ± 6	1200 ± 500		10.3 ± 4.3
13862 ± 6	1350 ± 400		11.5 ± 3.4
13863 ± 6	15000 ± 3000		127.0 ± 25.0
14082 ± 6	3100 ± 700.0		26.0 ± 5.0
14163 ± 6	3200 ± 700		27.0 ± 6.0
14337 ± 6	2650 ± 750		22.0 ± 6.3
14497 ± 6	2000 ± 500		16.6 ± 4.2
14605 ± 6	8700 ± 1800		72 ± 15
14862 ± 6	4800 ± 1200		39.0 ± 9.8

* gΓ_n Resonance considered p-wave by Liou et al (72)

¹⁷⁰Er
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THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 5.7 \pm 0.2 \text{ b} \\ \sigma_s &= 15.0 \pm 0.8 \text{ b} \\ \sigma_{\text{coh}}^c &= 10.9 \pm 0.5 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 20 \pm 2 \text{ b} \\ \langle D \rangle &= 150 \pm 15 \text{ eV} \\ S_0 &= 1.5 \pm 0.2 \\ S_1 &= 0.80 \pm 0.25\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^{\circ}$$

$$\% \text{Abrn} = 15.0$$

$$S_n = 5681.5 \pm 0.5 \text{ keV}$$

E ₀ (eV)	Γ _n (meV)	Γ _n ⁰ (meV)
95.07 ± 0.10	880 ± 40	90.0 ± 4.0
164.6 ± 0.2	*0.066 ± 0.045	0.005 ± 0.004
221.9 ± 0.2	*0.71 ± 0.21	0.045 ± 0.014
284.0 ± 0.3	600 ± 35	35.6 ± 2.1
394.3 ± 0.3	*0.54 ± 0.25	0.027 ± 0.013
408.9 ± 0.3	*1.3 ± 0.4	0.064 ± 0.020

¹⁷⁰
₆₈Er

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
483.8 ± 0.4	^a 0.95 ± 0.50	0.043 ± 0.023
496.7 ± 0.3	600 ± 40	30.0 ± 1.8
584.1 ± 0.5	^a 2.3 ± 0.9	0.095 ± 0.037
598.2 ± 0.5	^a 4.2 ± 1.4	0.17 ± 0.06
698.2 ± 0.7	^a 1.8 ± 0.8	0.068 ± 0.030
729.5 ± 0.7	^a 2.2 ± 1.0	0.081 ± 0.037
748.8 ± 0.6	125 ± 12	4.6 ± 0.4
809.2 ± 0.8	^a 0.97 ± 0.60	0.034 ± 0.021
935.6 ± 0.4	1600 ± 100	52.0 ± 3.3
975.0 ± 1.1	8.2 ± 2.7	0.26 ± 0.09
1089.0 ± 0.5	760 ± 50	23.0 ± 1.5
1230.7 ± 0.6	38 ± 7	1.1 ± 0.2
1391.1 ± 0.7	2850 ± 200	76.0 ± 5.4
1433.2 ± 1.9	^a 2.9 ± 2.1	0.077 ± 0.055
1512.1 ± 2.1	^a 8.5 ± 4.5	0.22 ± 0.11
1524.0 ± 0.8	71 ± 16	1.8 ± 0.4
1618.1 ± 2.3	^a 3.4 ± 2.2	0.084 ± 0.055
1693.4 ± 2.4	^a 5.8 ± 3.0	0.14 ± 0.07
1827.6 ± 2.7	^a 12 ± 6	0.28 ± 0.14
1844.1 ± 2.8	25 ± 11	0.58 ± 0.26
1874.9 ± 2.9	^a 12.1 ± 5.0	0.28 ± 0.12
1938.9 ± 3.0	^a 6.5 ± 3.5	0.15 ± 0.08
2009.9 ± 2.5	995 ± 75	22.2 ± 1.7
2087.2 ± 3.4	^a 3.7 ± 3.0	0.081 ± 0.066
2101.1 ± 0.7	1400 ± 100	31.0 ± 2.2
2190.9 ± 3.6	53 ± 20	1.1 ± 0.4
2249.3 ± 0.7	2120 ± 160	45.0 ± 3.4
2291.0 ± 3.9	^a 15.8 ± 7.0	0.33 ± 0.15
2377.9 ± 0.8	570 ± 70	11.7 ± 1.6
2482.3 ± 4.3	^a 14 ± 7	0.28 ± 0.14
2594.0 ± 4.6	38 ± 16	0.75 ± 0.32
2830.6 ± 1.0	3970 ± 450	74.6 ± 8.5
2857.3 ± 5.4	^a 27 ± 19	0.51 ± 0.36
2928.0 ± 5.6	^a 9.5 ± 6.0	0.18 ± 0.11
2977.8 ± 1.1	180 ± 25	3.3 ± 0.5
3018.6 ± 5.8	^a 21 ± 9	0.38 ± 0.16
3083.4 ± 6.0	^a 20 ± 8	0.36 ± 0.14
3150.3 ± 6.2	15 ± 6	0.27 ± 0.11
3302.1 ± 1.3	650 ± 70	11.3 ± 1.2
3352.8 ± 3.4	55 ± 24	0.95 ± 0.42
3414.7 ± 3.5	^a 34 ± 16	0.58 ± 0.27
3464.4 ± 1.4	195 ± 70	3.3 ± 1.2
3518.1 ± 3.7	^a 7.3 ± 5.0	0.12 ± 0.08
3599.7 ± 3.8	^a 28 ± 11	0.47 ± 0.18
3698.0 ± 4.0	^a 9.3 ± 6.0	0.15 ± 0.10
3715.9 ± 1.6	117 ± 40	1.9 ± 0.7
3843.9 ± 1.7	300 ± 70	4.8 ± 1.1
4067.4 ± 4.6	^a 9.0 ± 7.0	0.14 ± 0.11
4123.6 ± 1.8	360 ± 50	5.6 ± 0.8
4193.3 ± 1.9	1180 ± 120	18.2 ± 1.9
4240.9 ± 1.9	1350 ± 140	21.0 ± 2.2
4245.8 ± 7.6	1100 ± 150	16.9 ± 2.3

¹⁷⁰
₆₈Er

E_{β} (eV)	Γ_{α} (meV)	Γ_{β}^0 (meV)
4318.8 ± 5.0	36 ± 21	0.55 ± 0.32
4421.5 ± 2.0	1450 ± 150	22.0 ± 2.3
4559.6 ± 5.5	108 ± 50	1.6 ± 0.7
4715.1 ± 2.2	1400 ± 140	20.0 ± 2.0
5449.5 ± 2.8	4850 ± 500	66.0 ± 6.8
5946.4 ± 3.2	11800 ± 2000	153 ± 26
6032.0 ± 3.2	2420 ± 300	31.0 ± 3.9
6235.8 ± 3.4	4850 ± 500	61.0 ± 6.3
6365.0 ± 3.5	310 ± 120	3.9 ± 1.5
6638.5 ± 3.7	1150 ± 220	14.1 ± 2.7
6831.9 ± 3.9	420 ± 200	5.1 ± 2.4
6862.9 ± 3.9	760 ± 280	9.2 ± 3.4
7187.2 ± 4.2	645 ± 100	7.6 ± 1.2
7286.2 ± 4.3	3070 ± 400	36.0 ± 5.0
8223.5 ± 5.1	1300 ± 240	14.3 ± 2.7
8311.0 ± 5.2	6500 ± 1000	71.0 ± 11.0
8405.1 ± 5.3	24000 ± 3500	260 ± 36
8834.9 ± 5.8	1250 ± 300	13.3 ± 3.2
9348.6 ± 6.2	1700 ± 500	17.6 ± 5.2
9803.8 ± 6.6	6250 ± 750	63.0 ± 7.6
10054 ± 7	1500 ± 450	15.0 ± 4.5
10229 ± 7	4000 ± 600	40.0 ± 6.0
10329 ± 7	8300 ± 1200	82.0 ± 12.0
11103 ± 8	810 ± 300	7.7 ± 2.9
11208 ± 8	7700 ± 1400	73.0 ± 13.0
11281 ± 8	1900 ± 600	17.9 ± 5.7
11480 ± 8	9100 ± 1400	85.0 ± 13.0
11557 ± 9	770 ± 380	7.2 ± 3.6
11608 ± 9	5070 ± 800	47.0 ± 7.4
11702 ± 9	2050 ± 1300	19 ± 9.2
11798 ± 9	1600 ± 600	14.7 ± 5.5
12478 ± 10	8600 ± 1200	77.0 ± 11.0
13212 ± 10	5300 ± 1000	46.0 ± 8.7
13465 ± 5	1000 ± 350	8.6 ± 3.0
13806 ± 6	5900 ± 900	50.0 ± 8.0
13932 ± 6	8250 ± 1200	70.0 ± 10.0
14569 ± 6	3550 ± 600	29.0 ± 5.0
15404 ± 7	1350 ± 400	10.9 ± 3.20
15605 ± 7	10000 ± 1600	80.0 ± 13.0
15777 ± 7	6100 ± 900	49.0 ± 7.2
16045 ± 7	6800 ± 1100	54.0 ± 8.7
16142 ± 7	11000 ± 2000	87.0 ± 16.0
16448 ± 7	5200 ± 1100	41.0 ± 8.6
16468 ± 8	1740 ± 600	13.6 ± 4.7
16869 ± 8	9500 ± 1800	73.0 ± 14
17012 ± 8	4500 ± 1100	35.0 ± 8.4
17058 ± 8	4450 ± 1100	34.0 ± 8.4
17323 ± 8	5900 ± 1300	45.0 ± 9.9
17773 ± 8	7700 ± 1400	58.0 ± 11.0
18492 ± 9	3050 ± 900	22.0 ± 6.6
18621 ± 9	14500 ± 2200	106.0 ± 16.0
19319 ± 9	4900 ± 900	35.0 ± 6.5

¹⁷⁰₆₈Er

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
19536 ±10	6000 ±1500	43.0 ±11.0
19978 ±10	5300 ±1100	38.0 ± 7.8
20301 ±10	2800 ± 700	19.7 ± 4.9
20566 ±10	17000 ±3000	119 ±21
21003 ±10	7700 ±1500	53.0 ±11.0
21102 ±11	14000 ±2600	96.0 ±18.0
21517 ±11	6650 ±1200	45.0 ± 8.2
21939 ±11	17000 ±3000	115 ±20
22322 ±12	4100 ±1500	27.0 ±10.0
22374 ±12	4700 ±1600	31.0 ±11.0
22587 ±12	9800 ±1800	65.0 ±12.0
22803 ±12	3700 ±1300	25.0 ± 8.6
22904 ±12	4200 ±1700	28 ±11
23240 ±12	12500 ±3000	82 ±20
23695 ±12	8400 ±2000	55 ±13

^a $g\Gamma_n$ Possibly p-wave

The calculated absorption resonance integral is 42 b for a 0.79 ev radiation width.

¹⁷¹₆₈Er
[7.5 hr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 280 \pm 30 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Er ^{162,164,167,168}		PRIVATE COMM.(72)	Pappas
Er ^{166,167}	mass spectrometry	JMS,6,435(71)	Dobrozensky
Er ¹⁷¹	activation	JPJ,31,1304(71)	Miyano
Er	σ_t	AKE,16,49(70)	Knorr
Er	σ_y	NIM,86,83(70)	Malik
Er,Er ^{162,164,166}	σ_t	70HELSINKI,1,651(70)	Vertebnyi
Er ^{167,168,170}	σ_t	70HELSINKI,1,651(70)	Vertebnyi
Er ^{162,164,166-168}	σ_t	UFZ,13,420(68)	Koloty
Er ¹⁷⁰	σ_t	UFZ,13,420(68)	Koloty
Er ^{164,168}	σ_t	PR,162,1130(67)	Mughabghab
Er,Er ^{162,164,166}	σ_t	BAS,31,338(67)	Vertebnyi
Er ^{167,168,170}	σ_t	BAS,31,338(67)	Vertebnyi
Er	σ_t	NP/A,95,663(67)	Zimmerman
Er ^{167,170}	mass spectrometry	ORNL-4155,15(66)	Gillette
Er ¹⁶⁷	mass spectrometry	NS,14,(2),1(67)	Su
Er ^{162,164,166-168}	σ_t	UFZ,11,240(66)	Vlasov
Er ¹⁷⁰	σ_t	UFZ,11,240(66)	Vlasov
Er ^{162,164,166-168}	alpha emission	YF,1,252(65)	Andreev
Er	σ_t	PRIVATE COMM.(65)	Ohno
Er ¹⁶⁶	activation	NYO-10175(64)	Airino
Er	σ_y	PRIVATE COMM.(64)	Haddad
Er	σ_y	BAP,9,31(64)	Lopez
Er ¹⁶⁶	activation	ADP,12,225(63)	Alexander
Er ¹⁷⁰	activation	NP,41,372(63)	Mangal
Er ¹⁷⁰	activation	ZP,175,54(63)	Schoneberg
Er	σ_t	ANS,3,462(60)	Roeser
Er ^{162,164}	activation	CNI-6(59)	Segre
Er ^{166,167}	reactivity	BAP,3,336(58)	Hopkins
Er ^{168,170}	activation	ANL-5287(54)	Barnes
Er	diffraction	PR,91,597(53)	Koehler
Er	σ_t	PR,87,487(52)	Bernstein
Er	pile osci.	PR,83,641(51)	Pomerance
Er ¹⁷⁰	activation	ZN,1,179(46)	Bothe

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
E_{r166}	$\sigma_c \sigma_y (SI)$	30-750	PR/C.S. 974(72)	Lieu
E_{r166}	$\sigma_c \sigma_y (SI)$	15-9486	PR/C.S. 974(72)	Lieu
E_{r167}	$\sigma_c \sigma_y (SI)$	5.9-1686	PR/C.S. 974(72)	Lieu
E_{r168}	$\sigma_c \sigma_y (SI)$	79-14605	PR/C.S. 974(72)	Lieu
E_{r170}	$\sigma_c \sigma_y (SI)$	95-23695	PR/C.S. 974(72)	Lieu
E_{r167}	$\sigma_y (spectra)$	20.3-142	AERE-PR/MP-18.23(72)	Thomson
E_{r167}	$\sigma_y (spectra)$	5.9-106	BNP, 16, 496(71)	Mason
E_{r167}	polarization	0.46-9.6	PR/C.S. 2, 1137(70)	Brunhart
E_{r162}	$\sigma_c \sigma_y (SI)$	14-66	NYO-72-190(70)	Lieu
E_{r164}	$\sigma_c \sigma_y (SI)$	30-750	NYO-72-190(70)	Lieu
E_{r168}	$\sigma_c \sigma_y (SI)$	15-2987	NYO-72-190(70)	Lieu
E_{r167}	$\sigma_c \sigma_y (SI)$	7.9-652	NYO-72-190(70)	Lieu
E_{r169}	$\sigma_c \sigma_y (SI)$	79.8-8407	NYO-72-190(70)	Lieu
E_{r167}	$\sigma_y (spectra)$	0.46-27.4	PR/C.1, 1501(70)	Metzger
E_{r164}	$\sigma_c \sigma_y$	7.8-606	YF, 7, 225(68)	Karzhavina
E_{r166}	$\sigma_c \sigma_y$	15.6-1370	YF, 7, 225(68)	Karzhavina
E_{r167}	$\sigma_c \sigma_y$	6.0-321	YF, 7, 225(68)	Karzhavina
E_{r168}	$\sigma_c \sigma_y$	7.3-4360	YF, 7, 225(68)	Karzhavina
E_{r170}	$\sigma_c \sigma_y$	7.4-4730	YF, 7, 225(68)	Karzhavina
E_{r162}	σ_c	5.4-228	PR, 162, 1130(67)	Rughabghab
E_{r164}	σ_c	7.9-225	PR, 162, 1130(67)	Rughabghab
E_{r166}	σ_c	15-603	PR, 162, 1130(67)	Rughabghab
E_{r167}	σ_c	0.46-142	PR, 162, 1130(67)	Rughabghab
E_{r168}	σ_c	80-1410	PR, 162, 1130(67)	Rughabghab
E_{r170}	σ_c	94.8	PR, 162, 1130(67)	Rughabghab
E_{r167}	σ_y	7.9	MP, 71, 129(65)	Froelner
E_{r167}	σ_c	7.7-21	GSANTHEAP, 106(65)	Vertebnyi
E_{r164}	σ_c	7.95	GSANTHEAP, 106(65)	Vertebnyi
E_{r166}	σ_c	15.6	GSANTHEAP, 106(65)	Vertebnyi
E_{r167}	σ_c	0.46-27.5	GSANTHEAP, 106(65)	Vertebnyi
E_{r170}	σ_c	94.5	GSANTHEAP, 106(65)	Vertebnyi
E_r	σ_y	6-108	GA-3874(63)	Haddad
E_{r168}	σ_c	15.3	AE, 15, 247(63)	Vlasov
E_{r167}	σ_c	0.46-27.6	AE, 15, 247(63)	Vlasov
E_{r167}	polarization	0.46-9.6	PRIVATE COMM. (61)	Sailer
E_r	σ_c	0.46-0.58	AERE-PR/MP-2, 15(61)	Luckey
E_r	σ_c	0.46-0.58	HSE, 8, 103(60)	Heller
E_r	$\sigma_y (spectra)$	0.47-9.4	MP, 10, 306(59)	Fenstermacher
E_r	σ_c	0.47-94	PRIVATE COMM. (57)	Zimmerman

¹⁶⁹Tm

Thermal Cross Sections

$\sigma_f = 103 \pm 3$ b
 $\sigma_f = 8.1 \pm 1.6$ b (0.0041 ms ¹⁷⁰Tm*)
 $\sigma_f = 95 \pm 2$ b (130 day ¹⁷⁰Tm*)
 $\sigma_a = 12 \pm 2$ b
 $\sigma_{p,n} = 19$ b
 $\sigma_a < 0.01$ mb
 $\sigma_{c,n} = 7.05 \pm 0.05$ fm

Resonance Properties

$I_T = 1720 \pm 40$ b
 $R_T = 7.7 \pm 0.8$ fm
 $\langle Q \rangle = 7.3 \pm 0.5$ eV
 $S_0 = 1.4 \pm 0.2$

Resonance Parameters

$I^{\pi} = 1/2^{+}$		$\Gamma_{\text{obs}} = 100$		$S_0 = 6594.2 \pm 1.4$ keV	
E_0 (eV)	Γ (meV)	$2\sigma\Gamma_n$ (meV)	J	Γ_f (meV)	$2\sigma\Gamma_n^0$ (meV)
Bound level					
3.90 ± 0.02	108 ± 3	12.2 ± 0.3	1	96 ± 3	6.19 ± 0.15
15.4 ± 0.1	93 ± 3	4.6 ± 0.2	0	84 ± 3	1.2 ± 0.1
17.5 ± 0.1	90 ± 5	3.2 ± 0.4	0	84 ± 4	0.76 ± 0.10
29.1 ± 0.1		0.29 ± 0.03	1		0.05 ± 0.006
34.8 ± 0.1	93 ± 3	10.2 ± 0.5	1	83 ± 3	1.73 ± 0.08
38.1 ± 0.1		0.64 ± 0.07			0.11 ± 0.01
44.8 ± 0.1	96 ± 5	5.1 ± 0.3	1	93 ± 5	0.77 ± 0.05
50.7 ± 0.2	85 ± 5	8.4 ± 1.1	1	79 ± 5	1.13 ± 0.15
54.0 ± 0.2		0.60 ± 0.08			0.08 ± 0.01
59.2 ± 0.2	94 ± 5	15.6 ± 0.9	1	84 ± 5	2.03 ± 0.12
63.1 ± 0.2		1.5 ± 0.5	1		0.18 ± 0.06
65.9 ± 0.2	196 ± 15	56.5 ± 1.5	0	83 ± 4	6.95 ± 0.20
83.5 ± 0.2	93 ± 5	11.3 ± 0.6	1	85 ± 5	1.23 ± 0.06
94.1 ± 0.2		45 ± 9	1		4.7 ± 0.9
95.6 ± 0.2		4 ± 1	(0)		0.42 ± 0.10
101.8 ± 0.2		1.4 ± 0.2	1		0.13 ± 0.02
115.5 ± 0.2	112 ± 10	28.4 ± 0.9	1	93 ± 10	2.66 ± 0.09
125.2 ± 0.2	85 ± 8	20.7 ± 0.9	0	71 ± 8	1.85 ± 0.09
132.2 ± 0.2		1.2 ± 0.3	1		0.10 ± 0.03
136.1 ± 0.2	111 ± 4	33.5 ± 1.2	1	89 ± 4	2.87 ± 0.11
153.0 ± 0.3	166 ± 6	122 ± 6	0	85 ± 9	9.8 ± 0.5
160.5 ± 0.3		2.0 ± 0.5	1		0.16 ± 0.04
164.3 ± 0.3		7.5 ± 1.0	1		0.58 ± 0.08
207.6 ± 0.3		26	1		1.8
209.3 ± 0.3		4.0			0.28
213.5 ± 0.4		32.0			2.2
223.6 ± 0.4		15.0	0		1.0
227.2 ± 0.5		6.0	1		0.40
238.4 ± 0.5		22.0	1		1.42
243.4 ± 0.5		9.0	1		0.58
251.3 ± 0.5		108 ± 20	1	99 ± 6	0.68 ± 0.13

¹⁶⁹Tm
⁶⁹Tm

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
260.1 ± 0.5		20.8 ± 2.0	1		1.30 ± 0.13
274.0 ± 0.5	114 ± 10	31.5 ± 3.0	1	93 ± 10	1.91 ± 0.20
283.0 ± 0.5	185 ± 12	50.0 ± 5.0	1	85 ± 4	3.0 ± 0.3
288.0 ± 0.6		69.5 ± 2.0	0	100 ± 7	4.10 ± 0.13
295.3 ± 0.6		9.0 ± 1.4	0		0.52 ± 0.08
297.0 ± 0.6		27.0 ± 3.0	1	126 ± 20	1.58 ± 0.17
318.5 ± 0.6	170 ± 30	78 ± 10	1	118 ± 31	4.2 ± 0.5
319.3 ± 0.6	210 ± 30	58 ± 8	0	94 ± 34	3.2 ± 0.4
324.0 ± 0.6		13.6 ± 1.6	1		0.76 ± 0.09
333.0 ± 0.6	165 ± 25	70.4 ± 4.0	1	118 ± 25	3.86
346.3 ± 0.6	130 ± 20	33.0 ± 2.0	1	108 ± 20	1.78 ± 0.11
356.7 ± 0.6	180 ± 35	44.2 ± 2.0		92 ± 35	2.4 ± 0.1
363.1 ± 0.6		2.8 ± 0.8			0.14 ± 0.03
376.2 ± 0.6		18.8 ± 2.2	1		0.96 ± 0.11
377.8 ± 0.6		22.6 ± 2.4	0		1.16 ± 0.12
390.0 ± 0.6		66 ± 4	0		3.4 ± 0.5
399.8 ± 0.6		7 ± 2	1		0.34 ± 0.10
407.0 ± 0.6		40 ± 8			0.20 ± 0.04
408.9 ± 0.7		220 ± 30	1		10.8 ± 1.4
413.6 ± 0.8	500 ± 100	186 ± 20	0		9.2 ± 1.0
415.3 ± 0.8		52 ± 4	1		2.6 ± 0.5
440.6 ± 0.8		58.2 ± 2.0	1		2.8 ± 0.1
455.1 ± 0.8		7.4 ± 1.0	1		0.34 ± 0.05
459.3 ± 0.8		15.2 ± 2.0	1		0.70 ± 0.09
467.8 ± 0.9		36 ± 4	1		1.66 ± 0.17
471.7 ± 1.0		18 ± 2	0		0.86 ± 0.09
492.9 ± 1.0		40 ± 2	1		0.44 ± 0.08
512.0 ± 1.0	170 ± 40	74 ± 4	1	120 ± 40	3.2 ± 0.2
519.1 ± 1.0	340 ± 50	118 ± 6	0	103 ± 51	5.2 ± 0.3
542.3 ± 1.0		10 ± 2	1		0.40 ± 0.08
549.4 ± 1.0		42 ± 4	1		1.8 ± 0.2
556.5 ± 1.0	170 ± 40	78 ± 4	1	118 ± 40	3.2 ± 0.2
564.5 ± 1.0	220 ± 40	156 ± 8	1	119 ± 40	6.6 ± 0.3
573.0 ± 1.0	190 ± 40	106 ± 6	1	120 ± 40	4.4 ± 0.3
577.0 ± 1.0		6.0 ± 1.6			0.24 ± 0.06
585.8 ± 1.0	720 ± 100	310 ± 30	0		1.28 ± 0.13
591.7 ± 1.1		42 ± 4	1		1.74 ± 0.17
598.9 ± 1.1	210 ± 40	130 ± 8	1	118 ± 40	5.6 ± 0.3
606.9 ± 1.2	150 ± 60	34.0 ± 2.8	1	128 ± 60	1.36 ± 0.11
625.0 ± 1.3		90 ± 6	1		3.6 ± 0.2
630.9 ± 1.3		44.0 ± 3.2	1		1.74 ± 0.13
642.1 ± 1.3		32 ± 2.4	1		1.28 ± 0.10
658.5 ± 1.3		52 ± 4	0		2.04 ± 0.16
671.8 ± 1.3		230 ± 20	1		8.8 ± 0.8
676.1 ± 1.3		360 ± 40	1		13.8 ± 1.4
684.9 ± 1.3		20.0 ± 2.8	[1]		0.68 ± 0.10
693.6 ± 1.3		22 ± 2	[1]		0.82 ± 0.08
705.0 ± 1.3		8 ± 2			0.28 ± 0.04
711.9 ± 1.3	360 ± 50	132 ± 20	0		5.0 ± 0.8
715.1 ± 1.3	330 ± 50	290 ± 30	1	136 ± 53	10.8 ± 1.1
723.0 ± 1.4		11 ± 2			0.40 ± 0.08
730.0 ± 1.4	220 ± 45	48 ± 4.0	[1]	188 ± 45	1.78 ± 0.15
737.0 ± 1.4		26.0 ± 2.4	[1]		0.96 ± 0.09
755.6 ± 1.4		22 ± 2	[0]		0.80 ± 0.08
760.5 ± 1.4		11.2 ± 1.6	[1]		0.30 ± 0.04

THERMAL CROSS SECTIONS

$$\sigma_T = 92 \pm 4 \text{ b}$$

RESONANCE PROPERTIES

$$I_T^c = 460 \pm 50 \text{ b}$$

$$S_0 = 1.5 \pm 0.2$$

$^{170}_{69}\text{Tm}$
(129 day)

THERMAL CROSS SECTIONS

$$\sigma_T = 4.5 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 118 \pm 6 \text{ b}$$

$^{171}_{69}\text{Tm}$
(1.92 yr)

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Tm^{169}	magnetization	PRIVATE COMM.(73)	Lander
Tm^{169}	activation	PRIVATE COMM.(72)	Pappas
Tm	activation	JIN,34,2699(72)	Steinnes
Tm^{170}		JPJ,31,1304(71)	Miyano
Tm	σ_t	AKE,16,49(70)	Knorr
Tm	activation	JIN,32,2839(70)	Sias
Tm^{169}	activation	NP/A,102,241(67)	Andreef
Tm^{169}	σ_t 0.001-1.0	NP/A,95,683(67)	Zimmerman
Tm^{169}	mass spectrometry	ORNL-4155,15(66)	Gillette
Tm^{170}	mass spectrometry	ORNL-4155,15(66)	Gillette
Tm^{171}	mass spectrometry+activ.	ORNL-4155,15(66)	Gillette
Tm^{169}	diffraction	PR,126,1672(62)	Koehler
Tm^{169}	activation	ZP,149,215(57)	Houtermans
Tm^{169}	pile osci.	PR,83,641(51)	Pomerance

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Tm^{169}	σ_y (spectra)	14.4-153	AERE-PR/NP-18,23(72)	Thomas
Tm^{169}	σ_y (spectra)	3.9-716	71ALBANY,233(71)	Chrien
Tm^{169}	σ_y (spectra)	3.9-153	71ALBANY,251(71)	Thomas
Tm^{169}	σ_y (spectra)	14.4-115	PR/C,2,2031(70)	Bhat
Tm^{169}	$\sigma_t \sigma_y$	3.9-243	NP/A,131,305(69)	Borros
Tm^{170}	σ_t	2.8-89.6	PRIVATE COMM.(69)	Stokes
Tm^{169}	σ_t	3.9-760.5	CEA-R-3385(68)	Julien
Tm^{169}	σ_t	3.9	NP/A,91,644(67)	Al-Kital
Tm^{169}	$\sigma_y \bar{\sigma}_s$	14.3-297	GSANTHERP,65(65)	Asghar
Tm^{169}	$\bar{\sigma}_s$	3.9	NP,62,641(65)	Ceulemans
Tm^{169}	$\bar{\sigma}_s$	14-51	AERE-PR/NP,4,20(63)	Corvi
Tm^{169}	$\sigma_t \bar{\sigma}_s$	3.9-154	BAP,8,334(63)	Singh
Tm^{169}	σ_t	3.9-158	PR,99,10(55)	Harvey
Tm	σ_t	3.9-17.5	PR,96,1014(54)	Sailor
Tm^{169}	σ_t	3.9-17.6	PR,92,656(53)	Footo

⁷⁰Yb

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 36.6 \pm 2.0 \text{ b} \\ \sigma_a &= 25.0 \pm 0.8 \text{ b} \\ \sigma_{pa} &= 5.2 \pm 0.5 \text{ b} \\ a_{coh} &= 12.62 \pm 0.12 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_T = 182 \pm 10 \text{ b}$$

¹⁶⁸
⁷⁰Yb

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 3470 \pm 100 \text{ b} \\ \sigma_a &< 4 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$I_T = 31000 \pm 2000 \text{ b}$$

RESONANCE PARAMETERS

$I^0 = 0^+$	$\chi^2/\text{dof} = 0.14$	$S_n = 6867.2 \pm 0.5 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_T \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
0.597 ± 0.001	3.3 ± 0.5	70 ± 10	4.3 ± 0.7
22.50 ± 0.04	29 ± 2		6.1 ± 0.4

¹⁷⁰
⁷⁰Yb

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 10 \pm 1 \text{ b}$$

$$\sigma_a < 0.04 \text{ mb}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 300 \pm 30 \text{ b}$$

$$R' = 7.3 \pm 0.6 \text{ fm}$$

RESONANCE PARAMETERS

$$I'' = 0^{\circ}$$

$$\% \text{Abn} = 3.0$$

$$S_n = 6617.2 \pm 2.4 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
8.13±0.06	1.64± 0.15	0.583±0.053
39.93±0.06	187 ± 15	29.6 ±2.4
66.57±0.06	40 ± 7	4.9 ±0.9
72.91±0.07	55 ± 9	6.4 ±1.1
95.31±0.10	21 ± 3	2.3 ±0.3
167.7 ±2.0	21 ± 4	1.6 ±0.3
212.8 ±0.3	208 ± 30	14.2 ±2.0
270.0 ±0.2	76 ± 15	4.65 ±0.90
286.4 ±0.3	137 ± 22	8.1 ±1.3
358.0 ±0.4	76 ± 20	4.0 ±1.1
384.0 ±6.0	65 ± 20	3.3 ±1.0
394.0 ±7.0	70 ± 20	3.5 ±1.0
447.9 ±0.5	175 ± 30	8.3 ±1.4
451.8 ±0.5	68 ± 14	3.2 ±0.7
612.1 ±0.8	210 ± 60	8.5 ±2.4
761.8 ±1.2	200 ± 50	7.2 ±1.8
808.8 ±1.3	200 ± 40	7.0 ±1.4
868.9 ±0.7	89 ± 20	3.0 ±0.7
952.6 ±0.8	43 ± 15	1.39 ±0.49
978.4 ±0.8	630 ±130	20 ±4
1037.1 ±1.0	220 ± 80	6.8 ±2.5
1296.2 ±1.2	360 ±100	10.0 ±3.2
1328.0 ±1.4	190 ± 50	5.2 ±1.4

¹⁷¹Yb
70

THERMAL CROSS SECTIONS

$$\sigma_T = 50 \pm 4 \text{ b}$$

$$\sigma_a < 0.04 \text{ mb}$$

RESONANCE PROPERTIES

$$I_T = 332 \pm 30 \text{ b}$$

$$R_T = 6.3 \pm 0.6 \text{ fm}$$

$$\langle D \rangle = 5.8 \pm 0.5 \text{ eV}$$

$$S_0 = 1.7 \pm 0.2$$

RESONANCE PARAMETERS

$I^\pi = 1/2^-$		$\chi_{\text{Abn}} = 14.3$		$S_n = 8020.9 \pm 0.8 \text{ keV}$	
$E_0 \text{ (eV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_T \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$	
Bound level					
7.91±0.02	3.2 ± 0.2	1	70 ±10	1.14 ±0.08	
13.04±0.03	5.0 ± 0.3	0	81 ± 6	1.39 ±0.08	
*17.7		1			
21.72±0.06	0.27± 0.03	1		0.058±0.006	
28.13±0.04	3.54± 0.24	1	79 ±10	0.67 ±0.05	
34.54±0.05	7.5 ± 0.4	1	77 ± 8	1.28 ±0.07	
41.36±0.06	15.0 ± 0.8	0	66 ± 8	2.34 ±0.12	
46.38±0.07	1.60± 0.14	1		0.23 ±0.02	
52.87±0.09	10.0 ± 0.6	1	73 ±18	1.33 ±0.08	
54.18±0.13	30.0 ± 2.0	0	82 ±15	4.08 ±0.28	
60.09±0.05	8.4 ± 0.4	1	72 ±10	1.08 ±0.06	
64.70±0.06	14.2 ± 0.8	1	79 ±10	1.76 ±0.10	
76.94±0.08	20 ± 1.5	1	69 ±12	2.28 ±0.17	
82.23±0.08	5.2 ± 0.4	1		0.58 ±0.04	
84.31±0.09	4.7 ± 0.4			0.51 ±0.04	
96.05±0.11	5.6 ± 0.4	0	59 ±18	0.58 ±0.04	
107.7 ±0.1	76 ± 4	1	80 ±12	7.4 ±0.4	
111.9 ±1.1	30 ± 2	1	89 ±12		
120.2 ±0.2	0.24± 0.14			0.022±0.012	
127.6 ±0.2	20.4 ± 2.4	1	70 ±14	2.70 ±0.22	
139.9 ±0.2	24.0 ± 6.0			2.02 ±0.50	
145.9 ±0.2	15.8 ± 1.2			1.30 ±0.10	
160.4 ±0.2	116 ± 10		80 ±14	9.16 ±0.79	
164.6 ±0.2	78.0 ± 4.0		70 ±10	6.0 ±0.4	
175.6 ±0.1	22.0 ± 2.0		69 ±15	1.66 ±0.16	
179.1 ±0.1	1.88± 0.90			0.140±0.068	
182.3 ±0.1	22.8 ± 2.8			1.68 ±0.20	
193.6 ±0.2	10 ± 2				
208.3 ±0.2	10 ± 2			0.70 ±0.14	
210.4 ±0.2	200 ± 56			13.3 ±3.8	
216.8 ±0.2	1.38± 0.72			0.094±0.050	
226.8 ±0.2	42 ± 4		74 ±10	2.78 ±0.26	
239.9 ±0.2	7.2 ± 1.4			0.46 ±0.10	
250.1 ±0.2	48 ± 6		84 ±12	3.04 ±0.38	
255.26	58.0 ± 8.0		100 ±20	3.64 ±0.50	
269.7 ±0.3	1.96± 1.00			0.12 ±0.06	

¹⁷¹
70 Yb

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
276.6 ±0.3	16.6 ± 2.8			1.00 ±0.16
287.5 ±0.3	34.0 ± 4.0		80 ±18	2.00 ±0.24
290.6 ±0.3	164 ± 12		86 ±20	9.6 ±0.8
302.3 ±0.3	39.0 ± 6.0			2.24 ±0.34
310.1 ±0.3	64.0 ± 8.0		80 ±15	3.64 ±0.46
314.0 ±0.3	6.2 ± 2.6			0.34 ±0.14
319.9 ±0.3	50.0 ± 8.0			2.80 ±0.44
331.1 ±0.3	6.2 ± 3.0			0.34 ±0.16
341.6 ±0.4	32.0 ± 6.0			1.74 ±0.32
344.4 ±0.4	64.0 ± 10.0			3.44 ±0.54
354.4 ±0.4	330 ± 50		82 ±14	17.6 ±2.6
359.5 ±0.5	6.4 ± 3.2			0.34 ±0.16
370.4 ±0.5	4.8 ± 2.4			0.25 ±0.12
387.2 ±0.4	270 ± 50		70 ±25	13.8 ±2.6
392.0 ±0.5	7.0 ± 3.6			0.36 ±0.18
409.4 ±0.5	31.0 ± 5.0			1.54 ±0.24
411.7 ±0.5	38.0 ± 6.0			1.88 ±0.30
434.6 ±0.3	86.0 ± 10.0			4.12 ±0.48
436.7 ±0.3	25.0 ± 6.0			1.20 ±0.28
444.8 ±0.3	122 ± 14		80 ±14	5.80 ±0.60
455.2 ±0.7	8 ± 4			0.38 ±0.18
459.3 ±0.3	44 ± 8			2.1 ±0.4
470.8 ±0.3	60 ± 6		72 ±15	2.8 ±0.3
483.6 ±0.3	46 ± 6		62 ±18	2.1 ±0.3
494.3 ±0.3	142 ± 24			6.4 ±1.0
499.1 ±0.3	160 ± 20		78 ±15	7.2 ±1.0
515.9 ±0.3	186 ± 20		80 ±20	8.2 ±0.8
524.8 ±0.3	126 ± 14		77 ±18	5.6 ±0.6
531.5 ±0.9	8.8 ± 3.0			0.38 ±0.13
538.9 ±0.3	480 ± 60		70 ±15	20.6 ±2.6
547.1 ±0.4	80 ± 12			3.4 ±0.5
557.7 ±0.9	4.6 ± 2.0			0.19 ±0.08
560.9 ±0.9	3.4 ± 1.6			0.14 ±0.07
577.7 ±0.4	86 ± 10		72 ±15	3.6 ±0.4
594.2 ±0.4	38 ± 6			1.6 ±0.2
598.2 ±0.4	60 ± 10		87 ±18	2.5 ±0.4
603.9 ±0.4	130 ± 18		73 ±16	5.2 ±0.8
612.5 ±0.4	84 ± 10		64 ±16	3.4 ±0.4
620.5 ±0.4	48 ± 8			1.9 ±0.3
628.6 ±0.4	122 ± 16		86 ±20	4.8 ±0.6
633.1 ±0.4	92 ± 12			3.7 ±0.5
648.9 ±0.5	56 ± 8			2.2 ±0.4
657.2 ±1.2	17 ± 7			0.68 ±0.28
661.8 ±0.5	118 ± 18			4.6 ±0.8
667.4 ±0.5	76 ± 12			2.9 ±0.5
673.6 ±0.5	29 ± 5			1.1 ±0.2
685.7 ±0.5	42 ± 8			1.6 ±0.3
691.6 ±0.5	80 ± 12			3.04 ±0.46
695.1 ±0.5	15 ± 4			0.58 ±0.16
709.4 ±0.5	350 ± 44			13.2 ±1.6
716.3 ±1.3	2.8 ± 1.6			0.10 ±0.06
731.1 ±0.5	104 ± 12			3.8 ±0.4

¹⁷¹Yb
₇₀

E ₀ (eV)	2g _n ⁰ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
741.0 ±1.4	8 ± 4			0.30 ±0.14
746.2 ±0.6	36 ± 6			1.3 ±0.2
761.2 ±1.5	8 ± 4			0.29 ±0.14
774.9 ±0.6	54 ± 8			1.9 ±0.3
785.2 ±1.5	15.8 ± 5.0			0.56 ±0.18
790.8 ±0.6	196 ± 28			7.0 ±1.0
800.3 ±0.6	220 ± 24			7.8 ±0.8
810.8 ±0.8	4.0 ± 2.0			0.14 ±0.07
817.6 ±0.6	88 ± 10			3.1 ±0.3
829.4 ±0.3	36 ± 4			1.26 ±0.14
838.6 ±0.3	40 ± 6			1.4 ±0.2
841.6 ±0.3	114 ± 12			3.92 ±0.42
851.5 ±0.3	28 ± 4			0.96 ±0.14
875.3 ±0.4	174 ± 24			5.8 ±0.8
896.2 ±0.4	284 ± 40			9.4 ±1.4
905.4 ±0.4	80 ± 10			2.7 ±0.3
915.5 ±0.4	46 ± 10			1.5 ±0.3
923.5 ±0.4	152 ± 24			10.6 ±1.6
927.0 ±0.4	320 ± 48			7.4 ±1.2
932.4 ±0.4	76 ± 20			3.64 ±0.46
938.7 ±0.4	226 ± 36			0.84 ±0.32
945.0 ±0.4	112 ± 14			2.5 ±0.7
962.4 ±1.1	26 ± 10			0.38 ±0.20
971.8 ±1.1	12 ± 6			0.19 ±0.12
981.4 ±1.1	6 ± 4			14.0 ±2.6
991.1 ±0.4	440 ± 80			1.6 ±0.4
1005.3 ±0.5	50 ± 12			7.4 ±1.2
1009.7 ±0.5	234 ± 36			3.52 ±0.62
1017.5 ±0.5	112 ± 20			0.38 ±0.18
1020.2 ±1.1	12 ± 6			5.6 ±0.8
1026.9 ±0.5	178 ± 28			1.7 ±0.3
1037.1 ±0.5	56 ± 10			1.1 ±0.4
1047.9 ±0.5	34 ± 12			3.8 ±0.9
1049.8 ±0.5	122 ± 28			4.2 ±0.8
1062.9 ±0.5	136 ± 24			7.0 ±1.2
1071.5 ±0.5	228 ± 40			0.98 ±0.30
1078.7 ±0.5	32 ± 10			0.42 ±0.24
1086.5 ±0.5	14 ± 8			2.1 ±0.4
1091.4 ±0.5	68 ± 14			2.4 ±0.4
1110.4 ±0.5	80 ± 14			12.4 ±2.4
1136.2 ±0.5	420 ± 80			5.2 ±1.0
1157.9 ±0.6	176 ± 32			2.4 ±0.6
1167.1 ±0.6	82 ± 20			2.98 ±0.64
1173.2 ±0.6	102 ± 22			1.4 ±0.5
1185.9 ±0.6	48 ± 16			6.0 ±1.0
1209.7 ±0.6	206 ± 36			1.1 ±0.3
1217.2 ±0.6	40 ± 12			1.4 ±0.3
1229.5 ±0.6	50 ± 10			0.34 ±.18
1234.8 ±0.6	12 ± 6			1.6 ±0.4
1241.4 ±0.6	56 ± 14			13.0 ±2.2
1251.0 ±0.6	460 ± 80			10.6 ±2.2
1262.0 ±0.6	380 ± 80			

¹⁷¹
₇₀Yb

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1269.3 ±0.6	150 ± 32			4.2 ±1.0
1283.2 ±0.6	390 ± 66			10.8 ±1.8
1290.8 ±0.6	480 ± 80			13.4 ±2.2
1299.4 ±0.7	380 ± 80			10.6 ±2.2
1322.1 ±0.7	340 ± 60			9.4 ±1.6
1334.0 ±0.7	270 ± 76			7.4 ±2.2
1352.3 ±1.7	14 ± 8			0.38 ±0.22
1368.6 ±0.7	206 ± 44			5.6 ±1.2
1377.7 ±0.7	98 ± 32			2.6 ±0.9
1397.9 ±0.7	24 ± 12			0.64 ±0.32
1437.6 ±0.7	352 ± 90			9.2 ±2.4
1450.3 ±0.8	134 ± 44			3.52 ±1.16
1453.4 ±0.8	146 ± 50			3.82 ±1.32
1461.7 ±0.8	172 ± 48			4.4 ±1.2
1469.4 ±0.8	64 ± 22			1.66 ±0.58
1481.0 ±0.8	320 ± 60			8.4 ±1.6
1499.1 ±0.8	300 ± 60			7.8 ±1.6
1516.9 ±0.8	240 ± 40			6.2 ±1.0
1524.4 ±0.8	90 ± 30			2.3 ±0.8
1534.7 ±0.8	420 ± 80			10.8 ±2.0
1549.6 ±0.9	102 ± 36			2.6 ±1.0
1586.9 ±0.9	380 ±100			9.6 ±2.6
1593.8 ±0.9	78 ± 30			1.96 ±0.76
1617.6 ±0.9	196 ± 60			4.8 ±1.4
1637.3 ±0.9	116.0 ± 40			2.86 ±0.98
1661.6 ±0.9	240 ± 80			5.8 ±2.0
1675.8 ±0.9	96 ± 30			2.34 ±0.74
1684.7 ±0.9	280 ± 60			6.8 ±1.4

▪ Small Yb-171 resonance masked by the 17.7 eV Yb-173 resonance.

¹⁷²₇₀Yb

THERMAL CROSS SECTIONS

$$\sigma_T = 1.3 \pm 0.8 \text{ b}$$

$$\sigma_a < 0.03 \text{ mb}$$

RESONANCE PROPERTIES

$$I_T = 25 \pm 3 \text{ b}$$

$$R_T = 6.3 \pm 0.8 \text{ fm}$$

$$\langle D \rangle = 70 \pm 3 \text{ eV}$$

$$S_0 = 1.6 \pm 0.2$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\chi A b_n = 21.9$$

$$S_n = 6367.3 \pm 0.5 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_T (meV)	Γ_n^0 (meV)
139.9±0.2	134 ± 8.0	77 ± 16	11.3 ± 0.7
180.3±0.1	220 ± 14	80 ± 20	16.0 ± 1.0
201.5±0.2	16.2± 1.0		0.92± 0.07
323.7±0.3	7 ± 1		0.67± 0.22
459.3±0.3	40 ± 5		1.87± 0.23
508.7±0.3	240 ± 40	60 ± 20	10.6 ± 1.8
544.4±0.4	32 ± 8		1.37± 0.34
619.6±0.4	93 ± 8		3.7 ± 0.3
662.0±0.5	55 ± 7		2.14± 0.27
753.9±0.6	785 ± 50		28.6 ± 1.8
815.4±0.6	215 ± 25		7.5 ± 0.9
859.2±0.4	28 ± 5		0.96± 0.17
875.6±0.4	69 ± 9		2.3 ± 0.3
981.4±0.4	23 ± 5		0.73± 0.16
1066.7±0.5	330 ± 40		10 ± 2
1129.4±0.5	42 ± 7		1.25± 0.21
1204.0±0.6	19 ± 7		0.55± 0.20
1282.3±0.7	38 ± 12		1.06± 0.34
1334.7±0.7	97 ± 15		2.7 ± 0.4
1455.6±0.8	94 ± 15		2.5 ± 0.4
1511.9±0.8	230 ± 30		7.5 ± 0.8
1702.8±0.5	11 ± 7		0.27± 0.17
1733.9±0.5	230 ± 30		5.5 ± 0.7
1786.8±0.5	310 ± 50		7.3 ± 1.2
1826.6±1.0	4600 ± 700		108 ± 16
1892.7±0.6	980 ± 160		23 ± 4
1914.8±0.6	1100 ± 170		25 ± 4
1977.4±0.6	20 ± 14		0.45± 0.31
2001.6±0.7	32 ± 23		0.72± 0.51
2120.3±0.7	500 ± 80		10.8 ± 1.7
2162.1±0.7	96 ± 24		2.1 ± 0.5
2278.7±0.8	37 ± 12		0.78± 0.25
2401.4±0.8	4800 ± 700		98 ± 14
2433.4±1.7	62 ± 40		1.26± 0.81
2520.9±0.9	360 ± 60		7.2 ± 1.2
2549.1±0.9	150 ± 40		3.0 ± 0.8
2574.8±0.9	2100 ± 300		41.0 ± 6.0

¹⁷²
76 Yb

E_β (keV)	P_β (keV)	P_γ (keV)	P_γ^2 (keV)
2726.7±1.0	1800 ±300		31.0 ± 6.0
2817.8±1.0	250 ± 50		4.7 ± 0.9
2901.7±1.1	450 ± 70		8.4 ± 1.3
2913.5±1.1	950 ±140		17.6 ± 2.6
2953.1±1.1	720 ±100		13.2 ± 1.8
3027.8±1.2	710 ± 90		12.9 ± 1.6
3100.6±1.2	195 ± 60		3.5 ± 1.1
3203.2±1.3	610 ± 80		10.8 ± 1.4
3238.1±1.3	1300 ±150		23.0 ± 3.0
3334.8±1.3	300 ± 80		5.2 ± 1.4
3385.5±1.4	37 ± 24		0.64 ± 0.41
3520.2±1.4	540 ±100		9.1 ± 1.7
3556.2±1.5	1130 ±200		19.0 ± 3.0
3695.1±1.5	1650 ±200		27.0 ± 3.0
3734.6±1.6	260 ± 50		4.3 ± 0.8
3813.1±1.6	760 ± 90		12.3 ± 1.5
3878.4±1.7	350 ± 60		6.3 ± 1.3
3900.0±1.7	220 ± 80		3.5 ± 1.3
4027.9±1.8	170 ± 60		2.7 ± 0.9
4205.4±1.9	410 ± 90		6.3 ± 1.4
4362.8±2.0	950 ±130		14.0 ± 2.0
4386.5±2.0	960 ±130		14.0 ± 2.0
4483.6±2.1	750 ±110		11.2 ± 1.6
4566.9±2.1	240 ± 60		3.6 ± 0.9
4645.3±2.2	590 ±140		8.6 ± 2.1
4837.1±2.3	290 ± 60		4.2 ± 0.9
4877.6±2.3	6000 ±900		86.0 ±13.0
5001.1±2.5	1400 ±250		20.0 ± 4.0
5273.5±2.6	3200 ±500		44.0 ± 7.0
5371.8±2.7	530 ±110		7.2 ± 1.5
5565.6±2.9	1850 ±280		25.0 ± 4.0
5631.5±2.9	370 ±120		4.9 ± 1.6
5654.7±2.9	4300 ±700		57.0 ± 9.0
5775.9±3.0	490 ±130		6.4 ± 1.7
5830.4±3.0	530 ±130		6.9 ± 1.7
5904.2±3.1	1800 ±320		23.0 ± 4.0
5949.5±3.2	730 ±200		9.5 ± 2.6
6534.3±3.6	590 ±120		7.3 ± 1.5
6588.8±3.7	2800 ±500		34.0 ± 6.0
6610.8±3.7	820 ±160		10.0 ± 2.0
6791.5±3.8	770 ±160		9.3 ± 1.9
6876.6±3.9	990 ±150		11.9 ± 1.8
7086.2±4.1	1100 ±200		13.0 ± 2.0
7154.0±4.2	3600 ±400		43.0 ± 5.0
7267.1±4.3	4400 ±700		52.0 ± 8.0
7435.3±4.4	2300 ±300		27.0 ± 3.0
7515.0±4.5	2400 ±300		28.0 ± 3.0
7666.6±4.6	4200 ±600		48.0 ± 7.0
7799.2±4.7	1750 ±500		2.0 ± 6.0
8060.1±5.0	750 ±220		8.4 ± 2.5
8221.0±5.1	1550 ±280		17.0 ± 3.0
8298.0±5.2	3000 ±500		33.0 ± 5.0

¹⁷²
₇₀Yb

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
8601.0±5.5	1050 ±300		11.0 ± 3.0
8705.6±5.6	3200 ±600		34.0 ± 6.0
9132.1±6.0	2300 ±400		24.0 ± 4.0
9223.1±6.1	5700 ±800		59.0 ± 8.0
9476.7±6.4	800 ±400		8.2 ± 4.1
9656.0±6.5	4400 ±800		45.0 ± 8.0
9767.4±6.6	3400 ±700		34.0 ± 7.0
9807.2±6.6	1250 ±500		13.0 ± 5.0
9927.9±6.8	3100 ±700		31.0 ± 7.0
10017 ±7	3000 ±700		30.0 ± 7.0
10102 ±7	1600 ±500		16.0 ± 5.0

¹⁷³
₇₀Yb

THERMAL CROSS SECTIONS

$$\sigma_T = 19 \pm 2 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 390 \pm 40 \text{ b}$$

$$R_T = 7.4 \pm 0.6 \text{ fm}$$

$$\langle Q \rangle = 7.8 \pm 0.9 \text{ eV}$$

$$S_0 = 1.7 \pm 0.2$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$IAbn = 16.2$$

$$S_n = 7455.0 \pm 0.8 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
Bound level				
4.51±0.02	0.21± 0.02	3	80 ± 1	0.099±0.010
17.63±0.05	31 ± 2	2	82 ± 9	7.4 ±0.5
31.39±0.08	74.0 ± 4.0	2	70 ± 8	13.2 ±0.7
35.72±0.05	48 ± 4	3	80 ± 9	8.0 ±0.7
45.16±0.07	30 ± 2	2	73 ±10	4.5 ±0.3
53.47±0.09	8.2 ± 0.6	3	78 ±12	1.12 ±0.08
58.88±0.05	8.0 ± 0.6	3	74 ±10	1.04 ±0.08
66.18±0.06	9.0 ± 0.6	3	72 ±12	1.11 ±0.07
68.91±0.06	7.3 ± 0.6	2		0.89 ±0.07
74.49±0.07	7.0 ± 0.8	3		0.82 ±0.10
76.14±0.07	36 ± 2	2	68 ± 8	4.2 ±0.2
96.4 ±0.1	11.8 ± 1.0	3	75 ±15	1.2 ±0.1
105.8 ±0.1	60 ± 4	2		5.8 ±0.4
111.1 ±0.1	12.4 ± 1.0	2	70 ±12	1.18 ±0.10
124.3 ±0.2	20.0 ± 1.2		63 ±12	1.8 ±0.1
128.8 ±0.2	71 ± 4		74 ± 9	6.2 ±0.4
134.8 ±0.2	8.5 ± 0.6		62 ±14	0.73 ±0.05
145.3 ±0.2	19.4 ± 1.6		64 ±15	1.60 ±0.14
154.2 ±0.2	1.9 ± 0.2			0.15 ±0.02

¹⁷³Yb
70

E ₀ (eV)	2g _n ⁺ (meV)	J	γ _y (meV)	2g _n ⁺ (meV)
155.7 ±0.2	3.4 ± 0.4		77 ±10	0.27 ±0.03
166.8 ±0.2	54 ± 4		77 ±18	4.16 ±0.31
197.3 ±0.2	30 ± 3			2.1 ±0.2
205.0 ±0.2	7.6 ± 0.8			0.53 ±0.06
210.2 ±0.2	16.3 ± 1.4			1.26 ±0.11
221.7 ±0.2	8.2 ± 0.8			0.56 ±0.06
226.4 ±0.2	7.4 ± 0.8			0.50 ±0.06
229.6 ±0.2	29 ± 2		58 ±14	1.92 ±0.14
250.6 ±0.2	80 ± 6		70 ±10	5.0 ±0.4
256.6 ±0.2	29 ± 3		85 ±15	1.82 ±0.18
277.4 ±0.3	25.0 ± 2.6		72 ±14	1.5 ±0.2
283.5 ±0.3	80 ± 8		62 ±12	4.8 ±0.4
286.4 ±0.3	17.4 ± 2.2			1.02 ±0.14
303.9 ±0.4	1.2 ± 0.8			0.07 ±0.05
307.1 ±0.3	200 ± 14		95 ±12	11.4 ±0.8
318.3 ±0.3	43 ± 4		83 ±15	2.4 ±0.2
324.0 ±0.3	12.2 ± 1.6			0.68 ±0.08
340.2 ±0.3	42 ± 6		76 ±10	2.3 ±0.3
351.1 ±0.4	21.2 ± 2.4		74 ±10	1.14 ±0.12
361.5 ±0.4	102 ± 10			5.4 ±0.6
371.2 ±0.4	40 ± 4		69 ±17	2.08 ±0.21
392.5 ±0.4	4.8 ± 1.0			0.24 ±0.05
405.1 ±0.5	3.8 ± 1.2			0.19 ±0.06
420.1 ±0.2	112 ± 14			5.4 ±0.6
429.7 ±0.3	23.0 ± 3.4			1.1 ±0.2
438.9 ±0.3	180 ± 22		66 ±14	8.6 ±1.0
447.6 ±0.3	104 ± 12		58 ±15	5.0 ±0.6
460.3 ±0.3	15.8 ± 2.6			0.74 ±0.12
488.2 ±0.3	200 ± 28		89 ±15	8.6 ±1.0
497.2 ±0.3	6.0 ± 2.0			0.27 ±0.09
514.4 ±0.3	80 ± 10		100 ±22	3.9 ±0.4
528.4 ±0.3	46 ± 8			2.0 ±0.3
547.6 ±0.4	188 ± 18		78 ±15	8.0 ±0.8
550.1 ±0.4	104 ± 12			4.4 ±0.6
557.2 ±0.4	8.2 ± 2.0			0.34 ±0.08
565.6 ±0.9	3.0 ± 1.4			0.13 ±0.06
574.9 ±0.4	12.2 ± 3.0			0.50 ±0.12
588.8 ±1.0	10.0 ± 6.0			0.42 ±0.24
593.9 ±1.0	13.8 ± 5.2			0.56 ±0.22
605.5 ±0.4	170 ± 20			7.0 ±0.8
618.8 ±0.4	186 ± 26			7.4 ±1.0
621.3 ±0.4	12 ± 6			0.48 ±0.24
648.5 ±0.5	114 ± 16			4.4 ±0.6
653.9 ±0.5	18.4 ± 4.0			0.72 ±0.16
659.4 ±0.5	38 ± 6			1.48 ±0.24
682.7 ±0.5	8 ± 4			0.31 ±0.15
690.1 ±0.5	74 ± 10			2.8 ±0.4
701.7 ±0.5	96 ± 12			3.6 ±0.5
705.3 ±0.5	50 ± 8			1.9 ±0.3
710.9 ±1.3	2.0 ± 1.2			0.076±0.046
721.7 ±0.5	11 ± 4			0.40 ±0.14
728.9 ±0.5	250 ± 30			9.2 ±1.2

**^{173}Yb
70**

E_0 (eV)	$2g_{f_n}$ (meV)	J	Γ_γ (meV)	$2g_{f_n}^2$ (meV)
766.4 $\pm$ 0.6	140 $\pm$ 16			5.0 $\pm$ 0.6
771.4 $\pm$ 0.6	24 $\pm$ 6			0.86 $\pm$ 0.22
774.0 $\pm$ 0.6	74 $\pm$ 12			2.7 $\pm$ 0.4
782.3 $\pm$ 0.6	92 $\pm$ 12			3.3 $\pm$ 0.4
789.6 $\pm$ 1.6	10 $\pm$ 4			0.36 $\pm$ 0.14
796.3 $\pm$ 0.6	29.6 $\pm$ 5.0			1.0 $\pm$ 0.2
811.9 $\pm$ 0.6	9.8 $\pm$ 4.0			0.34 $\pm$ 0.14
815.1 $\pm$ 0.6	28 $\pm$ 8			0.98 $\pm$ 0.28
846.6 $\pm$ 0.3	126 $\pm$ 14			4.4 $\pm$ 0.6
851.0 $\pm$ 0.3	220 $\pm$ 30			7.6 $\pm$ 1.0
864.9 $\pm$ 0.4	246 $\pm$ 26			8.4 $\pm$ 0.8
883.1 $\pm$ 0.4	14.8 $\pm$ 3.6			0.50 $\pm$ 0.12
891.4 $\pm$ 0.4	33 $\pm$ 5			1.1 $\pm$ 0.2
895.8 $\pm$ 0.4	88 $\pm$ 14			2.9 $\pm$ 0.5
925.8 $\pm$ 0.4	480 $\pm$ 80			15.8 $\pm$ 2.6
932.0 $\pm$ 0.4	17.4 $\pm$ 5.0			0.56 $\pm$ 0.16
937.1 $\pm$ 0.4	76 $\pm$ 12			2.5 $\pm$ 0.4
941.3 $\pm$ 0.4	114 $\pm$ 18			3.7 $\pm$ 0.6
958.5 $\pm$ 0.4	146 $\pm$ 16			4.8 $\pm$ 0.6
968.5 $\pm$ 0.4	134 $\pm$ 16			4.4 $\pm$ 0.6
973.9 $\pm$ 0.4	62 $\pm$ 10			1.98 $\pm$ 0.32
985.8 $\pm$ 0.4	15.4 $\pm$ 6.0			0.50 $\pm$ 0.20
993.3 $\pm$ 0.4	110 $\pm$ 32			3.5 $\pm$ 1.0
998.0 $\pm$ 0.4	440 $\pm$ 80			14.0 $\pm$ 2.6
1008.8 $\pm$ 0.4	280 $\pm$ 44			8.8 $\pm$ 1.4
1017.5 $\pm$ 0.5	136 $\pm$ 24			4.2 $\pm$ 0.8
1022.4 $\pm$ 0.5	90 $\pm$ 18			2.82 $\pm$ 0.57
1027.4 $\pm$ 0.5	15.0 $\pm$ 6.0			0.48 $\pm$ 0.18
1044.2 $\pm$ 0.5	42 $\pm$ 10			1.3 $\pm$ 0.3
1061.0 $\pm$ 0.5	17.6 $\pm$ 4.4			0.54 $\pm$ 0.14
1069.1 $\pm$ 0.5	260 $\pm$ 40			8.0 $\pm$ 1.2
1086.5 $\pm$ 0.5	54 $\pm$ 10			1.64 $\pm$ 0.30
1107.4 $\pm$ 0.5	94 $\pm$ 14			2.8 $\pm$ 0.4
1118.1 $\pm$ 0.5	98 $\pm$ 14			2.94 $\pm$ 0.42
1137.0 $\pm$ 0.5	54 $\pm$ 14			1.6 $\pm$ 0.4
1140.9 $\pm$ 0.5	172 $\pm$ 28			5.0 $\pm$ 0.6
1153.1 $\pm$ 0.5	19.4 $\pm$ 10.0			0.58 $\pm$ 0.30
1162.3 $\pm$ 0.6	160 $\pm$ 26			4.6 $\pm$ 0.8
1169.6 $\pm$ 0.6	236 $\pm$ 36			7.0 $\pm$ 1.0
1185.3 $\pm$ 0.6	440 $\pm$ 60			12.8 $\pm$ 1.8
1195.5 $\pm$ 0.6	310 $\pm$ 60			9.0 $\pm$ 1.8
1199.4 $\pm$ 0.6	248 $\pm$ 54			7.2 $\pm$ 1.6
1205.1 $\pm$ 0.6	216 $\pm$ 54			6.2 $\pm$ 1.6
1209.7 $\pm$ 0.6	120 $\pm$ 70			3.4 $\pm$ 2.0
1217.2 $\pm$ 0.6	40 $\pm$ 20			1.14 $\pm$ 0.58
1235.4 $\pm$ 0.6	230 $\pm$ 46			6.6 $\pm$ 1.4
1241.1 $\pm$ 0.6	204 $\pm$ 40			5.8 $\pm$ 1.2
1258.6 $\pm$ 0.6	60 $\pm$ 24			1.7 $\pm$ 0.7
1263.5 $\pm$ 0.6	300 $\pm$ 60			8.4 $\pm$ 1.6
1274.9 $\pm$ 0.6	44 $\pm$ 22			1.2 $\pm$ 0.6
1309.7 $\pm$ 0.6	62 $\pm$ 20			1.72 $\pm$ 0.6
1313.6 $\pm$ 0.7	17.2 $\pm$ 9.0			0.48 $\pm$ 0.24

¹⁷³₇₀Yb

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n$ (meV)
1354.2 ±0.7	166 ± 26			4.6 ±0.8
1368.2 ±0.7	270 ± 44			7.2 ±1.2
1374.9 ±0.7	125 ± 30			3.4 ±0.6
1381.2 ±0.7	180 ± 36			4.8 ±1.0
1406.1 ±0.7	70 ± 16			1.86 ±0.42
1422.8 ±0.7	34 ± 18			0.9 ±0.48
1436.9 ±0.8	140 ± 42			3.7 ±1.1
1440.6 ±0.8	38 ± 20			1.0 ±0.5
1443.6 ±0.8	56 ± 30			1.5 ±0.8
1448.1 ±0.8	58 ± 30			1.5 ±0.8
1454.1 ±0.8	254 ± 50			6.6 ±1.4
1464.8 ±0.8	34 ± 20			0.88 ±0.52
1471.7 ±0.8	232 ± 48			6.0 ±1.2
1480.3 ±0.8	234 ± 48			6.0 ±1.2
1498.3 ±0.8	420 ± 80			10.8 ±2.0
1518.3 ±0.8	460 ± 80			11.8 ±2.0
1537.9 ±0.8	48 ± 24			1.2 ±0.6
1549.6 ±0.9	64 ± 32			1.6 ±0.8
1566.4 ±0.9	260 ± 60			6.6 ±1.6
1569.8 ±0.9	280 ± 60			7.0 ±1.6
1582.6 ±0.9	76 ± 24			1.9 ±0.6
1593.8 ±0.9	100 ± 32			2.5 ±0.8
1617.6 ±0.9	740 ±120			18.4 ±3.0
1631.0 ±0.9	102 ± 32			2.5 ±0.8
1641.0 ±0.9	52 ± 26			1.3 ±0.6
1679.6 ±0.5	72 ± 28			1.8 ±0.7
1684.3 ±0.5	88 ± 30			2.1 ±0.7
1698.5 ±0.5	38 ± 14			0.92 ±0.34
1704.7 ±0.5	190 ± 40			4.6 ±1.0
1711.5 ±0.5	26 ± 14			0.62 ±0.34
1720.7 ±0.5	64 ± 22			1.5 ±0.5
1730.9 ±0.5	420 ± 80			10 ±2
1739.8 ±0.5	194 ± 60			4.6 ±1.4
1748.8 ±0.5	38 ± 18			0.90 ±0.44
1755.8 ±0.5	20 ± 12			0.48 ±0.28
1760.8 ±0.5	36 ± 18			0.86 ±0.42
1775.8 ±0.5	244 ± 48			5.8 ±1.2
1782.7 ±0.5	326 ± 65			7.8 ±1.6
1789.9 ±0.5	86 ± 32			2.0 ±0.8
1796.8 ±0.5	84 ± 22			2.0 ±0.5

¹⁷⁴
70 Yb

THERMAL CROSS SECTIONS

$\sigma_T = 65 \pm 5$ b
 $\sigma_T = 46 \pm 4$ b (67 ms ¹⁷⁵Yb*)
 $\sigma_T = 19 \pm 6$ b (4.2 day ¹⁷⁵Yb*)
 $\sigma_n < 0.02$ mb

RESONANCE PROPERTIES

$I_T = 33 \pm 4$ b
 $R^2 = 7.5 \pm 0.5$ fm
 $\langle D \rangle = 162 \pm 18$ eV
 $S_0 = 1.6 \pm 0.2$

RESONANCE PARAMETERS

$I^{\pi} = 0^{+}$			
$\Sigma \Gamma_n = 31.8$			
$S_n = 5822.6 \pm 0.5$ keV			
E_0 (eV)	Γ_n (meV)	Γ_T (meV)	Γ_n^0 (meV)
-25.0		65	160
342.7 ± 0.4	480 ± 20	90 ± 20	25.9 ± 1.1
585.4 ± 0.4	122 ± 12	76 ± 20	5.0 ± 0.5
850.2 ± 0.4	480 ± 90		16.2 ± 3.0
1002.7 ± 0.4	250 ± 25		7.9 ± 0.8
1179.8 ± 0.6	42 ± 7		1.22 ± 0.20
1301.3 ± 0.7	5 ± 80		26 ± 2
1634.6 ± 0.9	13 ± 8		0.32 ± 0.20
1668.6 ± 1.0	7600 ± 1000		186 ± 24
1738.8 ± 0.5	800 ± 140		19.2 ± 3.4
1959.6 ± 0.6	2400 ± 200		54 ± 5
2073.1 ± 0.7	66 ± 12		1.45 ± 0.26
2259.9 ± 0.8	1100 ± 140		23 ± 3
2477.0 ± 0.9	770 ± 100		15.5 ± 2.0
2571.2 ± 0.9	54 ± 9		1.06 ± 0.18
2620.4 ± 0.9	3400 ± 400		66 ± 8
2682.3 ± 1.0	40 ± 8		0.77 ± 0.15
3058.1 ± 1.2	720 ± 100		13 ± 2
3080.1 ± 1.2	880 ± 130		15.9 ± 2.3
3287.7 ± 1.3	4000 ± 500		70 ± 9
3540.3 ± 1.5	1350 ± 150		23 ± 3
3840.7 ± 1.6	670 ± 110		11 ± 2
4036.9 ± 1.8	910 ± 110		14.3 ± 1.7
4146.3 ± 1.9	600 ± 100		9.3 ± 1.6
4482.6 ± 2.1	2200 ± 300		33 ± 4
4868.3 ± 2.3	4100 ± 500		59 ± 7
5149.6 ± 2.5	220 ± 50		3.1 ± 0.7
5218.9 ± 2.6	5900 ± 900		82 ± 12
5369.1 ± 2.7	320 ± 70		4.4 ± 1.0
5653.2 ± 2.9	8000 ± 1000		106 ± 13
5752.0 ± 3.0	1100 ± 200		14.5 ± 2.6
5954.2 ± 3.2	1400 ± 200		18.1 ± 2.6
6333.0 ± 3.5	330 ± 70		4.1 ± 0.9
6503.6 ± 3.6	190 ± 70		2.4 ± 0.9
6718.8 ± 3.8	1340 ± 220		16.3 ± 2.7

$^{174}_{70}\text{Yb}$

E_0 (eV)	Γ_n (meV)	Γ_f (meV)	Γ_n^0 (meV)
7080.0 ± 4.1	2900 ± 400		34 ± 5
7519.4 ± 4.5	1060 ± 250		12.2 ± 2.9
7726.6 ± 4.7	8800 ± 1000		100 ± 11
7851.3 ± 4.8	500 ± 130		5.6 ± 1.5
8104.9 ± 5.0	830 ± 200		9.2 ± 2.2
8689.0 ± 5.6	5200 ± 800		56 ± 9
8840.6 ± 5.7	9200 ± 1200		98 ± 13
9389.0 ± 6.2	1170 ± 250		12.1 ± 2.6
9754.2 ± 6.6	5300 ± 700		54 ± 7
10017 ± 7	2300 ± 400		23 ± 4
10148 ± 7	950 ± 300		9.4 ± 3.0
10304 ± 7	11000 ± 1500		105 ± 15
10405 ± 7	1100 ± 300		10.8 ± 2.9
10566 ± 8	4300 ± 700		42 ± 7
10694 ± 8	4800 ± 800		46 ± 8
10878 ± 8	2600 ± 600		25 ± 6
11003 ± 8	7900 ± 1600		75 ± 15
11083 ± 8	3300 ± 800		31 ± 8
12025 ± 9	1400 ± 450		12.8 ± 4.1
12528 ± 10	2500 ± 700		22 ± 6
12722 ± 10	11000 ± 2000		98 ± 18
13196 ± 11	8000 ± 1600		70 ± 14
13450 ± 11	13800 ± 2000		119 ± 17
14406 ± 12	14300 ± 2000		119 ± 17
14525 ± 12	3600 ± 800		30 ± 7
14953 ± 13	4900 ± 1000		40 ± 8
15143 ± 13	1500 ± 300		12.2 ± 2.4
15258 ± 13	4100 ± 900		33 ± 7
15707 ± 14	18000 ± 3000		144 ± 24
15829 ± 14	9300 ± 1800		74 ± 14
16147 ± 14	9100 ± 1800		72 ± 14
16431 ± 15	10500 ± 2000		82 ± 16
17223 ± 16	3700 ± 1500		28 ± 11
17568 ± 16	5700 ± 1000		43 ± 8
17810 ± 17	9200 ± 2000		69 ± 15
18090 ± 17	4800 ± 1400		36 ± 10
18207 ± 17	4400 ± 1400		33 ± 10
18291 ± 17	13000 ± 2500		96 ± 18
18600 ± 18	5500 ± 2000		40 ± 15
18916 ± 18	9300 ± 2500		68 ± 18
19801 ± 19	4700 ± 1000		33 ± 7

¹⁷⁶
70 Yb

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2.4 \pm 0.2 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} I_{\gamma} &= 6 \pm 2 \text{ b} \\ R^{\gamma} &= 7.0 \pm 0.6 \text{ fm} \\ \langle D \rangle &= 185 \pm 20 \text{ eV} \\ S_0 &= 2.1 \pm 0.3 \end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{Abn} = 12.7$$

$$S_n = 5566.8 \pm 1.0 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
97.9 ± 0.1	0.54 ± 0.06	0.055 ± 0.006
148.5 ± 0.2	8.0 ± 0.8	0.66 ± 0.07
397.9 ± 0.4	200 ± 20	10 ± 1
488.3 ± 0.6	2500 ± 100	113 ± 5
726.0 ± 1.1	3600 ± 400	134 ± 15
949.9 ± 0.8	10 ± 7	0.32 ± 0.23
992.8 ± 0.9	7.4 ± 5.0	0.23 ± 0.16
1182.0 ± 0.6	15 ± 11	0.44 ± 0.32
1392.5 ± 0.7	1700 ± 200	45.6 ± 5.4
1571.5 ± 1.7	5400 ± 600	136 ± 15
1606.8 ± 0.9	470 ± 40	12 ± 1
1915.9 ± 1.2	29 ± 18	0.66 ± 0.41
2009.3 ± 0.6	1200 ± 150	26.0 ± 3.4
2180.1 ± 0.7	2700 ± 300	57.8 ± 6.4
2487.1 ± 0.9	310 ± 50	6.2 ± 1.0
2508.8 ± 0.9	43 ± 30	0.86 ± 0.6
2722.4 ± 1.0	450 ± 70	8.6 ± 1.3
2929.1 ± 1.1	9000 ± 1000	166 ± 18
3234.3 ± 1.3	1760 ± 190	31 ± 3
3360.7 ± 2.7	48 ± 32	0.83 ± 0.55
3660.0 ± 1.5	1200 ± 140	20 ± 2
3781.1 ± 1.6	115 ± 20	1.87 ± 0.33
3792.3 ± 1.6	460 ± 60	7.5 ± 1.0
4300.3 ± 2.0	2000 ± 220	30 ± 3
4351.0 ± 2.0	1200 ± 150	18.2 ± 2.3
4620.2 ± 2.2	740 ± 100	10.9 ± 1.5
5037.7 ± 2.5	2700 ± 300	38 ± 4
5382.6 ± 2.7	6900 ± 800	94 ± 11
5481.3 ± 2.8	640 ± 130	8.6 ± 1.8
5716.3 ± 3.0	24000 ± 3000	320 ± 40
6001.7 ± 3.2	3100 ± 400	40 ± 5
6315.8 ± 3.5	6000 ± 800	75 ± 10
6480.4 ± 3.6	620 ± 100	7.7 ± 1.2
6722.6 ± 3.8	4300 ± 500	52 ± 6
6955.3 ± 4.0	6700 ± 800	80 ± 10
7331.1 ± 4.3	2900 ± 400	34 ± 5
7555.2 ± 4.5	920 ± 180	10.6 ± 2.1
7801.5 ± 4.7	1450 ± 300	16.4 ± 3.4

¹⁷⁶
70 Yb

E ₀ (eV)	Γ _n (meV)	Γ _n ⁰ (meV)
8200.6± 5.1	2400 ± 300	27 ± 3
8595.5± 5.5	8500 ±1000	92 ±11
8739.1± 5.6	3400 ± 400	36 ± 4
8984.6± 5.9	9000 ±1000	95 ±11
9217.0± 6.1	5800 ± 800	60 ± 8
9495.7± 6.4	27000 ±3000	280 ±30
9721.3± 6.6	7800 ±1000	79 ±10
9853.9± 6.7	8900 ±1200	90 ±12
10515 ± 7	1700 ± 500	16.6 ± 4.9
11629 ± 9	1600 ± 500	14.8 ± 4.6
11733 ± 9	9000 ±1400	83 ±13
12043 ± 9	1500 ± 800	13.7 ± 7.3
12089 ± 9	1100 ± 600	10.0 ± 5.5
12432 ±10	12000 ±1700	108 ±15
12761 ±10	19000 ±3000	168 ±27
13408 ±11	23000 ±4000	199 ±35
13601 ±11	18500 ±3000	159 ±26
13732 ±11	21000 ±3000	179 ±26
14051 ±12	8900 ±1400	75 ±12
14242 ±12	6200 ±1200	52 ±10
15067 ±13	4100 ±1000	33 ± 8
15169 ±13	12500 ±2000	101 ±16
16077 ±14	3800 ±1200	30 ± 9
17713 ±16	13500 ±2600	101 ±20
17794 ±16	13000 ±3000	97 ±22
18156 ±17	11500 ±2000	85 ±15
18783 ±18	3700 ±1200	27 ± 9
18988 ±18	8900 ±2200	65 ±16
19499 ±19	24000 ±4000	172 ±29
19649 ±19	21000 ±3500	150 ±25

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Yb ^{168,174,176}	activation	PRIVATE COMM.(72)	Alstad
Yb ¹⁷⁰⁻¹⁷³	mass spectrometry	JMS,6,435(71)	Dobrozemsky
Yb ¹⁶⁸	activation, ratio	70HELSINKI,2,589(70)	Ricabarra
Yb ^{168,174}	activation	JIN,32,2839(70)	Sims
Yb	σ_c	70HELSINKI,1,651(70)	Vertebnyi
Yb ¹⁷⁰⁻¹⁷⁴		PRIVATE COMM.(69)	Walker
Yb ^{170-174,176}	σ_c	PR,174,1400(68)	Mughabghab
Yb ¹⁶⁸	activation	PR,170,1108(68)	Shera
Yb ¹⁶⁸	activation	KE,10,25(67)	Albert
Yb	σ_c	NP/A,95,683(67)	Zimmerman
Yb ^{168,170-172,174}	σ_a	YF,1,252(65)	Andreev
Yb ¹⁷⁴	activation	ADP,12,225(63)	Alexander
Yb	diffraction	JCP,35,1950(61)	Atoji
Yb	σ_c diffraction	PR,121,610(61)	Atoji
Yb ¹⁶⁸	activation	BAP,6,506(61)+	Hudson
Yb	local osci.	PR,83,641(51)	Pomerance
Yb ^{168,174,176}		AMA,32A,2(46)	Atterling
Yb ^{168,174,176}	activation	ZN,1,179(46)	Bothe

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Yb ¹⁶⁸	$\sigma_e \sigma_\gamma$ (SI)	22-189	PR/C, 7, 823(73)+	Liou
Yb ¹⁷⁰	$\sigma_e \sigma_\gamma$ (SI)	8.1-1328	PR/C, 7, 823(73)+	Liou
Yb ¹⁷¹	$\sigma_e \sigma_\gamma$ (SI)	7.9-1685	PR/C, 7, 823(73)+	Liou
Yb ¹⁷²	$\sigma_e \sigma_\gamma$ (SI)	139-10102	PR/C, 7, 823(73)+	Liou
Yb ¹⁷³	$\sigma_e \sigma_\gamma$ (SI)	4.5-1797	PR/C, 7, 823(73)+	Liou
Yb ¹⁷⁴	$\sigma_e \sigma_\gamma$ (SI)	342-19801	PR/C, 7, 823(73)+	Liou
Yb ¹⁷⁶	$\sigma_e \sigma_\gamma$ (SI)	97-15649	PR/C, 7, 823(73)+	Liou
Yb ¹⁷³	σ_γ (spectra)	4.5-106	72BUD, 214(72)	Mughabghab
Yb ¹⁷¹	σ_γ (spectra)	7.9-127	BAP, 16, 496(71)	Cole
Yb ¹⁷³	σ_γ (spectra)	4.5-106	71KNOX, 2, 804(71)	Mughabghab
Yb ¹⁶⁸	$\sigma_e \sigma_\gamma$ (SI)	22-170	NYO-72-190(70)	Liou
Yb ¹⁷⁰	$\sigma_e \sigma_\gamma$ (SI)	40-358	NYO-72-190(70)	Liou
Yb ¹⁷¹	$\sigma_e \sigma_\gamma$ (SI)	7.9-354	NYO-72-190(70)	Liou
Yb ¹⁷²	$\sigma_e \sigma_\gamma$ (SI)	139-2724	NYO-72-190(70)	Liou
Yb ¹⁷³	$\sigma_e \sigma_\gamma$ (SI)	17-371	NYO-72-190(70)	Liou
Yb ¹⁷⁴	$\sigma_e \sigma_\gamma$ (SI)	342-3290	NYO-72-190(70)	Liou
Yb ¹⁷⁶	$\sigma_e \sigma_\gamma$ (SI)	98-3237	NYO-72-190(70)	Liou
Yb ¹⁶⁸	σ_e	22.6	PR, 174, 1400(68)	Mughabghab
Yb ¹⁷⁰	σ_e	8.1-449	PR, 174, 1400(68)	Mughabghab
Yb ¹⁷¹	σ_e	7.9-225	PR, 174, 1400(68)	Mughabghab
Yb ¹⁷²	σ_e	139-818	PR, 174, 1400(68)	Mughabghab
Yb ¹⁷³	σ_e	4.5-210	PR, 174, 1400(68)	Mughabghab
Yb ¹⁷⁴	σ_e	345-885	PR, 174, 1400(68)	Mughabghab
Yb ¹⁷⁶	σ_e	149-2188	PR, 174, 1400(68)	Mughabghab
Yb ¹⁷¹	$\sigma_e \sigma_\gamma$	7.9-147	YF, 3, 48(66)	Wang
Yb ¹⁷²	$\sigma_e \sigma_\gamma$	141	YF, 3, 48(66)	Wang
Yb ¹⁷³	$\sigma_e \sigma_\gamma$	4.5-130	YF, 3, 48(66)	Wang
Yb ¹⁷¹	σ_γ	13.5-134	ANL-6589(62)+	Carpenter
Yb ¹⁷³	σ_γ	8.1-205	ANL-6589(62)+	Carpenter
Yb ¹⁶⁸	σ_e	0.597	PR, 100, 1414(55)	Landon
Yb ¹⁶⁸	σ_e	0.597	PR, 96, 1014(54)	Sailor

⁷¹Lu

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 77 \pm 3 \text{ b} \\ \sigma_s &= 8 \pm 2 \text{ b} \\ \sigma_c &= 84.7 \pm 0.5 \text{ b} \\ a_{coh} &= 7.3 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 900 \pm 50 \text{ b} \\ S_0 &= 1.9 \pm 0.7\end{aligned}$$

¹⁷⁵Lu

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 23.4 \pm 2.0 \text{ b} \\ \sigma_T &= 16.4 \pm 0.9 \text{ b [} ^{176}\text{Lu}^n \text{]} \\ \sigma_T &= 7 \pm 1 \text{ b [} ^{176}\text{Lu}^g \text{]} \\ \sigma_a &< 0.06 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 890 \pm 50 \text{ b} \\ S_0 &= 1.9 \pm 0.7\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 7/2^+$$

$$\% \text{Abn} = 97.4$$

$$S_n = 6293.2 \pm 1.2 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
2.583 ± 0.006	0.209 ± 0.003	4	69.9 ± 1.2	0.130 ± 0.002
4.75 ± 0.03	0.34 ± 0.05	4		0.16 ± 0.01
5.25 ± 0.02	1.5 ± 0.3	3		0.66 ± 0.13
11.20 ± 0.04	3.1 ± 0.3	3	40 ± 20	0.92 ± 0.09
13.83 ± 0.06	20 ± 2	3		5.3 ± 0.5
15.35 ± 0.07	1.8 ± 0.4	4		0.46 ± 0.10
20.50 ± 0.10	2.3 ± 0.3	3	160 ± 50	0.50 ± 0.07
23.43 ± 0.15	6.5 ± 1.5	3		1.3 ± 0.3
27.92 ± 0.15	1.6 ± 0.3	4		0.33 ± 0.06
30.08 ± 0.15	12 ± 3			2.2 ± 0.5
31.04 ± 0.15	2.0 ± 0.5			0.36 ± 0.09
36.52 ± 0.15	6.8 ± 0.8	3	90 ± 30	1.12 ± 0.13
40.55 ± 0.15	29 ± 6	3	80 ± 30	4.5 ± 0.9
49.50 ± 0.15	8 ± 2			1.1 ± 0.3
50.27 ± 0.15	6 ± 2			0.8 ± 0.3
57.04 ± 0.15	3.4 ± 0.7			0.45 ± 0.09
61.22 ± 0.10				
69.53 ± 0.10				
69.98 ± 0.10				
73.65 ± 0.15				
81.09 ± 0.15				
85.50 ± 0.15				

¹⁷⁵
₇₁Lu

E_β (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^B$ (meV)
88.52 ±0.20				
99.81 ±0.20				
100.80 ±0.20				
103.05 ±0.25				
107.55 ±0.25				
112.87 ±0.25				
115.00 ±0.25				
118.73 ±0.30				
127.40 ±0.30				
129.63 ±0.30				
137.76 ±0.35				
143.04 ±0.40				
146.28 ±0.40				
148.83 ±0.40				
151.04 ±0.40				
155.62 ±0.45				
158.64 ±0.45				
163.80 ±0.45				
169.15 ±0.25				
171.34 ±0.25				
175.46 ±0.25				
180.67 ±0.25				
185.41 ±0.30				
192.96 ±0.30				
196.38 ±0.30				
202.87 ±0.30				
204.62 ±0.30				
217.02 ±0.35				
223.28 ±0.35				
227.82 ±0.40				
229.25 ±0.40				
235.85 ±0.40				
243.16 ±0.40				
251.24 ±0.45				
255.66 ±0.50				
261.35 ±0.50				
273.82 ±0.50				
277.58 ±0.50				
282.19 ±0.50				
288.80 ±0.55				
291.50 ±0.55				
294.80 ±0.55				
304.75 ±0.60				
307.68 ±0.60				
313.68 ±0.60				
318.29 ±0.60				
322.69 ±0.60				
324.61 ±0.65				
330.12 ±0.65				
335.34 ±0.65				
338.15 ±0.70				
340.89 ±0.70				

¹⁷⁵
71 Lu

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
343.66 ±0.70				
347.89 ±0.70				
355.84 ±0.70				
358.80 ±0.75				
364.45 ±0.75				
367.13 ±0.75				
379.37 ±0.80				
383.04 ±0.80				
385.11 ±0.80				
393.52 ±0.85				
398.26 ±0.85				
405.82 ±0.90				
413.02 ±0.90				
418.71 ±0.50				
422.25 ±0.50				
428.02 ±0.50				
434.14 ±0.50				
438.89 ±0.50				
443.97 ±0.55				
454.66 ±0.55				
467.12 ±0.55				
468.78 ±0.55				
473.54 ±0.55				
477.52 ±0.55				
484.45 ±0.60				
487.68 ±0.60				
494.23 ±0.60				
499.69 ±0.60				
504.62 ±0.60				
511.84 ±0.65				
515.03 ±0.65				
520.19 ±0.65				
528.07 ±0.65				
536.82 ±0.70				
539.90 ±0.70				
548.94 ±0.70				
551.41 ±0.70				
563.67 ±0.75				
566.24 ±0.75				
570.70 ±0.75				
577.86 ±0.75				
587.88 ±0.80				
592.59 ±0.80				
596.56 ±0.80				
601.38 ±0.80				
605.43 ±0.30				
614.51 ±0.85				
621.24 ±0.85				
627.22 ±0.85				
633.28 ±0.85				
638.55 ±0.90				
643.29 ±0.90				

¹⁷⁵
₇₁Lu

E_0 (eV)	$2g^{\Gamma_n}$ (meV)	J	Γ_{γ} (meV)	$2g^{\Gamma_n^0}$ (meV)
654.30 ±0.90				
657.52 ±0.95				
666.85 ±0.95				
671.12 ±0.95				
676.87 ±0.95				
682.20 ±1.0				
686.13 ±1.0				
692.57 ±1.0				
696.58 ±1.0				
699.10 ±1.0				
705.22 ±1.0				
718.21 ±1.0				
723.51 ±1.0				
725.65 ±1.1				
739.77 ±1.1				
750.35 ±1.1				
753.74 ±1.1				
761.16 ±1.1				
767.53 ±1.2				
774.56 ±1.2				
777.52 ±1.2				
783.49 ±1.2				
791.36 ±1.2				
796.26 ±1.2				
803.07 ±1.2				
820.97 ±0.65				
824.84 ±0.65				
829.40 ±0.65				
832.36 ±0.65				
836.65 ±0.65				
839.64 ±0.65				
843.65 ±0.65				
855.86 ±0.70				
862.06 ±0.70				
866.24 ±0.70				
874.67 ±0.70				
878.23 ±0.70				
883.96 ±0.70				
888.65 ±0.70				
893.75 ±0.75				
897.79 ±0.75				
905.20 ±0.75				
909.69 ±0.75				
913.46 ±0.75				
922.22 ±0.80				
928.77 ±0.80				
930.71 ±0.80				
940.11 ±0.80				
943.68 ±0.80				
954.08 ±0.80				
959.75 ±0.80				
965.07 ±0.80				

¹⁷⁵
71Lu

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
968.36 ±0.80				
974.58 ±0.85				
984.23 ±0.85				
989.48 ±0.85				
1004.84 ±0.85				
1008.78 ±0.90				
1012.30 ±0.90				
1022.97 ±0.90				
1027.46 ±0.90				
1034.71 ±0.90				
1042.96 ±0.90				
1048.99 ±0.95				
1050.38 ±0.95				
1055.06 ±0.95				
1058.82 ±0.95				
1063.08 ±0.95				
1066.41 ±0.95				
1079.40 ±0.95				
1084.8 ±1.0				
1091.2 ±1.0				
1103.1 ±1.0				
1109.6 ±1.0				
1113.2 ±1.0				
1122.4 ±1.0				
1131.7 ±1.0				
1138.5 ±1.0				
1143.8 ±1.0				
1147.0 ±1.0				
1152.9 ±1.0				
1165.3 ±1.0				
1175.2 ±1.0				
1180.1 ±1.0				
1186.3 ±1.0				
1201.5 ±1.0				

¹⁷⁶
₇₁Lu

THERMAL CROSS SECTIONS

$\sigma_f = 2100 \pm 50$ b
 $\sigma_f = 7 \pm 2$ b [161 day ¹⁷⁷Lu^{a2}]
 $\sigma_f = 315 \pm 60$ b [0.160 ms ¹⁷⁷Lu^{a1}]
 $\sigma_f = 1778 \pm 75$ b [¹⁷⁷Lu^g]
 $\sigma_a < 2$ mb

RESONANCE PROPERTIES

$I_f = 1160 \pm 70$ b
 $S_0 = 1.7 \pm 0.5$

RESONANCE PARAMETERS

$I^{\pi} = 7^{-}$		%Abn = 2.6		$S_n = 7072.1 \pm 1.0$ keV	
E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_f (meV)	$2g\Gamma_n^0$ (meV)	
0.1413 $\pm$ 0.0003	.0865 $\pm$ 0.0004	13/2	58.7 $\pm$ 0.2	0.230 $\pm$ 0.001	
1.568 $\pm$ 0.004	0.517 $\pm$ 0.005		59.9 $\pm$ 1.1	0.413 $\pm$ 0.004	
4.37 $\pm$ 0.03	0.48 $\pm$ 0.04			0.23 $\pm$ 0.02	
6.16 $\pm$ 0.04	1.54 $\pm$ 0.14			0.62 $\pm$ 0.06	
9.8 $\pm$ 0.1	1.49 $\pm$ 0.13			0.48 $\pm$ 0.04	
10.8 $\pm$ 0.2	1.5 $\pm$ 0.4			0.46 $\pm$ 0.12	
11.5 $\pm$ 0.2	0.6 $\pm$ 0.4			0.18 $\pm$ 0.12	
19.1 $\pm$ 0.3	0.12 $\pm$ 0.05			0.027 $\pm$ 0.011	
19.9 $\pm$ 0.3	0.30 $\pm$ 0.10			0.067 $\pm$ 0.022	
22.0 $\pm$ 0.2	1.7 $\pm$ 0.2			0.36 $\pm$ 0.09	
24.7 $\pm$ 0.3	4.6 $\pm$ 0.4			0.93 $\pm$ 0.08	
27.3 $\pm$ 0.2	11 $\pm$ 3			2.1 $\pm$ 0.6	
29.8 $\pm$ 0.5	12 $\pm$ 3			2.2 $\pm$ 0.6	
32.0 $\pm$ 0.5	7 $\pm$ 2			1.2 $\pm$ 0.4	
33.6 $\pm$ 0.5	3.7 $\pm$ 1.3			0.64 $\pm$ 0.22	
37.0 $\pm$ 0.5	7.9 $\pm$ 1.0			1.30 $\pm$ 0.16	
38.9 $\pm$ 0.6	0.8 $\pm$ 0.5			0.13 $\pm$ 0.08	
42.4 $\pm$ 0.6	16 $\pm$ 3			2.5 $\pm$ 0.5	
45.2 $\pm$ 0.6	3 $\pm$ 2			0.5 $\pm$ 0.3	
46.7 $\pm$ 0.6	5.8 $\pm$ 1.2			0.85 $\pm$ 0.18	

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Lu	σ_t	AKE,16,49(70)	Knorr
Lu	σ_t	70HELSINKI,1,651(70)	Vertebnyi
Lu, Lu ^{175,176}	σ_t	BNL-50276,89(70)	Young
Lu ¹⁷⁵	activation	PRIVATE COMM.(69)	Fabry
Lu ¹⁷⁵	isom. ratio	PRIVATE COMM.(58)	Fabry
Lu ¹⁷⁵	activation	68WASH,2,1263(68)-	Fabry
Lu ¹⁷⁶	activation	KE,10,25(67)	Albert
Lu ¹⁷⁶	activation	JIN,29,865(67)	Nethaway
Lu	σ_t	NP/A,95,683(67)	Zimmerman
Lu	σ_t	66PARIS,1,61(66)	Brunner
Lu	σ_a	YF,1,252(65)	Andreev
Lu ¹⁷⁶	activation	NP,70,415(65)	Meiser
Lu ¹⁷⁶	activation	ZFK-RN-23(64)	Alexander
Lu	pile osci.	NUK,6,245(64)	Sokolowski
Lu ¹⁷⁶	activation	PL,1,321(62)	Jorgensen
Lu	σ_t diffraction	PR,121,610(61)	Atoji
Lu	diffraction	JCP,35,1950(61)	Atoji
Lu ^{175,176}	σ_t	JNE,13,35(60)	Baston
Lu ¹⁷⁶	σ_t	NSE,7,502(60)	Roberge
Lu	pile osci.	PR,83,641(51)	Pomerance
Lu ^{175,176}	activation	ZN,1,179(49)	Bothe
Lu	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Lu ¹⁷⁶	σ_t	0.14	PRIVATE COMM.(72)	Herdade
Lu ¹⁷⁵	σ_γ (spectra)	2.6-40.6	PR/C,2,675(70)	Wasson
Lu ¹⁷⁵	σ_t	2.5-1202	BAP,14,496(69)+	Wynchank
Lu	σ_t	0.14-2.6	EIR-123(67)	Brunner
Lu	σ_t	0.01-0.3	NP/A,95,683(67)	Zimmerman
Lu	σ_t	0.14-2.6	66PARIS,1,61(66)	Brunner
Lu ¹⁷⁶	σ_t	0.14	JNE,13,35(60)	Baston
Lu ¹⁷⁶	σ_t	0.14	NSE,7,502(60)	Roberge
Lu ¹⁷⁵	σ_t	2.6-57.4	ORNL-2718,28(59)	Block
Lu ¹⁷⁶	σ_t	1.5-46.7	ORNL-2718,28(59)	Block
Lu ¹⁷⁵	σ_t	4.4-132	PR,99,10(55)	Harvey
Lu ¹⁷⁶	σ_t	0.14	PR,100,1414(55)	Landon
Lu	σ_t	0.14-20.6	PR,96,1014(54)	Sailor
Lu	σ_t	0.14-31	PR,92,656(53)	Foote

⁷²Hf

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 102 \pm 2 \text{ b} \\ \sigma_s &= 8 \pm 2 \text{ b} \\ \sigma_c &= 110 \pm 2 \text{ b} \\ a_{coh} &= 7.77 \pm 0.14 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 2000 \pm 100 \text{ b} \\ S_0 &= 1.8 \pm 0.7\end{aligned}$$

¹⁷⁴
⁷²Hf

THERMAL CROSS SECTIONS

$$\sigma_T = 390 \pm 55 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 465 \pm 50 \text{ b} \\ \langle D \rangle &= 16 \pm 3 \text{ eV} \\ S_0 &= 2.8 \pm 1.0\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\% \text{Abr} = 0.17$$

$$S_n = 6708.8 \pm 0.5 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
13.38 ± 0.08	4.8 ± 0.9	1.3 ± 0.3
30.0 ± 0.2	40 ± 8	7.3 ± 1.5
70.5 ± 0.3	12 ± 5	1.4 ± 0.6
77.9 ± 0.3	65 ± 6	7.4 ± 0.7
107.1 ± 0.6	122 ± 25	11.8 ± 2.4
124.6 ± 0.7	50 ± 20	4.5 ± 1.8
147.6 ± 1.0	120 ± 40	9.9 ± 3.3
153.5 ± 1.0	85 ± 20	6.9 ± 1.6
211 ± 2	180 ± 60	12.4 ± 4.1

¹⁷⁶
₇₂Hf

THERMAL CROSS SECTIONS

$$\sigma_T = 38 \pm 6 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned} \Gamma_0 &= 700 \pm 50 \text{ b} \\ \langle D \rangle &= 32 \pm 7 \text{ eV} \\ S_0 &= 1.4 \pm 0.6 \end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^+$$

$$\% \text{Abn} = 5.2$$

$$S_n = 6380.8 \pm 3.9 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)	E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
48.3 $\pm$ 0.1	125 $\pm$ 12	18.0 $\pm$ 1.7	435.6 $\pm$ 1.5	167 $\pm$ 30	8.00 $\pm$ 1.44
53.3 $\pm$ 0.2	1.9 $\pm$ 0.5	0.26 $\pm$ 0.07	444.8 $\pm$ 1.6	173 $\pm$ 35	8.20 $\pm$ 1.70
67.1 $\pm$ 0.2	15 $\pm$ 5	1.8 $\pm$ 0.6	577.1 $\pm$ 2.0	335 $\pm$ 75	13.9 $\pm$ 3.1
123.9 $\pm$ 0.5	42 $\pm$ 7	4.2 $\pm$ 0.7	627.5 $\pm$ 3.0	640 $\pm$ 100	25.6 $\pm$ 4.0
177.1 $\pm$ 0.9	47 $\pm$ 13	3.5 $\pm$ 1.0	657.5 $\pm$ 3.0	270 $\pm$ 35	10.5 $\pm$ 1.4
201.6 $\pm$ 1.0	39 $\pm$ 6	2.7 $\pm$ 0.4	870 $\pm$ 4	280 $\pm$ 90	9.5 $\pm$ 3.1
243.2 $\pm$ 0.6	22 $\pm$ 5	1.4 $\pm$ 0.3	921 $\pm$ 5	145 $\pm$ 80	4.8 $\pm$ 2.6
255.0 $\pm$ 0.7	95 $\pm$ 11	6.0 $\pm$ 0.7	956 $\pm$ 5	300 $\pm$ 120	9.7 $\pm$ 3.9
286.0 $\pm$ 0.8	285 $\pm$ 30	16.9 $\pm$ 1.8	994 $\pm$ 5	270 $\pm$ 125	8.6 $\pm$ 4.0
304.5 $\pm$ 0.9	21 $\pm$ 8	1.2 $\pm$ 0.5	1068 $\pm$ 6	250 $\pm$ 130	7.7 $\pm$ 4.0
347.2 $\pm$ 1.1	173 $\pm$ 23	9.28 $\pm$ 1.23			

* There is a large discrepancy between measured and calculated absorption resonance integrals of Hf-176. It is possible that low energy resonances are not yet identified.

¹⁷⁷₇₂Hf

THERMAL CROSS SECTIONS

$\sigma_f = 365 \pm 20$ b
 $\sigma_f = 1.1 \pm 0.1$ b [4.3 sec ¹⁷⁸Hf^m]
 $\sigma_c = 372 \pm 23$ b

RESONANCE PROPERTIES

$I_\gamma = 7260 \pm 200$ b
 $\langle \sigma \rangle = 2.4 \pm 0.3$ eV
 $S_0 = 1.7 \pm 0.2$

RESONANCE PARAMETERS

$I^0 = 7/2^-$

$\chi_{\text{Abn}} = 18.5$

$S_n = 7265 \pm 1$ keV

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1.098±0.02	1.92± 0.03	3	66 ± 1	1.83 ±0.03
2.380±0.004	8.8 ± 0.3	4	61 ± 1	5.7 ±0.2
5.89 ±0.02	5.1 ± 0.3	3		2.1 ±0.1
6.60 ±0.02	11.0 ± 2.2	4		4.3 ±0.9
8.88 ±0.02	6.8 ± 0.7	4		2.3 ±0.2
10.95 ±0.03	0.47± 0.04	3		0.14 ±0.01
13.67 ±0.03	0.82± 0.07	4		0.22 ±0.02
13.96 ±0.03	3.60± 0.35	3	84 ±16	0.96 ±0.09
21.97 ±0.03	2.25± 0.12	4		0.48 ±0.03
22.26 ±0.03	.73± .10	3		0.16 ±0.02
23.44 ±0.04	1.61± 0.09	4		0.33 ±0.02
25.64 ±0.04	0.46± .04	3		0.091±0.008
27.01 ±0.05	2.50± .20	3		0.48 ±0.04
31.58 ±0.05	.30± .04	3		0.053±0.007
32.82 ±0.05	1.55± 0.12	4		0.27 ±0.02
36.08 ±0.05	3.12± .19	3		0.52 ±0.03
36.95 ±0.05	10.63± 0.30	4	56 ± 8	1.75 ±0.05
43.05 ±0.05	5.67± 0.30	4		0.86 ±0.05
45.13 ±0.05	3.75± 0.19	4		0.56 ±0.03
46.22 ±0.05	7.83± 0.18	4	78 ±21	1.15 ±0.03
48.80 ±0.06	28.70± 1.78	3	82 ± 5	4.11 ±0.26
49.58 ±0.06	6.10± 0.41	4		0.87 ±0.06
54.77 ±0.06	17.78± 0.95	4	69 ±13	2.40 ±0.13
55.34 ±0.06	12.16± .47	3	70 ±14	1.62 ±0.06
57.02 ±0.06	4.50± 0.39	4		0.60 ±0.05
59.27 ±0.07	3.78± .22	3		0.49 ±0.03
62.18 ±0.07	1.24± .16	3		0.157±0.020
63.45 ±0.07	73.5 ± 2.5	4	55 ± 2	9.22 ±0.31
66.75 ±0.07	41 ± 3	3		5.02 ±0.61
70.02 ±0.07	0.50± 0.08	4		0.060±0.010
71.36 ±0.07	16.31± 0.63	4	54 ± 7	1.93 ±0.08
72.26 ±0.07	1.16± .22	3		0.14 ±0.03
75.60 ±0.07	1.93± .22	3		0.22 ±0.03
76.03 ±0.08	19.30± 0.99	4		2.10 ±0.11
82.37 ±0.08	0.56± 0.09	4		0.62 ±0.01
84.67 ±0.08	27.15± 1.53	4		2.95 ±0.17
86.78 ±0.08	1.04± 0.14	4		0.11 ±0.02

¹⁷⁷Hf
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E ₀ (eV)	2g _n ⁰ (meV)	J	Γ _γ (meV)	2g _n ⁰ (meV)
88.54 ± 0.09	4.03 ± .28	3		0.43 ± 0.03
93.17 ± 0.09	3.88 ± 0.24	3		0.402 ± 0.025
97.09 ± 0.09	21.60 ± 1.70	4	59 ± 14	2.19 ± 0.17
99.03 ± 0.09	0.97 ± 0.16	4		0.097 ± 0.016
103.08 ± 0.09	47.43 ± 2.91	3	63 ± 4	4.67 ± 0.29
111.3 ± 0.1	2.17 ± .14	3		0.206 ± 0.013
111.9 ± 0.1	4.43 ± 0.26	4		0.419 ± 0.025
115.1 ± 0.1	4.12 ± .28	3		0.385 ± 0.026
114.5 ± 0.1	0.23 ± .5	3		0.027 ± 0.005
121.3 ± 0.1	4.31 ± .34	3		0.384 ± 0.026
122.6 ± 0.1	0.54 ± .06	3		0.049 ± 0.005
123.7 ± 0.1	8.35 ± .49	3		0.751 ± 0.044
126.1 ± 0.1	0.69 ± 0.15	4		0.061 ± 0.013
131.4 ± 0.2	53.72 ± 4.38	3	67 ± 6	4.69 ± 0.38
134.1 ± 0.2	4.16 ± 0.26	4		0.354 ± 0.022
136.2 ± 0.2	0.62 ± .11	3		0.053 ± 0.009
137.6 ± 0.3	12.74 ± .70	4		1.086 ± 0.010
141.2 ± 0.2	26.9 ± 3.7	4	47 ± 13	2.26 ± 0.31
143.2 ± 0.2	4.35 ± .39	3		0.364 ± 0.033
143.8 ± 0.3	11.31 ± .82	4		0.943 ± 0.068
145.6 ± 0.2	6.15 ± 0.40	3		0.510 ± 0.033
148.6 ± 0.2	18.68 ± 1.02	3		1.532 ± 0.084
151.0 ± 0.2	0.52 ± 0.16	4		0.042 ± 0.013
152.9 ± 0.2	2.13 ± 0.11	4		0.172 ± 0.009
156.1 ± 0.2	2.79 ± 0.24	3		0.223 ± 0.019
160.1 ± 0.2	3.83 ± 0.29	4		0.303 ± 0.023
163.1 ± 0.2	39.29 ± 5.76	3	58 ± 11	3.076 ± 0.451
167.4 ± 0.2	7.25 ± 0.45	3		0.560 ± 0.035
171.1 ± 0.2	10.91 ± 0.76	3		0.834 ± 0.058
174.4 ± 0.2	13.23 ± 0.80	4		1.002 ± 0.061
176.2 ± 0.2	51 ± 20	3		3.84 ± 1.51
176.9 ± 0.2	130 ± 30	4		9.77 ± 2.26
181.1 ± 0.2	5.43 ± 0.50	4		0.403 ± 0.037
184.7 ± 0.2	1.53 ± 0.39	4		0.113 ± 0.029
192.8 ± 0.2	7.56 ± 0.59	4		0.545 ± 0.042
194.2 ± 0.2	7.37 ± .68	3		0.529 ± 0.049
199.2 ± 0.2	23.24 ± 1.50	4		1.650 ± 0.106
201.9 ± 0.2	16.11 ± 1.47	3		1.134 ± 0.103
208.7 ± 0.2	52 ± 8	4	49 ± 13	3.60 ± 0.55
210.1 ± 0.2	3.96 ± 5.52	3		0.273 ± 0.036
212.2 ± 0.2	1.89 ± 0.53	3		0.130 ± 0.036
217.2 ± 0.2	6.90 ± 0.66	4		0.468 ± 0.045
219.7 ± 0.2	9.99 ± 0.89	3		0.674 ± 0.050
222.4 ± 0.2	3.30 ± 0.52	3		0.221 ± 0.035
223.4 ± 0.2	7.09 ± 0.62	4		0.474 ± 0.042
224.8 ± 0.2	153 ± 18	3	10.2 ± 1.2	10.2 ± 1.2
226.8 ± 0.2	11.42 ± 1.02	4		0.758 ± 0.068
229.2 ± 0.2	6.48 ± 0.60	3		0.428 ± 0.040
232.7 ± 0.2	0.46 ± 0.46	4		0.030 ± 0.030
236.3 ± 0.2	10.32 ± 1.02	3		0.671 ± 0.066
238.8 ± 0.2	30 ± 9	3		1.94 ± 0.58
240.9 ± 0.2	20.18 ± 1.43	4		1.300 ± 0.092

¹⁷⁷Hf
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E_0 (eV)	$2g_{\pi}^{\pi}$ (meV)	J	Γ_{γ} (meV)	$2g_{\pi}^0$ (meV)
249.0 $\pm$ 0.2	25.00 $\pm$ 1.88	3		1.58 $\pm$ 0.119
259.7 $\pm$ 0.2	2.06 $\pm$ 0.55	4		0.128 $\pm$ 0.034
264.7 $\pm$ 0.3	81 $\pm$ 15	3	80 $\pm$ 23	4.98 $\pm$ 0.92
267.8 $\pm$ 0.3	38 $\pm$ 12	4		2.32 $\pm$ 0.73
272.3 $\pm$ 0.3	70 $\pm$ 15	4		4.24 $\pm$ 0.90
273.3 $\pm$ 0.3	18.78 $\pm$ 3.06	3		1.136 $\pm$ 0.185
284.9 $\pm$ 0.3	150 $\pm$ 25	3	87 $\pm$ 14	8.89 $\pm$ 1.48
288.1 $\pm$ 0.3	10.25 $\pm$ 1.01	4		0.604 $\pm$ 0.060
294.5 $\pm$ 0.3	4.17 $\pm$ 0.70	3		0.243 $\pm$ 0.041
298.7 $\pm$ 0.3	9.26 $\pm$ 1.21	3		0.536 $\pm$ 0.070
307.2 $\pm$ 0.4	107 $\pm$ 21			6.1 $\pm$ 1.2
320.3 $\pm$ 0.4	24 $\pm$ 12			1.3 $\pm$ 0.7
323.6 $\pm$ 0.4	80 $\pm$ 25			4.5 $\pm$ 1.4
327.6 $\pm$ 0.4	90 $\pm$ 25			5.0 $\pm$ 1.4
333.7 $\pm$ 0.4	13 $\pm$ 9			0.71 $\pm$ 0.49
342.5 $\pm$ 0.5	40 $\pm$ 14			2.2 $\pm$ 0.8
384.9 $\pm$ 0.5	70 $\pm$ 18			3.6 $\pm$ 0.9
357.7 $\pm$ 0.5	40 $\pm$ 14			2.1 $\pm$ 0.7
368.0 $\pm$ 0.5	60 $\pm$ 18			3.1 $\pm$ 0.9
376.3 $\pm$ 0.5	360 $\pm$ 50			18.6 $\pm$ 2.6
406.8 $\pm$ 0.6	50 $\pm$ 20			2.5 $\pm$ 1.0
426.3 $\pm$ 0.6	100 $\pm$ 30			4.8 $\pm$ 1.5
415.2 $\pm$ 0.6	95 $\pm$ 30			4.7 $\pm$ 1.5
426.3 $\pm$ 0.6	100 $\pm$ 30			4.8 $\pm$ 1.5
433.7 $\pm$ 0.6	100 $\pm$ 35			4.8 $\pm$ 1.7
444.3 $\pm$ 0.6	37 $\pm$ 19			1.8 $\pm$ 0.9
447.0	60 $\pm$ 20			2.8 $\pm$ 0.9
457.9	146 $\pm$ 45			6.8 $\pm$ 2.1
471.5	66 $\pm$ 25			3.0 $\pm$ 1.2
475.5	95 $\pm$ 35			4.4 $\pm$ 1.6
489.2	130 $\pm$ 45			5.9 $\pm$ 2.0
500	80 $\pm$ 40			3.6 $\pm$ 1.8
508	55 $\pm$ 29			2.4 $\pm$ 1.3
513	50 $\pm$ 30			2.2 $\pm$ 1.3
526	110 $\pm$ 40			4.8 $\pm$ 1.7
549	96 $\pm$ 40			4.1 $\pm$ 1.7
578	120 $\pm$ 50			5.0 $\pm$ 2.1
613	100 $\pm$ 50			4.0 $\pm$ 2.0
629	114 $\pm$ 55			4.6 $\pm$ 2.2
647	100 $\pm$ 50			3.9 $\pm$ 2.0
686	100 $\pm$ 55			3.8 $\pm$ 2.1
714	120 $\pm$ 75			4.5 $\pm$ 2.8
809	350 $\pm$ 130			12.3 $\pm$ 4.6
895	330 $\pm$ 160			11.0 $\pm$ 5.3

¹⁷⁸Hf
72

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 86 \pm 7 \text{ b} \\ \sigma_T &= 53 \pm 6 \text{ b [18.6 sec } ^{179}\text{Hf}^*] \\ \sigma_T &= 33 \pm 8 \text{ b [} ^{179}\text{Hf}^*] \\ \sigma_c &= 91 \pm 6 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 1950 \pm 100 \text{ b} \\ \langle D \rangle &= 60 \pm 20 \text{ eV} \\ S_0 &= 1.7 \pm 0.7\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 0^\circ$$

$$\% \text{Abrn} = 27.2$$

$$S_n = 6099.5 \pm 1.3 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
7.78 ± 0.02	50 ± 3	17.9 ± 1.1
104.5 ± 0.4	7 ± 2	0.7 ± 0.2
164.7 ± 0.7	15 ± 3	1.2 ± 0.2
255.5 ± 1.4	280 ± 35	17.5 ± 2.2
275.7	250 ± 35	15.7 ± 2.1
353.1 ± 2.5	8 ± 3	0.43 ± 0.16
383.5 ± 2.8	430 ± 30	2.2 ± 1.5
447.7 ± 3.3	180 ± 50	8.5 ± 2.4
504.3 ± 3.7	70 ± 28	3.1 ± 1.3
528.7 ± 3.9	168 ± 35	7.3 ± 1.5
580.1 ± 4.4	445 ± 60	18.5 ± 2.5
723 ± 5	1180 ± 120	43.9 ± 4.5
785 ± 5	1000 ± 140	35.7 ± 5.0
866 ± 5	130 ± 45	4.4 ± 1.5
889 ± 5	15 ± 12	0.50 ± 0.40
1096 ± 6	640 ± 150	
1163 ± 6	1400 ± 350	19.3 ± 4.5

¹⁷⁹
⁷²Hf

THERMAL CROSS SECTIONS

$\sigma_T = 45 \pm 5$ b
 $\sigma_T = 0.34 \pm 0.03$ b [5.5 hr ¹⁸⁰Hf*]
 $\sigma_c = 51 \pm 6$ b

RESONANCE PROPERTIES

$I_\gamma = 600 \pm 60$ b
 $\langle D \rangle = 4.4 \pm 0.2$ eV
 $S_0 = 1.6 \pm 0.2$

RESONANCE PARAMETERS

$I^\pi = 9/2^+$		$\chi_{\text{Abn}} = 13.8$		$S_n = 7387.6 \pm 0.5$ keV	
E_0 (eV)	$2g\Gamma_n$ (meV)	J	$2g\Gamma_n^0$ (meV)		
5.68±0.03	4.2 ± 0.4	5	1.8 ±0.5		
17.65±0.04	2.0 ± 0.2	4	0.48 ±0.05		
19.13±0.04	0.12± 0.04	5	0.028±0.001		
23.7 ±0.1	6.8 ± 1.5	5	1.4 ±0.3		
26.50±0.05	1.2 ± 0.2	4	0.23 ±0.04		
27.35±0.05	0.43± 0.14	5	0.082±0.027		
31.14±0.05	6.6 ± 0.4	4	1.2 ±0.1		
36.50±0.05	25 ± 5	5	4.1 ±0.8		
40.12±0.05	25 ± 1	5	3.9 ±0.2		
42.29±0.06	13 ± 2	4	2.0 ±0.3		
50.77±0.06	1.6 ± 0.6	4	0.22 ±0.08		
51.11±0.07		5			
54.79±0.07	4.7 ± 1.0	4	0.64 ±0.14		
69.03±0.07	9 ± 1	4	1.1 ±0.1		
73.53±0.07	8 ± 2	4	0.9 ±0.2		
76.63±0.08	3.1 ± 0.5	5	0.35 ±0.06		
82.94±0.08	5.4 ± 1.2	5	0.59 ±0.13		
85.42±0.09	7.0 ± 1.5	4	0.76 ±0.16		
92.07±0.09	46 ± 6	4	4.8 ±0.6		
92.67±0.09		5			
101.2 ±0.1	110 ± 10	5	10.9 ±1.0		
103.7 ±0.1	10 ± 3	5	0.98 ±0.29		
107.8 ±0.1	11 ± 3	4	1.1 ±0.3		
117.2 ±0.5	37 ± 6		3.4 ±0.6		
120.1 ±0.1	~2.2	4	~0.20		
121.9 ±0.1		4			
122.6 ±0.2	26 ± 6	5	2.2 ±0.5		
129.9 ±0.2	10 ± 3	4	0.9 ±0.3		
137.2 ±0.2	50 ± 10	5	4.3 ±0.9		
138.1 ±0.2		4			
144.2 ±0.2	28 ± 6	5	2.3 ±0.5		
147.0 ±0.2	11 ± 5	4	0.91 ±0.41		
152.3 ±0.2		4			
156.3 ±0.2	44 ± 6	5	3.5 ±0.5		
158.6 ±0.2		4			
165.7 ±0.3	22 ± 9	5	1.7 ±0.8		
174.9 ±0.3	130 ± 25		10 ±2		

¹⁷⁹
₇₂Hf

E_0 (eV)	$2g\Gamma_n$ (meV)	J	$2g\Gamma_n^0$ (meV)
177.9 ±0.3	25 ± 10		1.9 ±0.8
182.6 ±0.3	48 ± 17	4	3.6 ±1.3
188.5 ±0.3	32 ± 12	5	2.3 ±0.9
189.8 ±0.3		4	
192.9	5 ± 3	4	0.4 ±0.2
197.9 ±0.3	20 ± 10	5	1.4 ±0.7
202.6 ±0.4	90 ± 13	5	6.3 ±0.9
204.1 ±0.4	134 ± 18	4	9.4 ±1.3
213.1 ±0.4	62 ± 8		4.3 ±0.6
224.0 ±0.5		4	
224.5 ±0.5	230 ± 30		15 ±2
227.7 ±0.5	67 ± 12		4.4 ±0.8
241.6 ±0.5	67 ± 12	4	4.3 ±0.8
242.9 ±0.5		5	
245.3 ±0.5	46 ± 9	4	2.9 ±0.6
251.8		4	
254.2 ±0.6	61 ± 12		3.8 ±0.8
263.9 ±0.6	9 ± 5	4	0.55 ±0.31
270.0 ±0.6		[5]	
273.5 ±0.6		5	
276.3 ±0.6	50 ± 15	5	3.0 ±0.9
284.7 ±0.6		4	
288.7 ±0.6		4	
292.4 ±0.6		5	
300.6 ±0.6	35 ± 13	4	2.0 ±0.8
306.3 ±0.6		4	
313.6 ±0.6		5	
322.5 ±0.6	8 ± 4	4	0.45 ±0.22
327.0 ±0.6	34 ± 12	5	1.9 ±0.7
332.9 ±0.6		4	
338.2 ±0.6	60 ± 10	5	3.3 ±0.5
346.1 ±0.6	65 ± 20	5	3.5 ±1.1
356.1 ±0.6		4	
360.7 ±0.6		5	
364.4 ±0.7	70 ± 21	5	3.7 ±1.1
372.1 ±0.7		5	
375.2 ±0.7		4	
381.7 ±0.7	345 ± 70	4	17.7 ±3.6
385.6 ±0.7		4	
389.0 ±0.7		5	
390.6 ±0.7	100 ± 30		5.06 ±1.52
395.3 ±0.7		5	
401.1 ±0.7			
403.8 ±0.7			
408.8 ±0.7			
411.4 ±0.8		4	
413.6 ±0.8	26 ± 12		1.3 ±0.6
423.5 ±0.8		5	
428.9 ±0.8		5	
431.9 ±0.8	185 ± 50	4	8.9 ±2.4
462.8 ±1.7	210 ± 55		9.8 ±2.6
489.6 ±0.8	75 ± 33		3.4 ±1.5

¹⁷⁹₇₂Hf

E_0 (eV)	$2g\Gamma_n$ (meV)	J	$2g\Gamma_n^0$ (meV)
514	~30		~1.3
532	140 ± 50		6.1 ± 2.2
546	260 ± 65		11.1 ± 2.8
571	130 ± 50		5.4 ± 2.1
583	290 ± 90		12.0 ± 3.7
587	110 ± 50		4.5 ± 2.1
630	185 ± 65		7.4 ± 2.6
652	210 ± 70		8.2 ± 2.7
658	240 ± 85		9.4 ± 3.3
689	270 ± 95		10.3 ± 3.6
733	80 ± 50		3.0 ± 1.9
751 ± 3	80 ± 50		2.9 ± 1.8
848	125 ± 100		4.3 ± 3.4
893	150 ± 85		5.0 ± 2.8
900 ± 4	100 ± 75		3.3 ± 2.5
971	630 ± 225		20.2 ± 7.2
1010	220 ± 140		6.9 ± 4.4

¹⁸⁰₇₂Hf

THERMAL CROSS SECTIONS

$$\sigma_T = 12.6 \pm 0.7 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 43 \pm 8 \text{ b}$$

$$\langle D \rangle = 100 \pm 40 \text{ eV}$$

$$S_0 = 0.7 \pm 0.5$$

RESONANCE PARAMETERS

$$I'' = 0^+$$

$$\lambda_{Abn} = 35.1$$

$$S_n = 5694.5 \pm 1.5 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_n^0 (meV)
72.6 ± 0.3	54 ± 4	6.3 ± 0.5
171.7 ± 0.3	116 ± 15	8.9 ± 1.1
447.0 ± 1.6	210 ± 30	9.9 ± 1.4
477.0 ± 1.7	130 ± 30	5.6 ± 1.4
587.0 ± 2.0	78 ± 24	3.2 ± 1.0
792 ± 4	1900 ± 200	67.5 ± 7.1
914 ± 5	65 ± 25	2.15 ± .83

¹⁸¹₇₂Hf

[42.4 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 40 \pm 30 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Hf176-180	σ_t	BAP,14,496(69)	Conrad
Hf180	activation	CJP,47,2031(69)	Ricabarra
Hf179	mass spectrometry	RCA,8,188(67)	Boudin
Hf177,178	activation, ratio	EN,14,228(67)	Foglio
Hf179,180	activation	PR,158,1105(67)	Goldhaber
Hf	pile osci.	66PARIS,1,479(66)	Carre
Hf	diffraction	ACR,17,1087(64)	Atoji
Hf176-180	reactivity	PRIVATE COMM.(64)	Scoville
Hf177,178	activation	NP,32,482(62)	Alexander
Hf179	activation	BAP,6,70(61)	Esch
Hf	σ_t	NSE,11,298(61)	Joki
Hf	pulsed n	NSE,9,132(61)	Meadows
Hf	σ_t	BAP,6,70(61)	Moore
Hf	σ_t	PRIVATE COMM.(61)	Schermer
Hf180	mass spectrometry	PR,123,1354(61)	Wing
Hf	pile osci.	JNE,12,32(60)	Tattersall
Hf179	activation	NP,6,561(58)	Gvozdev
Hf	diffraction	ACR,9,607(56)	Sidhu
Hf177-179	pile osci.	PR,92,1527(53)	Bollinger
Hf	σ_t	PR,87,487(52)	Bernstein
Hf174,176-180	local osci.	PR,88,412(52)	Pomerance
Hf	σ_t	NAT,167,895(51)	Egelstaff
Hf174,176-180	local osci.	PR,83,641(51)	Pomerance
Hf	pile osci.	PPS/A,63,1175(50)	Colmer
Hf	pile osci.	PR,80,342(50)	Harris
Hf180	activation	PR,72,888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Hf ¹⁷⁷	$\sigma_f \sigma_f$ (SI)	10-300	72BJD,52(72)	Rohr
Hf ¹⁷⁷	γ cascade	1.1-300	71ALBANY,447(71)	Coceva
Hf ¹⁷⁹	γ cascade	5.6-431	71ALBANY,447(71)	Coceva
Hf ¹⁷⁷	γ cascade	1.1-208	NP/A,117,586(68)	Coceva
Hf ¹⁷⁴	σ_t	4.3-211	PRIVATE COMM.(66)	Harvey
Hf ¹⁷⁶	σ_t	48.3-1068	PRIVATE COMM.(66)	Harvey
Hf ¹⁷⁷	σ_t	1.1-1019	PRIVATE COMM.(66)	Harvey
Hf ¹⁷⁸	σ_t	7.8-1163	PRIVATE COMM.(66)	Harvey
Hf ¹⁷⁹	σ_t	5.7-1050	PRIVATE COMM.(66)	Harvey
Hf ¹⁸⁰	σ_t	72.5-914	PRIVATE COMM.(66)	Harvey
Hf ¹⁷⁹	σ_f (spectra)	thermal	PR,146,844(66)	Namenson
Hf ¹⁷⁷	σ_s	1.1-2.4	NP,62,641(65)	Ceulemans
Hf ¹⁷⁷		1.1-22.4	64PARIS,2,673(64)	Bollinger
Hf ¹⁷⁴	σ_t	4.2-211	ORNL-3778,38(64)	Fuketa
Hf ¹⁷⁶	σ_t	48.3-201	ORNL-3778,38(64)	Fuketa
Hf ¹⁷⁷	σ_t	1.1-176.5	ORNL-3778,38(64)	Fuketa
Hf ¹⁷⁸	σ_t	7.8-165	ORNL-3778,38(64)	Fuketa
Hf ¹⁷⁹	σ_t	5.7-187	ORNL-3778,38(64)	Fuketa
Hf ¹⁸⁰	σ_t	72.5-172	ORNL-3778,38(64)	Fuketa
Hf ¹⁷⁶	σ_f	57.1-659	BAP,8,80(63)	Russell
Hf ¹⁷⁷	σ_f	54.6-500	BAP,8,80(63)	Russell
Hf ¹⁷⁸	σ_f	104.6-864	BAP,8,80(63)	Russell
Hf ¹⁷⁹	σ_f	54.6-489.6	BAP,8,80(63)	Russell
Hf ¹⁸⁰	σ_f	72.6-911	BAP,8,80(63)	Russell
Hf ¹⁷⁷	σ_f		ANL-6589(62)+	Carpenter
Hf ¹⁷⁷	σ_t	1-2.4	NSE,11,298(61)	Joki
Hf ¹⁷⁷	σ_f	1.1-2.4	NP,10,386(59)	Fenstermacher
Hf ¹⁷⁷	σ_t	1.1-2.4	PR,101,726(56)	Igo
Hf ¹⁷⁷	σ_t	2.3-6.6	PR,101,1328(56)	Levin
Hf ¹⁷⁴	σ_t	30.5	PR,99,10(55)	Harvey
Hf ¹⁷⁷	σ_t	5.9-105	PR,99,10(55)	Harvey
Hf ¹⁷⁸	σ_t	7.8	PR,99,10(55)	Harvey
Hf ¹⁷⁹	σ_t	5.7-110	PR,99,10(55)	Harvey
Hf ¹⁸⁰	σ_t	73.9	PR,99,10(55)	Harvey
Hf ¹⁷⁷	σ_t	1.1-13.6	PR,92,1527(53)	Bollinger
Hf ¹⁷⁸	σ_t	7.6	PR,92,1527(53)	Bollinger
Hf ¹⁷⁹	σ_t	5.6	PR,92,1527(53)	Bollinger
Hf ¹⁷⁷	σ_t	1.1-2.2	NAT,167,896(51)	Egelstaff

¹⁸⁰
₇₃Ta

THERMAL CROSS SECTIONS

$$\sigma_T = 700 \pm 200 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 600 \pm 200 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 8^+$$

$$\%Abn = 0.012$$

$$S_n = 7644 \pm 22 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
0.433 ± 0.004	0.12 ± 0.02	30 ± 5	0.18 ± 0.03

¹⁸¹
₇₃Ta

THERMAL CROSS SECTIONS

$$\sigma_T = 10.3 \pm 2.5 \text{ mb [16 min } ^{182}\text{Ta}^*]$$

$$\sigma_T = 21.0 \pm 0.7 \text{ b [115 day } ^{182}\text{Ta}^*]$$

$$\sigma_s = 6.2 \pm 0.6 \text{ b}$$

$$\sigma_t = 27.2 \pm 0.8 \text{ b}$$

$$a_{coh} = 6.91 \pm 0.07 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 710 \pm 20 \text{ b}$$

$$\langle D \rangle = 4.4 \pm 0.3 \text{ eV}$$

$$S_0 = 1.8 \pm 0.2$$

RESONANCE PARAMETERS

$$I^\pi = 7/2^+$$

$$\%Abn = 99.988$$

$$S_n = 6063.0 \pm 0.5 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
4.28 ± 0.01	57 ± 4	4.4 ± 0.2	4	53 ± 4	2.13 ± 0.11
10.34 ± 0.05	60 ± 7	4.08 ± 0.18	3	55 ± 6	1.31 ± 0.05
13.95 ± 0.05	53 ± 4	1.14 ± 0.03	4	52 ± 4	0.31 ± 0.01
20.3 ± 0.1	61 ± 5	1.15 ± 0.04	3	60 ± 5	0.26 ± 0.01
22.7 ± 0.1	52 ± 10	0.22 ± 0.03	[3]	52 ± 10	0.046 ± 0.006
23.9 ± 0.1	60 ± 6	6.5 ± 0.2	4	53 ± 6	1.33 ± 0.04
30.00 ± 0.05	55 ± 15	0.22 ± 0.04	3	55 ± 15	0.04 ± 0.007
35.16 ± 0.05	76 ± 6	9.3 ± 0.4	3	65 ± 6	1.56 ± 0.08
35.90 ± 0.05	80 ± 8	16.9 ± 1.1	4	65 ± 7	2.8 ± 2.3
39.13 ± 0.06	100 ± 7	44.8 ± 0.9	4	60 ± 7	7.16 ± 0.16
49.15 ± 0.08	54 ± 4	1.05 ± 0.10	3	53 ± 6	0.150 ± 0.014
55.8 ± 0.3		0.02 ± 0.01			0.003 ± 0.002
57.54 ± 0.08		0.26 ± 0.03			0.034 ± 0.004
59.05 ± 0.08		0.12 ± 0.03			0.016 ± 0.004
63.12 ± 0.08	70 ± 7	5.8 ± 0.6	4	64 ± 7	0.73 ± 0.08
76.85 ± 0.08	60 ± 15	12 ± 1	4	48 ± 15	1.4 ± 0.1

¹⁸¹
⁷³Ta

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
77.64±0.10	60 ±15	5.6 ± 0.8	4	54 ±15	0.63 ±0.10
78.95±0.10		1.7 ± 0.2	3		0.19 ±0.03
82.94±0.05	66 ± 8	14 ± 1	4	52 ± 8	1.5 ±0.1
85.10±0.05	62 ±12	4.1 ± 0.4	[3]	58 ±12	0.44 ±0.04
85.75±0.05		0.2 ± 0.1			0.02 ±0.01
89.60±0.05	58 ±18	3.3 ± 0.2		55 ±18	0.35 ±0.02
91.44±0.05		2.3 ± 0.2			0.24 ±0.02
97.00±0.06		3.2 ± 0.4			0.32 ±0.04
99.32±0.06	165 ± 9	115 ± 5	3	50 ±10	11.5 ±0.5
103.52±0.06		1.1 ± 0.2			0.11 ±0.02
105.54±0.07	80 ±10	30 ± 3	3	50 ±10	2.9 ±0.3
115.08±0.07	98 ±10	41 ± 4	4	57 ±10	3.8 ±0.4
118.32±0.08		2.4 ± 0.4			0.23 ±0.04
126.46±0.08	98 ±10	44 ± 4	3	54 ±10	3.9 ±0.4
136.48±0.09	69 ±10	22 ± 1	[4]	47 ±10	1.9 ±0.1
138.33±0.09	79 ±20	13 ± 1	[4]	66 ±20	1.1 ±0.1
144.21±0.09		1.8 ± 0.2	3		0.15 ±0.02
148.31±0.09		4.6 ± 0.5			0.38 ±0.04
149.7 ±0.1		5.5 ± 0.4			0.45 ±0.04
159.8 ±0.1		0.30± 0.15			0.02 ±0.01
166.4 ±0.1		8.5 ± 0.8	4		0.66 ±0.06
175.0 ±0.1		100 ± 13	[4]		7.6 ±1.0
176.0 ±0.1		66 ± 13			5.0 ±1.0
178.6 ±0.1		1.0 ± 0.3			0.08 ±0.02
182.8 ±0.1		0.95± 0.05			0.070±0.004
185.5 ±0.1		0.60± 0.09			0.044±0.007
189.3 ±0.1		0.70± 0.14			0.05 ±0.01
194.8 ±0.1		112 ± 30	4		8 ±2
200.0 ±0.2	102 ±12	40 ± 5	3	62 ±10	2.8 ±0.4
204.7 ±0.2		2.6 ± 0.3			0.18 ±0.02
208.4 ±0.2		11 ± 1			0.75 ±0.06
215.0 ±0.2		48 ± 7		65 ±16	3.3 ±0.5
216.6 ±0.2		18 ± 2			1.2 ±0.1
219.7 ±0.2		16.7 ± 1.5			1.13 ±0.10
222.3 ±0.2		2.2 ± 0.5		52 ±13	0.15 ±0.03
225.3 ±0.2		22.5 ± 1.5			1.5 ±0.1
230.5 ±0.2		18 ± 3			1.2 ±0.2
232.3 ±0.2		65 ± 16			4.3 ±1.1
237.3 ±0.2		1.4 ± 0.3			0.09 ±0.02
242.7 ±0.2		9.7 ± 1.2			0.62 ±0.08
247.2 ±0.2		6.3 ± 0.6			0.40 ±0.04
248.4 ±0.2		1.4 ± 0.4			0.089±0.031
253.0 ±0.2		0.30± 0.06			0.019±0.004
259.1 ±0.2		11.0 ± 1.7			0.685±0.100
263.3 ±0.2		45.4 ± 9.7			2.80 ±0.60
264.7 ±0.2		10.4 ± 1.3			0.64 ±0.08
271.8 ±0.2		9.9 ± 1.7			0.60 ±0.10
273.9 ±0.2		66.2 ± 6.6			4.00 ±0.40
277.2 ±0.3		33.3 ± 6.7			2.00 ±0.40
280.3 ±0.3		18.4 ± 1.7			1.10 ±0.10
287.7 ±0.3		18.7 ± 1.7			1.10 ±0.10
290.4 ±0.3		13.6 ± 3.4			0.80 ±0.20

¹⁸¹
₇₃Ta

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
291.1 $\pm$ 0.3		9.6 $\pm$ 1.7			0.56 $\pm$ 0.10
304.0 $\pm$ 0.3		3.8 $\pm$ 0.4			0.22 $\pm$ 0.02
306.2 $\pm$ 0.3		21.0 $\pm$ 1.8			1.20 $\pm$ 0.10
311.7 $\pm$ 0.3		17.7 $\pm$ 1.8			1.00 $\pm$ 0.10
313.2 $\pm$ 0.3		110 $\pm$ 21			6.20 $\pm$ 1.20
322.8 $\pm$ 0.3		7.2 $\pm$ 0.7			0.40 $\pm$ 0.04
327.6 $\pm$ 0.3		1.8 $\pm$ 1.8			0.10 $\pm$ 0.10
329.4 $\pm$ 0.2		65.3 $\pm$ 7.3			3.60 $\pm$ 0.40
341.6 $\pm$ 0.2		4.8 $\pm$ 0.4			0.26 $\pm$ 0.02
344.5 $\pm$ 0.2		20.4 $\pm$ 1.9			1.10 $\pm$ 0.10
346.8 $\pm$ 0.2		14.9 $\pm$ 1.9			0.80 $\pm$ 0.10
349.2 $\pm$ 0.2		24.3 $\pm$ 1.9			1.30 $\pm$ 0.10
354.3 $\pm$ 0.2		32.0 $\pm$ 3.0			1.70 $\pm$ 0.16
357.3 $\pm$ 0.2		3.8 $\pm$ 0.4			0.20 $\pm$ 0.02
370.2 $\pm$ 0.2		37.7 $\pm$ 3.8			1.96 $\pm$ 0.20
378.6 $\pm$ 0.2		15.6 $\pm$ 3.9			0.80 $\pm$ 0.20
379.8 $\pm$ 0.2		3.9 $\pm$ 0.2			0.20 $\pm$ 0.01
382.1 $\pm$ 0.2		0.35 $\pm$ 0.12			0.018 $\pm$ 0.006
388.9 $\pm$ 0.2		35.6 $\pm$ 2.0			1.30 $\pm$ 0.10
396.5 $\pm$ 0.2		12.0 $\pm$ 8.0			0.60 $\pm$ 0.40
397.5 $\pm$ 0.2		35.9 $\pm$ 8.0			1.80 $\pm$ 0.40
403.7 $\pm$ 0.3		0.20 $\pm$ 0.12			0.010 $\pm$ 0.006
409.9 $\pm$ 0.3		81.0 $\pm$ 8.1			4.00 $\pm$ 0.40
415.7 $\pm$ 0.3		65.2 $\pm$ 16.3			3.20 $\pm$ 0.80
417.1 $\pm$ 0.3		65.4 $\pm$ 16.3			3.20 $\pm$ 0.80
419.6 $\pm$ 0.3		2.1 $\pm$ 2.1			0.10 $\pm$ 0.10
421.8 $\pm$ 0.3		2.9 $\pm$ 0.4			0.14 $\pm$ 0.02
428.9 $\pm$ 0.3		6.6 $\pm$ 0.8			0.32 $\pm$ 0.04
434.2 $\pm$ 0.3		24.2 $\pm$ 2.1			1.16 $\pm$ 0.10
439.2 $\pm$ 0.3		62.9 $\pm$ 8.4			3.00 $\pm$ 0.40
443.8 $\pm$ 0.3		71.6 $\pm$ 8.4			3.40 $\pm$ 0.40
446.1 $\pm$ 0.3		63.4 $\pm$ 8.5			3.00 $\pm$ 0.40
449.7 $\pm$ 0.3		12.7 $\pm$ 1.3			0.60 $\pm$ 0.06
461.4 $\pm$ 0.3		39.5 $\pm$ 4.3			1.84 $\pm$ 0.20
465.2 $\pm$ 0.3		4.3 $\pm$ 0.9			0.20 $\pm$ 0.04
467.7 $\pm$ 0.4		86.5 $\pm$ 8.7			4.00 $\pm$ 0.40
471.5 $\pm$ 0.4		39.1 $\pm$ 3.5			1.80 $\pm$ 0.16
473.6 $\pm$ 0.4		1.7 $\pm$ 0.9			0.08 $\pm$ 0.04
477.3 $\pm$ 0.4		0.9 $\pm$ 0.4			0.04 $\pm$ 0.02
482.2 $\pm$ 0.4		15.4 $\pm$ 1.3			0.70 $\pm$ 0.06
483.6 $\pm$ 0.4		13.2 $\pm$ 1.3			0.60 $\pm$ 0.06
490.2 $\pm$ 0.4		36.3 $\pm$ 3.5			1.64 $\pm$ 0.16
493.8 $\pm$ 0.4		13.3 $\pm$ 1.3			0.60 $\pm$ 0.06
495.3 $\pm$ 0.4		6.0 $\pm$ 1.3			0.27 $\pm$ 0.06
497.5 $\pm$ 0.4		0.45 $\pm$ 0.45			0.02 $\pm$ 0.02
500.0 $\pm$ 0.4		2.2 $\pm$ 0.9			0.10 $\pm$ 0.04
502.0 $\pm$ 0.4		33.8 $\pm$ 9.0			2.40 $\pm$ 0.40
519.4 $\pm$ 0.4		15.0 $\pm$ 1.4			0.66 $\pm$ 0.06
522.8 $\pm$ 0.4		91.5 $\pm$ 18.3			4.00 $\pm$ 0.80
524.3 $\pm$ 0.4		4.6 $\pm$ 2.3			0.20 $\pm$ 0.10
527.1 $\pm$ 0.4		91.8 $\pm$ 13.8			4.00 $\pm$ 0.60
533.9 $\pm$ 0.4		78.6 $\pm$ 13.9			3.40 $\pm$ 0.60

¹⁸¹
₇₃Ta

E _g (eV)	Γ (meV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
536.3 ±0.4		13.9 ± 1.4			0.60 ±0.06
542.5 ±0.4		41.9 ± 4.7			1.80 ±0.20
548.9 ±0.4		2.3 ± 2.3			0.10 ±0.10
554.3 ±0.4		1.4 ± 0.5			0.06 ±0.02
557.0 ±0.4		44.8 ± 4.7			1.90 ±0.20
561.3 ±0.4		1.2 ± 0.2			0.05 ±0.01
567.2 ±0.4		2.4 ± 0.5			0.10 ±0.02
569.5 ±0.4		52.5 ± 4.8			2.20 ±0.20
576.3 ±0.4		4.3 ± 0.5			0.18 ±0.02
581.5 ±0.4		0.24 ± 0.24			0.01 ±0.01
589.0 ±0.4		0.39 ± 0.24			0.016 ±0.010
591.6 ±0.4		48.6 ± 4.9			2.00 ±0.20
596.6 ±0.4		293.0 ± 97.7			12.00 ±4.00
600.5 ±0.4		1.2 ± 0.7			0.05 ±0.03
606.0 ±0.4		7.4 ± 2.5			0.30 ±0.10
608.8 ±0.4		44 ± 15			1.8 ±0.6
617.4 ±0.4		79.5 ± 14.9			3.20 ±0.60
624.1 ±0.2		37.5 ± 2.5			1.50 ±0.10
626.4 ±0.2		110 ± 10			4.40 ±0.40
636.0 ±0.2		5.0 ± 0.5			0.20 ±0.02
644.7 ±0.2		6.1 ± 1.0			0.24 ±0.04
647.4 ±0.2		76.3 ± 10.1			3.00 ±0.40
651.1 ±0.2		86.8 ± 10.2			3.40 ±0.40
658.1 ±0.2		8.2 ± 1.0			0.32 ±0.04
666.5 ±0.3		5.7 ± 2.1			0.22 ±0.08
668.4 ±0.3		3.1 ± 1.0			0.12 ±0.04
675.1 ±0.3		1.6 ± 0.5			0.06 ±0.02
677.9 ±0.3		7.6 ± 1.0			0.30 ±0.04
680.7 ±0.3		52.2 ± 7.8			2.0 ±0.3
695.9 ±0.3		52.8 ± 5.3			2.0 ±0.2
699.8 ±0.3		0.79 ± 0.26			0.03 ±0.01
702.5 ±0.3		21.2 ± 2.1			0.80 ±0.08
706.5 ±0.3		31.9 ± 21.3			1.20 ±0.80
710.3 ±0.3		8.0 ± 2.7			0.30 ±0.10
716.0 ±0.3		112 ± 21			4.0 ±0.80
719.7 ±0.3		0.54 ± 0.54			0.02 ±0.02
729.2 ±0.3		15.1 ± 4.3			0.56 ±0.16
731.9 ±0.3		162 ± 27			6.0 ±1.0
735.5 ±0.3		35 ± 27			1.3 ±0.1
739.4 ±0.3		120 ± 22			1.3 ±0.1
747.2 ±0.3		60 ± 5			4.4 ±0.8
757.3 ±0.3		66 ± 6			2.2 ±0.2
760.3 ±0.3		22 ± 6			2.4 ±0.2
769.2 ±0.3		6 ± 1			0.8 ±0.2
776.8 ±0.3		70 ± 14			0.20 ±0.04
782.7 ±0.3		1.2 ± 0.3			2.50 ±0.50
789.1 ±0.3		51 ± 6			0.04 ±0.010
797.6 ±0.3		40 ± 6			1.4 ±0.2
805.2 ±0.4		1.9 ± 0.9			1.8 ±0.2
808.2 ±0.4		54 ± 9			1.4 ±0.2
813.1 ±0.4		131 ± 23			0.07 ±0.03
820.8 ±0.4		143 ± 23			1.90 ±0.30
					4.6 ±0.8
					5.0 ±0.8

¹⁸¹Ta
73

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
825.5 $\pm$ 0.4		29 $\pm$ 6			1.0 $\pm$ 0.2
829.2 $\pm$ 0.4		0.58 $\pm$ 0.58			0.02 $\pm$ 0.02
833.3 $\pm$ 0.4		40 $\pm$ 12			1.4 $\pm$ 0.4
846.3 $\pm$ 0.4		41 $\pm$ 6			1.4 $\pm$ 0.2
852.5 $\pm$ 0.4		53 $\pm$ 6			1.8 $\pm$ 0.2
862.7 $\pm$ 0.4		0.59 $\pm$ 0.59			0.02 $\pm$ 0.02
870.0 $\pm$ 0.4		21 $\pm$ 3			0.70 $\pm$ 0.10
873.9 $\pm$ 0.4		53 $\pm$ 6			1.8 $\pm$ 0.2
878.9 $\pm$ 0.4		56 $\pm$ 3			1.9 $\pm$ 0.1
880.7 $\pm$ 0.4		15 $\pm$ 9			0.5 $\pm$ 0.3
888.3 $\pm$ 0.4		8.9 $\pm$ 3.0			0.30 $\pm$ 0.10
894.6 $\pm$ 0.4		66 $\pm$ 12			2.2 $\pm$ 0.4
896.9 $\pm$ 0.4		42 $\pm$ 12			1.4 $\pm$ 0.4
908.4 $\pm$ 0.4		72 $\pm$ 12			2.4 $\pm$ 0.4
912.8 $\pm$ 0.4		60 $\pm$ 18			2.0 $\pm$ 0.6
915.3 $\pm$ 0.4		48 $\pm$ 12			1.6 $\pm$ 0.4
919.2 $\pm$ 0.4		49 $\pm$ 6			1.6 $\pm$ 0.2
925.6 $\pm$ 0.4		43 $\pm$ 6			1.4 $\pm$ 0.2
929.8 $\pm$ 0.4		152 $\pm$ 30			5.0 $\pm$ 1.0
931.8 $\pm$ 0.4		122 $\pm$ 31			4.0 $\pm$ 1.0
936.4 $\pm$ 0.4		6.1 $\pm$ 1.2			0.20 $\pm$ 0.04
942.8 $\pm$ 0.4		184 $\pm$ 31			6.0 $\pm$ 1.0
945.3 $\pm$ 0.4		277 $\pm$ 62			9.0 $\pm$ 2.0
947.5 $\pm$ 0.4		246 $\pm$ 62			8.0 $\pm$ 2.0
952.4 $\pm$ 0.4		37 $\pm$ 6			1.2 $\pm$ 0.2
956.0 $\pm$ 0.4		3.7 $\pm$ 0.6			0.12 $\pm$ 0.02
966.0 $\pm$ 0.4		75 $\pm$ 31			2.4 $\pm$ 1.0
968.2 $\pm$ 0.4		40 $\pm$ 6			1.3 $\pm$ 0.2
973.6 $\pm$ 0.4		75 $\pm$ 13			2.4 $\pm$ 0.4
982.9 $\pm$ 0.4		69 $\pm$ 13			2.2 $\pm$ 0.4
988.3 $\pm$ 0.4		3.8 $\pm$ 1.3			0.12 $\pm$ 0.04
993.4 $\pm$ 0.4		28 $\pm$ 9			0.9 $\pm$ 0.3
996.0 $\pm$ 0.4		82 $\pm$ 19			2.6 $\pm$ 0.6
1001.6 $\pm$ 0.5		63 $\pm$ 6			2.0 $\pm$ 0.2
1006.2 $\pm$ 0.5		14 $\pm$ 1			0.44 $\pm$ 0.04
1015.6 $\pm$ 0.5		38 $\pm$ 6			1.2 $\pm$ 0.2
1018.6 $\pm$ 0.5		51 $\pm$ 6			1.6 $\pm$ 0.2
1025.5 $\pm$ 0.5		9.6 $\pm$ 1.9			0.30 $\pm$ 0.06
1031.0 $\pm$ 0.5		6.4 $\pm$ 1.9			0.20 $\pm$ 0.08
1035.4 $\pm$ 0.5		386 $\pm$ 64			12.0 $\pm$ 2.0
1043.0 $\pm$ 0.5		161 $\pm$ 32			5.0 $\pm$ 1.0
1052.1 $\pm$ 0.5		0.65 $\pm$ 0.65			0.02 $\pm$ 0.02
1055.8 $\pm$ 0.5		39 $\pm$ 6			1.2 $\pm$ 0.2
1063.3 $\pm$ 0.5		55 $\pm$ 7			1.7 $\pm$ 0.2
1071.2 $\pm$ 0.5		260 $\pm$ 65			8.0 $\pm$ 2.0
1080.2 $\pm$ 0.5		164 $\pm$ 33			5.0 $\pm$ 1.0
1081.9 $\pm$ 0.5		66 $\pm$ 33			2.0 $\pm$ 1.0
1090.4 $\pm$ 0.5		165 $\pm$ 33			5.0 $\pm$ 1.0
1093.4 $\pm$ 0.5		26 $\pm$ 7			0.8 $\pm$ 0.2
1096.8 $\pm$ 0.5		132 $\pm$ 33			4.0 $\pm$ 1.0
1103.3 $\pm$ 0.5		10 $\pm$ 3			0.3 $\pm$ 0.1
1106.1 $\pm$ 0.5					

¹⁸¹Ta
73

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1112.9±0.5		47 ± 3			1.4 ±0.1
1119.1±0.5		8 ± 2			0.24 ±0.06
1130.9±0.5		201 ± 34			6.0 ±0.1
1138.5±0.5		13 ± 3			0.4 ±0.1
1145.1±0.5		68 ± 14			2.0 ±0.4
1151.0±0.5		170 ± 34			5.0 ±1.0
1156.9±0.5		51 ± 10			1.5 ±0.3
1165.0±0.5		102 ± 20			3.0 ±0.6
1169.9±0.5		0.68± 0.68			0.02 ±0.02
1174.8±0.5		254 ± 55			7.4 ±1.6
1177.9±0.5		412 ± 69			12.0 ±2.0
1191.6±0.5		690 ±138			20.0 ±4.0
1203.5±0.6		21 ± 7			0.6 ±0.2
1208.1±0.6		24 ± 10			0.7 ±0.3
1211.8±0.6		17 ± 7			0.5 ±0.2
1216.0±0.6					
1218.5±0.6		35 ± 7			1.0 ±0.2
1226.6±0.6		119 ± 28			3.4 ±0.8
1233.0±0.6		7 ± 1.4			0.20 ±0.04
1239.7±0.6		25 ± 5			0.70 ±0.14
1246.6±0.6		247 ± 49			7.0 ±1.4
1251.1±0.6					
1259.0±0.6		213 ± 43			6.0 ±1.2
1263.0±0.6		50 ± 14			1.4 ±0.4
1268.0±0.6		7 ± 4			0.2 ±0.1
1275.7±0.6		114 ± 21			3.2 ±0.6
1280.0±0.6		4 ± 1			0.10 ±0.04
1283.2±0.6		29 ± 7			0.8 ±0.2
1286.7±0.6		14 ± 4			0.4 ±0.1
1293.0±0.6		144 ± 36			4.0 ±1.0
1299.7±0.6		187 ± 43			5.2 ±1.2
1307.0±0.7		14 ± 4			0.4 ±0.1
1312.1±0.7		109 ± 29			3.0 ±0.8
1316.9±0.7		87 ± 22			2.4 ±0.6
1323.5±0.7		15 ± 4			0.4 ±0.1
1328.4±0.7		255 ± 58			7.0 ±1.6
1332.0±0.7		255 ± 58			7.0 ±1.6
1335.0±0.7		183 ± 37			5.0 ±1.0
1342.8±0.7		7 ± 4			0.2 ±0.1
1348.7±0.7					
1352.0±0.7		11 ± 4			0.30 ±0.10
1356.0±0.7					
1361.0±0.7		369 ± 74			10.0 ±2.0
1363.0±0.7		148 ± 37			4.0 ±1.0
1371.8±0.7		37 ± 7			1.0 ±0.2
1376.7±0.7		134 ± 37			3.6 ±1.0
1388.0±0.7		60 ± 15			1.6 ±0.4
1391.5±0.7		112 ± 22			3.0 ±0.6
1397.9±0.7		224 ± 75			6.0 ±2.0

¹⁸²
⁷³Ta
[115 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 8200 \pm 600 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 1000 \pm 100 \text{ b}$$

$$S_0 = 1.0 \pm 0.5$$

RESONANCE PARAMETERS

$$I^{\pi} = 3^{-}$$

$$S_n = 6928 \pm 11 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
0.147±0.002	0.35±0.02	67 ±2	0.94±0.06
1.82 ±0.01	1.16±0.08	67 ±2	0.86±0.06
5.98 ±0.01	0.47±0.05	67 ±3	0.19±0.02
12.93 ±0.03	0.58±0.11		0.16±0.03
21.5 ±0.1	1.62±0.23		0.35±0.05
26.7 ±0.2	3.36±0.26		0.65±0.05
29.4 ±0.2	1.52±0.16		0.28±0.03
32.97 ±0.2	11.48±0.98		2.00±0.17
34.7 ±0.3			
49.5 ±0.3			
53.3 ±0.4			
58.3 ±0.4			
61.3 ±0.3			
69.3 ±0.4			
72.8 ±0.4			
75.8 ±0.4			
82.0 ±0.4			
88.0 ±0.5			

Isotope	Measurement	Reference	Author
Ta	Christiansen filters	ZN/A,26,391(71)	Koester
Ta	σ_y moxon rae	NIM,86,83(70)	Malik
Ta ¹⁸²	σ_c	NSE,33,16(68)	Stokes
Ta	σ_c	JNE,21,425(67)	Adib
Ta ¹⁸¹	activation	NYO-10175(64)	Arino
Ta ¹⁸¹	activation	PR,121,1158(61)	Sunyar
Ta ¹⁸¹	activation	NSE,8,378(60)	Lyon
Ta ¹⁸¹	activation	60VIENNA,63(60)	Maier-Leibnitz
Ta	σ_c	NSE,7,193(60)	Schmunk
Ta	pile osci.	JNE,12,32(60)	Tattersall
Ta ¹⁸²	activation	PR,97,1023(55)	Der Mateosian
Ta ¹⁸²	activation	PR,97,1007(55)	Murray
Ta ¹⁸²	activation	IDO-16238(55)	Smith
Ta	local osci.	PR,83,641(51)	Pomerance
Ta	pile osci.	PPS/A,63,1175(50)	Colmer
Ta	pile osci.	PR,80,342(50)	Harris
Ta ¹⁸¹	activation	PR,72,888(47)	Seren
Ta	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
Ta	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Ta ¹⁸¹	$\sigma_c \sigma_y$ (SI)	4.2-1398	BAP,18,96(73)	Hacken
Ta ¹⁸¹	σ_c	4.2-1398	PRIVATE COMM.(73)	Liou
Ta ¹⁸¹	σ_y (spectra)	4.3-200	NP/A,198,430(72)	Riehs
Ta ¹⁸¹	σ_y (spectra)	4.3-35	NP/A,132,161(69)	Hasson
Ta ¹⁸²	σ_c	0.147-88	NSE,33,16(68)	Stokes
Ta ¹⁸¹	polarization	4.3-10.3	PR,155,1330(67)	Stolovy
Ta ¹⁸¹	σ_c	30-1398	PRIVATE COMM.(66)	Garg
Ta ¹⁸¹	σ_c	4.3-200	61DUBNA,57(61)	Doil'nitsyn
Ta ¹⁸¹	σ_y (SI)	76.9-330	PR,120,2214(60)	Desjardins
Ta ¹⁸⁰	σ_c	0.43-5.96	ORNL-2718,26(59)	Block
Ta ¹⁸¹	$\sigma_c \bar{\sigma}_s \sigma_y$	4.3-98.8	NP,9,205(58)	Evans
Ta ¹⁸¹	σ_c	20.2-98.8	NP,9,198(58)	Firk
Ta ¹⁸⁰	σ_c	0.43-5.96	BAP,3,364(58)	Harvey
Ta ¹⁸¹	σ_c	14.0-147	PR,103,1778(56)	Fluharty
Ta ¹⁸¹	σ_c	10.2-197	AE,1,(5),55(56)	Radkevich
Ta ¹⁸¹	σ_c	4.3	PR,104,736(56)	Sailor
Ta ¹⁸¹	$\bar{\sigma}_s$	4.3	PR,104,1425(56)	Wood
Ta ¹⁸⁰	σ_c	0.43	PR,97,565(55)	Evans
Ta ¹⁸¹	σ_c	10.4-127	PR,99,10(55)	Harvey
Ta ¹⁸¹	σ_y	10.4-38.5	KAPL-1084(54)	Gaerttner
Ta ¹⁸¹	σ_c	4.3-39.4	PR,92,1509(53)	Christensen
Ta ¹⁸¹	σ_c	6.1-38.2	PR,92,702(53)	Melkonian
Ta ¹⁸¹	σ_c	4.1-37	PR,71,165(47)	Havens

⁷⁴W

THERMAL CROSS SECTIONS

$$\sigma_T = 18.5 \pm 0.5 \text{ b}$$

$$a_{coh} = 4.77 \pm 0.05 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 352 \pm 30 \text{ b}$$

$$R_T = 7.3 \pm 0.3 \text{ fm}$$

$$S_0 = 2.4 \pm 0.3$$

$$S_1 = 0.3 \pm 0.1$$

¹⁸⁰
⁷⁴W

THERMAL CROSS SECTIONS

$$\sigma_T^c = 3.5 \text{ b [140 day } ^{181}\text{W]}$$

RESONANCE PROPERTIES

$$I_T^c = 200 \text{ b}$$

$$R_T^c = 7.3 \pm 0.3 \text{ fm}$$

RESONANCE PARAMETERS

$I^n = 0^+$			
%Abn = 0.13			
$S_n = 6650 \pm 200 \text{ keV}$			
$E_0 \text{ (eV)}$	$\Gamma_n \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$	
15.9 $\pm$ 0.1	12.5 $\pm$ 1.5	3.0 $\pm$ 0.4	
49.3 $\pm$ 0.1	6.2 $\pm$ 0.7	0.88 $\pm$ 0.10	
62.7 $\pm$ 0.2	1.4 $\pm$ 0.2	0.18 $\pm$ 0.03	
75.2 $\pm$ 0.2	35 $\pm$ 2.0	4.0 $\pm$ 0.2	
87.4 $\pm$ 0.3	7.3 $\pm$ 0.5	0.78 $\pm$ 0.05	

The known resonance parameters contribute 3.5 b and 200 b to the thermal absorption cross section and absorption resonance integrals respectively.

THERMAL CROSS SECTIONS

$$\sigma_T = 20.7 \pm 0.5 \text{ b}$$

$$a_{coh} = 8.33 \pm 0.14 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T^c = 590 \pm 90 \text{ b}$$

$$R_T^c = 7.3 \pm 0.3 \text{ fm}$$

$$\langle D \rangle = 66 \pm 5 \text{ eV}$$

$$S_0 = 2.5 \pm 0.3$$

$$S_1 = 0.3 \pm 0.1$$

RESONANCE PARAMETERS

$$I^n = 0^\circ$$

$$\%Abn = 26.3$$

$$S_n = 6191.4 \pm 1.4 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_T (meV)	Γ_n^0 (meV)
Bound level			
4.16 ± 0.02	1.47 ± 0.03	50 ± 3	0.72 ± 0.02
21.2 ± 0.1	39 ± 1	62 ± 6	8.5 ± 0.2
114.4 ± 0.4	270 ± 10	60 ± 3	25.3 ± 0.9
212.8 ± 0.2	2.6 ± 0.3		0.18 ± 0.02
248.0 ± 0.2	960 ± 60		61.0 ± 3.8
341.6 ± 0.4	6.8 ± 1.0		0.37 ± 0.05
376.2 ± 0.4	140 ± 20	65 ± 13	7.2 ± 1.0
428.5 ± 0.3	260 ± 25	55 ± 7	12.6 ± 1.2
484.2 ± 0.3	460 ± 40	49 ± 7	20.9 ± 1.8
578.2 ± 0.4	270 ± 25	57 ± 7	11.2 ± 1.0
655.2 ± 0.5	140 ± 20	59 ± 7	5.5 ± 0.8
781.7 ± 0.6	12 ± 2		0.43 ± 0.07
862.8 ± 0.3	4.1 ± 1.5		0.14 ± 0.05
918.8 ± 0.4	345 ± 40		11.4 ± 1.3
947.3 ± 0.4	2000 ± 200		65.0 ± 6.5
1007.0 ± 0.4	510 ± 50		16.1 ± 1.6
1095.0 ± 0.5	1500 ± 200	69 ± 8	45.3 ± 6.0
1161.0 ± 0.6	484 ± 25		14.2 ± 0.7
1275.0 ± 0.6	39 ± 6		1.1 ± 0.2
1287.0 ± 0.7	90 ± 20		2.5 ± 0.6
1326.0 ± 0.7	25 ± 8		0.69 ± 0.22
1408.0 ± 0.7	130 ± 30		3.47 ± 0.80
1502.0 ± 0.8	440 ± 30	70 ± 10	11.4 ± 0.8
1514.0 ± 0.8	440 ± 60		11.3 ± 1.5
1582.0 ± 0.9	78 ± 15		2.0 ± 0.4
1646.0 ± 0.9	62 ± 15		1.53 ± 0.37
1772.0 ± 0.5	3000 ± 250		71.2 ± 5.9
1793.0 ± 0.5	250 ± 40		5.90 ± 0.95
1921.0 ± 2.0	60 ± 10		1.4 ± 0.2
2061.0 ± 0.7	1400 ± 150		30.8 ± 3.3
2104.0 ± 0.7	316 ± 25		6.9 ± 0.6
2180.0 ± 0.7	625 ± 50	50 ± 5	13.4 ± 1.1
2226.0 ± 0.7	760 ± 50	92 ± 9	16.1 ± 1.1
2328.0 ± 0.8	620 ± 60	86 ± 7	12.8 ± 1.2
2384.0 ± 0.8	850 ± 100	50 ± 6	17.4 ± 2.1

¹⁸²W
₇₄

E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n ⁰ (meV)
2412.0 ± 0.8	213 ± 30		4.34 ± 0.61
2530.0 ± 0.9	225 ± 30		4.47 ± 0.60
2576.0 ± 0.9	900 ± 100		17.7 ± 2.0
2607.0 ± 0.9	210 ± 30		4.1 ± 0.6
2790 ± 1	2850 ± 250		54.0 ± 4.7
2871 ± 1	253 ± 40		4.7 ± 0.8
2941 ± 1	295 ± 40		5.4 ± 0.7
3048 ± 1	1460 ± 150		26.5 ± 2.7
3119 ± 1	165 ± 30		3.0 ± 0.5
3203 ± 1.3	290 ± 30		5.1 ± 0.5
3257 ± 1.3	600 ± 80		10.5 ± 0.9
3306 ± 1.3	1565 ± 150		27.2 ± 2.6
3343 ± 1	170 ± 30		2.9 ± 0.5
3413 ± 1	2620 ± 300		44.9 ± 5.1
3494 ± 1	1710 ± 150		28.9 ± 2.5
3523 ± 2	510 ± 60		8.6 ± 1.0
3564 ± 2	430 ± 40		7.2 ± 0.7
3602 ± 2	1250 ± 150		20.8 ± 2.5
3786 ± 2	95 ± 20		1.54 ± 0.33
3846 ± 2	4600 ± 600		74.2 ± 9.7
3879 ± 2	1950 ± 250		31.3 ± 4.0
3975 ± 2	1675 ± 200		26.6 ± 3.2
3996 ± 2	290 ± 50		4.6 ± 0.8
4062 ± 2	1140 ± 175		17.9 ± 2.6
4212 ± 2	290 ± 30		4.5 ± 0.5
4266 ± 2	210 ± 30		3.2 ± 0.5
4313 ± 2	2000 ± 200		30.5 ± 3.1
4367 ± 2	85 ± 20		1.3 ± 0.3
4431 ± 2	2916 ± 250		43.8 ± 3.8
4492 ± 2	440 ± 50		6.6 ± 0.8
4715 ± 2	950 ± 100		13.8 ± 1.5
4832 ± 2	3000 ± 350		43.2 ± 5.0
4846 ± 2	153 ± 35		2.2 ± 0.5
4911 ± 2	1360 ± 200		19.4 ± 2.9
4961 ± 2	380 ± 50		5.4 ± 0.7
5138 ± 3	1113 ± 150		15.5 ± 2.1
5199 ± 3	5220 ± 400		72.4 ± 5.6
5435 ± 3	6300 ± 600		85.5 ± 8.1
5538 ± 3	575 ± 150		7.7 ± 2.0
5563 ± 3	700 ± 100		9.4 ± 1.3
5656 ± 3	14000 ± 2000		186.2 ± 26.6
5884 ± 3	385 ± 100		5.0 ± 1.3
6019 ± 3	240 ± 100		3.09 ± 1.29
6189 ± 3	4550 ± 400		57.8 ± 5.1
6259 ± 3	2590 ± 300		32.7 ± 3.8
6404 ± 4	3800 ± 400		47.5 ± 5.0
6514 ± 4	910 ± 150		11.3 ± 1.9
6536 ± 4	1890 ± 200		23.38 ± 2.47
6605 ± 4	380 ± 80		4.68 ± 0.98
6667 ± 4	4800 ± 500		58.8 ± 6.1
6732 ± 4	465 ± 100		5.7 ± 1.2
6743 ± 4	633 ± 100		7.7 ± 1.2

¹⁸²W
74

E ₀ (eV)	Γ _n (meV)	Γ _γ (meV)	Γ _n (meV)
6858 ± 4	1250 ± 150		15.1 ± 1.8
6961 ± 4	2800 ± 300		33.6 ± 3.6
7012 ± 4	590 ± 100		7.1 ± 1.2
7102 ± 4	485 ± 100		5.76 ± 1.19
7155 ± 4	2030 ± 300		24.0 ± 3.55
7243 ± 4	1080 ± 150		12.7 ± 1.8
7286 ± 4	344 ± 100		4.03 ± 1.17
7472 ± 4	3900 ± 300		45.1 ± 3.5
7552 ± 5	3350 ± 300		38.6 ± 3.5
7586 ± 5	540 ± 100		6.2 ± 1.2
7694 ± 5	3900 ± 300		44.5 ± 3.4
7745 ± 5	1235 ± 150		14.0 ± 1.7
7810 ± 5	3000 ± 250		33.95 ± 2.83
7834 ± 5	1300 ± 250		14.7 ± 2.8
8013 ± 5	1320 ± 200		14.8 ± 2.2
8192 ± 5	1640 ± 200		18.1 ± 2.2
8394 ± 5	1820 ± 250		19.9 ± 2.7
8506 ± 5	610 ± 150		6.6 ± 1.6
8533 ± 5	605 ± 150		6.55 ± 1.62
8725 ± 6	4480 ± 400		48.0 ± 4.3
8815 ± 6	1880 ± 250		20.0 ± 2.7
9005 ± 6	860 ± 150		9.1 ± 1.6
9231 ± 6	4050 ± 400		42.2 ± 4.2
9454 ± 6	3550 ± 450		36.5 ± 4.6
9472 ± 6	1250 ± 350		12.8 ± 3.6
9823 ± 7	2500 ± 250		25.2 ± 2.5
9896 ± 7	1640 ± 200		16.5 ± 2.0
9944 ± 7	660 ± 200		6.6 ± 2.0
9998 ± 7	3200 ± 600		32.0 ± 6.0
10025 ± 7	3300 ± 600		33.0 ± 6.0
10140 ± 7	1660 ± 200		16.5 ± 2.0
10260 ± 7	3720 ± 350		36.7 ± 3.5
10630 ± 8	1880 ± 250		18.2 ± 2.4
10900 ± 8	890 ± 300		8.5 ± 2.9
11000 ± 8	1835 ± 200		17.5 ± 1.9
11174 ± 8	1300 ± 250		12.3 ± 2.4
11310 ± 8	3150 ± 300		29.6 ± 2.8
11380 ± 8	6000 ± 600		56.3 ± 5.6
11560 ± 8	2555 ± 300		23.8 ± 2.8
11710 ± 9	3740 ± 350		34.6 ± 3.2
11780 ± 9	640 ± 150		5.9 ± 1.4
11820 ± 9	2740 ± 300		25.2 ± 2.8
11890 ± 9	3150 ± 300		28.9 ± 2.8
11910 ± 9	2540 ± 300		23.3 ± 2.8
12210 ± 9	1940 ± 300		17.6 ± 2.7
12361 ± 9	1100 ± 300		9.9 ± 2.7
12490 ± 10	3200 ± 300		28.6 ± 2.7
12540 ± 10	2860 ± 300		25.5 ± 2.7
12680 ± 10	2000 ± 300		17.8 ± 2.7
13057 ± 10	3050 ± 300		26.7 ± 2.6
13180 ± 10	5000 ± 700		43.6 ± 6.1
13253 ± 10	3300 ± 350		28.7 ± 3.0

THERMAL CROSS SECTIONS

$$\sigma_T = 10.2 \pm 0.3 \text{ b}$$

$$a_{coh} = 4.3 \pm 0.5 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 345 \pm 50 \text{ b}$$

$$R^T = 7.3 \pm 0.3 \text{ fm}$$

$$\langle D \rangle = 12 \pm 1 \text{ eV}$$

$$S_0 = 2.1 \pm 0.4$$

$$S_1 = 0.3 \pm 0.1$$

RESONANCE PARAMETERS

$$I'' = 1/2^-$$

$$\%Abn = 14.3$$

$$S_n = 7411.1 \pm 1.4 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
7.65±0.03	2.63± 0.15	1	70 ± 5	0.95 ± 0.06
27.05±0.03	63.0 ± 3.0	1	77 ± 6	12.2 ± 0.6
40.68±0.03	3.1 ± 0.6	1	68 ±30	0.51 ± 0.09
46.24±0.07	210 ± 6	1	69 ± 8	30.8 ± 1.4
47.8 ±0.04	57.5 ± 5.0	0	78 ±10	8.3 ± 0.7
65.34±0.03	3.3 ± 0.5	1	103 ±20	0.41 ± 0.05
101.1 ±0.1	120 ± 10	1	65 ±30	12 ± 1
103.9 ±0.1	4.1 ± 0.5			0.40 ± 0.05
138.0 ±0.1	4.5 ± 0.8		75 ±20	0.39 ± 0.06
144.2 ±0.1	47.5 ± 4.5	0	90 ±20	3.90 ± 0.35
154.4 ±0.1	205 ± 20	0	75 ± 8	16.5 ± 1.5
157.0 ±0.7	80 ± 12	1	120 ±30	6.4 ± 0.9
173.8 ±0.1	75 ± 8	1	90 ±30	5.7 ± 0.6
192.1 ±0.2	53 ± 6	1	70 ±30	3.8 ± 0.5
203.0 ±0.4	2.0 ± 0.5			8.14 ± 0.04
220.0 ±0.4	5.3 ± 0.7			0.36 ± 0.05
227.0 ±0.4	1.5 ± 0.3			1.0 ± 0.2
235.1 ±0.2	9.4 ± 1.2			0.62 ± 0.08
240.3 ±0.2	14.4 ± 3.0			0.92 ± 0.18
243.4 ±0.4	7 ± 2	1		0.45 ± 0.13
246.0 ±0.4	1.7 ± 0.3			0.11 ± 0.02
247.0 ±0.4	1.9 ± 0.4			0.12 ± 0.03
258.9 ±0.2	104 ± 14	0		6.46 ± 0.88
279.6 ±0.2	200 ± 20	1	77 ±10	12.0 ± 1.2
288.0 ±0.4	7.5 ± 2.0			0.44 ± 0.12
296.3 ±0.2	34 ± 4	1	99 ±26	2.0 ± 0.2
321.8 ±0.2	119 ± 16	1	98 ±26	6.64 ± 0.90
337.0 ±0.2	7.8 ± 1.2			0.42 ± 0.06
347.3 ±0.2	200 ± 18	1	95 ±19	10.8 ± 1.0
352.8 ±0.2	1.0 ± 0.6			0.054± 0.032
360.4 ±0.2	48 ± 6	1	70 ±12	2.52 ± 0.32
377.6 ±0.2	110 ± 23	1	78 ±22	5.7 ± 1.2
390.9 ±0.4	50 ± 8			2.6 ± 0.4
417.8 ±0.3	62 ± 12			3.0 ± 0.6
424.0 ±0.6	36 ± 6			1.8 ± 0.3
428.0 ±0.6	110 ± 30			5.3 ± 1.4

¹⁸³
74 W

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
459.0 ± 0.7	20 ± 3			0.94 ± 0.14
468.3 ± 0.7	3.0 ± 1.0			0.138 ± 0.046
479.0 ± 0.4	263 ± 30	[1]	65 ± 7	12.0 ± 1.4
492.7 ± 0.4	3.2 ± 0.3			0.14 ± 0.01
497.0 ± 0.7	1.0 ± 0.4			0.045 ± 0.016
511.0 ± 0.7	7.6 ± 0.4			0.34 ± 0.02
512.5 ± 0.4	1.5 ± 0.4			0.056 ± 0.018
533.0 ± 0.7	24.8 ± 7.0			1.08 ± 0.30
550.0 ± 0.4	108 ± 16			4.66
558.2 ± 0.4	120 ± 20			5.06 ± 0.82
567.7 ± 0.4	46 ± 10			1.94 ± 0.42
570.0 ± 0.7	88 ± 8	[0]		3.7 ± 0.4
587.9 ± 0.4	46 ± 6			1.90 ± 0.24
603.0 ± 0.4	116 ± 20			4.74 ± 0.82
608.3 ± 0.4	26 ± 4	[0]		1.1 ± 0.16
645.0 ± 0.7	840 ± 35		70 ± 7	33.1 ± 1.4
674.0 ± 0.7	188 ± 15	(1)	45 ± 6	7.2 ± 0.6
689.0 ± 0.7	540 ± 23		70 ± 6	20.6 ± 0.9
694.0 ± 0.8	65 ± 8	(0)	40 ± 6	2.5 ± 0.3
699.0 ± 0.8	360 ± 50	(1)	70 ± 8	13.6 ± 1.9
721.0 ± 0.8	1635 ± 300	(1)	90 ± 20	60.9 ± 11.2
752.0 ± 0.6	240 ± 40			8.76 ± 1.46
760.0 ± 0.7	142 ± 13	(0)	47 ± 8	5.15 ± 0.47
778				
790				
796				
801				
807.7 ± 0.6	40 ± 10			1.40 ± 0.36
852.1 ± 0.3	20 ± 6			0.68 ± 0.20
862.5 ± 0.3	80 ± 20			2.72 ± 0.68
867.3 ± 0.3	30 ± 16			1.02 ± 0.6
869.4 ± 0.3	180 ± 80			6.2 ± 2.8
894.0 ± 0.3	88 ± 16			3.0 ± 0.6
905				
925				
940.9 ± 0.4	80 ± 20			2.6 ± 0.6
949				
958				
981				
997				
1003				
1008				
1021				
1059 ± 1	26 ± 10			0.80 ± 0.30
1062 ± 1	74 ± 20			2.28 ± 0.62
1081				
1096				
1114 ± 1	42 ± 10			1.26 ± 0.30
1126				
1141 ± 1	680 ± 80			20.2 ± 2.4
1151 ± 1	54 ± 16			1.60 ± 0.48
1163				

¹⁸³
74 W

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
1176 ±1	54 ± 8			1.58 ± 0.24
1192				
1199				
1207				
1221				
1241 ±1	530 ± 70	1		15.04 ± 1.98
1270				
1286				
1313 ±1	230 ± 40			6.34 ± 1.10
1324				
1328				
1352				
1370 ±1	260 ± 60			7.02 ± 1.62
1381				
1392				
1396				
1442				
1451 ±1	52 ± 10			1.36 ± 0.26
1457				
1471				
1478				
1509				
1521 ±1	82 ± 16			2.0 ± 0.4
1539				
1556				
1567 ±1	60 ± 6			1.52 ± 0.30
1582				
1626 ±1	1.66 ± 16			4.2 ± 0.4
1631				
1663 ±1	160 ± 60			4.0 ± 1.4
1685 ±1	46 ± 14			1.12 ± 0.34
1688				
1710 ±1	400 ± 120			9.68 ± 2.90
1738 ±1	132 ± 30			3.2 ± 0.8
1754 ±1	94 ± 30			2.2 ± 0.8
1762				
1780				
1791				
1801				
1820 ±1	220 ± 50			5.16 ± 1.18
1836 ±1	440 ± 70			10.26 ± 1.64
1843				
1857 ±1	530 ± 60			12.30 ± 1.40
1866 ±1	300 ± 100			6.94 ± 2.32
1870 ±1	340 ± 120			7.86 ± 2.78
1904				
1919				
1948				
1955 ±1	168 ± 40			3.8 ± 1.0
1993 ±1	350 ± 70			7.84 ± 1.56
2012				
2040				

¹⁸³W
74

E ₀ (eV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
2061				
2080				
2093				
2116				
2144 ±1	400 ± 80			8.64 ± 1.72
2158 ±1	440 ± 80			9.48 ± 1.72
2167 ±1	460 ± 80			9.88 ± 1.72
2190				
2219 ±1	720 ±140			15.2 ± 3.0
2237 ±1	200 ±100			4.2 ± 2.0
2260 ±1	118 ± 50			2.48 ± 1.06
2281 ±1	240 ± 60			5.02 ± 1.26
2316 ±1	660 ±140			13.72 ± 2.90

¹⁸⁴W
74

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 1.8 \pm 0.2 \text{ b} \\ \sigma_{\gamma} &= 2.0 \pm 1.0 \text{ mb [1.7 min } ^{185}\text{W}] \\ a_{\text{coh}} &= 7.59 \pm 0.09 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 14 \pm 2 \text{ b} \\ R_{\gamma}^c &= 7.3 \pm 0.3 \text{ fm} \\ \langle D \rangle &= 95 \pm 7 \text{ eV} \\ S_0 &= 2.6 \pm 0.3 \\ S_1 &= 0.3 \pm 0.1\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$\% \text{Abn} = 30.7$$

$$S_n = 5749.7 \pm 3.1 \text{ keV}$$

E ₀ (eV)	gΓ _n (meV)	Γ _γ (meV)	gΓ _n ⁰ (meV)
Bound level			
101.7 ± 0.1	3.3 ± 0.3		0.33 ± 0.03
184.2 ± 0.1	1150 ± 50	57 ± 5	84.6 ± 3.7
242.0 ± 0.1	2.3 ± 1.8		0.15 ± 0.12
310.7 ± 0.3	75 ± 6	51 ± 9	4.26 ± 0.34
422.8 ± 0.3	45 ± 5		2.2 ± 0.2
683.0 ± 0.5	650 ± 50	78 ± 8	24.9 ± 1.9
703.7 ± 0.5	6.5 ± 1.0		0.25 ± 0.04
783.0 ± 0.7	21 ± 4		0.75 ± 0.14
799.3 ± 0.6	1680 ± 150	79 ± 8	59.4 ± 5.3
957.3 ± 0.4	1475 ± 150		47.7 ± 4.9
998.5 ± 0.4	87 ± 10		2.8 ± 0.3
1086.0 ± 0.5	3300 ± 200	95 ± 10	100 ± 6
1132.0 ± 0.5	340 ± 50		10.1 ± 1.5
1261.0 ± 0.6	1250 ± 100	63 ± 7	35.2 ± 2.8

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
1335.0 ± 0.7	18 ± 3		0.49 ± 0.08
1400.0 ± 0.7	3300 ± 200		88.2 ± 5.4
1424.0 ± 0.8	660 ± 100		17.5 ± 2.7
1514.0 ± 0.8	1400 ± 150		360 ± 3.9
1552.0 ± 0.9	68 ± 7		1.7 ± 0.2
1655.0 ± 0.9	260 ± 30		6.4 ± 0.7
1792.0 ± 0.5	1230 ± 150	65 ± 10	29.1 ± 3.5
1920.0 ± 0.6	240 ± 30		5.5 ± 0.7
2045.0 ± 0.6	1100 ± 100	60 ± 18	102.4 ± 8.8
2092.0 ± 0.7	4630 ± 400		101.2 ± 8.8
2211.0 ± 0.7	300 ± 30		6.4 ± 0.6
2252.0 ± 0.7	540 ± 40		11.4 ± 0.8
2411.0 ± 0.8	1200 ± 100		24.4 ± 2.0
2459.0 ± 0.8	600 ± 100		12.1 ± 2.0
2540.0 ± 0.9	630 ± 50		12.5 ± 1.0
2621.0	1290 ± 100		25.2 ± 2.0
2922 ± 1	2100 ± 200		38.9 ± 3.7
2982 ± 1	830 ± 90		15.2 ± 1.7
3133 ± 1	450 ± 60		8.04 ± 1.07
3182 ± 1	1000 ± 150		17.7 ± 2.7
3203 ± 1	2190 ± 200		38.7 ± 3.5
3232 ± 1	330 ± 30		5.8 ± 0.5
3457 ± 1	2280 ± 200		38.8 ± 3.4
3539 ± 1	1310 ± 150		22.0 ± 2.5
3596 ± 2	85 ± 20		1.4 ± 0.3
3736 ± 2	3225 ± 250		52.8 ± 4.1
3807 ± 2	4150 ± 400		67.3 ± 6.5
3941 ± 2	280 ± 50		4.5 ± 0.8
4008 ± 2	390 ± 100		6.2 ± 1.6
4186 ± 2	2560 ± 250		39.6 ± 3.9
4249 ± 2	1060 ± 150		16.3 ± 2.3
4547 ± 2	590 ± 100		8.8 ± 1.5
4614 ± 2	330 ± 60		4.9 ± 0.9
4802 ± 2	1850 ± 200		26.7 ± 2.9
4928 ± 2	1700 ± 250		24.2 ± 3.6
5053 ± 2	475 ± 70		6.7 ± 1.0
5090 ± 3	2800 ± 300		39.3 ± 4.2
5189 ± 3	1620 ± 200		22.5 ± 2.8
5807 ± 3	450 ± 75		5.9 ± 1.0
5884 ± 3	5140 ± 700		67.0 ± 9.1
6067 ± 3	395 ± 60		5.1 ± 0.8
6127 ± 3	11400 ± 2500		145.6 ± 31.9
6232 ± 3	960 ± 200		12.2 ± 2.5
6411 ± 4	220 ± 80		2.8 ± 1.0
6475 ± 4	750 ± 100		9.3 ± 1.2
6548 ± 4	680 ± 100		8.4 ± 1.2
6789 ± 4	990 ± 150		12.0 ± 1.8
6913 ± 4	370 ± 100		4.5 ± 1.2
6964 ± 4	970 ± 150		11.6 ± 1.8
7049 ± 4	6200 ± 700		73.9 ± 8.3
7122 ± 4	1570 ± 300		18.6 ± 3.6
7205 ± 4	435 ± 100		5.1 ± 1.2

¹⁸⁴
74 W

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
7303 ± 4	1840 ± 250		21.5 ± 2.9
7334 ± 4	840 ± 150		9.8 ± 1.8
7472 ± 5	6550 ± 600		75.8 ± 6.9
7552 ± 5	6200 ± 600		71.4 ± 6.9
7777 ± 5	1190 ± 250		13.5 ± 2.8
8167 ± 5	3650 ± 400		40.4 ± 4.4
8310 ± 5	1515 ± 250		16.6 ± 2.7
8458 ± 5	5350 ± 600		58.2 ± 6.5
8549 ± 5	5050 ± 500		54.6 ± 5.4
8603 ± 6	1140 ± 200		12.3 ± 2.2
8741 ± 6	1090 ± 200		11.7 ± 2.1
8889 ± 6	1880 ± 200		19.9 ± 2.1
8987 ± 6	1200 ± 250		12.7 ± 2.6
9046 ± 6	7700 ± 700		81.0 ± 7.4
9286 ± 6	2080 ± 250		21.6 ± 2.6
9372 ± 6	6430 ± 600		66.4 ± 6.2
9665 ± 7	595 ± 150		6.1 ± 1.5
9816 ± 7	1460 ± 350		14.7 ± 3.5
9843 ± 7	3320 ± 400		33.5 ± 4.0
10050 ± 7	5000 ± 500		49.9 ± 5.0
10250 ± 7	10300 ± 900		101.7 ± 9.0
10420 ± 7	1110 ± 250		10.9 ± 2.5
10680 ± 8	3360 ± 400		32.5 ± 3.9
10740 ± 8	920 ± 250		8.9 ± 2.4
11070 ± 8	9100 ± 1000		86.5 ± 9.5
11280 ± 8	3150 ± 400		29.7 ± 3.8
11370 ± 8	970 ± 250		9.1 ± 2.4
11450 ± 8	900 ± 250		8.4 ± 2.3
11650 ± 8	1140 ± 200		10.6 ± 1.9
11710 ± 9	6900 ± 700		63.8 ± 6.5
11820 ± 9	5450 ± 700		50.1 ± 6.4
11850 ± 9	9100 ± 1000		83.6 ± 9.2
12020 ± 9	1120 ± 350		10.2 ± 3.2
12170 ± 9	1340 ± 250		12.2 ± 2.3
12430 ± 9	2300 ± 250		20.6 ± 2.2
12660 ± 10	1545 ± 250		13.7 ± 2.2
13000 ± 10	4200 ± 400		36.8 ± 3.5
13080 ± 10	960 ± 250		8.4 ± 2.2
13200 ± 10	20000 ± 2500		174.1 ± 21.8
13360 ± 5	3400 ± 400		29.4 ± 3.5
13390 ± 5	3675 ± 500		31.8 ± 4.3
13480 ± 5	7000 ± 900		60.3 ± 7.8
13500 ± 5	420 ± 160		3.6 ± 1.4
13610 ± 5	780 ± 200		6.7 ± 1.7
13680 ± 5	1740 ± 250		14.9 ± 2.1
13930 ± 5	3600 ± 400		30.5 ± 3.4
14420 ± 5	11000 ± 1500		91.6 ± 12.5
14860 ± 6.1	6100 ± 700		50.0 ± 5.7
15070 ± 6	1390 ± 250		11.3 ± 2.0
15170 ± 6	2000 ± 250		16.2 ± 2.0
15250 ± 6	2250 ± 250		18.2 ± 2.0
15350 ± 6	1800 ± 250		14.5 ± 2.0

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
1335.0 ± 0.7	18 ± 3		0.49 ± 0.08
1400.0 ± 0.7	3300 ± 200		88.2 ± 5.4
1424.0 ± 0.8	660 ± 100		17.5 ± 2.7
1514.0 ± 0.8	1400 ± 150		360 ± 3.9
1552.0 ± 0.9	68 ± 7		1.7 ± 0.2
1655.0 ± 0.9	260 ± 30		6.4 ± 0.7
1792.0 ± 0.5	1230 ± 150	65 ± 10	29.1 ± 3.5
1920.0 ± 0.6	240 ± 30		5.5 ± 0.7
2045.0 ± 0.6	1100 ± 100	60 ± 18	102.4 ± 8.8
2092.0 ± 0.7	4630 ± 400		101.2 ± 8.8
2211.0 ± 0.7	300 ± 30		6.4 ± 0.6
2252.0 ± 0.7	540 ± 40		11.4 ± 0.8
2411.0 ± 0.8	1200 ± 100		24.4 ± 2.0
2459.0 ± 0.8	600 ± 100		12.1 ± 2.0
2540.0 ± 0.9	630 ± 50		12.5 ± 1.0
2621.0	1290 ± 100		25.2 ± 2.0
2922 ± 1	2100 ± 200		38.9 ± 3.7
2982 ± 1	830 ± 90		15.2 ± 1.7
3133 ± 1	450 ± 60		8.04 ± 1.07
3182 ± 1	1000 ± 150		17.7 ± 2.7
3203 ± 1	2190 ± 200		38.7 ± 3.5
3232 ± 1	330 ± 30		5.8 ± 0.5
3457 ± 1	2280 ± 200		38.8 ± 3.4
3539 ± 1	1310 ± 150		22.0 ± 2.5
3596 ± 2	85 ± 20		1.4 ± 0.3
3736 ± 2	3225 ± 250		52.8 ± 4.1
3807 ± 2	4150 ± 400		67.3 ± 6.5
3941 ± 2	280 ± 50		4.5 ± 0.8
4008 ± 2	390 ± 100		6.2 ± 1.6
4186 ± 2	2560 ± 250		39.6 ± 3.9
4249 ± 2	1060 ± 150		16.3 ± 2.3
4547 ± 2	590 ± 100		8.8 ± 1.5
4614 ± 2	330 ± 60		4.9 ± 0.9
4802 ± 2	1850 ± 200		26.7 ± 2.9
4928 ± 2	1700 ± 250		24.2 ± 3.6
5053 ± 2	475 ± 70		6.7 ± 1.0
5090 ± 3	2800 ± 300		39.3 ± 4.2
5189 ± 3	1620 ± 200		22.5 ± 2.8
5807 ± 3	450 ± 75		5.9 ± 1.0
5884 ± 3	5140 ± 700		67.0 ± 9.1
6067 ± 3	395 ± 60		5.1 ± 0.8
6127 ± 3	11400 ± 2500		145.6 ± 31.9
6232 ± 3	960 ± 200		12.2 ± 2.5
6411 ± 4	220 ± 80		2.8 ± 1.0
6475 ± 4	750 ± 100		9.3 ± 1.2
6548 ± 4	680 ± 100		8.4 ± 1.2
6789 ± 4	990 ± 150		12.0 ± 1.8
6913 ± 4	370 ± 100		4.5 ± 1.2
6964 ± 4	970 ± 150		11.6 ± 1.8
7049 ± 4	6200 ± 700		73.9 ± 8.3
7122 ± 4	1570 ± 300		18.6 ± 3.6
7205 ± 4	435 ± 100		5.1 ± 1.2

¹⁸⁴W
74

E_0 (eV)	g_n^+ (meV)	Γ_γ (meV)	g_n^0 (meV)
7303 ± 4	1840 ± 250		21.5 ± 2.9
7334 ± 4	840 ± 150		9.8 ± 1.8
7472 ± 5	6550 ± 600		75.8 ± 6.9
7552 ± 5	6200 ± 600		71.4 ± 6.9
7777 ± 5	1190 ± 250		13.5 ± 2.8
8167 ± 5	3650 ± 400		40.4 ± 4.4
8310 ± 5	1515 ± 250		16.6 ± 2.7
8458 ± 5	5350 ± 600		58.2 ± 6.5
8549 ± 5	5050 ± 500		54.6 ± 5.4
8603 ± 6	1140 ± 200		12.3 ± 2.2
8741 ± 6	1090 ± 200		11.7 ± 2.1
8889 ± 6	1880 ± 200		19.9 ± 2.1
8937 ± 6	1200 ± 250		12.7 ± 2.6
9046 ± 6	7700 ± 700		81.0 ± 7.4
9288 ± 6	2080 ± 250		21.6 ± 2.6
9372 ± 6	6430 ± 600		66.4 ± 6.2
9665 ± 7	595 ± 150		6.1 ± 1.5
9816 ± 7	1460 ± 350		14.7 ± 3.5
9843 ± 7	3320 ± 400		33.5 ± 4.0
10050 ± 7	5000 ± 500		49.9 ± 5.0
10250 ± 7	10300 ± 900		101.7 ± 9.0
10420 ± 7	1110 ± 250		10.9 ± 2.5
10680 ± 8	3360 ± 400		32.5 ± 3.9
10740 ± 8	920 ± 250		8.9 ± 2.4
11070 ± 8	9100 ± 1000		86.5 ± 9.5
11280 ± 8	3150 ± 400		29.7 ± 3.8
11370 ± 8	970 ± 250		9.1 ± 2.4
11450 ± 8	900 ± 250		8.4 ± 2.3
11650 ± 8	1140 ± 200		10.6 ± 1.9
11710 ± 9	6900 ± 700		63.8 ± 6.5
11820 ± 9	5450 ± 700		50.1 ± 6.4
12020 ± 9	9100 ± 1000		83.6 ± 9.2
12170 ± 9	1120 ± 350		10.2 ± 3.2
12430 ± 9	1340 ± 250		12.2 ± 2.3
12660 ± 10	2300 ± 250		20.6 ± 2.2
13000 ± 10	1545 ± 250		13.7 ± 2.2
13080 ± 10	4200 ± 400		36.8 ± 3.5
13200 ± 10	960 ± 250		8.4 ± 2.2
13360 ± 5	20000 ± 2500		174.1 ± 21.8
13390 ± 5	3400 ± 400		29.4 ± 3.5
13480 ± 5	3675 ± 500		31.8 ± 4.3
13500 ± 5	7000 ± 900		60.3 ± 7.8
13610 ± 5	420 ± 160		3.6 ± 1.4
13680 ± 5	780 ± 200		6.7 ± 1.7
13930 ± 5	1740 ± 250		14.9 ± 2.1
14420 ± 5	3600 ± 400		30.5 ± 3.4
14660 ± 6.1	11000 ± 1500		91.6 ± 12.5
15070 ± 6	6100 ± 700		50.0 ± 5.7
15170 ± 6	1390 ± 250		11.3 ± 2.0
15250 ± 6	3000 ± 250		16.2 ± 2.0
15350 ± 6	1250 ± 250		18.2 ± 2.0
	1800 ± 250		14.5 ± 2.0

184
74 W

E_0 (eV)	$g\Gamma_n$ (meV)	Γ_γ (meV)	$g\Gamma_n^0$ (meV)
15450 $\pm$ 7	9200 $\pm$ 1500		74.0 $\pm$ 12.1
15630 $\pm$ 7	19000 $\pm$ 2500		152.0 $\pm$ 20.0
15970 $\pm$ 7	11000 $\pm$ 2000		87.0 $\pm$ 15.8
16200 $\pm$ 7	3650 $\pm$ 400		28.7 $\pm$ 3.1
16320 $\pm$ 7	4000 $\pm$ 500		31.3 $\pm$ 3.9
16450 $\pm$ 7	1920 $\pm$ 300		15.0 $\pm$ 2.3

186
74 W

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 37.8 \pm 1.5 \text{ b}$$

$$a_{\text{coh}} = -1.19 \pm 0.05 \text{ fm}$$

RESONANCE PROPERTIES

$$I_\gamma = 500 \pm 35 \text{ b}$$

$$R_\gamma = 7.3 \pm 0.2 \text{ fm}$$

$$\langle D \rangle = 125 \pm 9 \text{ eV}$$

$$S_0 = 2.2 \pm 0.3$$

$$S_1 = 0.3 \pm 0.1$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\% \text{abn} = 28.6$$

$$S_n = 5466.1 \pm 1.4 \text{ keV}$$

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
18.84 $\pm$ 0.02	287 $\pm$ 5	50 $\pm$ 5	65.6 $\pm$ 1.1
170.7 $\pm$ 0.1	27 $\pm$ 3	65 $\pm$ 20	2.1 $\pm$ 0.2
217.5 $\pm$ 0.2	500 $\pm$ 30	62 $\pm$ 6	33.9 $\pm$ 2.0
286.7 $\pm$ 0.3	30 $\pm$ 5		1.8 $\pm$ 0.3
405.7 $\pm$ 0.3	86 $\pm$ 8	62 $\pm$ 15	4.3 $\pm$ 0.4
509.4 $\pm$ 0.3	82 $\pm$ 10	49 $\pm$ 12	3.6 $\pm$ 0.4
541.0 $\pm$ 0.4	490 $\pm$ 50	65 $\pm$ 8	21.1 $\pm$ 1.7
662.6 $\pm$ 0.4	650 $\pm$ 35		25.3 $\pm$ 1.4
720.0 $\pm$ 0.5	2150 $\pm$ 200		80.1 $\pm$ 7.5
831.0 $\pm$ 0.3	26 $\pm$ 4		0.90 $\pm$ 0.14
963.4 $\pm$ 0.4	1060 $\pm$ 100	72 $\pm$ 10	34.2 $\pm$ 3.2
1071.0 $\pm$ 0.5	515 $\pm$ 60	61 $\pm$ 7	15.7 $\pm$ 1.8
1121.0 $\pm$ 0.5	400 $\pm$ 40		12.0 $\pm$ 1.2
1187.0 $\pm$ 0.6	840 $\pm$ 80		24.4 $\pm$ 2.3
1418.0 $\pm$ 0.7	100 $\pm$ 20		2.7 $\pm$ 0.5
1500.0 $\pm$ 0.8	1250 $\pm$ 100		32.3 $\pm$ 2.6
1795.0 $\pm$ 0.5	30 $\pm$ 8		0.71 $\pm$ 0.19
1933.0 $\pm$ 0.6	780 $\pm$ 80	60 $\pm$ 11	17.7 $\pm$ 1.8
2025.0 $\pm$ 0.6	550 $\pm$ 65		12.2 $\pm$ 1.4
2105.0 $\pm$ 0.7	150 $\pm$ 35		3.3 $\pm$ 0.8
2349.0 $\pm$ 0.8	200 $\pm$ 30		4.1 $\pm$ 0.6
2515.0 $\pm$ 0.9	700 $\pm$ 75		14.0 $\pm$ 1.5
2590.0 $\pm$ 0.9	1030 $\pm$ 100		20.2 $\pm$ 2.0

¹⁸⁶
74 W

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
2659 ± 1	4850 ± 300		94.1 ± 5.8
2779 ± 1	430 ± 70		8.2 ± 1.3
2976 ± 1	114 ± 30		2.1 ± 0.6
3039 ± 2	11150 ± 1200		202.3 ± 21.8
3158 ± 1	2400 ± 200		42.7 ± 3.6
3312 ± 1	850 ± 100		14.8 ± 1.7
3423 ± 1	3200 ± 300		54.5 ± 5.1
3541 ± 2	500 ± 60		8.4 ± 1.0
3713 ± 2	165 ± 50		2.7 ± 0.8
3768 ± 2	1560 ± 150		25.4 ± 2.4
3871 ± 2	3250 ± 300		52.2 ± 4.8
3963 ± 2	700 ± 70		11.1 ± 1.1
4165 ± 2	1530 ± 150		23.7 ± 2.3
4221 ± 2	2760 ± 250		42.5 ± 3.9
4395 ± 2	1900 ± 200		28.7 ± 3.0
4540 ± 2	2240 ± 200		33.3 ± 3.0
4805 ± 2	6050 ± 300		87.3 ± 4.3
4976 ± 2.4	450 ± 120		6.4 ± 1.7
5158 ± 2.5	2700 ± 250		37.6 ± 3.5
5282 ± 2.7	415 ± 60		5.7 ± 0.8
5383 ± 2.7	1060 ± 150		14.5 ± 2.0
5402 ± 2.7	540 ± 60		7.4 ± 0.8
5667 ± 2.9	5300 ± 400		70.4 ± 5.3
5777 ± 3.0	5200 ± 400		68.4 ± 5.3
6293 ± 3	1350 ± 150		17.0 ± 1.9
6386 ± 4	1750 ± 200		21.9 ± 2.5
6489 ± 4	5075 ± 400		63.0 ± 5.0
6698 ± 4	245 ± 60		3.0 ± 0.7
6754 ± 4	4100 ± 350		49.9 ± 4.3
6949 ± 4	1100 ± 150		13.2 ± 1.8
6968 ± 4	1780 ± 180		21.3 ± 2.2
7114 ± 4	580 ± 90		6.9 ± 1.1
7176 ± 4	1400 ± 150		16.5 ± 1.8
7324 ± 4	680 ± 100		7.95 ± 1.17
7472 ± 4	5500 ± 500		63.6 ± 5.8
7634 ± 5	1740 ± 200		19.9 ± 2.3
7712 ± 5	2360 ± 250		26.9 ± 2.9
7844 ± 5	1020 ± 200		11.3 ± 2.3
7978 ± 5	1050 ± 150		11.8 ± 1.7
8132 ± 5	780 ± 100		8.7 ± 1.1
8295 ± 5	2600 ± 300		28.6 ± 3.3
8347 ± 5	880 ± 200		9.6 ± 2.2
8625 ± 6	875 ± 175		9.4 ± 1.8
8669 ± 6	640 ± 160		6.9 ± 1.7
9177 ± 6	4100 ± 400		42.8 ± 4.2
9201 ± 6	270 ± 100		2.8 ± 1.0
9286 ± 6	8500 ± 900		88.2 ± 9.3
9410 ± 6	9100 ± 900		93.8 ± 9.3
9542 ± 6	3000 ± 600		30.7 ± 6.1
9587 ± 6	27300 ± 3000		278.8 ± 30.6
9843 ± 7	2350 ± 250		23.7 ± 2.5
10270 ± 7	2080 ± 300		20.5 ± 3.0

186
74 W

E_0 (eV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
10350 ± 7	8300 ± 900		81.6 ± 8.9
10580 ± 7	1060 ± 250		10.3 ± 2.4
10630 ± 8	2970 ± 400		28.8 ± 3.9
10770 ± 8	3500 ± 400		33.7 ± 3.85
10850 ± 8	11000 ± 1500		105.6 ± 14.4
11750 ± 9	3600 ± 400		33.2 ± 3.7
11870 ± 9	1140 ± 400		10.5 ± 3.7
12310 ± 9	8000 ± 1500		72.1 ± 13.5
12410 ± 10	11150 ± 2000		100.1 ± 18.0
12590 ± 10	4200 ± 1000		37.4 ± 8.9
12620 ± 10	8000 ± 1700		71.2 ± 15.1
13200 ± 10	3100 ± 450		27.0 ± 3.9
13320 ± 11	2050 ± 500		17.8 ± 4.3
13570 ± 5.4	5900 ± 900		50.7 ± 7.7
14020 ± 5.6	3600 ± 600		30.4 ± 5.1
15200 ± 6.4	8150 ± 1200		66.1 ± 9.7
15440 ± 6.6	6100 ± 1500		49.1 ± 12.1
15480 ± 6.6	5850 ± 1500		47.0 ± 12.1
15650 ± 6.7	1900 ± 3000		151.9 ± 24.0
15720 ± 6.7	2775 ± 600		22.1 ± 4.8
16490 ± 7.2	8700 ± 1500		67.8 ± 11.7
16630 ± 7.3	9700 ± 1500		75.2 ± 11.6
16930 ± 7	8000 ± 1200		61.5 ± 9.2
17060 ± 8	1500 ± 600		11.5 ± 4.6
17300 ± 8	5900 ± 1000		44.9 ± 7.6
17340 ± 8	1250 ± 400		9.5 ± 3.0

187
74 W
[23.9 hr]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 64 \pm 10 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 2760 \pm 550 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
μ^{186}	activation	IN-1317,53(70)	Hogg
$\mu^{182,183,184,186}$	diffraction	YF,10,328(69)	Alexandrov
μ	Christiansen filters	ZP,219,300(69)	Koester
μ^{186}	activation	PRIVATE COMM.(67)	Dample
$\mu, \mu^{182-184,186}$	σ_y	NSE,26,487(66)	Friesenhahn
$\mu^{186,187}$	activation	ORNL-4013,5(66)	Gillette
μ^{184}	activation	BAP,8,71(63)	Kramer
μ^{184}	activation	NP,36,542(62)	Mangal
$\mu^{184,186}$	activation	NSE,8,378(60)	Lyon
μ	σ_c	NSE,7,193(60)	Schmunk
μ	pile osci.	JNE,12,32(60)	Tattersall
$\mu^{180,182-184,186}$	pile osci.	PR,88,412(52)	Pomerance
μ^{187}	activation	PR,84,240(51)	Lindner
μ	local osci.	PR,83,641(51)	Pomerance
μ	diffraction	PR,81,527(51)	Shull
μ	pile osci.	PPS/A,63,1175(50)	Colmer
μ	pile osci.	PR,80,342(50)	Harris
$\mu^{184,186}$	activation	PR,72,888(47)	Seren
μ	$\bar{\sigma}_s$ (7.8 b)	PRS/A,162,127(37)	Goldhaber
μ	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
μ^{182}	$\sigma_c \sigma_y$ (SI)	21-13253	CU-293(71)	Camarda
μ^{184}	$\sigma_c \sigma_y$ (SI)	102-16450	CU-293(71)	Camarda
μ^{186}	$\sigma_c \sigma_y$ (SI)	19-17340	CU-293(71)	Camarda
μ^{182}	$\sigma_c \sigma_y$	212-3598	NSE,37,137(69)	Bartolome
μ^{183}	$\sigma_c \sigma_y$	154-13077	NSE,37,137(69)	Bartolome
μ^{184}	$\sigma_c \sigma_y$	165-19701	NSE,37,137(69)	Bartolome
μ^{186}	$\sigma_c \sigma_y$	171-19914	NSE,37,137(69)	Bartolome
μ^{183}	σ_y (spectra)	7-101	BAP,13,1421(68)+	Beer
μ^{182}	σ_c	4.2	PRIVATE COMM.(67)	Ideno
μ^{183}	σ_c	7.6	PRIVATE COMM.(67)	Ideno
μ^{186}	activation	18.8	PRIVATE COMM.(66)	Dample
μ^{182}	σ_y	0.01-10	NSE,26,487(66)	Friesenhahn
μ^{183}	σ_y	0.01-10	NSE,26,487(66)	Friesenhahn
μ^{184}	σ_y	0.01-10	NSE,26,487(66)	Friesenhahn
μ^{186}	σ_y	0.01-10	NSE,26,487(66)	Friesenhahn
μ^{184}	σ_c	102-2090	NSE,25,31(66)	Khan
μ^{182}	$\sigma_c \sigma_y$	98-1100	ORNL-3924,31(65)	Block
μ^{183}	$\sigma_c \sigma_y$	40.7-392	ORNL-3924,31(65)	Block
μ^{184}	$\sigma_c \sigma_y$	102.1-1930	ORNL-3924,31(65)	Block
μ^{186}	$\sigma_c \sigma_y$	111.3-245	ORNL-3924,31(65)	Block
μ^{180}	σ_c	15.9-87.4	ORNL-3924,30(65)	Jung
μ^{182}	σ_y	1281-4005	ORNL-3778,53(64)	Block
μ^{183}	σ_y	419.1-2658	ORNL-3778,53(64)	Block
μ^{184}	σ_y	2053-4025	ORNL-3778,53(64)	Block
μ^{180}	σ_y	2360-3985	ORNL-3778,53(64)	Block

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
μ^{182}	σ_t	4.16-21.09	ORNL-3582,58(64)	Paya
μ^{183}	σ_t	7.67-27.08	ORNL-3582,58(64)	Paya
μ^{186}	σ_t	18.84	ORNL-3582,58(64)	Paya
μ^{180}	σ_γ	15.8-75.2	PRIVATE COMM.(64)	Russell
μ^{182}	σ_γ	4.14-487.3	PRIVATE COMM.(64)	Russell
μ^{183}	σ_γ	7.65-460.0	PRIVATE COMM.(64)	Russell
μ^{184}	σ_γ	102.2-424.7	PRIVATE COMM.(64)	Russell
μ^{186}	σ_γ	18.8-512.5	PRIVATE COMM.(64)	Russell
μ^{180}	$\sigma_\gamma(\text{spectra})$	15.9-75	PR,132,1640(63)	Bollinger
μ^{183}	$\sigma_\gamma(\text{spectra})$	7.6-65	PR,132,1640(63)	Bollinger
μ^{183}	$\sigma_\gamma(\text{spectra})$	7.6-103	ZET,45,875(63)	Ignatiev
μ^{183}	σ_t	7.62	CR,255,1913(62)	Le Pipec
μ^{182}	σ_t	27.05-157.5	JPR,21,426(60)	Corge
μ	σ_γ	114-5880	CR,249,413(59)	Corge
μ^{182}	σ_t	114	NP,12,552(59)	Firk
μ^{183}	σ_t	27.11-192	NP,12,552(59)	Firk
μ^{184}	σ_t	101.5-185	NP,12,552(59)	Firk
μ^{186}	σ_t	171	NP,12,552(59)	Firk
μ^{183}	$\sigma_\gamma(\text{spectra})$	7.6-66	PRL,2,505(59)	Hughes
μ^{183}	$\sigma_\gamma(\text{spectra})$	7.62-65.7	CR,248,2330(59)	Huynh
μ^{182}	$\sigma_t \bar{\sigma}_s \sigma_\gamma$	4.14-114	NP,12,563(59)	Waters
μ^{183}	$\sigma_t \bar{\sigma}_s \sigma_\gamma$	7.62-100.8	NP,12,563(59)	Waters
μ^{186}	$\sigma_t \bar{\sigma}_s \sigma_\gamma$	18.8	NP,12,563(59)	Waters
μ^{183}	σ_t	7.62-46.6	BAP,3,19(58)+	Chrien
μ^{182}	σ_t	4.14-384	BAP,1,187(56)+	Schwartz
μ^{183}	σ_t	27.1-287	BAP,1,187(56)+	Schwartz
μ^{184}	σ_t	185-316	BAP,1,187(56)+	Schwartz
μ^{186}	σ_t	18.8-412	BAP,1,187(56)+	Schwartz
μ^{182}	σ_t	4.15-21.5	PR,84,869(51)	Selove
μ^{183}	σ_t	7.8-49	PR,84,869(51)	Selove
μ^{186}	σ_t	19.5-225	PR,84,869(51)	Selove
μ	σ_t	4.0-18.0	PR,71,165(47)	Havens

⁷⁵Re

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 88 \pm 4 \text{ b} \\ \bar{\sigma}_a &= 11.3 \pm 0.5 \text{ b} \\ a_{coh} &= 9.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 830 \pm 50 \text{ b} \\ R' &= 8.7 \pm 0.3 \text{ fm} \\ S_0 &= 2.7 \pm 0.2 \\ S_1 &< 0.3\end{aligned}$$

¹⁸⁵
⁷⁵Re

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 112 \pm 3 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 1730 \pm 70 \text{ b} \\ \langle D \rangle &= 3.3 \pm 0.3 \text{ eV} \\ S_0 &= 2.3 \pm 0.7 \\ S_1 &< 0.3\end{aligned}$$

RESONANCE PARAMETERS

$$I'' = 5/2^+$$

$$\chi_{abn} = 37.5$$

$$S_n = 6179.0 \pm 1.5 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
-6.75				6.16 $\pm$ 0.77
2.156 $\pm$ 0.004	3.3 $\pm$ 0.3	3	54.9 $\pm$ 0.9	2.25 $\pm$ 0.20
5.92 $\pm$ 0.02	0.22 $\pm$ 0.01	2	69 $\pm$ 10	0.091 $\pm$ 0.003
7.24 $\pm$ 0.04	1.39 $\pm$ 0.03	3	55 $\pm$ 3	0.52 $\pm$ 0.01
11.88 $\pm$ 0.03	0.80 $\pm$ 0.05		61 $\pm$ 12	0.23 $\pm$ 0.02
12.87 $\pm$ 0.04	0.79 $\pm$ 0.04		68 $\pm$ 8	0.22 $\pm$ 0.01
14.65 $\pm$ 0.05	0.73 $\pm$ 0.04		56 $\pm$ 13	0.19 $\pm$ 0.01
21.3 $\pm$ 0.1	5.2 $\pm$ 0.3		51 $\pm$ 4	1.12 $\pm$ 0.06
21.9 $\pm$ 0.1	0.44 $\pm$ 0.02			0.094 $\pm$ 0.004
26.6 $\pm$ 0.1	0.62 $\pm$ 0.05			0.12 $\pm$ 0.01
27.2 $\pm$ 0.1	0.56 $\pm$ 0.02			0.107 $\pm$ 0.003
29.5 $\pm$ 0.2	0.50 $\pm$ 0.08			0.092 $\pm$ 0.05
32.6 $\pm$ 0.2	32 $\pm$ 2		51 $\pm$ 10	5.6 $\pm$ 0.4
36.6 $\pm$ 0.1	0.90 $\pm$ 0.04			0.15 $\pm$ 0.07
41.6 $\pm$ 0.1	11.4 $\pm$ 0.6			1.77 $\pm$ 0.09
45.4 $\pm$ 0.2	0.62 $\pm$ 0.03			0.092 $\pm$ 0.005
47.8 $\pm$ 0.2	0.85 $\pm$ 0.08			0.12 $\pm$ 0.01
50.4 $\pm$ 0.2	15.7 $\pm$ 0.7		51 $\pm$ 3	2.21 $\pm$ 0.10
51.5 $\pm$ 0.3	28.0 $\pm$ 1.4		51 $\pm$ 4	3.90 $\pm$ 0.19
55.1 $\pm$ 0.2	7.4 $\pm$ 0.6		54 $\pm$ 9	1.0 $\pm$ 0.1
58.5 $\pm$ 0.2	20 $\pm$ 2			2.6 $\pm$ 0.3
63.0 $\pm$ 0.2	4.0 $\pm$ 0.5			0.50 $\pm$ 0.06

¹⁸⁵Re
75

E_0 (eV)	$2g_n^2$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)
66.7 ±0.2	1.1 ±0.1			0.13 ±0.01
70.7 ±0.2	9.8 ±0.2			1.16 ±0.03
74.7 ±0.4	10.0 ±3.0			1.16 ±0.35
81.0 ±0.3	8.8 ±1.0			0.98 ±0.11
87.1 ±0.3	14 ±2			1.5 ±0.2
89.6 ±0.3	1.3 ±0.2			0.14 ±0.02
93.4 ±0.4				
95.6 ±0.5	5 ±1			0.51 ±0.10
98.6 ±0.4	8.5 ±0.6			0.86 ±0.06
100.8				
100.9 ±0.5	3.6 ±1.0			0.36 ±0.10
101.0 ±0.4	6.2 ±0.6			0.62 ±0.06
106.9				
113.7				
128.6				
133.5				
134.4				
138.8				
144.5				
148.1				
152.0				
154.8				
159.6				
164.6				
169.8				
185.6				
188.2				
201.4				
207.6				
214.7				
222.0				
230.1				
238.5				
240.2				
243.3				
249.4				
264.4				
267.6				
274.6				
282.0				
288.2				
291.0				
295.6				
298.0				
301.9				
302.8				
307.3				
312.9				
345.6				
351.9				
352.8				
356.9				

¹⁸⁵
₇₅Re

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
359.7				
362.6				
364.5				
371.4				
380.2				
394.7				
396.2				
400.6				
402.9				
405.1				
408.9				
411.2				
419.9				
432.2				
444.1				
448.9				
452.0				
462.5				
465.2				
473.3				
478.6				
486.0				
492.0				
498.6				
502.8				

¹⁸⁷
₇₅Re

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_\gamma &= 74 \pm 4 \text{ b} \\ \sigma_\gamma &= 73 \pm 4 \text{ b [18.7 min } ^{188}\text{Re}^{\text{m}}] \\ \sigma_\gamma &= 1.6 \pm 0.3 \text{ b [16.7 hr } ^{188}\text{Re}^{\text{g}}]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 300 \pm 20 \text{ b} \\ \langle D \rangle &= 3.8 \pm 0.4 \text{ eV} \\ S_0 &= 1.9 \pm 0.5 \\ S_1 &< 0.3\end{aligned}$$

RESONANCE PARAMETERS

$$I^\pi = 5/2^+$$

$$\% \text{Abn} = 62.5$$

$$S_n = 5873.4 \pm 1.3 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
-2.1				2.00 $\pm$ 0.21
4.416 $\pm$ 0.008	0.371 $\pm$ 0.004	3	51 $\pm$ 4	0.18 $\pm$ 0.02
11.14 $\pm$ 0.03	2.10 $\pm$ 0.04	2	61 $\pm$ 3	0.63 $\pm$ 0.01
16.07 $\pm$ 0.05	0.660 $\pm$ 0.014		59 $\pm$ 9	0.165 $\pm$ 0.003

¹⁸⁷
75 Re

E ₀ (eV)	2gΓ _n (meV)	J	Γ _γ (meV)	2gΓ _n ⁰ (meV)
17.56 ±0.06	2.07 ± 0.04			0.49 ±0.10
18.54 ±0.06	0.74 ± 0.06		60 ±10	0.17 ±0.01
24.9 ±0.1	0.131± 0.010			0.0263±0.002
32.0 ±0.1	9.6 ± 0.4		74 ± 7	1.7 ±0.07
34.0 ±0.1	1.02 ± 0.04		51 ±14	0.175 ±0.007
39.5 ±0.1	11.9 ± 0.8			1.90 ±0.12
46.9 ±0.2	0.10 ± 0.01			0.015 ±0.002
47.5 ±0.2	4.5 ± 0.5			0.65 ±0.07
53.5 ±0.3	6.0 ± 0.2		57 ± 6	0.82 ±0.03
59.0 ±0.2	2.2 ± 0.3			0.27 ±0.04
61.1 ±0.2	23 ± 2		61 ± 6	2.9 ±0.3
63.7 ±0.3	2.1 ± 0.2			0.26 ±0.03
69.5 ±0.2	26.7 ± 0.8		60 ± 6	3.20 ±0.10
73.8 ±0.3	70 ± 4		49 ± 4	8.1 ±0.5
75.0 ±0.3	28 ± 3		63 ±15	3.2 ±0.3
78.0 ±0.3	1.8 ± 0.2			0.20 ±0.02
79.0 ±0.3	2.8 ± 0.2		79 ±50	0.31 ±0.02
85.1 ±0.3	9.4 ± 0.4		65 ±12	1.02 ±0.04
87.6 ±0.3	4.0 ± 1.0			0.43 ±0.11
91.6 ±0.3	2.0 ± 0.2			0.21 ±0.02
95.9 ±0.5	72 ±10			7.4 ±1.0
99.3 ±0.5	1.6 ± 0.3			0.16 ±0.03
106.2 ±0.5				
106.6				
109.3 ±0.5				
114.5				
116.2				
121.7				
127.2				
129.6				
131.7				
136.7				
141.3				
143.8				
147.3				
151.1				
156.1				
160.9				
172.5				
178.8				
181.0				
184.5				
204.6				
212.7				
224.1				
237.1				
244.0				
251.3				
265.5				
258.5				
268.0				
292.3				

¹⁸⁷
₇₅Re

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^2$ (meV)
308.8				
323.4				
325.6				
331.7				
334.5				
343.8				
365.5				
375.1				
382.3				
387.9				
402.1				
413.6				
419.5				
426.0				
428.0				
439.8				
448.5				
460.2				
490.5				
493.5				

¹⁸⁸
₇₅Re

(17 hr)

THERMAL CROSS SECTIONS

$$\sigma_\gamma < 2 \text{ b (150 day } ^{188}\text{Re)}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Re	diffraction	ACR, A28, 357(72)	Bacon
Re	Σ_a	PRIVATE COMM. (70)	Kolotyi
Re, Re ^{185, 187}	σ_y	JNE, 22, 191(68)	Friesenhahn
Re ^{185, 187}	activation	66MASH, 1, 171(65)	Karam
Re ¹⁸⁷	isom. ratio	KFI, 14, 85(65)	Kardon
Re ^{185, 187}	activation	ANS, 9, 248(65)	Sher
Re ¹⁸⁷	isom. ratio	TID-22165(65)	Simons
Re ^{185, 187}	σ_a	AE, 19, 250(65)	Vertebnyi
Re ¹⁸⁷	isom. ratio	64PARIS, 2, 703(64)	Gulyas
Re ¹⁸⁷	isom. ratio	PR/B, 136, 18(64)	Takahashi
Re ^{185, 187}	activation	NSE, 8, 378(60)	Lyon
Re ¹⁸⁸	activation	JIN, 3, 157(56)	Smith
Re ^{185, 187}	isom. ratio	ZH/A, 217(53)	Fisshersfeld
Re ^{185, 187}	activation	AO-402668(53)	Karam
Re	σ_a	PR, 92, 702(53)	Mellonian
Re ^{185, 187}	absorption	PR, 88, 412(52)	Pomerance
Re	local osci.	PR, 83, 641(51)	Pomerance
Re ^{185, 187}	activation	PR, 72, 888(47)	Seren
Re	σ_a	PR, 48, 265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Re	σ_a	3-300	NSI, 9, 261(72)	Ideno
Re ¹⁸⁵	σ_a, σ_y			
Re ¹⁸⁷	σ_y (spectra)	2.2-503	JNE, 22, 191(68)	Friesenhahn
Re ¹⁸⁷	σ_a, σ_y			
Re ¹⁸⁵	σ_y (spectra)	4.4-494	JNE, 22, 191(68)	Friesenhahn
Re ¹⁸⁵	Σ_a	2.2	HP/A, 97, 657(67)	Poortmans
Re ¹⁸⁷	polarization	2.2-12.9	PR, 155, 1330(67)	Stolovy
Re ¹⁸⁷	polarization	4.4-11.2	PR, 155, 1330(67)	Stolovy
Re ¹⁸⁵	σ_a	2.2-21.5	AE, 19, 250(65)	Vertebnyi
Re ¹⁸⁷	σ_a	4.4-18.5	AE, 19, 250(65)	Vertebnyi
Re	σ_a	2.2-108.0	AE, 19, 250(65)	Vertebnyi
Re	σ_a	2.2-123	PRIVATE COMM. (59)	Chrien
Re ¹⁸⁷	σ_a	11.2-115	PRIVATE COMM. (59)	Chrien
Re	σ_a	2.2-12.8	PR, 100, 1338(55)	Igo
Re	σ_a	6.1-38.2	PR, 92, 702(53)	Mellonian

⁷⁶Os

THERMAL CROSS SECTIONS

$$\sigma_T = 15.3 \pm 0.7 \text{ b}$$

$$a_{coh} = 10.7 \text{ fm}$$

RESONANCE PROPERTIES

$$J_T = 210 \pm 10 \text{ b}$$

$$R^2 = 8.4 \pm 0.4 \text{ fm}$$

$$S_0 = 2.2 \pm 0.5$$

¹⁸⁴
⁷⁶Os

THERMAL CROSS SECTIONS

$$\sigma_T = 3000 \pm 150 \text{ b}$$

$$\sigma_a < 10 \text{ mb}$$

¹⁸⁶
⁷⁶Os

THERMAL CROSS SECTIONS

$$\sigma_a < 0.1 \text{ mb}$$

¹⁸⁷₇₆Os

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 336 \pm 17 \text{ b} \\ \sigma_a &< 0.1 \text{ mb} \\ \sigma_c &= 344 \pm 12 \text{ b}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 890 \pm 100 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 1/2^-$$

$$2A\text{bn} = 1.6$$

$$S_n = 7989.0 \pm 1.2 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	$2g\Gamma_n^0$ (meV)
9.43 ± 0.1		1	
12.7 ± 0.1	13 ± 2	1	3.7 ± 0.7
19.9		1	
40.5 ± 0.2	67 ± 10	1	11 ± 2
43.2		1	
47.6		0	
49.8		0	
108.7		1	
138.2		1	
176.8		1	
214.5		1	

¹⁸⁸₇₆Os

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T^c &= 4.3 \pm 1.0 \text{ b} \\ \sigma_a &< 0.03 \text{ mb} \\ \sigma_{\text{cch}} &= 7.8 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 135 \pm 35 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$2A\text{bn} = 13.3$$

$$S_n = 5923.3 \pm 2.6 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_γ (meV)	Γ_n^0 (meV)
38.7 ± 0.5	105 ± 18	47.8 ± 2.3	90 ± 20	7.5 ± 0.4
78.9 ± 0.5		360 ± 26		40.6 ± 3.0

¹⁸⁹₇₆Os

THERMAL CROSS SECTIONS

$\sigma_{\gamma}^c = 23 \pm 4$ b
 $\sigma_{\gamma} = 0.26 \pm 0.03$ mb [10 min ¹⁹⁰Os^m]
 $\sigma_a < 0.01$ mb
 $a_{coh} = 11.0$ fm

RESONANCE PROPERTIES

$I_{\gamma}^c = 750 \pm 50$ b

RESONANCE PARAMETERS

$I^{\pi} = 3/2^{-}$

$\lambda_{Abn} = 16.1$

$S_n = 7793.5 \pm 1.0$ keV

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_{γ} (meV)	$2g\Gamma_n^0$ (meV)
6.71 $\pm$ 0.01	3.1 $\pm$ 0.3	1	85 $\pm$ 5	1.21 $\pm$ 0.12
8.96 $\pm$ 0.01	10.4 $\pm$ 0.6	2	103 $\pm$ 10	3.48 $\pm$ 0.20
10.30 $\pm$ 0.05	3.8 $\pm$ 0.4	1	97 $\pm$ 10	1.15 $\pm$ 0.12
16.7 $\pm$ 0.1	9 $\pm$ 1	2		2.1 $\pm$ 0.2
22.1 $\pm$ 0.1	9.6 $\pm$ 1.0	1		2.1 $\pm$ 0.2
27.4 $\pm$ 0.1	6.8 $\pm$ 0.7	2		1.36 $\pm$ 0.14
28.3 $\pm$ 0.1	14.9 $\pm$ 1.1	2		2.8 $\pm$ 0.2
30.8 $\pm$ 0.4		2		
43.5	60 $\pm$ 15	[2]		9.1 $\pm$ 2.3
50.5 $\pm$ 0.2	88 $\pm$ 20	2		12 $\pm$ 3
55.0 $\pm$ 0.5	67 $\pm$ 19	2		9.0 $\pm$ 2.6
60.7 $\pm$ 0.2	273 $\pm$ 60	2		35 $\pm$ 8
63.8		1		
65.5	48 $\pm$ 11	2		6.2 $\pm$ 1.2
66.0		2		
75.0	72 $\pm$ 24	2		8.4 $\pm$ 3.0
87.9		1		
93.2		1		
128.0		1		

¹⁹⁰₇₆Os

THERMAL CROSS SECTIONS

$\sigma_{\gamma} = 13.0 \pm 0.3$ b
 $\sigma_{\gamma} = 3.9 \pm 0.8$ b [15 day ¹⁹¹Os^m]
 $\sigma_{\gamma} = 9.1 \pm 0.5$ b [15 hr ¹⁹¹Os^m]
 $\sigma_a < 0.02$ mb
 $a_{coh} = 11.4$ fm

RESONANCE PROPERTIES

$I_{\gamma}^c = 29 \pm 2$ b

¹⁹²
76 Os

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_y &= 2.0 \pm 0.1 \text{ b [31 hr } ^{193}\text{Os9]} \\ \sigma_y &= 0.014 \text{ b [16.8]} \\ \sigma_a &< 0.01 \text{ mb} \\ a_{coh} &= 11.9 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$I_y = 5.4 \pm 1.0 \text{ b}$$

¹⁹³
76 Os
[30.2 hr]

THERMAL CROSS SECTIONS

$$\sigma_y = 1540 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Os^{192}	isom. ratio	NP/A,125,305(69)	Bisgard
Os^{187}	σ_c	UFZ,14,1968(69)	Vertebnyi
Os^{190}	activation	RCA,9,61(68)-	Gijbels
$Os^{184,192}$	activation	RCA,9,61(68)	Kim
$Os^{184,186-190}$	σ_a	YF,1,252(65)	Andreev
Os^{189}	activation	NYO-10175(64)	Arino
$Os^{189,190}$	activation	NP,41,3;2(63)	Mangal
$Os, Os^{188-190,192}$	diffraction	ANL-6797,393(63)	Mueller
$Os^{189,190}$	activation	NP,20,183(60)	Hans
Os	diffraction	JAP,30,(9),1323(59)	Sidhu
Os^{184}		CJP,36,1409(5P)	Nablo
Os	diffraction	PR,105,216(57)	Heaton
$Os^{184,193}$	activation	PR,84,240(51)	Lindner
Os	inca osci.	PR,83,641(51)	Pomerance
$Os^{190,192}$	activation	PR,72,888(47)	Seren
Os	σ_c	PR,71,174(47)	Hu
Os	σ_s	PRS/A,162,127(37)	Goldhaber
Os	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Os^{187}	σ_y (spectra)	9.5-215	BAP,18,96(73)	Namenson
Os^{189}	σ_y (spectra)	6.7-128	BAP,17,487(72)	Namenson
Os^{187}	σ_y (spectra)	9.5-47.7	JINR-P3-6092(71)	Karzhavina
Os^{189}	σ_y (spectra)	6.7-60.8	JINR-P3-6092(71)	Karzhavina
Os^{189}	σ_y (spectra)	6.7	69STUDSVIK,105(69)	Kane
Os^{187}	σ_c	9.5-65	UFZ,14,1968(69)	Vertebnyi
Os^{188}	σ_c	39.2-83.4	UFZ,14,1968(69)	Vertebnyi
Os^{189}	σ_c	6.7-28	UFZ,14,1968(69)	Vertebnyi
Os		50.4-317	PRIVATE COMM.(65)	Ignatiev
Os^{187}	σ_c	6.7	PR,127,461(62)	Jackson
Os^{187}	σ_y (spectra)	9.5-47.5	PR,124,1142(61)	Jackson
Os^{189}	σ_y (spectra)	6.7-61.0	PR,124,1142(61)	Jackson
Os	σ_c	6.7-109.7	PRIVATE COMM.(58)	Chrien
Os	σ_c	6.7-89.9	AE,1,(5),55(56)	Radkevich
Os	σ_c	6.7-84	PR,71,174(47)	Hu

⁷⁷Ir

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 426 \pm 4 \text{ b} \\ \sigma_s &= 14 \pm 2 \text{ b} \\ \sigma_t &= 440 \pm 4 \text{ b} \\ a_{coh} &= 10.6 \pm 0.2 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 2250 \pm 200 \text{ b} \\ S_0 &= 2.1 \pm 0.2\end{aligned}$$

¹⁹¹
⁷⁷Ir

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 924 \pm 53 \text{ b} \\ \sigma_T &= 0.38 \pm 0.17 \text{ b [75 yr } ^{192}\text{Ir}^{m2}] \\ \sigma_T &= 300 \pm 30 \text{ b [1.4 min } ^{192}\text{Ir}^{m1}] \\ \sigma_T &= 624 \pm 60 \text{ b [74 day } ^{192}\text{Ir}^g]\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 3750 \pm 200 \text{ b} \\ \langle D \rangle &= 3.3 \pm 0.3 \text{ eV} \\ S_0 &= 2.2 \pm 0.2\end{aligned}$$

RESONANCE PARAMETERS

$$I^n = 3/2^+$$

$$\%abn = 37.4$$

$$S_n = 6198.7 \pm 2.0 \text{ keV}$$

E_0 (eV)	$2g\Gamma_n$ (meV)	J	Γ_T (meV)	$2g\Gamma_n^0$ (meV)
Bound level				
0.6551 ± 0.0014	0.541 ± 0.005	2	72.2 ± 1.0	0.668 ± 0.006
5.36 ± 0.04	6.0 ± 0.1	2	93 ± 10	2.59 ± 0.06
6.13 ± 0.04	0.53 ± 0.05		72 ± 23	0.216 ± 0.010
9.27 ± 0.08	4.4 ± 0.4	2		1.47 ± 0.13
9.90 ± 0.10	0.59 ± 0.11			0.19 ± 0.04
10.4 ± 0.1	0.33 ± 0.03			0.102 ± 0.010
19.2 ± 0.1	2.6 ± 0.5			0.59 ± 0.11
20.2 ± 0.1	1.8 ± 0.2			0.40 ± 0.05
25.2 ± 0.1	14.0 ± 2.5			2.76 ± 0.50
29.9 ± 0.1	16.8 ± 0.9	1		2.30 ± 0.12
31.6 ± 0.1	5.5 ± 1.5			0.98 ± 0.25
36.6 ± 0.2	3.5 ± 0.8			0.58 ± 0.14
40.4 ± 0.2	5.9 ± 0.9			0.92 ± 0.14
41.5 ± 0.1	2.0 ± 0.4			0.31 ± 0.06
44.6 ± 0.1	1.2 ± 0.3			0.18 ± 0.04
45.7 ± 0.1	2.3 ± 0.5			0.34 ± 0.08
51.0 ± 0.2	49.1 ± 3.1	1	87 ± 20	6.86 ± 0.44
52.8 ± 0.1	8.2 ± 1.6			1.13 ± 0.02
56.8 ± 0.1	2.6 ± 0.7			0.35 ± 0.09
62.8 ± 0.3	5.0 ± 1.3			0.63 ± 0.16

¹⁹¹₇₇Ir

E ₀ (eV)	2g _T ⁿ (meV)	J	Γ _γ (meV)	2g _T ⁰ (meV)
64.9 ±0.1	7.2 ±1.8			0.89 ±0.22
65.7 ±0.1	11.4 ±2.5			1.41 ±0.31
68.0 ±0.1	11.6 ±2.7			1.41 ±0.33
76.6 ±0.1	7.4 ±1.8			0.85 ±0.21
78.8 ±0.1	20.0 ±4.0			2.25 ±0.45
80.6 ±0.1	11.2 ±2.2			1.25 ±0.25
81.9 ±0.2	3.0 ±0.7			0.33 ±0.08
87.4 ±0.1	12.0 ±3.2			1.28 ±0.34
97.6 ±0.1	22.0 ±6.0			2.23 ±0.61
99.9 ±0.1	11.6 ±2.8			1.16 ±0.28
103.6 ±0.1	24.0 ±5.4			2.36 ±0.53
104.8 ±0.2	22.0 ±5.6			2.15 ±0.55
106.4 ±0.2	2.2 ±0.6			0.21 ±0.58
114.3 ±0.2	8.6 ±2.2			0.80 ±0.02
116.7 ±0.2	7.8 ±2.0			0.72 ±0.19
127.0 ±0.3	5.4 ±1.9			4.8 ±0.17
128.1 ±0.2	7.6 ±2.0			0.67 ±0.18
129.9 ±0.2	15.0 ±3.4			1.32 ±0.30
134.2 ±0.2	20.0 ±5.0			1.73 ±0.43
137.6 ±0.2	11.6 ±3.2			0.99 ±0.27
142.9 ±0.4	16.0 ±7.2			1.34 ±0.60
147.7 ±0.2	>80			>6.6
151.8 ±0.4	8.0 ±4.0			0.65 ±0.32
156.2 ±0.4	>80			6.4
161.5 ±0.2	>80			6.3

¹⁹²₇₇Ir
[74.3 day]

THERMAL CROSS SECTIONS
σ_T = 1100±400 b

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 112.5 \pm 7.5 \text{ b} \\ \sigma_T &= 110 \pm 15 \text{ b [19 hr } ^{194}\text{Ir}^{\text{a}}\text{]} \\ \sigma_T &= 5.8 \pm 2.0 \text{ b [32 ms } ^{194}\text{Ir}^{\text{a}}\text{]}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 1350 \pm 150 \text{ b} \\ \langle D \rangle &= 7.7 \pm 0.8 \text{ eV} \\ S_0 &= 2.0 \pm 0.2\end{aligned}$$

RESONANCE PARAMETERS

$I^n = 3/2^+$		%Abrn = 62.6		$S_n = 6066.1 \pm 1.5 \text{ keV}$	
$E_0 \text{ (eV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_T \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$	
Bound level					
1.303 ± 0.003	0.913 ± 0.017	2	86.6 ± 1.0	0.8000 ± 0.020	
9.07 ± 0.08	3.1 ± 0.3			1.02 ± 0.10	
24.51 ± 0.05	4.3 ± 0.4	102 ± 38		0.87 ± 0.08	
25.04 ± 0.05	4.2 ± 0.4			0.84 ± 0.08	
26.0 ± 0.1	1.7 ± 0.3			0.34 ± 0.06	
41.6 ± 0.1	2.8 ± 0.4			0.43 ± 0.06	
43.3 ± 0.2	50 ± 6			7.70 ± 0.98	
52.6 ± 0.2	5.3 ± 0.5			0.73 ± 0.07	
53.9 ± 0.2	14.3 ± 1.8			1.95 ± 0.25	
69.3 ± 0.2	84 ± 5			10.1 ± 0.6	
71.6 ± 0.1	2.2 ± 0.3			0.26 ± 0.04	
77.8 ± 0.1	42 ± 4			4.7 ± 0.5	
80.8 ± 0.2	2.7 ± 0.9			0.30 ± 0.10	
89.1 ± 0.3	5.0 ± 1.0			0.53 ± 0.11	
98.3 ± 0.2	6.4 ± 1.3			0.65 ± 0.13	
109.9 ± 0.4	24 ± 2			2.3 ± 0.2	
116.2 ± 0.1	8.9 ± 1.4			0.83 ± 0.12	
123.7 ± 0.2	1.6 ± 0.5			0.14 ± 0.05	
127.6 ± 0.2	1.6 ± 0.5			0.14 ± 0.04	
143.5 ± 0.2	13.1 ± 3.8			1.09 ± 0.32	
149.9 ± 0.4	18.0 ± 4.0			1.47 ± 0.33	
152.0 ± 0.5	20.4 ± 4.2			1.66 ± 0.34	
163.5 ± 0.5	27.3 ± 6.9			2.14 ± 0.54	
174.3 ± 0.5	16.0 ± 4.4			1.21 ± 0.33	
178.9 ± 0.3	20 ± 4			1.50 ± 0.30	
185.7 ± 0.3	>80			>5.9	
201.5 ± 0.6	3.9 ± 1.0			0.27 ± 0.07	
206.0 ± 0.7	12.0 ± 2.2			0.84 ± 0.15	
213.4 ± 0.4	12.8 ± 2.6			0.88 ± 0.18	
216.9 ± 0.4	9.2 ± 1.8			0.63 ± 0.12	
222.0 ± 0.7	9.8 ± 1.8			0.66 ± 0.12	
223.4 ± 0.4	40.0 ± 8.0			2.68 ± 0.54	
229.0 ± 0.4	40.0 ± 8.0			2.64 ± 0.53	
267.0 ± 1.0	4.0 ± 1.8			0.25 ± 0.11	
272.0 ± 0.5	>80			>4.9	
279.0 ± 0.5	>80			>4.8	
288.0 ± 0.6	>80			>4.7	
299.0 ± 0.6	16.0 ± 3.2			0.93 ± 0.19	
309.0 ± 0.6	>80			>4.6	

$^{193}_{77}\text{Ir}$
[12 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} > 0.035 \text{ b [171 day } ^{194}\text{Ir}^{m2}]$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ir^{191}	activation	NHK, 12, 197(69)	Koehler
Ir^{193}	activation	NP/A, 115, 213(68)	Meiser
Ir^{193}	activation	ZK, 150, 81(68)	Meiser
Ir^{191}	activation	JIN, 30, 349(68)	Sims
Ir^{193}	activation	PRL, 21, 237(68)	Sunyar
Ir^{191}	activation	PRIVATE COMM. (67)	Schneider
Ir	σ_c	66PARIS, 1, 61(66)	Brunner
$Ir^{191, 193}$	activation	NYO-10175(64)	Arino
Ir	diffraction	PR, 131, 1518(63)	Felcher
Ir^{191}	activation	NP, 41, 604(63)	Harbottle
$Ir^{191, 193}$	isom. ratio	PR, 129, 769(63)	Keisch
Ir	diffraction	NNL-6797, 393(63)	Mueller
$Ir^{191, 193}$	σ_c	BAP, 4, 271(59)*	Bolotin
Ir^{191}	isom. ratio	PRL, 3, 47(59)	Goldhaber
Ir^{192}	activation	PRIVATE COMM. (58)	Schuman
Ir^{192}	activation	PR, 105, 974(57)	Boehm
Ir	pile osci.	PR, 83, 641(51)	Powersance
Ir	pile osci.	PR, 80, 342(50)	Harris
Ir	σ_c	PR, 71, 65(47)	Rainwater
$Ir^{191, 193}$	activation	PR, 72, 888(47)	Seren

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Ir^{191}	σ_T	19.2-225	JINR-P3-6545(72)	Lason
Ir^{193}	σ_T	24.5-391	JINR-P3-6545(72)	Lason
Ir	σ_c	0.65-1.30	EIR-123, 61(67)	Brunner
Ir^{191}	$\bar{\sigma}_s$	0.65-9.1	NP/A, 97, 657(67)	Poortmans
Ir^{193}	$\bar{\sigma}_s$	1.3-9.1	NP/A, 97, 657(67)	Poortmans
Ir	polarization	0.65-9.1	PR, 155, 1330(67)	Stolovy
Ir	$\bar{\sigma}_s$	5.4-51.3	CJP, 44, 399(66)	Bhat
Ir	σ_c	0.65-1.3	66PARIS, 1, 61(66)	Brunner
Ir	σ_c	19.2-416	PRIVATE COMM. (65)	Ignatiev
Ir, Ir^{191}	σ_c	5.4-51.3	NP, 42, 676(63)	Bolotin
Ir, Ir^{193}	σ_c	43.4	NP, 42, 676(63)	Bolotin
Ir, Ir^{191}	σ_c	0.65-104	BAP, 4, 271(59)*	Bolotin
Ir, Ir^{193}	σ_c	1.3-223	BAP, 4, 271(59)*	Bolotin
Ir, Ir^{193}	$\sigma_T, \bar{\sigma}_s$	9-77	NP, 5, 294(58)	Bovey
Ir, Ir^{191}	σ_c	5-9.1	PRIVATE COMM. (58)	Chrien
Ir	σ_c	5.3-93.5	AE, 1, (5), 55(56)	Radkevich
Ir	σ_c	0.65-5.4	PR, 100, 1414(55)	Landon
Ir	σ_c	0.65-25	PR, 71, 65(47)	Rainwater
Ir	σ_c	0.6-1.3	PR, 72, 109(47)	Sauyer

⁷⁸Pt

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 10.0 \pm 0.2 \text{ b} \\ \sigma_A &= 11.2 \pm 1.0 \text{ b} \\ \sigma_{\text{tot}} &= 9.5 \pm 0.3 \text{ fb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}J_p &= 1^+ \pm 0.6 \text{ b} \\ S_0 &= 1.7 \pm 0.3\end{aligned}$$

UNASSIGNED RESONANCES

E_0 (eV)	Γ (meV)	$\sigma \Gamma^2$ (meV)	Γ_p (meV)	$\sigma \Gamma^2$ (meV)
98.1*		.03		
*177.1	210 $\pm$ 40	0.90 $\pm$ 0.08		0.07
180.2		0.051 $\pm$ 0.02		0.0034
*202.2	80 $\pm$ 20	1.01 $\pm$ 0.08		0.07
237.6		0.17 $\pm$ 0.04		
266.9		0.077 $\pm$ 0.03		0.047
288.4		0.20 $\pm$ 0.06		0.011
289.5		0.14 $\pm$ 0.03		0.008
292.2				
319.6		6.9 $\pm$ 0.7		0.38
340.5				
342.2		1.5 $\pm$ 0.1		0.06
344.6		1.1 $\pm$ 0.1		
358.9		1.9 $\pm$ 0.4		0.1
*405.1		1.1 $\pm$ 0.1		0.55
*406.1		1.3 $\pm$ 0.1		0.66
414.4				
433.5				
*439.2		0.40 $\pm$ 0.08		0.02
458.5		0.6 $\pm$ 0.1		0.03
466.3				
472.6		1.1 $\pm$ 0.1		
509.8		0.47 $\pm$ 0.09		
*560.1		4.1 $\pm$ 0.4		0.17
616.3		1.4 $\pm$ 0.2		0.06
646.8		0.6 $\pm$ 0.1		0.025
655.9				
*661.9	170 $\pm$ 30	2.4 $\pm$ 0.3	150 $\pm$ 30	0.1
695.5				
716.4		2.3 $\pm$ 0.2		0.06
*744.6	130 $\pm$ 30	3.6 $\pm$ 0.3		1.3
814.5		29 $\pm$ 3		
*820.2				

- * Even-even isotope
- * Not 192
- * 196 or 198

¹⁹⁰
⁷⁸Pt

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 150 \pm 150 \text{ b} \\ \sigma_A &< 8 \text{ mb}\end{aligned}$$

¹⁹²Pt
78

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &< 14 \text{ b} \\ \sigma_T &= 2.2 \pm 0.8 \text{ b (4.4 day } ^{192}\text{Pt}^*) \\ \sigma_a &< 0.2 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 83 \pm 10 \text{ b} \\ R_T^c &= 0.7 \pm 0.5 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$$I^* = 0^+$$

$$\Sigma \Gamma_{\text{br}} = 0.78$$

$$S_n = 6247 \pm 3 \text{ keV}$$

E_0 (eV)	Γ (meV)	g^2_{br} (meV)	Γ_γ (meV)	$g^2_{\text{br}}^0$ (meV)
46.55 $\pm$ 0.05	105 $\pm$ 10	47 $\pm$ 2	58 $\pm$ 10	6.9 $\pm$ 0.3
53.74 $\pm$ 0.05	70 $\pm$ 15	17 $\pm$ 1	53 $\pm$ 15	2.3 $\pm$ 0.1
129.7 $\pm$ 0.1	260 $\pm$ 30	225 $\pm$ 12	35 $\pm$ 32	20 $\pm$ 1
144.9 $\pm$ 0.1	210 $\pm$ 35	170 $\pm$ 10	40 $\pm$ 35	14 $\pm$ 1
368.7 $\pm$ 0.3	370 $\pm$ 25	308 $\pm$ 27	62 $\pm$ 25	15.6 $\pm$ 1.4

¹⁹⁴Pt
78

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 1.2 \pm 0.8 \text{ b} \\ \sigma_T &= 0.090 \pm 0.013 \text{ b (4.1 hr } ^{194}\text{Pt}^*) \\ \sigma_a &< 0.005 \text{ mb}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma^c &= 4 \pm 2 \text{ b} \\ R_T^c &= 8.7 \pm 0.5 \text{ fm}\end{aligned}$$

RESONANCE PARAMETERS

$$I^* = 0^+$$

$$\Sigma \Gamma_{\text{br}} = 32.9$$

$$S_n = 6124 \pm 14 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_{br} (meV)	J	Γ_γ (meV)	Γ_{br}^0 (meV)
377.0 $\pm$ 0.3	275 $\pm$ 15	216 $\pm$ 9	1/2	59 $\pm$ 17	11.1 $\pm$ 0.4
492.3 $\pm$ 0.4	210 $\pm$ 35	131 $\pm$ 9	1/2	79 $\pm$ 35	5.9 $\pm$ 0.4
603.3 $\pm$ 0.4	1250 $\pm$ 45	1100 $\pm$ 45	1/2		45.0 $\pm$ 1.8
698.3 $\pm$ 0.4	1100 $\pm$ 100	1040 $\pm$ 100	1/2		39.3 $\pm$ 3.9

¹⁹⁵Pt
⁷⁸Pt

THERMAL CROSS SECTIONS

$$\sigma_y = 27 \pm 2 \text{ b}$$

$$\sigma_a < 0.005 \text{ mb}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 355 \pm 50 \text{ b}$$

$$R_\gamma^c = 8.7 \pm 0.5 \text{ fm}$$

$$\langle D \rangle = 18 \pm 3 \text{ eV}$$

$$S_0 = 1.9 \pm 0.4$$

RESONANCE PARAMETERS

$I^0 = 1.0$		$\% \text{Abn} = 33.8$		$S_n = 7920.9 \pm 1.0 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_\gamma \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$
Bound level					
11.9±0.1	127 ± 8	15.2± 0.6	1	107 ± 8	4.4 ±0.2
19.6±0.1	107 ± 8	10.4± 0.5	1	100 ± 8	2.3 ±0.1
67.1±0.2	280 ±30	85 ± 5	0	110 ±30	10.4 ±0.6
67.7±0.2	181 ±20	61.5± 2.0	1	140 ±20	7.5 ±0.8
111.8±0.2	144 ±15	25.5± 3.0	1	127 ±15	2.4 ±0.3
119.3±0.2		13 ± 2	0	69 ±15	1.2 ±0.2
120.5±0.2	235 ±20	150 ±15	1	135 ±15	13.7 ±1.4
139.9±0.2	170 ±13	90 ± 5	1	110 ±13	7.6 ±0.4
150.4±0.2	270 ±20	268 ±16	1	90 ±23	21.8 ±1.3
154.7±0.2	575 ±30	220 ±15	0	135 ±30	17.8 ±1.2
188.5±0.2	140 ±10	31.5± 3	1	120 ±10	2.25±0.15
204.8±0.2		30 ± 2	0	100 ±10	2.1 ±0.2
222.2±0.2		56 ± 2	1	130 ±13	3.8 ±0.2
256.9±0.2	160 ±15	82.5± 7.5	1	105 ±15	5.1 ±0.5
261.7±0.2	210 ±15	72 ± 4	0	65 ±15	4.4 ±0.2
280.0±0.2	110 ±25	18 ± 1	1	98 ±25	1.08±0.11
285.6±0.2	175 ±15	104 ± 4	1	105 ±15	6.2 ±0.2
302.3±0.2	145 ±20	84 ± 5	1	89 ±20	4.8 ±0.3
309.6±0.3	260 ±25	92 ± 4	0	76 ±25	5.2 ±0.3
353.2±0.3		6.6± 0.6			0.36±0.3
382.8±0.3	140 ±20	60 ± 6	1	100 ±20	3.0 ±0.3
410.1±0.3	195 ±10	146 ± 6	1	98 ±10	7.2 ±0.3
453.2±0.3	1040 ±50	479 ±20	0		22 ±1
484.8±0.3	203 ±15	142 ± 6	1	108 ±15	6.4 ±0.3
490.0±0.3	270 ±40	222 ±14	1	122 ±40	11.0 ±0.7
517.2±0.3	140 ±30	34 ± 2	0	72 ±30	1.5 ±0.1
529.3±0.4	390 ±30	312 ±18	1	182 ±32	13.6 ±0.8
548.8±0.4	254 ±25	158 ±10	1	144 ±26	6.7 ±0.4
558.7±0.4	215 ±30	110 ± 9	1	142 ±31	4.6 ±0.4
632.6±0.4		9.5± 1.2			0.38±0.05
659.8±0.4		77 ± 6	1	168 ±27	3.0 ±0.2
680.0±0.4	160 ±25	62 ± 5	1	118 ±25	2.4 ±0.2
*706.0±0.4	570 ±50	231 ±18	0	105 ±50	8.7 ±0.7
709.3±0.5	450 ±40	406 ±24	1	180 ±43	15.2 ±0.9
718.3±0.5	210 ±25	69 ± 6	[0]		2.6 ±0.2
763.5±0.5	280 ±30	180 ±12	1	160 ±30	6.5 ±0.4

¹⁹⁵
78 Pt

E_0 (eV)	Γ (meV)	$2\sigma\Gamma_n$ (meV)	J	Γ_γ (meV)	$2\sigma\Gamma_n^0$ (meV)
779.9±0.5	375 ±30	254 ±15	1	206 ±34	9.1 ±0.5
*785.7±0.5	140 ±30	25 ± 2			0.89±0.08
794.2±0.5		154 ±12	(1)		5.5 ±0.4
810.9±0.5					
825.2±0.5	750 ±80	930 ±60	(1)		32.3 ±2.1

* Isotopic assignment uncertain

¹⁹⁶
78 Pt

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 0.74 \pm 0.08 \text{ b}$$

$$\sigma_\gamma = 0.050 \pm 0.010 \text{ b (1.5 hr } ^{196}\text{Pt}^*)$$

RESONANCE PROPERTIES

$$I_\gamma = 8 \pm 2 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\lambda_{\text{Abn}} = 25.3$$

$$S_n = 5849 \pm 3 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	J	Γ_γ (meV)	Γ_n^0 (meV)
*303.±0.2	210 ±30	98 ±5		112 ±30	5.8 ±0.3
565.±0.4	234 ±25	102 ±6	1/2	132 ±25	4.32±0.26

* Isotopic assignment uncertain

¹⁹⁸
78 Pt

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 3.7 \pm 0.2 \text{ b}$$

$$\sigma_\gamma = 0.027 \pm 0.003 \text{ b (14 sec } ^{198}\text{Pt}^*)$$

RESONANCE PROPERTIES

$$I_\gamma = 56 \pm 6 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\lambda_{\text{Abn}} = 7.2$$

$$S_n = 5602 \pm 3 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	J	Γ_γ (meV)	Γ_n^0 (meV)
95.8±0.05	570 ±20	423 ±15	1/2	147 ±25	43.2±1.5

¹⁹⁹
78 Pt

[30.8 min]

THERMAL CROSS SECTIONS

$$\sigma_\gamma = 15 \pm 10 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pt ^{190,190}	activation	JNE,25,129(71)	Ryves
Pt ^{190,190}	activation	NYO-10175(64)	Arino
Pt ¹⁹⁰	activation	AMEC/TN-191(63)	Connolly
Pt ^{192,194,196}	activation	NP,41,372(63)	Mangal
Pt ^{192,194,196}	activation	PR,120,761(62)	Singhal
Pt ¹⁹⁶	activation	NSE,8,378(60)	Lyon
Pt	pile osci.	JNE,12,32(60)	Tattersall
Pt ¹⁹⁰	activation	PR-CN-84(56)	Herritt
Pt ^{190,192,194,196}	pile osci.	ORNL-1879,50(55)	Pomerance
Pt ^{190,190}	pile osci.	ORNL-1879,50(55)	Pomerance
Pt ¹⁹²	activation	PRIVATE COMM.(58)	Malder
Pt	pile osci.	PR,83,641(51)	Pomerance
Pt	diffraction	PR,81,527(51)	Shults
Pt	pile osci.	PPS/A,63,1175(50)	Colmer
Pt	pile osci.	PR,80,342(50)	Harris
Pt	σ_a	PR,71,165(47)	Havens
Pt ^{190,190}	activation	PR,72,888(47)	Seren
Pt	σ_s	PR5/A,162,127(37)	Goldhaber
Pt	σ_a	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Pt	$\sigma_a \sigma_\gamma$ (spectra)	11.9-825	NP/A,131,305(69)	DeBarros
Pt	$\sigma_a \sigma_\gamma$	11.9-680	NP/A,132,129(69)	Julien
Pt	$\sigma_a \sigma_\gamma$ (spectra)	11.9-825	BAP,11,337(66)*	Julien
Pt	σ_γ (spectra)	11.9-189	PR,132,1640(63)	Bollinger
Pt	$\sigma_a \sigma_s$			
Pt ¹⁹⁵	σ_γ (spectra)	11.9-68	ZET,45,875(63)	Ignatiev
Pt	σ_γ (spectra)	11.9-296	PR,127,1680(62)	Chrien
Pt	σ_c	11.9-308	PL,3,67(62)	Julien
Pt	σ_c	111-308	CR,254,4287(62)	Julien
Pt	σ_γ (spectra)	7-22	PRL,6,695(61)	Cote
Pt	σ_γ		PR,124,1142(61)	Jackson
Pt ¹⁹⁵	σ_c	113-304	JPR,21,426(60)	Corge
Pt	σ_γ (spectra)	11.9-19.6	ZET,38,1446(60)	Galanina
Pt	σ_s	11.9-96	PR,120,2090(60)	Mators
Pt	σ_γ (spectra)	47-568	NP,14,212(59)*	Bird
Pt ¹⁹⁵	σ_γ (spectra)	11.9-68	PRL,3,376(59)	Bollinger
Pt ¹⁹⁵	σ_γ (spectra)	11.9-300	BAP,4,472(59)*	Brussel
Pt ¹⁹⁵	σ_γ (spectra)	11.9-68	BAP,4,34(59)	Brussel
Pt ¹⁹⁵	σ_γ (spectra)	69-1470	CR,249,413(59)	Corge
Pt	σ_γ (spectra)	11.9-19.6	NP,14,693(59)	Draper
Pt	σ_c	139-150	PRIVATE COMM.(59)	Oven
Pt	σ_c	66.9-155	NNL-6072(59)	Thomas
Pt	σ_c	11.9-151	PRIVATE COMM.(58)	Zimmerman
Pt	σ_c	11.9-19.6	PR,108,353(57)	Stolovy
Pt	σ_c	0.3-30	PR,71,165(47)	Havens

¹⁹⁷
⁷⁹Au

Thermal Cross Sections

$$\sigma_T = 98.8 \pm 0.3 \text{ b}$$

$$\sigma_{coh} = 7.6 \pm 0.1 \text{ fm}$$

Resonance Properties

$$I_T = 1550 \pm 40 \text{ b}$$

$$R^2 = 9.6 \pm 0.2 \text{ fm}$$

$$\langle D \rangle = 16.2 \pm 0.3 \text{ eV}$$

$$S_0 = 2.1 \pm 0.2$$

Resonance Parameters

$I^* = 3/2^+$		$\lambda_{Au} = 100$		$S_n = 6512.7 \pm 0.8 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2\sigma_n^0 \text{ (meV)}$	J	$\Gamma_\gamma \text{ (meV)}$	$2\sigma_n^0 \text{ (meV)}$
Bound level					
4.906 ± 0.010	139 ± 3	19.0 ± 0.3	2	124 ± 3	8.63 ± 0.15
46.45 ± 0.08		0.11 ± 0.02	(1)		0.016 ± 0.003
58.1 ± 0.1		3.30 ± 0.14	1	112 ± 15	0.44 ± 0.02
60.3 ± 0.1	198 ± 25	85 ± 5	2	130 ± 20	11.0 ± 0.6
78.4 ± 0.2		12.5 ± 0.6	1	130 ± 20	1.38 ± 0.08
107.0 ± 0.2	128 ± 15	9.7 ± 0.4	2	120 ± 15	0.94 ± 0.04
122.3 ± 0.2		1.0 ± 0.2			0.09 ± 0.02
144.2 ± 0.3	129 ± 20	6.7 ± 0.3	1	120 ± 20	0.56 ± 0.02
151.3 ± 0.3	180 ± 15	27.5 ± 0.3	2	120 ± 20	2.25 ± 0.09
162.9 ± 0.3	180 ± 15	37.5 ± 2.3	1	130 ± 15	2.94 ± 0.16
164.9 ± 0.3	115 ± 15	11.6 ± 0.6	2	106 ± 15	0.90 ± 0.06
190.3 ± 0.4	174 ± 20	33 ± 3	1	130 ± 20	2.4 ± 0.2
209.3 ± 0.4		0.72 ± 0.07			0.050 ± 0.005
240.5 ± 0.5	172 ± 15	90 ± 5	2	100 ± 15	5.8 ± 0.3
255.7 ± 0.5		0.5 ± 0.1			0.037 ± 0.006
262.4 ± 0.5	253 ± 16	100 ± 4	1	120 ± 12	6.13 ± 0.23
273.6 ± 0.5	110 ± 20	5.2 ± 0.2		105 ± 20	0.32 ± 0.01
293.0 ± 0.6	511 ± 50	456 ± 44	2	146 ± 38	26.6 ± 2.6
329.5 ± 0.7	180 ± 15	57.2 ± 2.8	2	134 ± 13	3.14 ± 0.16
331.0 ± 0.7	200 ± 17	46.8 ± 2.4	1	138 ± 17	2.56 ± 0.12
355.0 ± 0.7	168 ± 15	49.0 ± 2.4	2	125 ± 15	2.60 ± 0.12
370.7 ± 0.7	190 ± 20	105 ± 8	2	106 ± 20	5.4 ± 0.4
375.1 ± 0.8	140 ± 14	10.4 ± 1.0		130 ± 18	0.54 ± 0.06
381.5 ± 0.8	166 ± 20	76.4 ± 6.2	2	105 ± 20	3.92 ± 0.40
400.0 ± 0.8		25 ± 4		140 ± 40	1.25 ± 0.20
440.0 ± 0.9	420 ± 35	216 ± 16	1	139 ± 20	10.2 ± 0.7
450.9 ± 0.9	172 ± 20	77.5 ± 7.5	2	110 ± 15	3.65 ± 0.36
477.0 ± 1.0	450 ± 40	400 ± 28	2	130 ± 20	18.4 ± 1.2
490.0 ± 1.0	190 ± 20	43 ± 4	1	130 ± 21	2.04 ± 0.02
494.0 ± 1.0	160 ± 17	34 ± 3	2	136 ± 17	1.54 ± 0.12
534.1 ± 0.3	162 ± 15	34 ± 4	2	130 ± 15	1.90 ± 0.17
548.6 ± 0.3	180 ± 20	40 ± 4	1	127 ± 20	1.71 ± 0.17
579.1 ± 0.3	520 ± 40	462 ± 26	2	150 ± 45	19.3 ± 1.2
580.9 ± 0.3	260 ± 25	110.6 ± 7.0	1	115 ± 27	4.58 ± 0.32
587.0 ± 0.4	160 ± 30	26.0 ± 2.6		134 ± 36	1.08 ± 0.10
602.8 ± 0.4	369 ± 20	280 ± 14	2	145 ± 15	11.4 ± 0.6

¹⁹⁷
₇₉Au

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
617.3 ±0.4	234 ± 25	93 ± 8	2	160 ±25	3.74 ±0.32
624.8 ±0.4	170 ± 30	37 ± 3	1	121 ±45	1.48 ±0.12
628.4 ±0.4	160 ± 30	28.0 ± 2.4	2	138 ±30	1.10 ±0.08
638.7 ±0.4	630 ± 40	600 ± 30	2	150 ±45	23.8 ±1.2
658.7 ±0.4		4.8 ± 0.8			0.18 ±0.04
685.9 ±0.4		10.0 ± 1.4			0.38 ±0.04
695.8 ±0.4	830 ± 80	500 ± 40	1	165 ±90	18.9 ±3.0
699.0 ±0.4	880 ± 80	920 ± 60		144 ±90	34.8 ±4.0
715.6 ±0.4	285 ± 35	144 ± 12	2	170 ±40	5.4 ±0.4
738.4 ±0.4		10.0 ± 1.4			0.36 ±0.04
759.9 ±0.4	580 ± 50	320 ± 22	1	154 ±60	11.6 ±0.8
773.8 ±0.5	600 ± 50	356 ± 26	1	126 ±60	5.3 ±1.4
784.3 ±0.5	280 ± 30	150 ± 12		160 ±30	5.4 ±0.7
796.0 ±0.5	325 ± 30	222 ± 18	2	150 ±30	7.88 ±0.60
813.5 ±0.5		16.6 ± 2.0			0.58 ±0.06
819.5 ±0.5	380 ± 40	288 ± 22	2	150 ±45	10.12 ±0.80
825.0 ±0.5	700 ± 55	666 ± 40	2	165 ±65	23.2 ±1.6
864.5 ±0.5	170 ± 50	23 ± 3			0.78 ±0.10
879.7 ±0.5	170 ± 40	44 ± 4		125 ±50	1.48 ±0.12
932.4 ±0.5	560 ± 45	514 ± 34	2	150 ±55	16.8 ±1.2
961.3 ±0.5	260 ± 35	82 ± 6	1	150 ±35	2.64 ±0.20
984.2 ±0.5	480 ± 50	414 ± 30	2	150 ±45	13.2 ±1.0
988.6 ±0.5	290 ± 60	151 ± 14	2	170 ±60	4.88 ±0.60
995.5 ±0.5	650 ± 60	620 ± 40	2	150 ±65	19.8 ±1.2
1022.4 ±0.6		1.0			0.031
1039.6 ±0.6		33 ± 4	[1]		1.04 ±0.13
1043.0 ±0.6	610 ± 60	364 ± 30	1		11.3 ±0.9
1063.9 ±0.6		8.0 ± 1.0			0.24 ±0.03
1077.7 ±0.6		270 ± 24	[1]		8.2 ±0.7
1092.5 ±0.6	520 ± 50	470 ± 36	2		14.3 ±1.1
1120.4 ±0.6		16.6 ± 2.0			0.50 ±0.06
1128.6 ±0.6		46 ± 6	[2]		1.36 ±0.18
1135.4 ±0.6	490 ± 50	424 ± 40	2		12.6 ±1.2
1177.5 ±0.6		10.0 ± 1.2	[2]		0.30 ±0.04
1183.0 ±0.6	430 ± 50	362 ± 34	2		10.6 ±1.0
1207.0 ±0.6	500 ± 50	450 ± 40	2		12.8 ±1.1
1218.5 ±0.6		40 ± 6	[2]		1.14 ±0.17
1223.3 ±0.6	700 ± 80	420 ± 40	1		12.0 ±1.14
1245.4 ±0.6		100 ± 12	1		2.8 ±0.3
1281.7 ±0.6	600 ± 50	344 ± 34	1		9.6 ±1.0
1288.0 ±0.6		16.8 ± 2.4	[2]		0.92 ±0.12
1310.7 ±0.6		316 ± 30	2		8.5 ±0.8
1328.8 ±0.6	840 ± 70	528 ± 40	1		14.5 ±1.1
1335.8 ±0.6		156 ± 16	[2]		2.4 ±0.2
1354.3 ±0.6	720 ± 60	444 ± 36			11.9 ±1.0
1359.5 ±0.6		33 ± 4	[2]		0.52 ±0.06
1367.7 ±0.6		200 ± 20	[1]		5.4 ±0.5
1395.8 ±0.6		40 ± 4	[2]		1.08 ±0.11
1426.2 ±0.6		196 ± 28	1		5.3 ±0.8
1428.8 ±0.6		532 ± 70	2		13.8 ±1.8
1450.5 ±0.6	410 ± 50	346 ± 32	2		8.80 ±0.81
1469.2 ±0.6		46 ± 6	[2]		1.10 ±0.14

¹⁹⁷Au
₇₉

E_0 (eV)	Γ (meV)	$2g_n^0$ (meV)	J	Γ_γ (meV)	$2g_n^0$ (meV)
1474.3 ± 0.6		120 ± 14	[1]		3.1 ± 0.4
1490.4 ± 0.6	1160 ± 120	1294 ± 100	2		33.4 ± 2.6
1501.5 ± 0.7		22.8 ± 3.0	[1]		0.50 ± 0.06
1530.0 ± 0.7		37.4 ± 4.4	[1]		0.96 ± 0.11
1552.3 ± 0.7	300 ± 50	188 ± 12	2		5.20 ± 0.33
1569.6 ± 0.7		8.8 ± 2.0			0.26
1578.4 ± 0.7	640 ± 60	360 ± 24	1		9.0 ± 0.6
1593.3 ± 0.7		74 ± 6	2		1.86 ± 0.15
1614.4 ± 0.7	280 ± 40	208 ± 20	2		5.2 ± 0.5
1641.5 ± 0.7		90 ± 8			2.3 ± 0.2
1646.4 ± 0.7		120 ± 12			2.9 ± 0.3
1660.5 ± 0.7		4.6 ± 0.8			0.12 ± 0.02
1693.2 ± 0.7		168 ± 20	[2]		4.06 ± 0.48
1706.2 ± 0.7		338 ± 32	[2]		8.2 ± 0.8
1721.2 ± 0.7		46 ± 6	[2]		1.1 ± 0.1
1734.4 ± 0.7		394 ± 40	[2]		9.4 ± 0.9
1754.5 ± 0.7		400 ± 40	2		9.4 ± 0.9
1756.3 ± 0.7		426 ± 60	1		9.9 ± 1.4
1811.4 ± 0.7		72 ± 8	[1]		1.7 ± 0.2
1821.1 ± 0.7		18 ± 3			0.44 ± 0.07
1832.0 ± 0.7		66 ± 8	[1]		1.54 ± 0.18
1856.3 ± 0.7	1550 ± 200	1040 ± 80	1		24.6 ± 1.9
1860.0 ± 0.7		108 ± 14	2		2.5 ± 0.3
1883.6 ± 0.7		170 ± 20	1		3.9 ± 0.5
1893.3 ± 0.7		4.6 ± 0.8			0.10 ± 0.02
1913.6 ± 0.7	2600 ± 250	1840 ± 120	1		42.0 ± 2.7
1939.7 ± 0.7	650 ± 100	390 ± 40	1		8.88 ± 0.91
1960.9 ± 0.7	900 ± 120	918 ± 80	2		20.8 ± 1.8
2021.1 ± 0.7		140 ± 22			3.10 ± 0.48
2028.4 ± 0.7		200 ± 24	[1]		4.44 ± 0.53
2032.8 ± 0.7		320 ± 40	[1]		7.08 ± 0.89
2035.5 ± 0.7		300 ± 30	[1]		6.66 ± 0.67
2059.2 ± 0.7		190 ± 24			4.2 ± 0.5
2075.0 ± 0.7	1200 ± 150	1352 ± 100	2		29.6 ± 2.2
2082.5 ± 0.7		592 ± 60	[2]		13.0 ± 1.3
2089.1 ± 0.7		354 ± 44	[1]		7.76 ± 0.96
2112.7 ± 0.7		90 ± 12			1.96 ± 0.26
2131.3 ± 0.7	1500 ± 170	1036 ± 120	1		22.4 ± 2.6
2147.8 ± 0.7		614 ± 80	[2]		13.3 ± 1.7

¹⁹⁸Au
₇₉
[2.495 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 25800 \pm 1200 \text{ b}$$

¹⁹⁹Au
₇₉
[3.14 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 30 \pm 15 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Au ¹⁹⁷	σ_t	ZP,250,166(72)	Steyerl
Au ¹⁹⁷	σ_t	71KNOX,2,673(71)	Eiland
Au ¹⁹⁷	σ_t	PL/8,29,33(69)	Steyerl
Au ¹⁹⁷	σ_γ	JNE,22,191(68)	Friesenhahn
Au ¹⁹⁷	σ_t	NIM,33,229(65)	Antonini
Au ¹⁹⁷	σ_t	PR/8,133,925(64)	Als-Nielsen
Au ¹⁹⁷	local osci.	KE,6,336(63)	Muttel
Au ¹⁹⁸	σ_t	ANS,6,43(63)	Simpson
Au ¹⁹⁷	σ_t	PR,126,29(62)	Brugger
Au ¹⁹⁷	σ_t	NMK,4,165(62)	Teutsch
Au ¹⁹⁷	pile osci.	61BUCHAR,623(61)	Bouzyk
Au ¹⁹⁷	pulsed n	NSE,9,132(61)	Meadows
Au ¹⁹⁷	diffraction	ARN,11,303(61)	Wilkinson
Au ¹⁹⁷	σ_t	NSE,8,453(60)	Gould
Au ¹⁹⁷	pile osci.	JNE,12,32(60)	Tattersall
Au ¹⁹⁹		PRIVATE COMM.(56)	Smith
Au ¹⁹⁸	activation	CJP,33,457(55)	Bell
Au ¹⁹⁷	σ_t	JNE,1,57(54)	Egelstaff
Au ¹⁹⁷	pile osci.	JNE,1,144(54)	Green
Au ¹⁹⁷	σ_t	PR,92,716(53)	Carter
Au ¹⁹⁸	activation	PR,83,1097(51)	Sherk
Au ¹⁹⁷	diffraction	PR,81,527(51)	Shull
Au ¹⁹⁷	σ_t	PR,72,585(47)	Brill
Au ¹⁹⁷	σ_t	PR,72,729(47)	MacDaniel
Au ¹⁹⁷	activation	PR,72,888(47)	Seren
Au ¹⁹⁷	σ_t	PR,49,453(36)	Mitchell
Au ¹⁹⁷	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Au ¹⁹⁷	$\bar{\sigma}_s$	534-996	71KNOX,2,868(71)	Hoffman
Au ¹⁹⁷	σ_t	1000-2100	NP/A,131,450(69)	Alves
Au ¹⁹⁷	σ_γ (spectra)	thermal	NP/A,130,353(69)	Samour
Au ¹⁹⁷	σ_t	4.9	CEA-N-1230(69)	Tellier
Au ¹⁹⁷	σ_γ (spectra)	0.025-107	PR,173,1170(68)	Wasson
Au ¹⁹⁷	$\sigma_t \sigma_\gamma$	46.5-995.4	NP,76,391(66)	Julien
Au ¹⁹⁷	$\bar{\sigma}_s$	60.25-240.3	CR/B,262,507(66)	Trochon
Au ¹⁹⁷	$\sigma_\gamma \bar{\sigma}_s$	46.45-547.0	65ANTWERP,65(65)	Asghar
Au ¹⁹⁷	σ_t	78.34	CR,255,1913(62)	Le Pipec
Au ¹⁹⁷	$\sigma_t \sigma_\gamma$ (SI)	46.7-2470	PR,120,2214(60)	Desjardins
Au ¹⁹⁷	σ_t	61.0-266	BAP,3,177(58)	Slaughter
Au ¹⁹⁷	$\sigma_t \bar{\sigma}_s$	4.9	PR,104,1425(56)	Wood
Au ¹⁹⁷	σ_t	46.5	PRIVATE COMM.(56)	Zimmerman
Au ¹⁹⁷	σ_t	4.91	PR,93,1030(54)	Landon
Au ¹⁹⁷	σ_t	4.94-194	PR,95,476(54)	Seidl
Au ¹⁹⁷	$\sigma_t \bar{\sigma}_s$	4.87	PR,83,746(51)	Tittman
Au ¹⁹⁷	$\bar{\sigma}_s$	4.8	PR,79,11(50)	Harris
Au ¹⁹⁷	σ_t	4.8	PR,71,165(47)	Havens

⁸⁰Hg

THERMAL CROSS SECTIONS

$$\sigma_T = 375 \pm 5 \text{ b}$$
$$a_{coh} = 12.69 \pm 0.02 \text{ fm}$$

RESONANCE PROPERTIES

$$I_T = 73 \pm 10 \text{ b}$$
$$R_T = 9.8 \pm 0.7 \text{ fm}$$
$$S_0 = 1.3 \pm 0.3$$

UNASSIGNED RESONANCES

E_0 (eV)	Γ (meV)	$2ag\Gamma_n$ (meV)	$2ag\Gamma_n^0$ (meV)
270.7	2300 ± 900	8.8 ± 1.4	0.53 ± 0.08
513	1550 ± 2010	8.6 ± 1.0	0.38 ± 0.04
650		16 ± 12	0.63 ± 0.47

¹⁹⁶Hg
⁸⁰

THERMAL CROSS SECTIONS

$$\sigma_T = 120 \pm 13 \text{ b [24 hr } ^{197}\text{Hg}^*]$$
$$\sigma_T = 3080 \pm 200 \text{ b [65 hr } ^{197}\text{Hg}^*]$$

RESONANCE PROPERTIES

$$I_T = 58.9 \pm 2.4 \text{ b [65 hr } ^{197}\text{Hg}^*]$$
$$I_T = 413 \pm 15 \text{ b [24 hr } ^{197}\text{Hg}^*]$$

RESONANCE PARAMETERS

$I^n = 0^+$		$\%Abn = 0.15$		$S_n = 6981 \pm 23 \text{ keV}$	
E_0 (eV)	Γ (meV)	Γ_n (meV)	J	Γ_T (meV)	Γ_n^0 (meV)
Bound level *93.5	405 ± 100	184 ± 12	1/2	221 ± 100	19.0 ± 1.2

* Isotopic assignment uncertain

¹⁹⁸Hg
80

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.018 \pm 0.004 \text{ b [43 min } ^{198}\text{Hg}^{\circ}]$$

$$\sigma_{\gamma}^c = 1.9 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 70 \pm 30 \text{ b}$$

$$R_{\gamma}^c = 9.8 \pm 0.7 \text{ fm}$$

RESONANCE PARAMETERS

$I^{\pi} = 0^+$		$\% \text{Abn} = 10.1$		$S_n = 6648.8 \pm 2.8 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$\Gamma_n \text{ (meV)}$	J	$\Gamma_{\gamma} \text{ (meV)}$	$\Gamma_n^0 \text{ (meV)}$
23.06 ± 0.02	127 ± 15	6.7 ± 0.2	1/2	120 ± 10	1.40 ± 0.04
89.81 ± 0.06	178 ± 20	28 ± 1	1/2	150 ± 20	2.96 ± 0.11
302.5 ± 0.2	940 ± 80	778 ± 60	1/2	165 ± 90	44.8 ± 3.3
344.0 ± 0.2	222 ± 35	57 ± 5	1/2	165 ± 40	3.0 ± 0.3
417.4 ± 0.3	300 ± 50	152 ± 10	1/2	150 ± 50	7.8 ± 1.3

¹⁹⁹Hg
80

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 2000 \pm 1000 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma}^c = 153 \pm 30 \text{ b}$$

$$R_{\gamma}^c = 9.8 \pm 0.7 \text{ fm}$$

RESONANCE PARAMETERS

$I^{\pi} = 1/2^-$		$\% \text{Abn} = 16.9$		$S_n = 8028.8 \pm 0.5 \text{ keV}$	
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	J	$\Gamma_{\gamma} \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$
Bound level			0		
33.50 ± 0.03	341 ± 10	69.0 ± 1.5	1	295 ± 10	12.0 ± 0.3
129.7 ± 0.1	434 ± 25	204 ± 20	0	230 ± 30	17.9 ± 1.8
175.1 ± 0.1	1245 ± 80	1395 ± 60	1	315 ± 80	105.7 ± 4.6
263.9 ± 0.2	320 ± 50	48 ± 4	1	290 ± 50	3.0 ± 0.3
314.5 ± 0.2	1370 ± 80	1240 ± 60	1	340 ± 100	70.5 ± 3.4
491.5 ± 0.3	2820 ± 120	1300 ± 40	0	220 ± 300	52.5 ± 1.8
686 ± 0.5	1450 ± 150	600 ± 60	0	250 ± 180	
808 ± 3	848 ± 271	872 ± 186	1		10.2 ± 2.2
880 ± 3	3350 ± 182	4418 ± 162	1	405 ± 172	149.0 ± 5.4

²⁰⁰₈₀Hg

THERMAL CROSS SECTIONS

$$\sigma_T < 60 \text{ b}$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$\chi A_{br} = 23.1$$

$$S_n = 6225.4 \pm 2.3 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	J	Γ_γ (meV)	Γ_n^0 (meV)
1325	9500 $\pm$ 1500	9000 $\pm$ 1500	1/2	(500)	250 $\pm$ 40
2710	12500 $\pm$ 2000	12000 $\pm$ 2000	1/2	(500)	230 $\pm$ 40
5060	18500 $\pm$ 2000	18000 $\pm$ 2000	1/2	(500)	250 $\pm$ 30
7800	59000 $\pm$ 16000	59000 $\pm$ 16000	1/2	500	660 $\pm$ 180

²⁰¹₈₀Hg

THERMAL CROSS SECTIONS

$$\sigma_T < 60 \text{ b}$$

RESONANCE PROPERTIES

$$R' = 9.8 \pm 0.7 \text{ fm}$$

RESONANCE PARAMETERS

$$I^\pi = 3/2^-$$

$$\chi A_{br} = 13.2$$

$$S_n = 7755.6 \pm 1.4 \text{ keV}$$

E_0 (eV)	Γ (meV)	$2g\Gamma_n$ (meV)	J	Γ_γ (meV)	$2g\Gamma_n^0$ (meV)
43.0 $\pm$ 0.1	289 $\pm$ 15	4.38 $\pm$ 0.15	2	285 $\pm$ 15	0.66 $\pm$ 0.03
70.9 $\pm$ 0.1	472 $\pm$ 30	9.0 $\pm$ 0.4	1	460 $\pm$ 30	1.07 $\pm$ 0.05
210.3 $\pm$ 0.2	805 $\pm$ 40	315 $\pm$ 20	1	385 $\pm$ 100	21.7 $\pm$ 1.4
312.7 $\pm$ 0.2	730 $\pm$ 60	508 $\pm$ 40	2	320 $\pm$ 65	29.2 $\pm$ 2.3
445.0 $\pm$ 0.3	1450 $\pm$ 100	690 $\pm$ 25	1	530 $\pm$ 100	32.8 $\pm$ 1.2
564.0 $\pm$ 0.5	1450 $\pm$ 100	1440 $\pm$ 45	2	300 $\pm$ 100	60.8 $\pm$ 1.9
685.0 $\pm$ 0.7	1580 $\pm$ 150	880 $\pm$ 75	1	410 $\pm$ 170	33.4 $\pm$ 2.9

²⁰²₈₀Hg

THERMAL CROSS SECTIONS

$$\sigma_T = 4.9 \pm 0.1 \text{ b}$$

RESONANCE PROPERTIES

$$I_T = 4.9 \pm 0.2 \text{ b}$$

RESONANCE PARAMETERS

$$I^0 = 0^0$$

$$\Sigma A_{Br} = 29.7$$

$$S_n = 5992.1 \pm 3.7 \text{ keV}$$

E ₀ (eV)	Γ (meV)	Γ _n (meV)	J	Γ _γ (meV)	Γ _n ⁰ (meV)
1710	5000 ± 2000	5500 ± 2000	1/2	(500)	130 ± 50
4105	18500 ± 6000	18000 ± 6000	1/2	(500)	280 ± 90

²⁰⁴₈₀Hg

THERMAL CROSS SECTIONS

$$\sigma_T = 0.43 \pm 0.10 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Hg	n reflection	PR,174,313(68)	Bartolini
Hg ²⁰²	activation	JIN,30,349(68)	Sims
Hg ¹⁹⁶	activation	NSE,31,545(68)	Tilbury
Hg ^{196,202}	activation	RCA,8,165(67)	Kim
Hg	n reflection	PRIVATE COMM. (65)	Koester
Hg	n refractometer	ZP,182,328(65)	Koester
Hg ¹⁹⁶	activation	NYO-10175(64)	Arino
Hg ¹⁹⁶	activation	NP,41,372(63)	Mangal
Hg ^{196,202}	activation	PR,128,761(62)	Sehgal
Hg ¹⁹⁶	pulsed n	NSE,9,132(61)	Meadows
Hg ¹⁹⁶	activation	PR,120,1313(60)	Vandenbosch
Hg ^{196,198}	activation	NP,12,261(59)	Sehgal
Hg	local osci.	JPR,13,171(52)	Ailloud
Hg	pile osci.	CR,232,2089(51)	Grimeland
Hg	$\bar{\nu}_e$ mirror reflections	PR,82,560(51)	Hibdon
Hg	n reflection	PR,82,560(51)	Hibdon
Hg ^{202,204}	activation	PR,82,276(51)	Lyon
Hg	local osci.	PR,83,641(51)	Pomerance
Hg	pile osci.	PR,80,342(50)	Harris
Hg ¹⁹⁹⁻²⁰¹	mass spectrometry	PR,71,561(47)	Inghram
Hg ²⁰⁴	activation	PR,72,888(47)	Seren
Hg	σ_c	PR,49,453(36)	Mitchell
Hg	σ_c	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Hg ²⁰¹	σ_{γ} (spectra)	43-554	AERE-PR/NP-17,22(70)	Thomas
Hg ¹⁹⁸	σ_t	23.1-417	NP/A,132,129(69)	Julien
Hg ¹⁹⁹	σ_t	33-686	NP/A,132,129(69)	Julien
Hg ²⁰¹	σ_t	43-685	NP/A,132,129(69)	Julien
Hg ¹⁹⁸	$\sigma_t\sigma_{\gamma}$	23.06-417.4	CEA-R-2810(65)	Huynh
Hg ¹⁹⁹	$\sigma_t\sigma_{\gamma}$	33.5-686	CEA-R-2810(65)	Huynh
Hg ²⁰¹	$\sigma_t\sigma_{\gamma}$	43.0-685	CEA-R-2810(65)	Huynh
Hg	σ_{γ} (spectra)	thermal	NP,50,209(64)	Bartholomew
Hg ²⁰¹	$\sigma_t\sigma_{\gamma}$	43-70.9	PRIVATE COMM.(63)	Bianchi
Hg ¹⁹⁹	σ_{γ} (spectra)	34-260	PR,132,1640(63)	Bollinger
Hg ¹⁹⁸	σ_t	23.3-91.1	NP,42,676(63)	Bolotin
Hg ¹⁹⁹	σ_t	33.5-131	NP,42,676(63)	Bolotin
Hg ²⁰¹	σ_t	43.3-71.8	NP,42,676(63)	Bolotin
Hg ²⁰¹	$\sigma_t\sigma_{\gamma}$	210.1	PL,3,67(62)	Julien
Hg ¹⁹⁹	σ_{γ} (spectra)	0.025-175	ANL-6146,1(60)	Bollinger
Hg	σ_t			
	σ_{γ} (spectra)	270.7-650	NP,21,66(60)	Carpenter
Hg ¹⁹⁸	$\sigma_t\sigma_{\gamma}$ (spectra)	93.5	NP,21,66(60)	Carpenter
Hg ¹⁹⁹	$\sigma_t\sigma_{\gamma}$ (spectra)	23.0-417	NP,21,66(60)	Carpenter
Hg ¹⁹⁹	$\sigma_t\sigma_{\gamma}$ (spectra)	33.5-880	NP,21,66(60)	Carpenter
Hg ²⁰⁰	$\sigma_t\sigma_{\gamma}$ (spectra)	1325-7800	NP,21,66(60)	Carpenter
Hg ²⁰¹	$\sigma_t\sigma_{\gamma}$ (spectra)	43.0-685	NP,21,66(60)	Carpenter
Hg ²⁰²	$\sigma_t\sigma_{\gamma}$ (spectra)	1710-4105	NP,21,66(60)	Carpenter
Hg ¹⁹⁸	$\sigma_t\sigma_{\gamma}$ (spectra)	90.0	NP,13,525(59)	Bird
Hg ¹⁹⁹	$\sigma_t\sigma_{\gamma}$ (spectra)	33.5-175	NP,13,525(59)	Bird
Hg ²⁰¹	$\sigma_t\sigma_{\gamma}$ (spectra)	43.0-209	NP,13,525(59)	Bird
Hg ¹⁹⁹	σ_{γ} (spectra)	33-264	BAP,4,34(59)+	Brussel
Hg ²⁰¹	σ_{γ} (spectra)	43-441	BAP,4,34(59)+	Brussel
Hg ¹⁹⁹	σ_{γ} (spectra)	33-264	BAP,4,472(59)	Brussel
Hg ²⁰¹	σ_{γ} (spectra)	43-441	BAP,4,472(59)	Brussel
Hg ¹⁹⁹	σ_{γ} (spectra)	0.025-177	PR,107,1333(57)	Landon
Hg ¹⁹⁸	σ_t	23-300	PRIVATE COMM.(57)	Zimmerman
Hg ¹⁹⁹	σ_t	33.3-491	PRIVATE COMM.(57)	Zimmerman
Hg ²⁰¹	σ_t	43-558	PRIVATE COMM.(57)	Zimmerman
Hg ¹⁹⁸	σ_t	23.3	PR,101,1328(56)	Levin
Hg ¹⁹⁹	σ_t	34.0	PR,101,1328(56)	Levin
Hg ¹⁹⁸	σ_t	23-311	PR,102,228(56)	Palmer
Hg ¹⁹⁹	σ_t	34-177	PR,102,228(56)	Palmer
Hg ²⁰¹	σ_t	43-206	PR,102,228(56)	Palmer
Hg	σ_t	23-191	PPS/A,65,992(52)	Hodgson
Hg ¹⁹⁹	$\bar{\sigma}_s$	thermal	PR,82,560(51)	Hibdon
Hg ¹⁹⁹	σ_t	thermal	PR,70,154(46)	Havens
Hg	$\bar{\sigma}_s$	thermal	PR,60,688(41)	Kimura

81 ²⁰³Tl

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 3.4 \pm 0.5 \text{ b} \\ \sigma_s &= 9.7 \pm 0.4 \text{ b} \\ \sigma_t &= 13.1 \pm 0.7 \text{ b} \\ a_{coh} &= 8.89 \pm 0.02 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma} &= 12 \pm 1 \text{ b} \\ R_{\gamma} &= 9.6 \pm 0.3 \text{ fm}\end{aligned}$$

203
81 ²⁰³Tl

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 11.0 \pm 0.5 \text{ b}$$

RESONANCE PROPERTIES

$$I_{\gamma} = 39.5 \pm 2.0 \text{ b}$$

RESONANCE PARAMETERS

$I^{\pi} = 1/2^{+}$		%Abn = 29.5		$S_n = 6655.8 \pm 1.5 \text{ keV}$		
$E_0 \text{ (keV)}$		$2g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_{\gamma} \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$
.03793 ± .00005		.000041 ± 4.00-6		1	0.27 ± 0.07	
0.2388 ± .0015		6.75 ± 0.60	1	0	0.64 ± 0.07	0.438 ± 0.039
1.2 ± 0.1						
5.0 ± 0.2			0	0		
6.4						
8.9						
10.9						
13						
26						
29						

²⁰⁴
81 **Tl**
[3.78 yr]

THERMAL CROSS SECTIONS
 $\sigma_{\gamma} = 21.6 \pm 2.0 \text{ b}$
 RESONANCE PROPERTIES
 $\Gamma_{\gamma}^c = 86 \pm 17 \text{ b}$
 RESONANCE PARAMETERS

$I^{\pi} = 2^{-}$

$S_n = 7541.4 \pm 3.8 \text{ keV}$

$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (eV)}$	$\Gamma_{\gamma} \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$
0.1229	2.00	0.75 ± 0.15	0.180
0.7962	9.80	(0.60)	1.23

205
81 **Tl**

THERMAL CROSS SECTIONS

$$\sigma_y = 0.10 \pm 0.03 \text{ b}$$

RESONANCE PROPERTIES

$$I_\gamma = 0.7 \pm 0.2 \text{ b}$$

$$S_0 = 0.55 \pm 0.15$$

RESONANCE PARAMETERS

$I^\pi = 1/2^+$		$\Sigma \text{Abn} = 70.5$		$S_n = 6503.9 \pm 1.5 \text{ keV}$		
$E_0 \text{ (keV)}$	$2g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$2g\Gamma_n^0 \text{ (eV)}$	
.04455 ± .00005	.000062 ± 4.00-6	2	1	0.22 ± 0.04		
1.445			1			
2.794	1.80 ± 0.18	1	0	0.79 ± 0.08	0.034 ± 0.003	
3.042	7.5 ± 0.5	1	0	0.71 ± 0.07	0.136 ± 0.009	
4.43						
4.44						
5.11			0			
6.68			1			
8.46			1			
10.25						
11.79			1			
12.36						
13.29						
14.54						
16.29						
16.45	21.2	(0)	0	1.0 ± 0.2	1.69	
16.83						
17.48						
18.72						
19.29			1			
20.80						
22.98						
23.66						
24.12						
24.79						
25.92						
26.88						
27.35						
27.95						
28.65						
29.76						
30.33						
31.20	72.4		0	1.0 ± 0.3	0.41	
32.92			1			

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Tl	Christiansen filters	ZN/A,27,901(72)	Koester
Tl ²⁰⁵	activation, ratio	AECL-3742,41(70)	Merritt
Tl ²⁰³	activation	JIN,32,2839(70)	Sims
Tl ^{203,204}	mass spectrometry	ORNL-4306,2(68)	Druschel
Tl	diffraction	JAP,30,1323(59)	Sidhu
Tl ^{203,205}	pile osci.	PR,88,412(52)	Pomerance
Tl	local osci.	PR,83,641(51)	Pomerance
Tl	pile osci.	PR,80,342(50)	Harris
Tl	σ_t	PR,75,975(49)	Winsberg
Tl ^{203,205}	activation	PR,72,888(47)	Seren
Tl	σ_t	PR,71,174(47)	Wu
Tl ²⁰³	activation	PR,59,102(41)	O'Neal
Tl	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
Tl	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Tl ²⁰⁵	σ_t	2.79-3.04	PRIVATE COMM.(73)	Harvey
Tl ²⁰³	σ_t	0.0379	PRIVATE COMM.(72)	Thomas
Tl ²⁰⁵	σ_t	0.446	PRIVATE COMM.(72)	Thomas
Tl ²⁰⁵	$\sigma_y, \sigma_y(\text{spectra})$	2.8-222	71ALBANY,263(71)+	Earle
Tl ²⁰³	σ_t	0.238	NSAC-31,70(70)	Watanabe
Tl ²⁰⁴	σ_t	0.122-0.796	68WASH,2,893(68)	Watanabe
Tl	σ_t	0.238	PRIVATE COMM.(65)	Ignatiev
Tl ²⁰³	σ_y	0.238-1.3	ZET,47,795(64)	Konks
Tl ²⁰⁵	σ_y	3.0	ZET,47,795(64)	Konks
Tl ²⁰³	σ_t	0.238-29	AP,14,346(61)	Newson
Tl ²⁰⁵	σ_t	3-55	AP,14,346(61)	Newson
Tl ²⁰³	σ_t	0.238	PR,108,353(57)	Stolovy
Tl ²⁰³	σ_t	0.238	PR,101,1328(56)	Levin

⁸²Pb

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 0.170 \pm 0.002 \text{ b} \\ \bar{\sigma}_s &= 11.4 \pm 0.2 \text{ b} \\ \sigma_c &= 11.6 \pm 0.2 \text{ b} \\ a_{coh} &= 9.42 \pm 0.01 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T &= 0.16 \pm 0.04 \text{ b} \\ R_T &= 9.48 \pm 0.05 \text{ fm}\end{aligned}$$

²⁰⁴₈₂Pb

THERMAL CROSS SECTIONS

$$\sigma_T = 0.661 \pm 0.070 \text{ b}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_T^c &= 1.7 \pm 0.5 \text{ b} \\ R_T^c &= 9.5 \pm 0.1 \text{ fm} \\ S_0 &= 0.65 \pm 0.20\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$		%Abn = 1.4		$S_n = 6734.2 \pm 1.5 \text{ keV}$		
$E_0 \text{ (keV)}$	$g\Gamma_n \text{ (eV)}$	J	ℓ	$\Gamma_\gamma \text{ (eV)}$	$g\Gamma_n^0 \text{ (eV)}$	$g\Gamma_n^1 \text{ (eV)}$
1.33±0.05	0.030± 0.001					
1.68±0.05	3.9 ± 0.3	1/2	0	0.73±0.06	.095±0.007	
2.48±0.05	5.8 ± 0.5	1/2	0	0.47±0.06	0.12 ±0.01	
6.6 ±0.1	1.9 ± 1.2	1/2	0		.023±0.015	
8.35±0.05	50 ± 4	1/2	0	1.6 ±0.4	0.55 ±0.04	
9.64±0.05	15 ± 5	1/2	0	1.2 ±0.4	0.15 ±0.05	
12.9±0.05	50 ±10	1/2	0	0.6 ±0.4	0.44 ±0.09	
14.8±0.2	3.1 ± 1.0		1			0.4
19.5±0.3	4.0 ± 1.7		1			0.4
21.5	35 ± 5	1/2	0		0.24 ±0.03	
22.6	<10				<0.067	
23.5	60 ±10	1/2	0		0.39 ±0.07	
24.4	12 ± 5				0.077±0.032	
26.9	29 ± 7	1/2	0		0.18 ±0.04	
32.0	27 ± 7	1/2	0		0.15 ±0.04	
33.1	12 ± 5				0.066±0.03	
34.9	9 ± 6				0.048±0.032	
38.4	100 ±10	1/2	0		0.51 ±0.05	
42	10 ± 6				0.049±0.029	
45	5 ± 5				0.024±0.024	
48.1	24 ±10		[0]		0.11 ±0.05	
53.4	85 ±20	1/2	0		0.37 ±0.09	
59	10 ± 7		[0]		0.041±0.029	

²⁰⁶₈₂Pb

THERMAL CROSS SECTIONS

$$\sigma_y = 30.5 \pm 0.8 \text{ mb}$$

RESONANCE PROPERTIES

$$I_\gamma^c = 0.2 \pm 0.1 \text{ b}$$

$$R' = 9.5 \pm 0.1 \text{ fm}$$

RESONANCE PARAMETERS

$$I'' = 0^+$$

$$\% \text{Abn} = 24.1$$

$$S_n = 6740.9 \pm 2.3 \text{ keV}$$

E_0 (keV)	Γ (eV)	$g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
3.36 $\pm$ 0.01		5 $\pm$ 2			0.64 $\pm$ 0.13	0.086 $\pm$ 0.035	
14.25 $\pm$ 0.01		24 $\pm$ 5			*0.20 $\pm$ 0.04	0.20 $\pm$ 0.04	
16.47 $\pm$ 0.01	20 $\pm$ 4	20 $\pm$ 4	1/2	1	0.70 $\pm$ 0.08		2.5
19.80 $\pm$ 0.02		41 $\pm$ 8			*0.32 $\pm$ 0.06	0.29 $\pm$ 0.06	
21.94 $\pm$ 0.04		33 $\pm$ 5		>0	*0.22 $\pm$ 0.08		
25.48 $\pm$ 0.05		74 $\pm$ 10	3/2	1	0.55 $\pm$ 0.10		4.9
36.40 $\pm$ 0.08		78 $\pm$ 12	3/2	1	0.5 $\pm$ 0.1		3.2
42.2 $\pm$ 0.1					*0.8 $\pm$ 0.3		
47.6 $\pm$ 0.1		96 $\pm$ 14	3/2	1			2.7
58.4 $\pm$ 0.1		<130			*0.8 $\pm$ 0.2		
66.20 $\pm$ 0.05		116 $\pm$ 35	1/2	0	2.0 $\pm$ 0.6	0.45 $\pm$ 0.14	
71.0 $\pm$ 0.1	155 $\pm$ 45						
83.8 $\pm$ 0.2		210 $\pm$ 50	[3/2]	1			3.0
115.0 $\pm$ 0.2	264						
118.2 $\pm$ 0.2	270						
125.1 $\pm$ 0.2	250						
126.2 $\pm$ 0.3	200			1			
140.1 $\pm$ 0.3	470						
151.0 $\pm$ 0.5	450 $\pm$ 70		[3/2]	1			
169.0 $\pm$ 0.5	300						
199.0 $\pm$ 0.4	340 $\pm$ 80	340 $\pm$ 80	1/2	1			1.7

$$^* g\Gamma_n\Gamma_\gamma/\Gamma$$

²⁰⁷Pb
₈₂

THERMAL CROSS SECTIONS

$$\sigma_T = 709 \pm 10 \text{ mb}$$

RESONANCE PROPERTIES

$$I_1^e = 0.4 \pm 0.2 \text{ b}$$
$$R_1^f = 9.5 \pm 0.1 \text{ fm}$$
$$S_1 = 1.0 \pm 0.3$$

RESONANCE PARAMETERS

$$I^e = 1/2^-$$

$$\chi R_{\text{th}} = 22.1$$

$$S_n = 7368.2 \pm 1.4 \text{ keV}$$

E_0 (keV)	Γ (eV)	$2g\Gamma_n$ (eV)	J	ℓ	Γ_γ (eV)	$2g\Gamma_n^0$ (eV)	$g\Gamma_n^1$ (eV)
3.070	2 ± 1	3.0 ± 1.5	1	1			6.6
10.21	21 ± 2	53 ± 5	2	1			3.7
12.39	16 ± 5	40 ± 13	2	1			6.5
16.20	41 ± 4	103 ± 10	2	1	0.53 ± 0.06		9.0
16.80	60 ± 10	150 ± 25	1	1	0.27 ± 0.06		2.5
29.44	60 ± 20	90 ± 30	1	1			1.9
30.54	30 ± 10	75 ± 25	2	1	0.93 ± 0.13		
37.80	65 ± 20	98 ± 30	1	1	5.0 ± 0.5	6.13 ± 0.74	
41.64	1250 ± 150	1250 ± 150	1	0			
44.35	390		1	0		1.50 ± 0.34	2.4
48.51	220 ± 50	330 ± 75	1	1		1.27	1.6
62.93	100	250	1	1			
67.10	220	330	1	1		1.26	2.2
67.93	120	180	1	1			7.0
68.50	220	330	2	1			
83.18	130	325	1	1	1.9 ± 0.2	6.00	
90.35	760 ± 90	1140 ± 135	1	1		4.53	
93.15	730	1825	(2)			2.67	
98.75	570	1425	1	1			4.0
102.25	570	855	2	1			8.0
112.30	340	850	1	1	2.6 ± 1.0		2.8
115.50	1230	1845	1	1	2.3 ± 1.0		5.9
125.0	440	660	1	1			1.4
128.2	970	1455	1	1			
130.6	230	345	1	1			
149.8	1470		1	1			
162.1	720	1080	1	1			
179.4	460	690	1	1			
181.9	310	465	1	1			
187.0	570	855	1	1			
257.1	4050	6075	1	1			11.7

²⁰⁸Pb
82

Thermal cross sections
 $\sigma_T = 0.48 \pm 0.030$ mb
Resonance properties
 $R' = 9.5 \pm 0.1$ fm
Resonance parameters

$I^\pi = 0^+$ $\lambda_{Pb\alpha} = 52.4$ $S_n = 3938 \pm 5$ keV

E_0 (keV)	Γ (keV)	Γ_n (keV)	J	ℓ	Γ_γ (eV)	Γ_n^1 (eV)
80.0 $\pm$ 0.5	1.00 $\pm$ 0.100		1/2	1	1.3 $\pm$ 0.3	13.1 $\pm$ 1.31
118 $\pm$ 1	0.44 $\pm$ 0.090		1/2	1		3.65 $\pm$ 0.75
362 $\pm$ 2		6.45 $\pm$ 1.3	1/2	1		21 $\pm$ 4
515		100				141
525 $\pm$ 2		7.1 $\pm$ 1.5	3/2	1		13 $\pm$ 3
720 $\pm$ 3	4.6 $\pm$ 0.8		3/2	1		6.4 $\pm$ 1.1
769.0 $\pm$ 3.3	4.0 $\pm$ 1.0		5/2	2		
821.0 $\pm$ 3.2	10.8 $\pm$ 1.0		3/2	2		
855.0 $\pm$ 3.2	5.0 $\pm$ 1.0		3/2	2		
953.0 $\pm$ 3.1	5.0 $\pm$ 1.0		3/2	1		
1111.1 $\pm$ 1.7	5.2 $\pm$ 1.0		3/2	1		
1154.1 $\pm$ 1.7	7.0 $\pm$ 1.0		1/2	1		
1204.1 $\pm$ 2.0	7.0 $\pm$ 1.0		3/2	1		
1239.1 $\pm$ 2.0	12.0 $\pm$ 1.5		3/2	1		
1285.1 $\pm$ 2.0	6.0 $\pm$ 0.2		3/2	1		
1354.1 $\pm$ 2.1	4.0 $\pm$ 1.0		1/2	1		
1386.1 $\pm$ 2.0	6.0 $\pm$ 1.5		3/2	1		
1431.1 $\pm$ 2.6	1.0 $\pm$ 0.8		5/2	2		
1477.1 $\pm$ 2.9	5.0 $\pm$ 1.0		3/2	2		
1600.1 $\pm$ 3.0	6.0 $\pm$ 1.0		3/2	1		
1620.1 $\pm$ 3.0	10 $\pm$ 1		3/2	1		
1632.1 $\pm$ 3.0	2.6 $\pm$ 1.0		3/2	1		
1701.1 $\pm$ 2.5	6.0 $\pm$ 1.0		5/2	3		
1735.1 $\pm$ 2.5	60 $\pm$ 15		1/2	0		
1749.1 $\pm$ 2.5	10.6 $\pm$ 1.0		7/2	3		
1761.1 $\pm$ 2.5	4.4 $\pm$ 1.0		7/2	3		
1797.1 $\pm$ 2.8	3.0 $\pm$ 1.0		3/2			
1872.1 $\pm$ 3.0	13.0 $\pm$ 1.5		1/2			

* Possibly a Doublet

²¹⁰Pb
82
[22.3 yr]
Thermal cross sections
 $\sigma_T = 0.5 \pm 0.5$ b

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Pb	σ_y	NP/A,169,95(71)	Cranston
Pb	$\bar{\sigma}_s$	70HELSINKI,1,651(70)	Vertebnyi
Pb ²⁰⁸	activation	ORNL-4343,71(68)	Emery
Pb	$\bar{\sigma}_s$	UFZ,13,605(68)	Vertebnyi
Pb ²⁰⁴	σ_y (spectra)	NP/A,94,351(67)	Jurney
Pb	reflection	67JUELICH,80(67)	Koester
Pb	σ_t total reflection	ZP,190,295(66)	Niklaus
Pb	σ_e	NP,61,381(65)	Rayburn
Pb ²⁰⁸	pile osci.	PRIVATE COMM.(63)	Carre
Pb ^{204,206,207}	σ_y (spectra)	ANL-6797,236(63)	Jurney
Pb	pile osci.	61BUCHAR,553(61)	Stefanescu
Pb	pile osci.	AERE-R/R-2516(59)	Jovitt
Pb ^{204,206,207}	mass spectrometry	PR,111,590(58)	Wing
Pb ^{206,207}	mass spectrometry	PPS/A,65,761(52)	Aitken
Pb ^{204,206-208}	pile osci.	PR,88,412(52)	Pomerance
Pb	filtered beam	PRIVATE COMM.(52)	Weiss
Pb	local osci.	PR,83,641(51)	Pomerance
Pb	n diffraction	PR,81,527(51)	Shull
Pb	pile osci.	PPS/A,63,1175(50)	Colmer
Pb	pile osci.	PR,80,342(50)	Harris
Pb	σ_y	PR,69,411(46)	Coltman
Pb	$\bar{\sigma}_s$	PR,60,155(41)	Whitaker
Pb	$\bar{\sigma}_s$	SCP,36,153(39)	Kimura
Pb	$\bar{\sigma}_s$	PR5/A,162,127(37)	Goldhaber
Pb	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
Pb ²⁰⁶	σ_{γ}	207-620	PRIVATE COMM.(72)	Allen
Pb ²⁰⁷	σ_c	40.8	BAP,17,18(72)	Phillips
Pb ²⁰⁷	σ_c	300-560	AP,69,451(72)	Seibel
Pb ²⁰⁷	σ_{γ}	3.0-699	71KNOX,764(71)	Allen
Pb ²⁰⁷	$\sigma(\gamma,n)$	205-543	PR/C,3,2475(71)	Baglan
Pb ²⁰⁸	$\sigma(\gamma,n)$	91-615	PRIVATE COMM.(70)	Nakajma
Pb ²⁰⁴	σ_{γ}	1.33-27.4	RP1-328-160,7(69)	Block
Pb ²⁰⁶	$\sigma(\gamma,n)$	1.6-50	PR,178,1827(69)	Bowman
Pb ²⁰⁷	$\sigma(\gamma,n)$	3.4-25	PR,178,1827(69)	Bowman
Pb ²⁰⁸	$\sigma(\gamma,n)$	3.0-41	PR,178,1827(69)	Bowman
Pb ²⁰⁸	activation	12-118	PR,181,1639(69)	Macklin
Pb ²⁰⁶	$\sigma_{\gamma}(\text{spectra})$	16-72	PR,154,1136(67)	Biggerstaff
Pb ²⁰⁷	$\sigma_{\gamma}(\text{spectra})$	12-41	PR,154,1136(67)	Biggerstaff
Pb	σ_{γ}	1-128	PRIVATE COMM.(67)	Block
Pb ²⁰⁴	σ_{γ}	1.33-18.8	PRIVATE COMM.(67)	Block
Pb ²⁰⁶	σ_{γ}	3.36-65.8	PRIVATE COMM.(67)	Block
Pb ²⁰⁷	σ_{γ}	3.02-128	PRIVATE COMM.(67)	Block
Pb ²⁰⁸	σ_c	277-1156	CEA-R-3279(67)	Cabe
Pb ²⁰⁴	σ_c	6.5-59	PR,153,1356(67)	Gibbons
Pb ²⁰⁸	$\bar{\sigma}_s$	723-1761	PR,147,870(66)	Fowler
Pb ²⁰⁶	σ_c	205-514	PL,17,286(65)	Farrell
Pb ²⁰⁶	$\sigma_c \sigma_{\gamma}$	12.2-75	PR/B,136,695(64)	Macklin
Pb ²⁰⁷	$\sigma_c \sigma_{\gamma}$	12.1-41.2	PR/B,136,695(64)	Macklin
Pb	$\sigma_c \sigma_{\gamma}$	12.3-24.4	BAP,8,513(63)-	Block
Pb ²⁰⁴	$\sigma_c \sigma_{\gamma}$	1.68-12.9	BAP,8,513(63)-	Block
Pb ²⁰⁶	$\sigma_c \sigma_{\gamma}$	3.35-25.4	BAP,8,513(63)-	Block
Pb ²⁰⁷	$\sigma_c \sigma_{\gamma}$	3.06-16.6	BAP,8,513(63)-	Block
Pb ²⁰⁸	σ_c	723-1872	PR,127,2192(62)	Fowler
Pb	σ_c	116-147	AP,14,387(61)	Bilpuch
Pb ²⁰⁶	σ_c	85-197	AP,14,387(61)	Bilpuch
Pb ²⁰⁷	σ_c	19.6-141	AP,14,387(61)	Bilpuch
Pb ²⁰⁸	σ_c	80-118	AP,14,387(61)	Bilpuch
Pb ²⁰⁸	σ_c	352-718	PR,121,1150(61)	Wilenzick
Pb ²⁰⁸	σ_c	352	PR,79,935(50)	Peterson

²⁰⁹Bi
83

THERMAL CROSS SECTIONS

$\sigma_T = 33 \pm 4$ mb
 $\sigma_T = 14 \pm 3$ mb [²¹⁰Bi¹⁰]
 $\sigma_T = 19 \pm 2$ mb [^{3.5X10⁸} yr ²¹⁰Bi⁹]
 $\lambda_{coh} = 8.625 \pm 0.004$ fm

RESONANCE PROPERTIES

$1\gamma^e = 0.19 \pm 0.03$ b
 $R_1^f = 9.47 \pm 0.05$ fm
 $S_0 = 0.65 \pm 0.28$
 $S_1 = 0.25 \pm 0.08$

RESONANCE PARAMETERS

E_0 (keV)	$2\Gamma_n^0$ (eV)	J	ℓ	Γ_γ (eV)	$2\Gamma_n^0$ (eV)	$2\Gamma_n^1$ (eV)
0.800 $\pm$ 0.002	4.9 $\pm$ 0.3	5	0	0.045 $\pm$ 0.005	0.173 $\pm$ 0.011	
2.310 $\pm$ 0.004	16.2 $\pm$ 0.4	4	0		3.38 $\pm$ 0.07	0.230
4.432 $\pm$ 0.005	0.216 $\pm$ 0.020	1				
5.102 $\pm$ 0.005	6.16 $\pm$ 0.30	5	0		0.087 $\pm$ 0.004	
6.253	0.112 $\pm$ 0.028	1				0.076
6.488	0.74 $\pm$ 0.12	1				0.466
8.970	0.52 $\pm$ 0.16	1				0.200
9.100	0.40 $\pm$ 0.12	1				0.142
9.660	0.10 $\pm$ 0.04	1				0.034
9.710	0.74 $\pm$ 0.14	1				0.260
12.14 $\pm$ 0.04	240 $\pm$ 10	4	0		2.18 $\pm$ 0.09	
15.51 $\pm$ 0.04	108 $\pm$ 8	4	0		0.868 $\pm$ 0.054	
17.34 $\pm$ 0.05	2.2 $\pm$ 0.4	1				0.324
20.94 $\pm$ 0.05	7.6 $\pm$ 1.2	1				0.848
25.18 $\pm$ 0.06	28.0 $\pm$ 2.4	1				2.42
27.00 $\pm$ 0.06	22.0 $\pm$ 1.6	4	0		0.134 $\pm$ 0.010	
28.61 $\pm$ 0.06	0.8 $\pm$ 0.4					
28.86 $\pm$ 0.06	2.2 $\pm$ 0.6					0.142
29.06 $\pm$ 0.07	4.6 $\pm$ 1.0	1				0.312
29.37 $\pm$ 0.07	3.6 $\pm$ 1.0	1				0.260
32.56 $\pm$ 0.07	2.4 $\pm$ 1.2					
32.73 $\pm$ 0.07	1.4 $\pm$ 0.8					
33.28 $\pm$ 0.08	250 $\pm$ 20	4	0		1.37 $\pm$ 0.11	
34.50 $\pm$ 0.09	2.2 $\pm$ 0.8	1				0.124
37.06 $\pm$ 0.10	17.4 $\pm$ 1.8	1				0.872
38.94 $\pm$ 0.10	2.6 $\pm$ 1.0					
42.27 $\pm$ 0.12	20 $\pm$ 2					0.848
45.32 $\pm$ 0.13	173 $\pm$ 12	5	0		0.812 $\pm$ 0.056	
46.41 $\pm$ 0.13	10.0 $\pm$ 2.0	1				0.366
49.60 $\pm$ 0.14	9.4 $\pm$ 1.0	[4]	0		0.042 $\pm$ 0.005	
50.76 $\pm$ 0.15	10.0 $\pm$ 1.2					0.324
52.45 $\pm$ 0.17	25.2 $\pm$ 3.0	0			0.110 $\pm$ 0.011	
53.38 $\pm$ 0.17	8.0 $\pm$ 4.0	0				
53.51 $\pm$ 0.17	41.4 $\pm$ 4.0	0			0.18 $\pm$ 0.02	
53.93 $\pm$ 0.17	16.4 $\pm$ 4.0	1				0.488

²⁰⁹Bi
83

E ₀ (keV)	2gΓ _n (eV)	J	ℓ	Γ _γ (eV)	2gΓ _n ⁰ (eV)	2gΓ _n ¹ (eV)
55.15 ± 0.18	4.8 ± 2.0		1			0.136
58.00 ± 0.19	12.0 ± 2.4		1			0.328
60.26 ± 0.20	4.8 ± 2.0		1			0.152
61.33 ± 0.21	88.2 ± 8.0	[5]	0		0.356 ± 0.036	
62.67 ± 0.21	8.2 ± 2.4		1			0.196
63.40 ± 0.22	5.6 ± 1.8		1			0.134
66.83 ± 0.24	15.0 ± 4.0		1		2.10 ± 0.15	0.335
68.84 ± 0.25	552 ± 40	5	0			0.443
70.32 ± 0.26	21.0 ± 4.0		1		0.35 ± 0.07	
81.80 ± 0.32	100 ± 20		0		0.45 ± 0.09	
85.40 ± 0.35	130 ± 25		0			
86.50 ± 0.35						
95.50 ± 0.41	410 ± 50		0		1.33 ± 0.16	
102.7 ± 0.46	720 ± 70		0		2.25 ± 0.22	
107.40 ± 0.49						
108.8 ± 0.5						
112.90 ± 0.53	260 ± 30		0		0.77 ± 0.09	
118.30 ± 0.57	165 ± 25		0		0.48 ± 0.07	
129.00 ± 0.64						
133.50 ± 0.67						
136.20 ± 0.70	330 ± 35		0		0.90 ± 0.10	

²¹⁰Bi
83

[3.5 × 10⁴ yr]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 54 \pm 5 \text{ mb}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
B ₁ ²⁰⁹	n reflection	ZP,227,152(69)	Nuecker
B ₁ ²⁰⁹	$\bar{\sigma}_s$	NUK,12,4(68)	Scherm
B ₁ ²⁰⁹	σ_t (1.44 ev)	NP,61,381(65)	Rayburn
B ₁ ²⁰⁹	σ_t filtered beam	ZP,186,23(65)	Triftshaeuser
B ₁ ²⁰⁹	$\bar{\sigma}_s$	ZN/A,19,406(64)	Scherm
B ₁ ²⁰⁹	$\bar{\sigma}_s$	ZN/A,19,354(63)	Scherm
B ₁ ²¹⁰	activation	ORNL-3320,2(62)	Halperin
B ₁ ²⁰⁹	n refractometer	ZAP,14,738(62)	Maier-Leibnitz
B ₁ ²⁰⁹	pile osci.	JNE/A,12,32(60)	Tattersall
B ₁ ²⁰⁹	pile osci.	JNE,6,41(57)	Horsley
B ₁ ²⁰⁹	σ_t	AERE-N/R-1131(53)	Egelstaff
B ₁ ²⁰⁹	σ_t	AERE-N/R-1147(53)	Egelstaff
B ₁ ²⁰⁹	n diffraction	PRIVATE COMM.(53)	Hughes
B ₁ ²⁰⁹	$\sigma_t \bar{\sigma}_s$	PR,92,1206(53)	Hughes
B ₁ ²⁰⁹	mirror reflection	PR,90,497(53)	Hughes
B ₁ ²⁰⁹	pile osci.	PPS/A,66,700(53)	Littler
B ₁ ²⁰⁹	σ_t	PRIVATE COMM.(52)	Harvey
B ₁ ²⁰⁹	$\bar{\sigma}_s$ activation, reactivity	PR,83,234(51)	Palevsky
B ₁ ²⁰⁹	diffraction	PR,81,527(51)	Shull
B ₁ ²⁰⁹	pile osci.	PPS/A,63,1175(50)	Colmer
B ₁ ²⁰⁹	pile osci.	PR,80,342(50)	Harris
B ₁ ²⁰⁹	$\bar{\sigma}_s$	PR,83,379(51)	Weiss
B ₁ ²⁰⁹	σ_t	PR,75,1098(49)	Krueger
B ₁ ²⁰⁹	activation	PR,72,888(47)	Seren
B ₁ ²⁰⁹	activation	PR,59,102(41)	O'Neal
B ₁ ²⁰⁹	$\bar{\sigma}_s$	PRS/A,162,127(37)	Goldhaber
B ₁ ²⁰⁹	$\bar{\sigma}_s$	PR,50,133(36)	Mitchell
B ₁ ²⁰⁹	σ_t	PR,48,265(35)	Dunning

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (keV)	Reference	Author
B ₁ ²⁰⁹	σ_t	4.4-70	NP/A,123,561(69)	Morgenstern
B ₁ ²⁰⁹	σ_t	0.804-151	CR-1860(64)-	Garg
B ₁ ²⁰⁹	σ_t	0.784-15.5	NP,44,431(63)	Firk
B ₁ ²⁰⁹	σ_t	12.0-134	AP,8,250(59)	Nichols
B ₁ ²⁰⁹	σ_t	2.3-33	PR,109,926(58)	Good
B ₁ ²⁰⁹	σ_t	0.784-12	NP,7,613(58)	Lynn
B ₁ ²⁰⁹	σ_t	0.8-2.3	AE,5,69(58)	Vladiminskii
B ₁ ²⁰⁹	σ_t	1-70	PR,102,1574(56)	Gibbons
B ₁ ²⁰⁹	σ_t	0.810-2.37	PR,100,126(55)	Bollinger
B ₁ ²⁰⁹	σ_t	12	ANL-5498,52(55)	Hibdon

$^{210}_{84}\text{Po}$
[138.4 day]

THERMAL CROSS SECTIONS

$\sigma_{\gamma} < 30 \text{ mb}$ [0.52 sec $^{211}\text{Po}^g$]
 $\sigma_{\gamma} < 0.5 \text{ mb}$ [25 sec $^{211}\text{Po}^a$]
 $\sigma_c < 2 \text{ mb}$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Po^{210}	σ_a	YF,1,252(65)	Andreev
Po^{210}	activation	NSE,15,217(63)	Halperin
Po^{210}	activation	60VIENNA,239(60)	Stoughton

²²⁰₈₆Rn
[55.6 sec]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} < 0.2 \text{ b}$$

²²²₈₆Rn
[3.824 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 0.72 \pm 0.07 \text{ b}$$

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Rn ²²²	activation	PR,90,1121(53)	Baerg
Rn ²²⁰	activation	PRIVATE COMM.(54)	Hanna

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 130 \pm 20 \text{ b} \\ \sigma_f &= 0.7 \pm 0.3 \text{ b}\end{aligned}$$

²²³₈₈Ra
[11.43 day]

THERMAL CROSS SECTIONS

$$\sigma_{\gamma} = 12.0 \pm 0.5 \text{ b}$$

²²⁴₈₈Ra
[3.64 day]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 11.5 \pm 1.5 \text{ b} \\ \sigma_f &< 0.1 \text{ mb}\end{aligned}$$

²²⁶₈₈Ra
[1600 yr]

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 222 \pm 15 \text{ b} \\ R^{\dagger} &= 10.0 \pm 0.6 \text{ fm} \\ \langle D \rangle &= 48.8 \pm 10.4 \text{ eV} \\ S_0 &= 0.38^{+0.12}_{-0.16}\end{aligned}$$

RESONANCE PARAMETERS

$$I^{\pi} = 0^{+}$$

$$S_n = 4565 \pm 21 \text{ keV}$$

E_0 (eV)	Γ (meV)	Γ_n (meV)	Γ_{γ} (meV)	Γ_n^0 (meV)
0.539 ± 0.004	28 ± 1	0.021 ± 0.001	28 ± 1	0.029 ± 0.002
39.6 ± 0.4		0.40 ± 0.04		0.062 ± 0.008
55.7 ± 0.6		6.5 ± 0.4	21.7 ± 3.5	0.87 ± 0.05
88.4 ± 1.2		18.3 ± 1.0	25.2 ± 5.0	1.94 ± 0.11
238 ± 5		129 ± 20		8.36 ± 1.31
262 ± 6		12.7 ± 2.9		0.78 ± 0.18
293 ± 7		77.0 ± 25.0		4.50 ± 1.50

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma} &= 36 \pm 5 \text{ b} \\ \sigma_f &< 2 \text{ b}\end{aligned}$$

²²⁸₈₈Ra
[5.75 yr]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ra ²²⁶	σ_t	72BUD,100(72)	Ceulemans
Ra ²²⁶	σ_t	YF,14,22(71)	Kalebin
Ra ²²³	σ_f	JIN,29,267(67)	Jain
Ra ²²³	activation	JIN,1,253(55)	Harbottle
Ra ^{224,225}	activation	PR-CE-20(53)+	Baerg
Ra ²²⁶	activation	PR,91,1219(53)	Butler
Ra ²²⁸	activation	PR,85,49(52)	Depocas
Ra ²²⁶	activation	ACS,72,768(50)	Hagemann
Ra ²²⁶	activation	TRANSU.EL.,148(49)	
		PAPER(19.4)	Ames
Ra ^{223,228}	σ_f	TRANSU.EL.,148(49)	
		PAPER(19.5)	Peterson

RESONANCE PARAMETERS

Isotope	Measurement	Energy Range (eV)	Reference	Author
Ra ²²⁶	σ_t	0.539	72BUD,100(72)	Ceulemans
Ra ²²⁶	σ_t	0.539-293	YF,14,22(71)	Kalebin
Ra ²²⁶	σ_t	0.539	AE,1,(4),67(56)	Pevzner

THERMAL CROSS SECTIONS

$$\sigma_f = 515 \pm 35 \text{ b}$$

$$\sigma_f < 2 \text{ mb}$$

²²⁷₈₉Ac
[21.77 yr]

THERMAL CROSS SECTIONS

Isotope	Measurement	Reference	Author
Ac ²²⁷	σ_f	PRIVATE COMM.(72)	DeMarmol
Ac ²²⁷	activation	CJC,37,1094(59)	Cabell
Ac ²²⁷	pile osci.	PR,102,1140(56)	Kirby
Ac ²²⁷	activation	ANL-5263(54)	Sjblom
Ac ²²⁷	σ_f	ANL-4039(47)	Peterson
Ac ²²⁷	pile osci.	ORNL-1415,15(52)	Pomerance
Ac ²²⁷	activation	MLM-744(52)	Timma

²²⁷₉₀Th
[18.72 day]

THERMAL CROSS SECTIONS

$$\sigma_T = 200 \pm 20 \text{ b}$$

²²⁸₉₀Th
[1.913 yr]

THERMAL CROSS SECTIONS

$$\sigma_T = 123 \pm 15 \text{ b}$$

$$\sigma_f < 0.3 \text{ b}$$

RESONANCE PROPERTIES

$$1_\gamma^c > 1013 \text{ b}$$

RESONANCE PARAMETERS

$I'' = 0^\circ$		$S_n = 5237 \pm 10 \text{ keV}$	
$E_0 \text{ (eV)}$	$g\Gamma_n \text{ (meV)}$	$\Gamma_\gamma \text{ (meV)}$	$g\Gamma_n^0 \text{ (meV)}$
$1.896 \pm .002$	$.785 \pm .055$	36 ± 2	$.57 \pm .04$
$7.55 \pm .02$	$1.21 \pm .14$	70 ± 30	$.44 \pm .05$

Note - Energy region below 1.8eV have not been investigated for resonances.
Single-level Breit-Wigner parameters.

²²⁹Th
90
[7340 yr]

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_{\gamma}^c &= 54 \pm 6 \text{ b} \\ \sigma_f^c &= 30.5 \pm 3.0 \text{ b} \\ \sigma_a^c &= 84.5 \pm 6.7 \text{ b} \\ \nu &= 2.14 \pm 0.04\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_{\gamma}^c &= 1000 \pm 175 \text{ b} \\ I_f^c &= 464 \pm 70 \text{ b} \\ \langle D \rangle &= 2.0 \pm 0.5 \text{ eV} \\ S_0 &= 0.62 \pm 0.16\end{aligned}$$

RESONANCE PARAMETERS

$I^n = 5/2^+$			$S_n = 6789.9 \pm 3.7 \text{ keV}$		
$E_0 \text{ (eV)}$	$\Gamma \text{ (meV)}$	$2g\Gamma_n \text{ (meV)}$	$\Gamma_{\gamma} \text{ (meV)}$	$2g\Gamma_n^0 \text{ (meV)}$	$\Gamma_f \text{ (meV)}$
.609 ± .003	47 ± 4	.132 ± .005	43 ± 4	.169 ± .006	4.4
1.26 ± .01	41 ± 16	.160 ± .008		.142 ± .007	29.0
1.44 ± .02		.024 ± .008		.020 ± 0.007	
1.72 ± .01	40 ± 25	.075 ± .005	23 ± 25	.057 ± .005	16.5
1.96 ± .03	62 ± 25	.186 ± .008	37 ± 25	.133 ± .006	25.1
3.18 ± .03		.100 ± .025		.056 ± .014	^a 52 ± 6
4.16 ± .05	140 ± 40	1.36 ± .10		.67 ± .05	155
4.75 ± .05		.037 ± .028		.017 ± .013	
5.58 ± .05		.58 ± .04		.25 ± .02	^a 30 ± 6
5.95 ± .05					^a 20 ± 5
6.95 ± .07		.76 ± .06		.29 ± .02	^a 39 ± 7
8.27 ± .08		.16 ± .08		.06 ± .03	^a 10 ± 4
9.15 ± .09		.36 ± .16		.12 ± .05	^a 50 ± 9
9.6 ± 0.1					^a 35 ± 8
10.4 ± .1					^a 35 ± 8
10.8 ± .1					^a 18 ± 6
12.6 ± 0.1		1.39 ± .35		.39 ± .10	^a 48 ± 10
13.3 ± .1					^a 19 ± 7
14.6 ± .1		.32 ± .11		.084 ± .028	^a 41 ± 10
15.4 ± 0.2		2.5 ± 0.3		.64 ± .07	^a 83 ± 15
16.8					^a 57 ± 13
23.3					^a 55 ± 14
25.9					^a 56 ± 15
29.7		3.14 ± .85		.58 ± 0.22	^a 152 ± 26
35.0					^a 81 ± 20
39.3					^a 166 ± 30
43.2					^a 149 ± 30
46.5					^a 114 ± 27
48.5					^a 98 ± 25
51.0					^a 41 ± 16

^a $\sigma_0 \Gamma_f \text{ (b-eV)}$

Note - Single-level Breit-Wigner parameters.

²³⁰Th
90
[7.7 × 10⁴ yr]

THERMAL CROSS SECTIONS

$$\sigma_T = 23.2 \pm 0.6 \text{ b}$$

$$\sigma_f < 1.2 \text{ mb}$$

RESONANCE PROPERTIES

$$I_\gamma = 1010 \pm 30 \text{ b}$$

$$R_\gamma = 10.3 \pm 0.7 \text{ fm}$$

$$\langle D \rangle = 10 \pm 2 \text{ eV}$$

$$S_0 = 1.3 \pm 0.3$$

RESONANCE PARAMETERS

$$I^\pi = 0^+$$

$$S_n = 5129 \pm 4 \text{ keV}$$

E ₀ (eV)	Γ (meV)	gΓ _n (meV)	Γ _γ (meV)	gΓ _n ⁰ (meV)
1.427 ± .005	25.3 ± 1.5	.358 ± .006	24.9 ± 1.5	.300 ± .005
17.27 ± .04		13.1 ± .6	22.3 ± 3.2	3.15 ± .14
23.84 ± .07		11.1 ± .6	26.6 ± 4.0	2.27 ± .12
32.2 ± 0.1		3.3 ± .1	29.9 ± 5.2	.58 ± .02
39.8 ± .1		8.5 ± .3	29.1 ± 3.4	1.35 ± .05
48.1 ± 0.2		10.0 ± 0.4	29.0 ± 4.9	1.44 ± .06
64.5 ± 0.2		3.1 ± .3	(24)	.39 ± .04
75.6 ± 0.2		2.7 ± 0.4	(24)	.31 ± .05
83.3 ± 0.2		24.8 ± 2.1	(24)	2.72 ± .23
103.0 ± 0.3		5.2 ± 0.6	(24)	.51 ± .06
116.1 ± 0.3		40.3 ± 4.0	(24)	3.74 ± .37
133.8 ± .5		7.5 ± 3.3	(24)	.65 ± .29
139.0 ± .6		2.4 ± 1.2	(24)	.20 ± .10
148.2 ± 0.6		5.6 ± 2.7	(24)	.46 ± .22
171.4 ± 0.8		25.3 ± 4.5	(24)	1.94 ± .34
184.2 ± 0.9		23.3 ± 4.5	(24)	1.71 ± .33
195 ± 1		45.3 ± 5.5	(24)	3.24 ± .39
209 ± 1		75.3 ± 11.0	(24)	5.21 ± .76
226 ± 1		22.8 ± 5.0	(24)	1.52 ± .33
241 ± 1		5.5 ± 2.0	(24)	.35 ± .13
248 ± 1		55.3 ± 6.0	(24)	3.51 ± .38
294 ± 2		95.3 ± 11.0	(24)	5.56 ± .64

Note - A peak at neutron energy of 720 keV is observed in the fission cross section of Th-230.

THERMAL CROSS SECTIONS

$$\begin{aligned}\sigma_T &= 7.40 \pm 0.08 \text{ b} \\ \sigma_P &= 0.039 \pm 0.004 \text{ mb} \\ \bar{\sigma}_n &= 12.67 \pm 0.08 \text{ b} \\ \sigma_c &= 20.07 \pm 0.11 \text{ b} \\ \nu_{sp} &= 2.12 \pm 0.10 \\ a_{coh} &= 10.08 \pm 0.04 \text{ fm}\end{aligned}$$

RESONANCE PROPERTIES

$$\begin{aligned}I_\gamma &= 85 \pm 3 \text{ b} \\ R^\gamma &= 9.65 \pm 0.08 \text{ fm} \\ \langle D \rangle &= 7.0 \pm 1.0 \text{ eV} \\ S_0 &= 0.84 \pm 0.08 \\ S_1 &= 1.6 \pm 0.2\end{aligned}$$

RESONANCE PARAMETERS

$I^\pi = 0^+$ $X_{\text{fbrn}} = 100$ $S_n = 4786.5 \pm 2.0 \text{ keV}$

E_0 (eV)	Γ (meV)	$g_{\Gamma n}^0$ (meV)	J	ℓ	Γ_γ (meV)	$g_{\Gamma n}^0$ (meV)	$g_{\Gamma n}^1$ (meV)
-4.4			1/2	0	(21.2)	.81	
8.35 ± .01	29.0 ± 8.7	.00023 ± .00002		1	29.0 ± 8.7		2.9
13.11 ± .02		.0002 ± .00003		1			1.3
21.78 ± .02	24.9 ± 2.0	1.90 ± .04	1/2	0	23 ± 2	.407 ± .009	
23.43 ± .02	28.4 ± 2.0	3.36 ± .08	1/2	0	25 ± 2	.694 ± .017	
36.95 ± .04		.0010 ± .0002		1			1.3
38.18 ± .04		.00062 ± .00012		1			.80
40.92 ± .04		.00059 ± .00015		1			.68
47.00 ± .04		.0017 ± .0002		1			1.6
49.85 ± .05		.00046 ± .00020		1			.39
55.20 ± .05		.0011 ± .0006		1			.81
58.80 ± .05		.0084 ± .0021		1			5.6
59.48 ± .05	27.2 ± 1.2	4.04 ± .10	1/2	0	23.2 ± 1.2	.524 ± .013	
64.58 ± .06		.0005 ± .0005		1			.29
69.07 ± .06	65.9 ± 2.2	44.0 ± 2.0		0	21.9 ± 1.0	5.29 ± .24	
90.09 ± .08		.007 ± .003	1/2	[1]			1.5
98.06 ± .08		.0043 ± .0008		[1]			1.7
103.66 ± .08		.0052 ± 0.0010		[1]			1.5
111.98 ± .10		.004 ± .003		[1]			1.0
112.95 ± .08	33.1 ± 1.0	13.0 ± 0.5	1/2	0	20.1 ± .9	1.22 ± .05	

^{232}Th
90
[1.4 × 10¹⁰ yr]

E ₀ (eV)	Γ (meV)	g _n ⁰ (meV)	J	ℓ	Γ _γ (meV)	g _n ⁰ (meV)	g _n ¹ (meV)
117.75±.08		.0020 ± .0012	1/2	1			.47
120.77±.10	44.0± 1.8	23.0 ± 1.5	1/2	0	21 ± 1	2.09 ± .14	
128.21±.10		.055 ± .015		[1]			11.4
129.10±.13	22.2± 2.0	3.4 ± 0.2	1/2	0	18.8±2.0	.30 ± .02	
145.72±0.15		.095 ± .017		[1]			16.3
148.07±.15		.014 ± .004		[1]			2.4
154.24±.16		.21 ± .05	1/2	0		.017 ± .004	
167.03±.17		.016 ± .010	1/2	0	22.4±0.9	4.60 ± .15	2.2
170.3 ±0.2	82.4± 2.2	60 ± 2	1/2	0			4.4
178.7 ±0.2		.035 ± .010		[1]			
182.6 ±0.2	36.1± 2.2	18.1 ± 0.9	1/2	0	18 ± 2	1.30 ± .06	
196.2 ±0.2		.076 ± .014	1/2	0		.0054±.0010	
197.5 ±0.2		.17 ± .05	1/2	0	18.5±2.0	.758 ± .050	18.5
199.3 ±0.2	29.2± 2.1	10.7 ± 0.7	1/2	0			2.9
202.5 ±0.3		.028 ± .007		[1]			2.0
210.9 ±0.2		.020 ± .007		[1]			
219.4 ±0.3		.051 ± .026	1/2	0	20.7±1.5	2.03 ± .07	
221.2 ±0.2	50.9± 1.8	30.2 ± 1.0	1/2	0			3.2
242.3 ±.2		.040 ± .008		[1]			1.2
249.8 ±.2		.015 ± .005	1/2	0	21.5±1.5	2.02 ± .08	
251.5 ±0.2	53.5± 2.0	32.0 ± 1.3	1/2	0			.73
258.3 ±.2		.010 ± .003		[1]			
263.0 ±0.2	41.9± 1.7	23.3 ± 0.9	1/2	0	18.6±1.4	1.44 ± .06	
285.7 ±0.2	50.7± 2.0	29.9 ± 1.6	1/2	0	20.8±1.2	1.77 ± .10	
290.2 ±0.2		.070 ± .010		[1]			4.3
299.6 ±0.2		.052 ± .010		[1]			
302.3 ±.2		.012 ± .003	1/2	0			6.9
305.4 ±0.2	46 ± 3	26 ± 2	1/2	0	20 ± 2	1.49 ± .11	
309.3 ±0.2		.053 ± .019		[1]			2.9
321.5 ±0.3		.060 ± .020	1/2	0	23.0±1.0	4.10 ± .22	3.1
328.9 ±.3	97.4± 4.1	74.4 ± 4.0	1/2	0			1.3
335.05±.3		.035 ± .018		[1]			2.6
338.3 ±.3	57.0± 2.2	37.0 ± 1.9	1/2	0	20.0±1.0	2.00 ± .10	
341.8 ±0.3		.088 ± .020		[1]			3.9
361.5 ±0.3	48.0± 2.5	27.0 ± 1.5	1/2	0	21 ± 2	1.41 ± .79	
365.1 ±0.3	47.0± 2.5	25.0 ± 1.5	1/2	0	22 ± 2	1.30 ± .08	
369.4 ±0.3		.012 ± .02		[1]			4.9
380.4 ±0.3		.17 ± .03	[1/2]	0	25 ± 6	.0089±.0015	
391.5 ±0.3		10.8 ± 0.7	1/2	0		.539 ± .035	
400.9 ±0.4		.080 ± .030		[1]			3.4
402.6 ±0.4							

E_p (eV)	Γ (meV)	g_n^0 (meV)	J	ℓ	Γ_γ (meV)	g_n^0 (meV)	g_n^1 (meV)
411.6 ± 4		.23 ± .05		[1]			8.3
420.9 ± 0.4		.43 ± .09	1/2	0		.0210 ± .0044	
454.2 ± 4		1.1 ± 0.2	1/2	0		.052 ± .009	
456.9 ± 0.4		.063 ± .022		[1]			1.9
462.4 ± 0.4	84.5 ± 4.3	63 ± 4	1/2	0	21.5 ± 1.5	2.93 ± .19	
466.3 ± 0.4		.10 ± .04		[1]			3.0
470.6 ± 0.4		.048 ± .031		[1]			1.4
476.5 ± 4		.18 ± .06		[1]			
486.6 ± 0.3	79.1 ± 4.2	59.9 ± 4.0	1/2	0	19.2 ± 1.2	2.71 ± .18	1.4
500.0 ± 0.3		.05 ± .05		[1]			
510.3 ± 0.3		4.2 ± 0.8	1/2	0		.186 ± .035	
528.5 ± 0.3	33.5 ± 3.4	13.5 ± 1.5	1/2	0	20 ± 3	.587 ± .065	6.6
533.3 ± 0.3		.27 ± .05		[1]			8.5
535.5 ± 3		0.35 ± .07		[1]			22.3
540.1 ± 0.3		.93 ± .09		[1]			
569.9 ± 0.3	47.8 ± 2.2	28.7 ± 1.6	1/2	0	19.1 ± 1.6	1.20 ± .07	
573.5 ± 0.3		.65 ± .14		[1]			
576.0 ± 0.3		1.9 ± 0.4	[1/2]	[0]		.079 ± .017	2.3
584.0 ± 0.3		0.11 ± .05		[1]			
596.2 ± 0.3	29.0 ± 2.3	10.0 ± 1.0	1/2	0	19 ± 2	.409 ± .004	
617.8 ± 0.3		4.3 ± 0.5	1/2	0		.17 ± .02	1.0
625.0 ± 0.3		.053 ± .037		[1]			3.7
644.1 ± 0.4		.20 ± .10		[1]			
656.5 ± 4	69.0 ± 3.7	50.0 ± 3.1	1/2	0	19 ± 2	1.95 ± .12	
665.2 ± 0.4	43.0 ± 2.5	25.0 ± 1.6	1/2	0	18 ± 2	.969 ± .062	
675.2 ± 4	227 ± 10	208 ± 8	1/2	0	19.0 ± 1.6	8.01 ± .31	
687.3 ± 4	71.3 ± 5.2	50 ± 5	1/2	0	21.3 ± 1.5	1.91 ± .19	
688.9 ± 0.4		.15 ± .15		[1]			
700.9 ± 4	33 ± 5	14 ± 2	1/2	0	19 ± 4	.529 ± .076	
704.5 ± 4		.20 ± .08		[1]			
712.8 ± 4	43.9 ± 4.2	24.9 ± 3.0	1/2	0	19 ± 3	.933 ± .112	
724.1 ± 4		.12 ± .04		[1]			
740.9 ± 4	211.4 ± 15.0	190 ± 15	1/2	0	21.4 ± 1.4	6.98 ± .55	1.0
758.5 ± 0.4		.070 ± .045		[1]			
764.7 ± 4		.83 ± .16	[1/2]	[0]		0.030 ± .006	1.7
771.7 ± 4		0.12 ± .08		[1]			.7
774.4 ± 0.4		.05 ± .05		[1]			
778.6 ± 0.5	36.4 ± 2.7	11.0 ± 0.8	1/2	0	25.4 ± 2.6	.394 ± .029	1.1
792.7 ± 0.5		.083 ± .074		[1]			
804.1 ± 0.5	205 ± 10	185 ± 10	1/2	0	20.0 ± 1.2	6.52 ± .35	1.8
812.8 ± .5		.14 ± .06		[1]			

E ₀ (eV)	Γ (meV)	g _π ⁺ (meV)	J	ℓ	Γ _γ (meV)	g _π ⁰ (meV)	g _π ⁻ (meV)
816.9 ± 0.5		.14 ± .07	[1/2]	[1]		.035 ± .007	1.8
820.9 ± .5		1.0 ± 0.2	[1/2]	[0]			3.0
828.9 ± 0.5		.24 ± .08	[1]	[1]			
836.6 ± .5		1.45 ± .21	[1/2]	[0]		.0501 ± .0073	
842.2 ± .5	46.6 ± 2.9	27.6 ± 2.1	1/2	0	19 ± 2	.951 ± .072	
850.5 ± .5		1.13 ± .21	[1/2]	[0]		.0387 ± .0072	
866.2 ± .5	35.9 ± 8.3	12.9 ± 1.2	1/2	0	23 ± 3	.438 ± .041	
869.3 ± .5		.56 ± .18	[1]	[1]			6.6
884.7 ± 0.5		.35 ± .08	[1]	[1]			4.0
889.9 ± .3		37.9 ± 2.3	1/2	0	21 ± 2	1.27 ± .08	
906.1 ± .3		1.8 ± .3	[1]	[1]			4.9
919.3 ± .3		.45 ± .10	[1]	[1]			
926.5 ± .3		.50 ± .09	[1]	[1]			3.2
934.2 ± .3		0.30 ± .09	1/2	0	23 ± 2	1.47 ± .09	
943.2 ± .3	68.0 ± 3.3	45.0 ± 2.6	1/2	0			1.8
956.0 ± 0.3		.18 ± .18	[1]	[1]		.19 ± .02	
962.6 ± 0.3		5.8 ± .6	[1]	0		.0083 ± .0058	
974.5 ± 0.3		.26 ± .18				1.02 ± .10	
982.7 ± .3	52.9 ± 3.7	32.0 ± 3.1		0	20.9 ± 2.0	2.29 ± .22	
990.5 ± .3	93.7 ± 7.5	72 ± 7		0	21.7 ± 2.5		
995.5 ± 0.3		.41 ± .19	[1]	[1]			3.9
1001.2 ± 0.3		.25 ± .11	[1]	[1]			2.8
1010.4 ± .4	135.1 ± 10.2	115 ± 10	1/2	0	20.1 ± 2.1	3.62 ± .31	
1021.4 ± .4		.40 ± .07	[1]	[1]			3.7
1029.4 ± 0.4		.21 ± .07	[1]	[1]			1.9
1039.1 ± .4		13.8 ± 1.6	1/2	0		.428 ± .050	
1043.7 ± .4		.63 ± .08	[1]	[1]			5.7
1064.5 ± .4		4.6 ± .7	1/2	0		.14 ± .02	
1077.2 ± .4		11.1 ± 2.0	1/2	0		.338 ± .061	
1093.3 ± .4		1.8 ± 0.3	1/2	0		.660 ± .018	
1099.8 ± .4	39 ± 3	22.0 ± 0.6	1/2	0	17 ± 3	.05 ± .01	
1114.7 ± .4		1.6 ± .3	[1/2]	[0]			8.1
1115.9 ± 0.4		1.0 ± 0.3	[1]	[1]		.090 ± .018	
1120.2 ± .4		3.0 ± 0.6	1/2	0			1.7
1128.0 ± 0.4		.21 ± .08	[1]	[1]			3.0
1132.7 ± .4		0.38 ± .10	[1]	[1]			
1136.8 ± .4	34.5 ± 3.2	15.5 ± 1.0	1/2	0	19 ± 3	.459 ± .030	
1150.2 ± 0.4	42.8 ± 2.6	20.8 ± 1.7	1/2	0	22 ± 2	.613 ± .050	
1175.8 ± .4		.34 ± .09	1/2	0			
1184.4 ± 0.4		8.0 ± 0.8	1/2	0		.23 ± .02	
1204.1 ± .4		1.9 ± 0.3	1/2	0			

E_α (keV)	Γ (meV)	g_n^+ (meV)	J	ℓ	Γ_γ (meV)	g_n^0 (meV)	g_n^1 (meV)
1219.1 ± .4		.3		[1]			2.1
1217.3 ± .4		0.60 ± .10		[1]			4.3
1223.8 ± .4		.42 ± .15		[1]			3.0
1227.8 ± .4	52.1 ± 3.5	31.1 ± 1.8	1/2	0	21 ± 3	.088 ± .051	
1233.3 ± .4		0.86 ± .16		[1]			6.0
1243.1 ± .4	39.0 ± 3.7	19.0 ± 2.1	1/2	0	20 ± 3	.539 ± .060	
1248.6 ± .4	135 ± 10	117 ± 9	1/2	0	18 ± 3	3.31 ± .45	
1260.8 ± .5		.86 ± .25		[1]			5.8
1261.7 ± .5		1.0 ± 0.2		[1]			6.8
1266.4 ± .5		.28 ± 0.28		[1]			1.9
1269.4 ± .5	39.5 ± 3.3	19.5 ± 1.4	1/2	0	20 ± 3	.547 ± .039	
1287.8 ± .3		0.5 ± 0.2		[1]			3.3
1291.9 ± .3	128 ± 8	103 ± 8	1/2	0	25 ± 2	2.87 ± .22	
1301.6 ± .3	71.4 ± 4.0	51.4 ± 3.5	1/2	0	20 ± 2	1.43 ± .10	
1335.7 ± .3		3.2 ± 0.6		[1]			6.7
1345.8 ± .3		1.1 ± 0.2		[1]			
1354.9 ± .3	112.4 ± 9.4	89.4 ± 8.9	1/2	0	23 ± 3	2.43 ± .24	
1359.8 ± .3		8.9 ± 1.4		[1/2]		.24 ± .04	
1372.5 ± .3		1.0 ± 0.4		[1/2]		.027 ± .011	
1377.9 ± .3	75.8 ± 5.6	52.6 ± 5.2	1/2	0	23 ± 2	1.42 ± .14	
1387.7 ± .3		2.2 ± 0.4		[1/2]		.059 ± .011	
1397.9 ± .3	156.2 ± 10.2	137 ± 10	1/2	0	19.2 ± 2.0	3.86 ± .27	
1417.9 ± .3		.54 ± .16		[1]			
1426.4 ± .3	126 ± 9	105 ± 9	1/2	0	21.0 ± 2.4	2.78 ± .24	
1433.8 ± .3	53.8 ± 5.2	34.8 ± 4.2	1/2	0	19 ± 3	.92 ± .11	
1441.3 ± .3		1.2 ± 0.3		[1]			6.6
1461.3 ± .3		1.2 ± .3		[1/2]		.031 ± .008	
1478.2 ± .3		1.9 ± .4		[1/2]		.05 ± .01	
1502.2 ± .6		.67 ± .20		[1]			3.5
1508.6 ± .3		5.0 ± 1.3		[1]			
1518.6 ± .3	206.3 ± 18.1	185 ± 18	1/2	0	21.9 ± 2.1	4.75 ± .46	
1524.4 ± .3	221.7 ± 13.2	200 ± 13	1/2	0	21.7 ± 2.5	5.12 ± .33	
1555.6 ± .3		6.7 ± .8		[1/2]		.17 ± .02	
1581.3 ± .4	41.1 ± 4.4	21.1 ± 1.6	1/2	0	20 ± 4	.531 ± .040	
1589.5 ± .4	359 ± 25	330 ± 25	1/2	0	23.6 ± 2.0	8.28 ± .63	
1602.6 ± .4	74.5 ± 5.0	50.5 ± 4.6	1/2	0	24 ± 2	1.26 ± .11	
1610.7 ± .4		.95 ± .15		[1]			4.5
1623.5 ± .3		.5 ± .2		[1]		.012 ± .005	
1630.9 ± .4	549 ± 30	530 ± 30	1/2	0	19.2 ± 3.6	13.1 ± .7	
1640.5 ± .4	66.7 ± 5.3	42.7 ± 4.9	1/2	0	24 ± 2	1.05 ± .12	
1661.5 ± .4	146.7 ± 10.4	122 ± 10	1/2	0	24.7 ± 2.9	2.99 ± .25	

E ₀ (eV)	Γ (meV)	g _π (meV)	J	ℓ	Γ _γ (meV)	g _π ⁰ (meV)	g _π ¹ (meV)
1677.7 ± .4		24.7 ± 2.1	1/2	0		.603 ± .051	
1689.7 ± .4		1.2 ± 0.3		[1]			5.2
1696.9 ± .4		1.7 ± 0.4	[1/2]	[0]		.041 ± .010	
1705.0 ± .4		2.9 ± 0.4	[1/2]	[0]		.070 ± .010	
1719.7 ± .4	52.5 ± 4.2	35.5 ± 3.0	1/2	0	17 ± 3	.856 ± .072	
1725.0 ± .4		1.3 ± 0.2		[1]			6.7
1729.5 ± .4		1.6 ± 0.4		[1]			
1740.2 ± .4		6.0 ± .8	[1/2]	[0]		.145 ± .019	
1746.5 ± .4	52.5 ± 4.0	31.1 ± 2.9	1/2	0	21.4 ± 2.8	.744 ± .069	
1753.7 ± .4		.7 ± .7		[1]			2.9
1762.6 ± .4	136 ± 9	110 ± 8	1/2	0	26 ± 3	2.62 ± .19	
1785.4 ± .4		2.1 ± .6	[1/2]	[0]		.050 ± .014	1.9
1793.3 ± .4		.48 ± .34		[1]			
1803.3 ± .4	108.3 ± 7.4	88.3 ± 6.8	1/2	0	20 ± 3	2.08 ± .16	
1811.9 ± .4	66.1 ± 6.7	45.1 ± 6.0	1/2	0	21 ± 3	1.06 ± .14	
1824.0 ± .4	105.3 ± 7.4	96.3 ± 6.8	1/2	0	19 ± 3	2.02 ± .16	4.6
1834.1 ± .4		1.2 ± 0.3		[1]			
1848.4 ± .4		4.3 ± 0.9	[1/2]	[0]		.10 ± .02	
1854.4 ± .4	66.3 ± 7.5	41.3 ± 6.9	1/2	0	25 ± 3	.956 ± .160	
1861.9 ± .4	60 ± 5	38 ± 4	1/2	0	22 ± 3	.88 ± .09	3.4
1888.5 ± .4		.91 ± .28		[1]			7.3
1896.9 ± .4		2 ± 1		[1]			
1900.2 ± .4		120 ± 10	1/2	0		2.75 ± .23	
1928.5 ± .4		8.2 ± 1.6	[1/2]	[0]		.187 ± .036	
1930.8 ± .4		12.3 ± 2.6	1/2	0		.280 ± .059	1.1
1940.0 ± .4		.32 ± .32	[1/2]	[1]			
1950.5 ± .4	124.0 ± 15.5	100 ± 15	1/2	0	24 ± 4	2.26 ± .34	
1971.4 ± .4	258 ± 20	235 ± 20	1/2	0	23 ± 4	5.29 ± .45	
1987.8 ± .4	60.8 ± 5.7	42.8 ± 4.9	1/2	0	18 ± 3	.96 ± .11	
2005.0 ± .4	44.8 ± 5.1	22.8 ± 3.1	1/2	0	22 ± 4	.51 ± .07	2.6
2015.4 ± .4		.77 ± .39		[1]			3.3
2035.1 ± .5		1.0 ± 1.0		[1]			
2051.9 ± .5		19. ± 3.2	1/2	0		.42 ± .07	
2061.9 ± .5	77 ± 9	60 ± 8	1/2	0	17 ± 3	1.32 ± .18	
2074.0 ± .5		6.8 ± 1.8	[1/2]	[0]		.15 ± .04	
2079.0 ± .5		9.1 ± 1.8	[1/2]	[0]		.20 ± .04	
2097.3 ± .5		.92 ± .46	[1/2]	[0]		.02 ± .01	
2116.9 ± .5		75.0 ± 6.0	1/2	0	20 ± 3	1.63 ± .13	
2147.6 ± .5	104.9 ± 8.1	90.9 ± 7.0	1/2	0	14 ± 4	1.96 ± .15	6.1
2158.1 ± .5		2.0 ± 1.0		[1]			
2162.6 ± .5		87.0 ± 7.0	1/2	0	26 ± 4	1.87 ± .15	

²³²Th
⁹⁰

E ₀ (eV)	Γ (meV)	g ₁ ⁿ (meV)	J	ℓ	Γ _γ (meV)	g ₁ ⁰ (meV)	g ₁ ¹ (meV)
2170.4 ± .5		2.7 ± 0.7	1/2	[1]	17 ± 3	1.65 ± .13	8.1
2177.9 ± .5		77.2 ± 6.1	1/2	0		1.06 ± .11	
2197.2 ± .5		49.9 ± 5.2	1/2	[1]			6.4
2207.3 ± .5		2.2 ± 0.4	1/2	0			
2216.2 ± .5		24.0 ± 1.9	1/2	0	27 ± 5	.510 ± .040	
2222.0 ± .5	115.3 ± 10.3	88.3 ± 9.0	1/2	[0]		1.87 ± .19	
2233.7 ± .5		1.6 ± .5	[1/2]	[0]		.034 ± .011	
2270.9 ± .5		28.2 ± 2.7	1/2	0		.592 ± .057	
2276.3 ± .6		45.8 ± 4.7	1/2	0	24 ± 3	.960 ± .010	
2286.5 ± .6		267 ± 20	1/2	0	19 ± 5	5.58 ± .42	
2306.9 ± .5		3.0 ± 0.9	1/2	[1]			8.2
2321.1 ± .6		4.1 ± 1.0	[1/2]	[0]		.085 ± 0.021	
2329.7 ± .6		2.0 ± 0.6	[1/2]	[1]	20 ± 4		5.4
2336.0 ± .6	135 ± 14	115 ± 13	1/2	0		2.38 ± .27	
2344.4 ± .6		5.5 ± 1.5	[1/2]	[0]		.114 ± .031	
2352.5 ± .6		15.0 ± 2.9	1/2	0		.31 ± .06	
2353.7 ± .6		14.1 ± 2.9	1/2	0		.29 ± .06	
2375.2 ± .6		118 ± 13	1/2	0		2.42 ± .27	
2382.8 ± .6		2.5 ± 1.0	[1/2]	[0]		.051 ± .020	
2391.2 ± .6		3.4 ± 1.0	[1/2]	[0]		.07 ± .02	
2418.5 ± .6		89.8 ± 8.9	1/2	[1]		1.83 ± .18	6.9
2427.4 ± .6		2.7 ± .8	1/2	0			
2434.8 ± .6		2.5 ± 0.5	1/2	0			6.3
2440.1 ± .6		10.5 ± 1.5	[1/2]	[0]		.213 ± .030	
2456.1 ± .6		170 ± 15	1/2	0		3.43 ± .30	9.4
2462.5 ± .6		3.8 ± .9	1/2	1		.04 ± .02	
2474.6 ± .6		2.0 ± 1.0	[1/2]	[0]		.144 ± .030	
2491.8 ± .6		7.2 ± 1.5	[1/2]	[0]		6.71 ± .50	
2509.3 ± .6		336 ± 25	1/2	0		.93 ± .12	
2527.2 ± .6		46.8 ± 6.0	1/2	0		.07 ± .02	
2557.1 ± .7		3.5 ± 1.0	[1/2]	[0]		6.18 ± .40	
2563.1 ± .7		313 ± 20	1/2	0		1.26 ± .16	
2569.6 ± .7		64 ± 8	1/2	0			4.5
2603.7 ± .7		2.0 ± 0.6	1/2	[1]		1.81 ± .14	
2612.5 ± .7		92.3 ± 7.3	1/2	0		.14 ± .04	
2624.3 ± .7		7.2 ± 2.1	[1/2]	[0]		3.27 ± .25	
2635.1 ± .7		168 ± 13	1/2	0		.09 ± .04	
2655.2 ± .7		4.6 ± 2.1	[1/2]	[0]		3.88 ± .39	
2663.4 ± .7		200 ± 20	1/2	0		.23 ± .04	
2677.1 ± .7		11.9 ± 2.1	1/2	0		3.86 ± .39	
2688.4 ± .7		200 ± 20	1/2	0			

E_0 (eV)	Γ (meV)	g_n^0 (meV)	J	ℓ	Γ_γ (meV)	g_n^0 (meV)	g_n^1 (meV)
2713.0 ± .7		96 ± 12	1/2	0		1.84 ± .23	
2722.7 ± .7		11.5 ± 2.1	1/2	0		.22 ± .04	
2733.4 ± .7		377 ± 30	1/2	0		7.21 ± .57	
2748.3 ± .7		14.9 ± 2.5	1/2	0		.284 ± .048	
2773.6 ± .8		76 ± 10	1/2	0		1.44 ± .19	
2793.0 ± .8		160 ± 20	1/2	0		3.03 ± .38	
2803.0 ± .8		4.8 ± 1.2	1/2	[1]			9.8
2815.6 ± .8		28 ± 4	1/2	0		.53 ± .08	
2832.9 ± .8		40 ± 5	1/2	0		.75 ± .09	
2839.1 ± .8		1.1 ± 0.8	1/2	0		.027 ± .020	
2843.6 ± .8		1.0 ± 0.4	1/2	[1]			2.0
2852.4 ± .8		210 ± 30	1/2	0		3.93 ± .56	
2861.6 ± .8		7.7 ± 2.6	1/2	[1]			15.1
2870.4 ± .8		1.5 ± 0.4	1/2	[1]			3.0
2884.0 ± .8		4.8 ± 1.6	1/2	0		.089 ± .030	
2895.9 ± .8		2.2 ± .5	1/2	0		.04 ± .01	
2915.2 ± .8		3.2 ± 1.1	1/2	0		.06 ± .02	
2932.0 ± .8		1.6 ± 0.5	1/2	[1]			3.1
2948.6 ± .8		98.7 ± 9.8	1/2	0		1.82 ± .18	
2956.6 ± .8		47 ± 4	1/2	0		.86 ± .07	
2965.3 ± .8		14.2 ± 2.4	1/2	0		.261 ± .044	
2979.6 ± .8		9.3 ± 1.5	1/2	0		.17 ± .03	
2988.3 ± .8		35 ± 6	1/2	0		.64 ± .11	
3006.7 ± .9		1.65 ± .55	1/2	0		.03 ± .01	
3017.3 ± .9		28 ± 3	1/2	0		.51 ± .05	
3027.3 ± .9		230 ± 25	1/2	0		4.18 ± .45	
3038.7 ± .9		59 ± 5	1/2	0		1.07 ± .09	
3050.2 ± .9		5 ± 3	1/2	0		.09 ± .05	
3061.4 ± .9		29 ± 3	1/2	0		.52 ± .05	
3082.8 ± .9		55 ± 6	1/2	0		.99 ± .11	
3103.6 ± .9		1.7 ± .6	1/2	0		.03 ± .01	
3109.2 ± .9		22 ± 3	1/2	0		.39 ± .05	
3120.7 ± .9		7.3 ± 2.2	1/2	0		.13 ± .04	
3148.5 ± .9		185 ± 20	1/2	0		3.30 ± .36	
3153.4 ± .9		200 ± 20	1/2	0		3.56 ± .36	
3163.0 ± .9		21 ± 4	1/2	0		.37 ± .07	
3186.6 ± .9		75 ± 7	1/2	0		1.33 ± .12	
3194.5 ± .9		4 ± 3	1/2	0		.07 ± .05	
3207.4 ± .9		95 ± 10	1/2	0		1.68 ± .18	
3229.4 ± 1.0		17 ± 3	1/2	0		.30 ± .05	
3242.5 ± 1.0		14 ± 3	1/2	0		.25 ± .05	