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COMPILATION OF REQUESTS FOR NUCLEAR DATA

COMPILED AND EDITED BY THE NATIONAL NUCLEAR DATA CENTER
FOR THE
DOE NUCLEAR DATA COMMITTEE

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NATIONAL NUCLEAR DATA CENTER

Philip F. Rose and Alyce Daly, Editors

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I. INTRODUCTION

This request list summarizes the current needs of U.S. nuclear energy programs and other applied technologies for experimentally measured nuclear data. Every four years, the Department of Energy (DOE) and contractors, the Department of Defense laboratories and contractors, and other interested groups, are asked to review and revise their requests for nuclear data. The review is coordinated by the Data Request and Status Subcommittee of the Cross Section Evaluation Working Group (CSEWG). The submission of OFE data requests is coordinated by E. T. Cheng (GA).

The Request List is ordered by target nucleus (Isotope) and then reaction type (Quantity). An attempt has been made to describe the Quantity in standard notation. In appendix A, the user will find a glossary of these symbols with a short explanatory text.

Each request is assigned a unique identifying number. The first two digits of this number give the year the request was initiated. All requests for a given isotope and quantity are grouped (or blocked) together. The requests in a block are followed by any free text comments that apply, and occasionally by STATUS comments pertinent to the request.

Each request has a unique isotope, quantity and requester. The requester is identified by laboratory, last name, and requesting U. S. government agency, e.g. *BET, DEI, DNR*. The Requesting Agency (previously called "Sponsor") is the government agency funding and/or directing the requester's programs requiring nuclear data. All requesters, together with their addresses and phone numbers, are given in appendix B. A list of the evaluators responsible for ENDF/B-VI evaluations with their affiliations appears in appendix C.

All requests give the energy (or range of energy) for the incident particle where appropriate. The accuracy needed (in percent) is also given. The error quoted is assumed to be $1-\sigma$ at each measured point in the energy range requested unless a comment specifies otherwise. Sometimes a range of accuracy indicated by two values is given, or some statement is given in the free text comments. An incident particle energy resolution in percent is sometimes provided.

Because of the changing and continuing character of the need for data request information, as well as the probability that current measurements may satisfy a portion of the requests, this report is to be regarded as a working document. In fact, it is maintained as a data base by the National Nuclear Data Center (NNDC).

The Request List is produced from the computerized data file by the NNDC. The contents of this document, except for requests withheld by sponsoring organizations, will be included in the forthcoming edition of WRENDATA, published by the International Atomic Energy Agency.

II. PROCEDURES FOR SUBMITTING REQUESTS

New data requests should be submitted to the designated representative* at each laboratory who coordinates requests and does an initial screening. If your institution does not have a designated representative, requests may be submitted directly to the NNDC, on forms available for that purpose. Data requests must include a justification of the request and should state its importance and application.

On receiving a request for nuclear data, the NNDC assumes that the originator or the requesting agency has established that the existing data base has been reviewed and determined to be inadequate. In this regard, comments on evaluations that may be necessary, or the need for results from further theoretical work, should be included in the request. Final review and acceptance of requests lies with the Data Request and Status Subcommittee of CSEWG.

*A. B. Smith (ANL), J. Hardy (BET), T. Ward (BNL), E. Cheng (GA), R. E. Schenter (HEDL), R. Heath (INEL), C. Lubitz (KAPL), P. G. Young (LANL), R. White (LLNL), A. Carlson (NBS), D. Larson (ORNL)

III. PRIORITY ASSIGNMENTS

The exact meaning of priority is difficult to assess but the following definitions, which closely resemble those used by both NEANDC and the NEACRP, have been adopted by the DOE/NDC.

- PRIORITY I. Nuclear data which satisfy the criteria of Priority II and which have been selected for maximum practicable attention taking into account the urgency of nuclear energy program requirements.
- PRIORITY II. Nuclear data that will be required during the next few years in the applied nuclear energy programs (for example, data needed to make the best use of reactor fuel and construction materials such as neutron moderators, absorbers, and radiation shields, space and bio-medical applications, data required for better understanding of some significant aspect of reactor behavior).
- PRIORITY III. Nuclear data of more general interest and data required to fill out the body of information needed for nuclear technology.

*For example, the NEACRP assigns its highest priorities for reactor measurements as follows:

"The highest priority should be given to requests for nuclear data for reactors to be built in the near future if these data are still necessary to predict the different reactor properties after all information from integral experiments and operating reactors has been used, or information on an important reactor parameter is in principle attainable through mathematical calculations from nuclear data only, or these data are needed for materials required in reactor physics measurements."

IV. DOE/NDC COMMITTEE MEMBERSHIP

(July 1, 1985 - June 30, 1987)

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^1H	$\sigma_{n,\text{tot}}$ (E)	2	1.00 keV $\rightarrow$.500 MeV	.3 %		LAS Stewart To check on primary standard in largely unmeasured regions with high accuracy.	RSDT	78175
^1H	$\sigma_{n,n}$ (E, θ)	2	10.0 MeV $\rightarrow$ 50.0 MeV	1. %		LAS Stewart To confirm or improve present evaluation. Absolute values at a few incident energies required.	RSDT	80289
^1H	$\sigma_{n,x}$ (E)	2	.100 keV $\rightarrow$ 1.00 MeV	30. %	30. %	NBS Bowman Electron excitation or removal induced by sudden acceleration of nucleus in neutron-nucleus scatter (n,n'e). Neutron spectrum calculations.	NBS	82050
^3He	$\sigma_{n,p}$ (E)	2	.100 MeV $\rightarrow$ 3.00 MeV	1. %		NBS Carlson To improve accuracy of standard cross section.	RSDT	86147
$^{\text{nat}}\text{Li}$	$\sigma_{\alpha,n}$ (E)	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %		LAS Walton Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.	DSS	78167
^6Li	$\sigma_{n,2n}$ (E)	2	Thresh $\rightarrow$ 16.0 MeV	5. $\rightarrow$ 8. %		GA Cheng Improved precision needed. Data are needed in order to satisfactorily evaluate all reactions near 14 MeV. Presently it is difficult to account for all reaction cross sections and have them sum to total. (Stewart/LANL)	OFE	86013
^6Li	$\sigma_{n,t}$ (E)	2	.500 MeV $\rightarrow$ 3.00 MeV	1. $\rightarrow$ 3. %		LAS Hale Absolute values required. Accuracy of 3% useful. Energy resolution must reproduce true shape. For use as standard.	RSDT	69009
		1	1.00 keV $\rightarrow$.100 MeV	1. %		LAS Hale For use as standard below 1 MeV.	RSDT	72009
^6Li	$\sigma_{n,t}$ (E, θ)	2	.500 MeV $\rightarrow$ 3.00 MeV	5. %		LAS Hale Absolute cross section as a function of angle. Needed for use of $^6\text{Li}(n,\alpha)$ as standard.	RSDT	68291

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^6Li	$\sigma_{t,p}$ (E)	2	0 $\rightarrow$ 4.00 MeV	10. %		LLL White Activation product with short half-life. For diagnosing ICF implosions.	OMA	86054
^7Li	$\sigma_{n,n't}$ (E)	2	Thresh $\rightarrow$ 6.00 MeV	15. %	200K	ORL Peele Need 15% accuracy for estimation of gas production. For a possible Li cooled fast reactor design.	RSdT	86079
^9Be	$\sigma_{n,tot}$ (E)	2	1.00 MeV $\rightarrow$ 10.0 MeV	1. %	100K	ANL Smith Resolution should be $\leq$ 100 keV. For high-temperature and space systems.	RSdT	86046
^9Be	$\sigma_{n,n}$ (E, θ)	2	2.00 MeV $\rightarrow$ 20.0 MeV	5. %	100K	ANL Smith Accuracy sufficient to provide non-elastic cross section to 5%. Resolution $\leq$ 100 keV. For high-temperature and space systems.	RSdT	86049
^9Be	$\sigma_{n,n'}$ (E, θ ,E $_{n'}$)	2	2.00 MeV $\rightarrow$ 10.0 MeV	5. %		ANL Smith 5% accuracy on discrete inelastic. 10% on breakup spectrum. For high-temperature and space systems.	RSdT	86047
^9Be	$\sigma_{n,2n}$ (E)	1	14.0 MeV $\rightarrow$ 15.0 MeV	3. %		GA Cheng Improved precision needed.	OFE	86096
^9Be	$\sigma_{t,a}$ (E)	2	0 $\rightarrow$ 4.00 MeV	10. %		LLL White Activation product with short half-life. For diagnosing ICF implosions.	OMA	86055
^9Be	$\sigma_{a,n}$ (E)	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %		LAS Walton Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.	DSS	78168
^{10}B	$\sigma_{n,tot}$ (E)	2	1.00 keV $\rightarrow$ 2.00 MeV	1. %	10K	ANL Smith Needed to resolve discrepancy.	RSdT	86060

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{10}B	$\sigma_{n,\alpha} (E)$	2	.100 MeV $\rightarrow$.300 MeV	3. %		DOE Hemmig	RSdT	69373
		2	.300 MeV $\rightarrow$ 10.0 MeV	5. %		ANL Smith	RSET	
						For use as standard. Absolute values required for 480 keV γ .		
		2	1.00 keV $\rightarrow$.100 MeV	1. %		NBS Carlson	RSdT	86148
						Needed to resolve FBR discrepancy in C/E values.		
						To improve accuracy of standard cross section.		
^{10}B	$\sigma_{n,\alpha} (E)$		RATIO					
		2	1.00 keV $\rightarrow$.100 MeV	1. %		DOE Hemmig	RSdT	69364
		2	.100 MeV $\rightarrow$.300 MeV	2. %		DOE Hemmig	RSdT	
		2	.300 MeV $\rightarrow$ 10.0 MeV	5. %		DOE Hemmig	RSdT	
						Absolute values required.		
						α_0/α_1 ratio needed for both α and γ detection.		
						Needed to resolve FBR discrepancy in C/E values.		
						For use as standard.		
^{10}B	$\sigma_{t,2n} (E)$	2	0 $\rightarrow$ 4.00 MeV	10. %		LLL White	OMA	86056
						Activation product with short half-life.		
						For diagnosing ICF implosions.		
^{10}B	$\sigma_{t,p} (E)$	2	0 $\rightarrow$ 4.00 MeV	10. %		LLL White	OMA	86057
						Activation product with short half-life.		
						For diagnosing ICF implosions.		
^{10}B	$\sigma_{\alpha,n} (E)$	1	0 $\rightarrow$ 4.00 MeV	10. %		LLL White	OMA	86052
						Activation product with short half-life.		
						For diagnosing ICF implosions.		
^{nat}C	$\sigma_{n,n'\gamma} (E, \theta_\gamma)$	2	5.00 MeV $\rightarrow$ 20.0 MeV	5. %		ORL Fu	RSdT	74177
						For 4.43 MeV γ 's only.		
						Measurement needed at four or more angles.		
^{nat}C	$\sigma_{\alpha,n} (E)$	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %		LAS Walton	DSS	78169
						Thick target yields required.		
						Relative error of 3.0% needed.		
						α energy resolution 100 keV.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{12}C	$\sigma_{n,\alpha}$ (E)	2	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell	DNA	76111
						Measurement at threshold and several energies throughout the range should be sufficient. γ -ray production and charged-particle spectra are of interest. Needed for energy deposition calculations for radiotherapy.		
^{12}C	$\sigma_{n,n'\alpha}$ (E)	2	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell	DNA	76112
						Measurement at threshold and several energies throughout the range should be sufficient. α spectra are of interest. Needed for energy deposition calculations for radiotherapy. Discrepancy exists at 15 to 20 MeV neutron energy between experimental data and theoretical calculations of secondary particle energy deposition spectra.		
^{13}C	$\sigma_{t,p}$ (E)	2	0 $\rightarrow$ 4.00 MeV	10. %		LLL White	OMA	86058
						Activation product with short half-life. For diagnosing ICF implosions.		
^{13}C	$\sigma_{t,\alpha}$ (E)	2	0 $\rightarrow$ 4.00 MeV	10. %		LLL White	OMA	86059
						Activation product with short half-life. For diagnosing ICF implosions.		
^{14}N	$\sigma_{n,n}$ (E, θ)	2	9.00 MeV $\rightarrow$ 15.0 MeV	5. %		LAS Young	OMA	76046
						Complete angular distribution required.		
^{14}N	$\sigma_{n,p}$ (E)	1	5.00 MeV $\rightarrow$ 14.0 MeV	20. %		GA Cheng	OFE	86174
						Long-lived radionuclide, ^{14}C (5730 yr), produced.		
^{16}O	$\sigma_{n,n}$ (E, θ)	3	14.0 MeV	5. %		LAS Young	OMA	76047
						Complete angular distribution required.		
		2	5.00 keV $\rightarrow$ 10.0 MeV	5. %		BET Dei	DNR	76051
						To resolve discrepancies between calculated and measured multiplication factors in small critical assemblies.		
^{16}O	$\sigma_{n,xn}$ (E, θ , E_n)	1	6.00 MeV $\rightarrow$ 12.0 MeV	10. %		GA Cheng	OFE	86150
						Measurements recommended at 6, 8, 10 and 12 MeV.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{18}O	$\sigma_{\alpha,n} (E)$	2	100 MeV $\rightarrow$ 6.50 MeV	6. %		LAS Walton Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.	DSS	78170
^{18}O	$\sigma_{n,\alpha} (E)$	2	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell Measurement at threshold and several energies throughout the range should be sufficient. γ -ray production and charged-particle spectra are of interest. Needed for energy deposition calculations for radiotherapy.	OHER	76113
^{18}O	$\sigma_{n,n'\alpha} (E)$	2	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell Measurement at threshold and several energies throughout the range should be sufficient. γ -ray production and charged-particle spectra are of interest. Needed for energy deposition calculations for radiotherapy.	OHER	76114
^{18}O	$\sigma_{n,n'\alpha} (E)$	2	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell At least one measurement is needed for normalization. Measurement at threshold and several energies throughout the range should be sufficient. α spectra are of interest. Needed for energy deposition calculations for radiotherapy.	OHER	76115
^{18}O	$\sigma_{\alpha,n} (E)$	3	Thresh $\rightarrow$ 9.00 MeV	10. %	200K	BET Dei Needed for intrinsic source.	DNR	66010
^{19}F	$\sigma_{n,\gamma} (E)$	2	Thermal $\rightarrow$ 15.0 MeV	20. %		GA Cheng Activation data needed for afterheat and safety assessment.	OFE	86099
^{19}F	$\sigma_{n,xn} (E,\theta,E_n')$	2	6.00 MeV $\rightarrow$ 12.0 MeV	10. %		GA Cheng Double differential data needed for neutron transport calculations. Measurements recommended at 6, 8, 10 and 12 MeV.	OFE	86094

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{19}F	$\sigma_{a,n}$ (E)	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %		LAS Walton Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.	DSS	78171
^{23}Na	$\sigma_{n,n}$ (E, θ)	2	10.0 keV $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig 15% in angular distribution.	RSdT	74012
^{23}Na	$\sigma_{n,n'}$ (E, $E_{n'}$)	3	4.00 MeV $\rightarrow$ 10.0 MeV	10. %	10. %	ANL Smith Total integral over 4π required. Spectra at several angles if significantly anisotropic. $\Delta E_{n'} \leq 10\%$.	RSdT	62006
^{23}Na	$\sigma_{n,n'}$ (E, θ , $E_{n'}$)	2 2	Thresh $\rightarrow$ 2.00 MeV 2.00 MeV $\rightarrow$ 15.0 MeV	5. % 10. %	10. % 10. %	DOE Hemmig DOE Hemmig Accuracy of 15% in energy spectra. $\Delta E_{n'} = 10\%$.	RSdT	74014
^{23}Na	$\sigma_{n,2n}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	15. %		DOE Hemmig Needed. for coolant activation.	RSdT	74020
^{23}Na	$\sigma_{n,p}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	10. %		ORL Larson Activation measurement to guide model calculations.	RSdT	80262
^{23}Na	$\sigma_{n,\alpha}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	10. %		ORL Larson Activation measurement to guide model calculations.	RSdT	80263
^{23}Na	$\sigma_{n,x}$ (E)	2	1.00 keV $\rightarrow$ 14.0 MeV	30. %	30. %	NBS Bowman Electron excitation or removal induced by sudden acceleration of nucleus in neutron nucleus scatter (n,n'e). Neutron spectrum calculation.	NBS	82052
^{27}Al	$\sigma_{a,n}$ (E)	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %	100K	LAS Walton Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.	DSS	78172

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{nat}Si	$\sigma_{n,xn} (E, \theta, E_n)$	2	10.0 MeV $\rightarrow$ 12.0 MeV	10. %		GA Cheng Recommend measurements at 10 and 12 MeV.	OFE	86151
^{28}Si	$\sigma_{n,p} (E)$	1	0 $\rightarrow$ 15.0 MeV	10. %		LLL White Activation product with short half-life. For diagnosing ICF implosions.	OMA	86050
^{28}Si	$\sigma_{n,2p} (E)$	2	14.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Activation data needed for afterheat and safety assessments for SiC-based fusion reactor concepts.	OFE	86100
^{30}Si	$\sigma_{n,\gamma} (E)$	2	Thermal $\rightarrow$ 10.0 MeV	20. %		GA Cheng Activation data needed for afterheat and safety assessments for SiC-based fusion reactor concepts.	OFE	86101
^{nat}S	$\sigma_{n,abs} (E)$	2	Thermal	1. %		NBS Carlson The measurement could be at thermal or for an energy range which includes thermal. To improve determination of thermal constants.	RSDT	86089
^{40}Ar	$\sigma_{n,2n} (E)$	2	10.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{39}Ar (269 yr), produced.	OFE	86102
^{39}K	$\sigma_{n,p} (E)$	2	10.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{39}Ar (269 yr), produced.	OFE	86104
^{39}K	$\sigma_{n,\alpha} (E)$	2	.100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{36}Cl (3.01×10^5 yr), produced.	OFE	86103
^{41}K	$\sigma_{n,\gamma} (E)$	2	Thermal $\rightarrow$ 15.0 MeV	20. %		GA Cheng Activation data needed for afterheat and safety assessment.	OFE	86105
^{nat}Ca	$\sigma_{n,\gamma} (E)$	2	1.00 keV $\rightarrow$.500 MeV	10. %		DOE Hemmig For shielding effect of concrete.	RSDT	74029
^{nat}Ca	$N_{n,\gamma} (E, E_\gamma)$	2	2.00 keV $\rightarrow$ 1.00 MeV	5. %		ORL Fu	DNA	74183

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{nat}Ca	$\sigma_{n,n}$ (E)	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %	100K	LAS Walton Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.	DSS	78173
^{40}Ca	$\sigma_{n,2p}$ (E)	2	8.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{39}Ar (269 yr), produced.	OFE	86106
^{42}Ca	$\sigma_{n,2n}$ (E)	3	12.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{41}Ca (1.03×10^5 yr), produced.	OFE	86107
^{42}Ca	$\sigma_{n,\alpha}$ (E)	3	.100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{39}Ar (269 yr), produced.	OFE	86108
^{43}Ca	$\sigma_{n,2p}$ (E)	3	11.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{42}Ar (32.9 yr), produced.	OFE	86109
^{43}Ca	$\sigma_{n,n'\alpha}$ (E)	3	8.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{39}Ar (269 yr), produced.	OFE	86110
^{45}Ca	$\sigma_{n,\alpha}$ (E)	1	RADIOACTIVE 163.8 DAY 1.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{42}Ar (32.9 yr), produced. $^{46}\text{Ti}(n,\alpha)^{45}\text{Ca}(n,\alpha)^{42}\text{Ar}$ chain reaction critical for V-Cr-Ti alloy to qualify as Class C (shallow-land burial) waste material.	OFE	86111
^{48}Ti	$\sigma_{n,2p}$ (E)	2	10.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Activation data needed for radioactivity analysis in fusion reactors.	OFE	86112
^{48}Ti	$\sigma_{n,2p}$ (E)	2	13.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Activation data needed for radioactivity analysis in fusion reactors.	OFE	86113

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{48}Ti	$\sigma_{n,\alpha}$ (E)	1	3.00 MeV $\rightarrow$ 14.0 MeV	15. %		GA Cheng Important for analysis of long-lived ^{42}Ar production: $^{48}\text{Ti}(n,\alpha)^{45}\text{Ca}(n,\alpha)^{42}\text{Ar}$.	OFE	86175
^{50}V	$\sigma_{n,2n}$ (E)	1	10.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Medium-term activation product, ^{49}V (330 day), produced.	OFE	86114
^{51}V	$\sigma_{n,n'}$ (E, $E_{n'}$)	3 3	4.00 MeV $\rightarrow$ 14.0 MeV 1.50 MeV $\rightarrow$ 4.00 MeV	5. % 15. %		ANL Smith DOE Hemmig Total integral over 4π required. Spectra at several angles if significantly anisotropic. Needed for ENDF/B-VI evaluation.	RSdT RSdT	62011
^{51}V	$\sigma_{n,xn}$ (E, $\theta, E_{n'}$)	1	6.00 MeV $\rightarrow$ 12.0 MeV	10. %		GA Cheng Recommend measurements at 6, 8, 10 and 12 MeV.	OFE	86152
^{nat}Cr	$\sigma_{n,tot}$ (E)	2	1.00 keV $\rightarrow$ 20.0 MeV	3. %		DOE Hemmig 5% accuracy minima. Energy resolution - sufficient to resolve major structure.	RSdT	72035
^{nat}Cr	$\sigma_{n,n}$ (E, θ)	3	4.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig	RSdT	74032
^{nat}Cr	$\sigma_{n,n'}$ (E, $E_{n'}$)	2	4.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig Total integral over 4π required. Spectra at several angles if significantly anisotropic. Energy resolution required to determine major structure.	RSdT	66012
^{nat}Cr	$\sigma_{n,\gamma}$ (E)	2	1.00 keV $\rightarrow$.200 MeV	15. %	20. %	DOE Hemmig Resonance parameters needed, especially γ widths.	RSdT	72036
^{nat}Cr	$\sigma_{n,xn}$ (E, $\theta, E_{n'}$)	1	6.00 MeV $\rightarrow$ 12.0 MeV	20. %		GA Cheng Measurements recommended at 6, 8, 10 and 12 MeV.	OFE	86153
^{nat}Cr	$\sigma_{n,\alpha}$ (E)	2	Thresh $\rightarrow$ 14.0 MeV	20. %		ORL Larson	RSdT	86080

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{50}Cr	$\sigma_{n,\gamma} (E)$	2	50.3 mV $\rightarrow$.300 MeV	10. %		ORL Larson	RSdT	86081
		1	.300 MeV $\rightarrow$ 14.0 MeV	15. %		GA Cheng	OFE	86176
						Activation data needed for afterheat and safety assessment.		
^{50}Cr	$\sigma_{n,2n} (E)$	2	14.0 MeV $\rightarrow$ 20.0 MeV	20. %		ORL Larson	RSdT	86082
^{52}Cr	$\sigma_{n,2n} (E)$	2	14.0 MeV $\rightarrow$ 20.0 MeV	20. %		ORL Larson	RSdT	86083
^{52}Cr	$\sigma_{n,p} (E)$	2	10.0 MeV $\rightarrow$ 18.0 MeV	25. %		ORL Larson	RSdT	86084
						Hydrogen production evaluation.		
^{52}Cr	$\sigma_{n,n'\alpha} (E)$	2	10.0 MeV $\rightarrow$ 20.0 MeV	10. %		GA Cheng	OFE	86020
						For Cr evaluation (Hetrick/ORNL).		
^{55}Mn	$\sigma_{n,xn} (E,\theta,E_n')$	2	6.00 MeV $\rightarrow$ 12.0 MeV	20. %		GA Cheng	OFE	86154
						Measurements recommended at 6, 8, 10 and 12 MeV.		
^{55}Mn	$\sigma_{n,x\alpha} (E,\theta,E_n')$	2	6.00 MeV $\rightarrow$ 15.0 MeV	15. %		GA Cheng	OFE	86184
						Needed for radiation damage assessment. (Larson/ORNL)		
^{nat}Fe	$\sigma_{\gamma,n} (E)$	2	Thresh $\rightarrow$ 20.0 MeV	30. %	5. %	GA Cheng	OFE	86155
						Important for study of fusion devices during hydrogen operation. (Driemeyer, MDD)		
^{nat}Fe	$\sigma_{n,n} (E,\theta)$	2	5.00 MeV $\rightarrow$ 15.0 MeV	5. %		ANL Smith	RSdT	69086
						Energy resolution - to at least resolve intermediate structure. For OFE and RRT needs.		
^{nat}Fe	$\sigma_{n,n'} (E,E_n')$	2	2.00 MeV $\rightarrow$ 15.0 MeV	10. %		ORL Bartine	RSdT	76075
						To resolve spectra measurements from stainless steel.		
^{nat}Fe	$\sigma_{n,xn} (E,\theta,E_n')$	1	6.00 MeV $\rightarrow$ 15.0 MeV	5. %		GA Cheng	OFE	86185
						Measurements recommended at 6, 8, 10, 12 and 14 MeV.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{56}Fe	$\sigma_{n,\gamma}$ (E)	1	10.0 keV $\rightarrow$ 1.00 MeV	10. $\rightarrow$ 15. %		DOE Hemmig Energy averaged accuracy to 10-15%.	RSDD	82033
^{56}Fe	$\sigma_{n,x}$ (E)	2	1.00 keV $\rightarrow$ 14.0 MeV	30. %	30. %	NBS Bowman Electron excitation or removal induced by sudden acceleration of nucleus in neutron-nucleus scatter (n,n'e). Neutron spectrum calculations.	NBS	82053
^{56}Fe	Resonance Parameters	1	.800 keV $\rightarrow$ 1.00 MeV	10. %		ORL Fu Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted.	RSDD	86086
^{56}Fe	$\sigma_{n,\gamma}$ (E)	1	30.0 keV $\rightarrow$ 14.0 MeV	15. %		GA Cheng Important reaction leading toward production of long-lived radionuclide ^{60}Fe (1.49×10^6 yr): $^{56}\text{Fe}(n,\gamma)^{56}\text{Fe}(n,\gamma)^{60}\text{Fe}$.	OFE	86177
^{56}Fe	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE 44.5 DAY Thermal $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{60}Fe (1.49×10^6 yr), produced. $^{56}\text{Fe}(n,\gamma)^{56}\text{Fe}(n,\gamma)^{60}\text{Fe}$ multiple reactions are important for the assessment of waste disposal for iron-based blanket materials.	OFE	86115
^{58}Co	$\sigma_{n,\gamma}$ (E)	2	METASTABLE 9.15 HR .500 eV $\rightarrow$ 10.0 keV	10. %		BET Dei Resonance integral needed. For interpretation of $^{58}\text{Ni}(n,p)$ fluence monitor data.	DNR	72045
^{58}Co	$\sigma_{n,\gamma}$ (E)	2 2	1.00 keV $\rightarrow$ 10.0 MeV 10.0 MeV $\rightarrow$ 20.0 MeV	10. % 15. $\rightarrow$ 20. %		ANL Smith ANL Smith Activation is required. To ground and metastable states. For use as a fluence monitor.	RSDD	86087
^{60}Co	$\sigma_{n,p}$ (E)	2	RADIOACTIVE 5.27 YR .100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{60}Fe (1.49×10^6 yr), produced.	OFE	86116

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{nat}Ni	$\sigma_{n,n} (E, \theta)$	2	4.00 MeV $\rightarrow$ 15.0 MeV	5. %		ANL Smith Energy resolution - resolution of intermediate structure probably adequate.	RSdT	72048
^{nat}Ni	$\sigma_{n,n'} (E, E_{n'})$	2	4.00 MeV $\rightarrow$ 15.0 MeV	10. %	10. %	DOE Hemmig Total integral over 4π required. Spectra at several angles if significantly anisotropic. $\Delta E_{n'} = 10\%$. Energy resolution required to determine major structure. For Inconel shield design.	RSdT	66024
^{nat}Ni	$\sigma_{n,\gamma} (E)$	2	.500 MeV $\rightarrow$ 1.00 MeV	10. %		ANL Smith	RSdT	74053
^{nat}Ni	$N_{n,\gamma} (E, E_{\gamma})$	2	Thermal $\rightarrow$.600 MeV	20. %		DOE Hemmig All γ 's are of interest. For shielding and γ heating calculations.	RSdT	72052
^{nat}Ni	$\sigma_{n,\alpha} (E)$	2	Thermal $\rightarrow$ 20.0 MeV	10. %		ORL Larson For evaluation and model testing purposes.	RSdT	86088
^{58}Ni	$\sigma_{n,\gamma} (E)$	2	2.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Production of long-lived radionuclide, ^{58}Ni (7.5×10^4 yr).	OFE	66178
^{58}Ni	$\sigma_{n,p} (E)$	3	Thresh $\rightarrow$ 15.0 MeV	5. %		BET Dei For use as fluence monitor.	DNR	72055
^{59}Ni	$\sigma_{n,\alpha} (E)$	2	RADIOACTIVE 7.5x(10 ⁴)YR 5.00 keV $\rightarrow$ 14.0 MeV	10. %		ORL Larson α channel is open at zero neutron energy. Important for helium production.	RSdT	86090
^{59}Ni	Resonance Parameters	2	RADIOACTIVE 7.5x(10 ⁴)YR 25.3 mV $\rightarrow$.500 MeV	10. %		ORL Larson Elastic, γ , α and proton widths.	RSdT	86091
^{60}Ni	$\sigma_{n,2n} (E)$	2	12.0 MeV $\rightarrow$ 15.0 MeV	10. %		GA Cheng Evaluation needs (Hetrick/ORNL).	OFE	86022

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{60}Ni	$\sigma_{n,n'\alpha}$ (E)	2	7.00 MeV $\rightarrow$ 15.0 MeV	10. %		GA Cheng Evaluation needs (Hetrick/ORNL).	OFE	86021
^{61}Ni	$\sigma_{n,2p}$ (E)	2	10.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{60}Fe (1.49×10^6 yr), produced.	OFE	86117
^{62}Ni	$\sigma_{n,\gamma}$ (E)	1	.200 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Production of long-lived radionuclide, ^{63}Ni (100.1 yr).	OFE	86179
^{63}Ni	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 100 YR 1.00 mV $\rightarrow$ 10.0 MeV	10. %		BET Dei Flux monitor from Cu(n,p) reaction.	DNR	76053
^{63}Ni	$\sigma_{n,\alpha}$ (E)	1	RADIOACTIVE 100 YR .100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{60}Fe (1.49×10^6 yr), produced.	OFE	86118
^{64}Ni	$\sigma_{n,2n}$ (E)	1	13.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{63}Ni (100.1 yr), produced. Needed for the assesement of allowable Ni level in structural alloys to qualify as low activation material.	OFE	86119
^{nat}Cu	$\sigma_{\gamma,n}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	30. %	5. %	GA Cheng Important for analysis of fusion devices during hydrogen operation. (Driemeyer, MDD)	OFE	86156
^{nat}Cu	$\sigma_{n,tot}$ (E)	2	1.00 keV $\rightarrow$ 2.00 MeV	1.0 %		GA Cheng	OFE	86157
		2	13.0 MeV $\rightarrow$ 15.0 MeV	1.0 %		GA Cheng Evaluation needs (Young/LANL).	OFE	86158
^{nat}Cu	$\sigma_{n,n}$ (E)	2	13.0 MeV $\rightarrow$ 15.0 MeV	5.0 %		GA Cheng Evaluation needs (Young/LANL).	OFE	86159
^{63}Cu	$\sigma_{n,p}$ (E)	2	Thresh $\rightarrow$ 15.0 MeV	5. %		BET Dei Needed for long term flux monitor.	DNR	76055

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{65}Cu	$\sigma_{n,t}$ (E)	1	9.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{63}Ni (100.1 yr), produced. Critical for justification for isotopic tailoring of copper to meet lower residual activation criteria.	OFE	86120
^{64}Zn	$\sigma_{n,2p}$ (E)	2	7.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{63}Ni (100.1 yr), produced.	OFE	86121
^{66}Zn	$\sigma_{n,\alpha}$ (E)	2	.100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{63}Ni (100.1 yr), produced.	OFE	86122
^{nat}Ge	$\sigma_{n,x\gamma}$ (E)	2	Thresh $\rightarrow$ 10.0 MeV	10. %		ORL Roussin Photon production needed to properly interpret detector response above the inelastic threshold.	RSST	86034
^{78}Kr	$\sigma_{n,p}$ (E)	2	10.0 MeV $\rightarrow$ 15.0 MeV	10. %		LLL White Activation product with short half-life. For diagnosing ICF implosions.	OMA	86053
^{80}Kr	$\sigma_{n,2n}$ (E)	1	Thresh $\rightarrow$ 15.0 MeV	10. %		LLL White Activation product with short half-life. For diagnosing ICF implosions.	OMA	86051
^{82}Kr	$\sigma_{n,2n}$ (E)	3	11.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{81}Kr (2.1×10^5 yr), produced.	OFE	86123
^{82}Kr	$\sigma_{n,\alpha}$ (E)	3	.100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{78}Se (≤ 65000 yr), produced.	OFE	86124
^{83}Kr	$\sigma_{n,n'\alpha}$ (E)	3	7.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{78}Se (≤ 65000 yr), produced.	OFE	86125

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
⁸³ Kr	Resonance Parameters	2	1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Dei	DNR	67190
		2	1.00 mV $\rightarrow$ 1.00 keV	10. %		KAP Feiner	DNR	
		For fission product absorption calculation.						
⁸⁶ Kr	$\sigma_{n,2n}$ (E)	3	10.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	88126
						Long-lived activation product, ⁸⁵ Kr (10.72 yr), produced.		
⁸⁹ Y	$\sigma_{n,tot}$ (E)	3	14.0 MeV $\rightarrow$ 20.0 MeV	1. %	500K	ANL Smith	RSDT	88024
						Important fission product.		
⁸⁹ Y	$\sigma_{n,\gamma}$ (E)	2	.100 MeV $\rightarrow$.500 MeV	10. %		ANL Smith	RSDT	88028
						Energy-average values to 10%. Needed to check discrepant values.		
⁸⁹ Y	$\sigma_{n,xn}$ (E, θ ,E _{n'})	3	5.00 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith	RSDT	88025
						Determine angle-energy spectra at 2 MeV incident-energy intervals.		
⁸⁹ Y	$\sigma_{n,p}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	5. %		ANL Smith	RSDT	88026
						10% accuracy should be sought to threshold.		
⁸⁹ Y	$\sigma_{n,\alpha}$ (E)	3	Thresh $\rightarrow$ 20.0 MeV	10. %		ANL Smith	RSDT	88027
^{nat} Zr	$\sigma_{n,xn}$ (E, θ ,E _{n'})	2	3.00 MeV $\rightarrow$ 14.0 MeV	10. %	10%	KAP Feiner	DNR	67003
						For design of pressurized water reactors using Zr.		
		2	3.00 MeV $\rightarrow$ 14.0 MeV	10. %	10%	ANL Smith	RSDT	67004
						$\Delta E_n = 10\%$. Needed for IFR-FBR concept.		
^{nat} Zr	Capture RI	1	.500 eV	2. %		KAP Feiner	DNR	69143
		1	.500 eV	2. %		BET Dei	DNR	
		Energy requested is a minimum value only. Shielded integrals down to 0.4 times dilute integral also wanted. To resolve discrepancies in existing data.						
⁸³ Zr	$\sigma_{n,\alpha}$ (E)	1	RADIOACTIVE 1.53x10 ⁶ YR .100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	88127
						Long-lived activation product, ⁹⁰ Sr, (28.6 yr), produced.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{94}Zr	$\sigma_{n,2n}$ (E)	1	7.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{93}Zr (1.53×10^6 yr), produced.	OFE	86128
^{94}Zr	$\sigma_{n,n'\alpha}$ (E)	1	4.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{90}Sr , (28.6 yr), produced.	OFE	86129
^{92}Zr	$\sigma_{n,\gamma}$ (E)	3	RADIOACTIVE 64.0 DAY 1.00 eV $\rightarrow$ 10.0 keV	20. %		BET Dei KAP Feiner	DNR DNR	67010
		2	.500 eV $\rightarrow$ 10.0 keV	10. $\rightarrow$ 20. %		Thermal cross section and RI wanted. Accuracy - 10% if $\sigma > 100$ barns, 20% if 10-100 barns. Energies above 1 eV of interest to give - 10% in RI if > 1000 barns, 20% if 100-1000 barns. Decays to important fission product.		
^{93}Nb	$\sigma_{n,n}$ (E, θ)	3	10.0 MeV $\rightarrow$ 20.0 MeV	5. %	5%	ANL Smith Resolution consistent with optical model. Sufficient accuracy to provide non-elastic cross section to 5% (i.e., to angle-integrated values of $\approx 5\%$).	RSdT	86032
^{93}Nb	$\sigma_{n,n'}$ (E)	2	.500 MeV $\rightarrow$ 15.0 MeV	10. %	10%	NBS McGarry Reactor pressure vessel dosimetry.	NBS	82056
		2	2.00 MeV $\rightarrow$ 3.50 MeV	5. $\rightarrow$ 10. %		ANL Smith Activation cross section needed. To resolve evaluation discrepancy.	RSdT	86031
^{93}Nb	$\sigma_{n,\gamma}$ (E)	1	1.00 MeV $\rightarrow$ 14.0 MeV	15. %		GA Cheng Production of long-lived ^{94}Nb (2.04×10^4 yr) activity.	OFE	86180
<div><div>STATUS :</div><div>GA</div><div>CHENG: Recent ANL evaluation provides definition at energies ≤ 1 MeV (ANL/NDM-88).</div></div>								
^{93}Nb	$\sigma_{n,\gamma\gamma}$ (E, E_γ)	3	Thermal $\rightarrow$ 20.0 MeV	10. %		ANL Smith Broad resolution γ spectrum measurements needed. Accuracy sufficient to confirm energy conservation to 10%.	RSdT	86030

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{93}Nb	$\sigma_{n,xn} (E, \theta, E_n)$	3	5.00 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith Determine angle-energy spectra at 2 MeV incident-energy intervals.	RSDT	86029
^{95}Nb	$\sigma_{n,\gamma} (E)$	2	RADIOACTIVE Thermal 35.1 DAY	10. $\rightarrow$ 20. %		KAP Feiner Thermal average useful. Accuracy - 20% if absorption cross section is 10-100 barns, 10% if greater. Decays to important fission product poison.	DNR	67012
^{nat}Mo	$\sigma_{n,tot} (E)$	2	1.00 keV $\rightarrow$ 20.0 MeV	1. %		ANL Smith Resolution should be consistent with optical model. For high-temperature and space systems.	RSDT	86042
^{nat}Mo	$\sigma_{n,n} (E, \theta)$	2	.250 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith Angle-integrated accuracy <10%. For high-temperature and space systems.	RSDT	86043
^{nat}Mo	$\sigma_{n,n'} (E, \theta, E_n)$	2	.250 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith Include discrete neutron groups below $E_x = 3.0$ MeV. Include continuum spectra above 3 MeV. For high-temperature and space systems.	RSDT	86044
^{nat}Mo	$\sigma_{n,\gamma} (E)$	2	1.00 keV $\rightarrow$ 1.50 MeV	10. %		ANL Smith 10% accuracy in energy-averaged values. For high-temperature and space systems.	RSDT	86045
^{94}Mo	$\sigma_{n,p} (E)$	1	2.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Production of long-lived radionuclide, ^{94}Nb (2.03×10^4 yr).	OFE	86182
^{95}Mo	$\sigma_{n,n'p} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ^{94}Nb (2.03×10^4 yr), produced. This reaction cross section is needed to assess the allowable level of Mo in structural alloys to qualify it as a low activation material.	OFE	86130
^{95}Mo	$\sigma_{n,d} (E)$	1	7.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Production of long-lived radionuclide, ^{94}Nb (2.03×10^4 yr).	OFE	86181

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
⁹⁷ Mo	$\sigma_{n,n'} (E)$	3	3.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product, ⁹³ Zr (1.53x10 ⁶ yr), produced.	OPE	86131
⁹⁹ Mo	$\sigma_{n,\gamma} (E)$	3	RADIOACTIVE 66 HR 1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		BET Dei KAP Feiner	DNR DNR	67013
		3	1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		Resonance parameters also wanted. Accuracy - 10% if $\sigma > 100$ barns, 20% if 10-100 barns. Energies above 1 eV of interest to give - 10% in RI if > 1000 barns, 20% if 100-1000 barns. Decays to important fission product.		
¹⁰² Ru	$\sigma_{n,\gamma} (E)$	3	RADIOACTIVE 39.4 DAY 1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		KAP Feiner	DNR	67015
						Accuracy - 10% if $\sigma > 100$ barns, 20% if 10-100 barns. Energies above 1 eV of interest to give - 10% in RI if > 1000 barns, 20% if 100-1000 barns. For calculation of fission product poisons.		
¹⁰⁴ Ru	$\sigma_{n,p} (E)$	1	4.70 MeV $\rightarrow$ 15.0 MeV	5. %		GA Cheng For Tokamak fusion test reactor diagnostics (Ku/PPPL).	OPE	86132
¹⁰³ Rh	$\sigma_{n,n'} (E)$	2	.500 MeV $\rightarrow$ 10.0 MeV	10. %	10. %	NBS McGarry Reactor pressure vessel dosimetry. Absolute measurement needed.	NBS	82057
¹⁰⁹ Ag	$\sigma_{n,2n} (E)$	1	9.20 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Long-lived activation product ^{108m} Ag (127 yr), produced.	OPE	86133
¹⁰⁹ Ag	$\sigma_{n,p} (E)$	1	Thresh $\rightarrow$ 15.0 MeV	5. %		GA Cheng For Tokamak Fusion Test Reactor neutron diagnostics. Evaluation available. (Ku/PPPL)	OPE	86011
¹²⁷ Te	$\sigma_{n,\gamma} (E)$	2	METASTABLE 109 DAY 1.00 mV $\rightarrow$ 1.00 eV	20. %		KAP Feiner Thermal average or 0.025 eV value useful. For calculation of fission product poisons.	DNR	67022

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{127}I	$\sigma_{n,\gamma}$ (E)	2	0 $\rightarrow$ 10.0 MeV	10. %		ORL Roussin	RSDT	86035
						Photon production needed to properly interpret NaI detector response.		
^{133}I	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 20.8 HR 1.00 mV $\rightarrow$ 1.00 keV	20. %		BET Dei	DNR	67024
						Accuracy 10% if $\sigma > 9000$ barns. Above 1 eV want RI to 20% if in range 9000-90,000 barns, to 10% if larger. For calculation of fission product poisons.		
^{133}Xe	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 5.245 DAY 1.00 mV $\rightarrow$ 5.00 keV	10. %		BET Dei	DNR	74088
						Thermal cross section and RI wanted. For fission product poison calculations.		
^{135}Xe	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 9.09 HR 1.00 mV $\rightarrow$ 5.00 eV	2. %		BET Dei	DNR	74089
		2	1.00 mV $\rightarrow$ 5.00 eV	3. %		KAP Feiner	DNR	
		2	5.00 eV $\rightarrow$ 5.00 keV	5. %		BET Dei		
						Thermal cross section wanted to 2%. For fission product poison calculations.		
^{133}Cs	$\sigma_{n,\gamma}$ (E)	2	0 $\rightarrow$ 10.0 MeV	10. %		ORL Roussin	RSDT	86033
						Photon production needed to properly interpret NaI detector response.		
^{137}Ba	$\sigma_{n,p}$ (E)	3	.400 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86134
						Long-lived activation product ^{137}Cs (30.17 yr), produced.		
^{138}Ba	$\sigma_{n,n'p}$ (E)	2	9.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86135
						Long-lived activation product ^{137}Cs (30.17 yr), produced.		
^{143}Nd	$\sigma_{n,\gamma}$ (E)	2	.500 eV $\rightarrow$ 1.00 keV	5. %		BET Dei	DNR	86002
						Resonance integral wanted. Improved precision needed. For calculation of fission product poisons.		
^{145}Nd	$\sigma_{n,\gamma}$ (E)	2	.500 eV $\rightarrow$ 1.00 keV	10. %		BET Dei	DNR	86003
						Resonance integral wanted. Improved precision needed. For calculation of fission product poisons.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{147}Nd	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 11 DAY 1.00 mV $\rightarrow$ 1.00 keV	5. $\rightarrow$ 10. %		BET Dei	DNR	67040
		2	1.00 mV $\rightarrow$ 1.00 keV	5. $\rightarrow$ 10. %		KAP Feiner Thermal cross section and RI wanted.	DNR	
^{148}Pm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 5.37 DAY 1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Dei	DNR	67046
		2	1.00 mV $\rightarrow$ 1.00 eV	10. %		KAP Feiner Thermal cross section and RI wanted. Look for $1/v$ above 1 eV. For calculation of fission product poisons.	DNR	
^{148}Pm	$\sigma_{n,\gamma}$ (E)	2	METASTABLE 41.3 DAY 1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Dei Thermal cross section and RI wanted. Improved precision needed. For calculation of fission product poisons.	DNR	86004
^{149}Pm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 53.1 HR 1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		BET Dei Thermal cross section and RI wanted to 10% accuracy. RI wanted to 10% if $> 10,000$ barns, 20% if 1,000-10,000 barns.	DNR	86005
^{151}Pm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 28.4 HR 1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Dei Thermal cross section and RI wanted. Energies above 1 eV of interest to give RI to 10%. For calculation of fission product poisons.	DNR	67057
^{151}Sm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 90 YR 1.00 mV $\rightarrow$ 1.00 keV	5. %	5%	BET Dei Thermal cross section and RI wanted. Energies above 1 eV of interest to give RI to 10%. For calculation of fission product poisons.	DNR	67054
^{153}Sm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 46.7 HR 1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		BET Dei	DNR	67061
		2	1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		KAP Feiner Thermal cross section and RI wanted. Accuracy - 10% if $\sigma > 30,000$ barns, 20% if lower. Energies above 1 eV of interest to give - 10% in RI if > 300 barns, 20% if 30-300 barns. For calculation of fission product poisons.	DNR	
^{151}Eu	$\sigma_{n,\gamma}$ (E)	2	1.00 keV $\rightarrow$ 1.00 MeV	5. %		DOE Hemmig	RSST	74099
^{153}Eu	$N_{n,\gamma}$ (E,E ₇)	2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		DOE Hemmig	RSST	74106

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{152}Gd	$\sigma_{n,\gamma}(E)$	1	RADIOACTIVE 1.1x(10 ¹⁴)YR Thermal $\rightarrow$.100 MeV	5. $\rightarrow$ 10. %		HED Schenter $\sigma(n,\gamma)$ resonance parameters up to 1 keV. $\bar{\sigma}(E)$ for $E \geq 1$ keV.	RSdT	86075
^{153}Gd	$\sigma_{n,\gamma}(E)$	1	RADIOACTIVE 241.6 DAY Thermal $\rightarrow$.100 MeV	20. $\rightarrow$ 40. %		HED Schenter $\sigma(n,\gamma)$ resonance integral and thermal. $\bar{\sigma}(E)$ for $E \geq 1$ keV if possible.	RSdT	86076
^{166}Er	$\sigma_{n,\gamma}(E)$	2	1.00 mV $\rightarrow$ 5.00 keV	3. $\rightarrow$ 5. %		GA Mathews 3% accuracy below 1 eV, 5% accuracy above 1 eV. Burnable poison for thermal reactors.	DOE	86077
^{167}Er	$\sigma_{n,\gamma}(E)$	2	1.00 mV $\rightarrow$ 2.00 keV	3. $\rightarrow$ 5. %		GA Mathews 3% accuracy below 1 eV, 5% accuracy above 1 eV. Burnable poison for thermal reactors.	DOE	86078
^{181}Hf	$\sigma_{n,\gamma}(E)$	2	1.00 mV $\rightarrow$ 1.00 eV	2. %		KAP Feiner To resolve discrepancies in thermal data. For Monte Carlo calculations of burn-up in thermal reactors.	DNR	62024
^{176}Hf	$\sigma_{n,\gamma}(E)$	2 2	1.00 mV $\rightarrow$ 5.00 keV 1.00 mV $\rightarrow$ 5.00 keV	10. $\rightarrow$ 40. % 10. $\rightarrow$ 40. %		BET Dei KAP Feiner Accuracy - thermal value: 20%, < 1 eV: 40%, - 10-100 eV: Γ_{tot} , Γ_n , Γ_γ to 10%, - 100 eV-5 keV: Γ_{tot} , Γ_n , Γ_γ to 20%, - average p-wave Γ_γ to 20%, - s-wave strength function to 40%. To resolve discrepancies in RI. For Monte Carlo burn-up calculations.	DNR DNR	62026
^{177}Hf	$\sigma_{n,\gamma}(E)$	2 2	1.00 mV $\rightarrow$ 5.00 keV 1.00 mV $\rightarrow$ 5.00 keV	4. $\rightarrow$ 20. % 4. $\rightarrow$ 20. %		BET Dei KAP Feiner Accuracy - < 1 eV: 4%, - 10-100 eV: Γ_{tot} , Γ_n , Γ_γ to 10%, - 100 eV-5 keV: Γ_{tot} , Γ_n , Γ_γ to 20%, - 5.89, 6.57, 8.87 eV: widths to 5%, - average p-wave Γ_γ to 20%, - s-wave strength function to 20%. To resolve discrepancies in RI. For Monte Carlo burn-up calculations.	DNR DNR	62028

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{178}Hf	$\sigma_{n,\gamma}$ (E)	2	1.00 mV $\rightarrow$ 5.00 keV	3. $\rightarrow$ 20. %		BET Dei	DNR	62030
		2	1.00 mV $\rightarrow$ 5.00 keV	3. $\rightarrow$ 20. %		KAP Feiner	DNR	
Accuracy - < 1 eV: 5%. - 10-100 eV: Γ_{tot} , Γ_n , Γ_γ to 10%, - 100 eV- 5 keV: Γ_{tot} , Γ_n , Γ_γ to 20%, - 7.78 eV: widths to 3%, - average p-wave Γ_γ to 20%, - s-wave strength function to 20%. To resolve discrepancies in RI. For Monte Carlo burn-up calculations.								
^{179}Hf	$\sigma_{n,\gamma}$ (E)	2	1.00 mV $\rightarrow$ 5.00 keV	5. $\rightarrow$ 20. %		BET Dei	DNR	62032
		2	1.00 mV $\rightarrow$ 5.00 keV	5. $\rightarrow$ 20. %		KAP Feiner	DNR	
Accuracy - < 1 eV: 5%. - 10-100 eV: Γ_{tot} , Γ_n , Γ_γ to 10%, - 100 eV- 5 keV: Γ_{tot} , Γ_n , Γ_γ to 20%, - 5.68 eV: widths to 5%, - average p-wave Γ_γ to 20%, - s-wave strength function to 20%. To resolve discrepancies in RI. For Monte Carlo burn-up calculations.								
^{180}Hf	$\sigma_{n,\gamma}$ (E)	2	1.00 mV $\rightarrow$ 5.00 keV	4. $\rightarrow$ 20. %		BET Dei	DNR	67080
		2	1.00 mV $\rightarrow$ 5.00 keV	4. $\rightarrow$ 20. %		KAP Feiner	DNR	
Accuracy - < 1 eV: 4%, 10-100 eV: Γ_{tot} , Γ_n , Γ_γ to 10%, 100 eV- 5 keV: Γ_{tot} , Γ_n , Γ_γ to 20%. average p-wave Γ_γ to 20%. s-wave strength function to 20%. To resolve discrepancies in RI. For Monte Carlo burn-up calculations.								
^{181}Ta	$\sigma_{n,\text{tot}}$ (E)	2	1.00 keV $\rightarrow$ 20.0 MeV	1. %		ANL Smith	RS DT	86039
Resolution should be consistent with optical model. For high-temperature and space systems.								
^{181}Ta	$\sigma_{n,n}$ (E, θ)	2	.140 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith	RS DT	86040
Angle-integrated accuracy <10%. For high-temperature and space systems.								
^{181}Ta	$\sigma_{n,n'}$ (E, θ , $E_{n'}$)	2	.140 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith	RS DT	86041
Include discrete neutron groups below $E_x = 3.0$ MeV. For high-temperature and space systems.								

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{nat}W	$\sigma_{n,xn} (E, \theta, E_n)$	1	6.00 MeV $\rightarrow$ 12.0 MeV	10. %		GA Cheng	OFE	86095
						Double differential data needed for neutron transport calculations. Measurements recommended at 6, 8, 10 and 12 MeV.		
^{180}W	$\sigma_{n,\gamma} (E)$	2	Thermal $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86136
						Activation data needed for ETR radioactivity analysis.		
^{180}W	$\sigma_{n,n'p} (E)$	2	7.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86137
						Activation data needed for ETR radioactivity analysis.		
^{180}W	$\sigma_{n,d} (E)$	2	5.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86138
						Activation data needed for ETR radioactivity analysis.		
^{182}W	$\sigma_{n,n'a} (E)$	1	.100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86139
						Activation data leading to production of meta stable nuclide, ^{178m}Hf (31 yr), is needed.		
^{183}W	$\sigma_{n,p} (E)$	1	Thresh $\rightarrow$ 15.0 MeV	5. %		GA Cheng	OFE	86012
						For Tokamak Fusion Test Reactor neutron diagnostics. Evaluation available. (Ku/PPPL)		
^{186}W	$\sigma_{n,n'a} (E)$	1	.100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86140
						Long-lived activation product, ^{182}Hf (9×10^6 yr), produced.		
^{nat}Re	$\sigma_{n,tot} (E)$	2	1.00 keV $\rightarrow$ 20.0 MeV	1. %		ANL Smith	RSMT	86048
						Resolution consistent with optical model. For high-temperature and space systems.		
^{nat}Re	$\sigma_{n,n} (E, \theta)$	2	.130 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith	RSMT	86036
						Angle-integrated accuracy < 10%. For high-temperature and space systems.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{nat}Re	$\sigma_{n,n'}(E, \theta, E_n')$	2	.130 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith Include discrete neutron groups below $E_x = 3.0$ MeV. Include continuum spectra above 3 MeV. For high-temperature and space systems.	RSdT	86037
^{nat}Re	$\sigma_{n,\gamma}(E)$	2	1.00 keV $\rightarrow$ 1.50 MeV	10. %		ANL Smith 10% accuracy in energy-averaged values. For high-temperature and space systems.	RSdT	86038
^{nat}Pt	$\sigma_{n,n}(E, \theta)$	2	10.0 mV $\rightarrow$ 10.0 eV	10. %		NBS Carlson For scattering corrections in Pt fission deposit backings.	NBS	78177
^{197}Au	$\sigma_{n,\gamma}(E)$	2	.200 MeV $\rightarrow$ 3.50 MeV	2. $\rightarrow$ 3. %		NBS Carlson To improve accuracy of standard cross section.	RSdT	86146
^{nat}Pb	$\sigma_{\gamma,n}(E)$	3	Thresh $\rightarrow$ 20.0 MeV	20. %	5. %	GA Cheng Useful for initial phases of fusion reactor operation. (Driemeyer, MDD)	OFE	86160
^{nat}Pb	$\sigma_{n,2n}(E)$	1	14.0 MeV $\rightarrow$ 15.0 MeV	3. %		GA Cheng Improved accuracy desired.	OFE	86097
^{nat}Pb	$\sigma_{n,3n}(E)$	2	14.2 MeV $\rightarrow$ 15.0 MeV	10. %		GA Cheng Contributes to Pb neutron multiplication reactions.	OFE	86098
^{nat}Pb	$\sigma_{n,xn}(E, \theta, E_n')$	1	6.00 MeV $\rightarrow$ 12.0 MeV	5. %		GA Cheng Measurements recommended at 6, 8, 10 and 12 MeV. Necessary to accurately calculate neutron multiplication.	OFE	86161
^{204}Pb	$\sigma_{n,2n}(E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Activation data needed for afterheat and safety assessments for Li-Pb based fusion reactor concepts.	OFE	86141
^{204}Pb	$\sigma_{n,p}(E)$	1	.100 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng Activation data needed for afterheat and safety assessments for Li-Pb based fusion reactor concepts.	OFE	86142

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{206}Pb	$\sigma_{n,nd}$ (E)	1	13.0 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86144
						Activation data needed for afterheat and safety assessments for Li-Pb based fusion reactor concepts.		
^{206}Pb	$\sigma_{n,t}$ (E)	1	7.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86143
						Activation data needed for afterheat and safety assessments for Li-Pb based fusion reactor concepts.		
^{208}Bi	$\sigma_{n,2n}$ (E)	3	RADIOACTIVE 3.68x10 ⁵ YR 7.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Cheng	OFE	86145
						Long-lived activation product, ^{207}Bi (32.2 yr), produced.		
^{230}Th	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 7.54x(10 ⁴)YR Thermal $\rightarrow$ 1.00 MeV	10. %		ORL Bartine	RSMT	78196
						Key reaction for production of U ²³² .		
^{232}Th	$\sigma_{n,2n}$ (E)	2	RADIOACTIVE 1.41x(10 ¹⁰)YR Thresh $\rightarrow$ 15.0 MeV	5. %		BET Dei	DNR	76065
						For calculation of fuel activity in Th ²³² cycle reactors.		
		3	11.0 MeV $\rightarrow$ 15.0 MeV	5. %		GA Cheng	OFE	86162
						For hybrid system design.		
^{232}Th	$\sigma_{n,3n}$ (E)	3	RADIOACTIVE 1.41x(10 ¹⁰)YR 11.0 MeV $\rightarrow$ 15.0 MeV	10. %		GA Cheng	OFE	86163
						For hybrid system design.		
^{232}Th	$N_{n,f}$ (E,E _n)	3	RADIOACTIVE 1.41x(10 ¹⁰)YR Thresh $\rightarrow$ 14.0 MeV	10. %		GA Cheng	OFE	86164
						Energy and angular distribution of fission neutrons needed for fusion hybrid applications.		
^{232}Th	$N_{n,f}$ (E,E _n) (delayed)	1	RADIOACTIVE 1.41x(10 ¹⁰)YR	2. %		BET Dei	DNR	78182
						Need fast group yields and spectra. To verify existing evaluations.		
^{233}U	Prompt $\bar{\nu}$	2	RADIOACTIVE 1.592x(10 ⁵)YR 14.0 MeV	2. %		LAS Young	OMA	78164
						Prompt $\bar{\nu}$ wanted. Needed for multipurpose evaluation.		
^{233}U	$\sigma_{n,tot}$ (E)	2	RADIOACTIVE 1.592x(10 ⁵)YR 60.0 eV $\rightarrow$ 100 MeV	3. %		LAS Stewart	RSMT	79001
						Needed to cover the unresolved range and overlap the recent ANL data which begins at 42 keV.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{233}U	$\sigma_{n,n} (E)$	2	RADIOACTIVE 1.592x(10 ⁵)YR 1.00 mV $\rightarrow$ 1.00 eV	5. %		NBS Carlson Suitable measurements at thermal may be acceptable. Well-characterized samples must be used. Extinction effects must be determined. For determination of the thermal constants.	RSDT	86070
^{233}U	$\sigma_{n,n'} (E, E_{n'})$	3	RADIOACTIVE 1.592x(10 ⁵)YR 1.00 MeV $\rightarrow$ 7.00 MeV	10. $\rightarrow$ 20. %		ANL Smith	RSDT	67086
^{233}U	$\sigma_{n,\gamma} (E)$	2	RADIOACTIVE 1.592x(10 ⁵)YR .100 keV $\rightarrow$.200 MeV	5. $\rightarrow$ 10. %		ORL Peelle Most important below 30 keV where there are no data.	RSDT	76081
		2	60.0 eV $\rightarrow$.500 MeV	5. $\rightarrow$ 8. %		LAS Stewart Needed to cover the unresolved range and to extend to higher energies. No data available above 2 keV except α measurements of Diven.	RSDT	79002
^{233}U	$\sigma_{n,Xn} (E, \theta, E_{n'})$	3	RADIOACTIVE 1.592x(10 ⁵)YR 1.00 MeV	5. $\rightarrow$ 10. %		LAS Stewart Absolute cross sections required. Measure at several angles and detect low energy neutrons.	RSDT	79004
^{233}U	$\sigma_{n,f} (E)$	2	RADIOACTIVE 1.592x(10 ⁵)YR 60.0 eV $\rightarrow$.100 MeV	5. $\rightarrow$ 8. %		LAS Stewart Measurements relative to ^{235}U not desired due to large cross section fluctuations. Needed to cover the unresolved range and overlap the ratio measurements of Carlson.	RSDT	79003
^{233}U	$\bar{\nu} (E) \text{ (delayed)}$	1	RADIOACTIVE 1.592x(10 ⁵)YR Thermal	5. %		BET Dei To resolve discrepancies.	DNR	74116
^{233}U	$N_{n,f} (E, E_{n'})$	3	RADIOACTIVE 1.592x(10 ⁵)YR Thresh $\rightarrow$ 3.00 MeV	1. %		ANL Smith Spectrum relative to ^{252}Cf .	RSDT	86062
^{233}U	$Y_{n,f} (E, \text{nuclide})$	1	RADIOACTIVE 1.592x(10 ⁵)YR Thermal	1. %		KAP Feiner Nuclides of interest are Y^{82} , Sr^{90} , Mo^{95} , Tc^{99} , Rh^{103} , Rh^{105} , Xe^{135} , Cs^{135} , Xe^{136} , Cs^{137} , La^{139} , Pr^{141} , Pm^{147} , Nd^{147} , Sm^{149} , Sm^{151} , Sm^{152} and Eu^{153} . Data needed to improve accuracy of predicted fission product poisons.	DNR	78191

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{234}U	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE $2.45 \times (10^5)\text{YR}$					
		2	1.00 mV $\rightarrow$ 2.00 eV	3. %		ORL Peelle	RSdT	86092
		2	2.00 eV $\rightarrow$ 10.0 keV	6. %		ORL Peelle	RSdT	
		2	10.0 keV $\rightarrow$ 1.00 MeV	10. %		ORL Peelle	RSdT	
^{234}U	$N_{n,f}$ (E, E_n) (delayed)	1	RADIOACTIVE $2.45 \times (10^5)\text{YR}$	5. %		BET Dei Need fast group yields and spectra. No measurements available. For non-destructive assay of $\text{U}^{233}\text{-Th}^{232}$ fuel.	DNR	78187
^{235}U	$\sigma_{n,tot}$ (E)	1	RADIOACTIVE $7.038 \times (10^8)\text{YR}$ 1.00 mV $\rightarrow$ 1.00 eV	0.5 %		DOE Hemmig Needed to determine the thermal shape accurately.	RSdT	82004
^{235}U	$\sigma_{n,n}$ (E)	2	RADIOACTIVE $7.038 \times (10^8)\text{YR}$ 1.00 mV $\rightarrow$ 1.00 eV	5. %		NBS Carlson Suitable measurements at thermal may be acceptable. Well-characterized samples must be used. Extinction effects must be determined. For determination of the thermal constants.	RSdT	86071
^{235}U	$\sigma_{n,n}$ (E, θ)	2	RADIOACTIVE $7.038 \times (10^8)\text{YR}$ 1.00 MeV $\rightarrow$ 5.00 MeV	10. %	.5M	ANL Smith Needed for analyzing fast critical experiments.	RSdT	69237
^{235}U	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE $7.038 \times (10^8)\text{YR}$ 1.00 mV $\rightarrow$ 1.00 eV	0.5 %		DOE Hemmig Needed to determine the thermal shape accurately.	RSdT	82006
^{235}U	$\sigma_{n,xn}$ (E, E_n)	1	RADIOACTIVE $7.038 \times (10^8)\text{YR}$.100 MeV $\rightarrow$ 14.0 MeV	10. $\rightarrow$ 15. %		DOE Hemmig Spectrum of emitted neutrons needed at several energies.	RSdT	82028
^{235}U	$\sigma_{n,f}$ (E)	1	RADIOACTIVE $7.038 \times (10^8)\text{YR}$ 7.50 eV $\rightarrow$ 30.0 keV	1. %		NBS Carlson Resolved and unresolved resonance parameters needed yielding fission and capture resonance integrals consistent with integral measurements, and to resolve discrepancies in recent fission measurements over the range 0.1-1.0 keV. To resolve discrepancy in recent cross section measurements.	RSdT	80294
		1	30.0 keV $\rightarrow$ 14.0 MeV	1.0 %		DOE Hemmig Ratio to H(n,p) and 10-B (n, α) and possibly other standards.	RSdT	82003
		1	1.00 mV $\rightarrow$ 1.00 eV	0.5 %		DOE Hemmig Needed to determine the thermal shape accurately.	RSdT	82005
		2	14.0 MeV $\rightarrow$ 20.0 MeV	1. %		NBS Carlson To improve accuracy of standard cross section.	RSdT	86149

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{235}U	Alpha (E)	1	RADIOACTIVE 7.038x(10 ⁸)YR 1.00 mV $\rightarrow$ 1.00 eV	1. %		BET Dei Capture cross section equally useful. Experimental uncertainties need verification.	DNR	72077
^{235}U	Alpha (E)	2	RADIOACTIVE 7.038x(10 ⁵)YR 1.00 keV $\rightarrow$ 1.00 MeV	5. $\rightarrow$ 10. %		ANL Smith Discrepancies are too large.	RSDT	86063
^{235}U	Eta (E)	2	RADIOACTIVE 7.038x(10 ⁸)YR Thermal $\rightarrow$ 50.0 keV	.5 $\rightarrow$ 2. %		DOE Hemmig Accuracy 0.5% at thermal, 2% elsewhere.	RSDT	67100
		1	1.00 mV $\rightarrow$ 1.00 eV	.4 %		BET Dei Shape especially important at low energy. Use technique other than manganese bath.	DNR	74119
^{235}U	$\bar{\nu}$ (E)	1	RADIOACTIVE 7.038x(10 ⁸)YR 1.00 mV $\rightarrow$ 1.00 eV	.2 %		BET Dei Measurements relative to U ²³³ , Pu ²³⁹ and Cf ²⁵² wanted.	DNR	78189
^{235}U	$\bar{\nu}$ (E) (delayed)	1	RADIOACTIVE 7.038x(10 ⁸)YR 0 $\rightarrow$ 20.0 MeV	3. %		BET Dei For the entire energy range. To resolve uncertainties in available data.	DNR	74120
^{235}U	$N_{n,f}$ (E,E _n)	3	RADIOACTIVE 7.038x(10 ⁸)YR Thermal $\rightarrow$ 3.00 MeV	1. %		ANL Smith Verification of fission spectrum. Spectrum relative to ²⁵² Cf.	RSDT	69256
		1	Thermal	1. %		BET Dei Need shape of neutron energy distribution from 100 keV to 15 MeV. Relative peak to 1%. Needed for criticality calculations.	DNR	72080
^{235}U	$Y_{n,f}$ (E,nucleide)	1	RADIOACTIVE 7.038x(10 ⁸)YR Thermal	1. %		BET Dei KAP Feiner	DNR	78192
		1	Thermal	1. %		Nuclides of interest are Rh ¹⁰⁵ , Xe ¹³⁵ , Cs ¹³⁵ , Cs ¹³⁷ , Nd ¹⁴⁷ , Sm ¹⁴⁹ and Eu ¹⁵³ . Data needed to improve accuracy of predicted fission product poisoning.	DNR	
^{235}U	Resonance Parameters	2	RADIOACTIVE 7.038x(10 ⁸)YR Thermal $\rightarrow$.200 keV	10. %		BET Dei Multilevel fit where feasible. Verification of existing data useful.	DNR	69263
^{238}U	$\sigma_{n,n}$ (E, θ)	1	RADIOACTIVE 4.468x(10 ⁹) 2.00 MeV $\rightarrow$ 10.0 MeV	5. %		ANL Smith	RSDT	69407

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{238}U	$\sigma_{n,n'}(E)$	1	RADIOACTIVE 4.468x(10 ⁹)YR Thresh $\rightarrow$ 10.0 MeV	5. %	$\rightarrow$ 7. %	DOE Hemmig Total inelastic cross section needed. Accuracy should be sufficient to determine broad group (e.g. 29 group) transfer matrix elements to 7-10%.	RSDT	82029
^{238}U	$\sigma_{n,\gamma}(E)$	1	RADIOACTIVE 4.468x(10 ⁹)YR 1.00 eV $\rightarrow$ 1.00 keV	5. %		DOE Hemmig	RSDT	69419
		1	1.00 keV $\rightarrow$.300 MeV	1. %		ANL Smith	RSDT	
		1	.300 MeV $\rightarrow$.500 MeV	1.5 %		ANL Smith		
		1	.500 MeV $\rightarrow$ 10.0 MeV	2.5 %		ANL Smith		
						For fast reactor calculations.		
^{238}U	$\sigma_{n,\gamma}(E)$	1	RATIO 4.468x(10 ⁹)YR 1.00 eV $\rightarrow$ 1.00 keV	5. %		ANL Smith	RSDT	86064
		1	1.00 keV $\rightarrow$ 10.0 keV	3. %		ANL Smith		
		1	10.0 keV $\rightarrow$.200 MeV	2. %		ANL Smith		
		1	.200 MeV $\rightarrow$ 1.00 MeV	3. %		ANL Smith		
						Ratio to ^{239}Pu (n,f). Key quantity for FBR breeding.		
^{238}U	$\sigma_{n,3n}(E)$	2	RADIOACTIVE 4.468x(10 ⁹)YR 14.0 MeV $\rightarrow$ 20.0 MeV	20. %		ANL Smith Energy resolution 10%.	RSDT	80002
^{238}U	$\sigma_{n,xn}(E, \theta, E_n')$	2	RADIOACTIVE 4.468x(10 ⁹)YR 14.0 MeV	10. %		LAS Stewart Spectra at several angles required. Must record neutrons down to a few hundred keV.	OMA	74218
^{238}U	$\bar{\nu}(E)$ (delayed)	1	RADIOACTIVE 4.468x(10 ⁹)YR Thresh $\rightarrow$ 5.00 MeV	3. %	$\rightarrow$ 5. %	DOE Hemmig This must be an absolute measurement.	RSDT	82014
^{238}U	$N_{n,f}(E, E_n')$	1	RADIOACTIVE 4.468x(10 ⁹)YR Thresh $\rightarrow$ 10.0 MeV			DOE Hemmig Prompt fission neutron spectrum with reference to that of ^{252}Cf with an accuracy of E to 1-1.5%. An absolute measurement of the shape of the spectrum may be necessary.	RSDT	82031
^{238}U	Resonance Parameters	1	RADIOACTIVE 4.468x(10 ⁹)YR 1.00 keV $\rightarrow$ 30.0 keV			DOE Hemmig Resonance parameters and capture cross section. Thick sample transmission and self-indication data desirable; need resolved and unresolved parameters to compute group cross sections to 3.0% accuracy for various self-shielding conditions.	RSDT	82013

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{237}Np	Half-life (alpha decay)	2	RADIOACTIVE 2.14x(10 ⁶)YR	.5 %		NBS Gilliam	NBS	76123
						For mass determination of fissionable deposits.		
^{237}Np	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 2.14x(10 ⁶)YR 50.0 keV → 7.00 MeV	2. %		NBS Gilliam	NBS	78178
						For materials dosimetry. This nuclide is an important standard for measurements in both fast and thermal reactors.		
^{239}Pu	$\sigma_{n,tot}$ (E)	1	RADIOACTIVE 24119 YR .100 mV → 1.00 eV	1. %		DOE Hemmig	RSDT	82007
						Needed to determine the thermal shape accurately.		
^{239}Pu	$\sigma_{n,n}$ (E)	2	RADIOACTIVE 24119 YR 1.00 mV → 1.00 eV	5. %		NBS Carlson	RSDT	86072
						Suitable measurements at thermal may be acceptable. Well-characterized samples must be used. Extinction effects must be determined. For determination of the thermal constants.		
^{239}Pu	$\sigma_{n,f}$ (E)	2	RADIOACTIVE 24119 YR 1.00 eV → 3.00 MeV	1.5 %		ANL Smith	RSDT	69467
		2	3.00 MeV → 15.0 MeV	3. %		ANL Smith	RSDT	
						Verification of current accuracy or intermediate accuracy useful. Need related accuracy for 5-10% energy bins. For fast reactor calculations.		
		2	10.0 mV → 1.00 eV	1. %		ORR Weston	RSDT	86171
^{239}Pu	Alpha (E)	2	RADIOACTIVE 24119 YR 1.00 eV → 50.0 keV	4. %		ANL Smith	RSDT	69314
		2	.600 MeV → 10.0 MeV	10. %		ANL Smith	RSDT	
		2	10.0 mV → 1.00 eV	2. %		Capture cross section equally useful. ORR Weston	RSDT	86172
^{239}Pu	$\bar{\nu}$ (E) (delayed)	3	RADIOACTIVE 24119 YR Thermal → 5.00 MeV	5. %		ANL Smith	RSDT	76090
^{240}Pu	$\sigma_{n,tot}$ (E)	1	RADIOACTIVE 6570 YR 5.00 keV → 20.0 MeV	1. → 2. %		DOE Hemmig	RSDT	82035
^{240}Pu	$\sigma_{n,n}$ (E,θ)	3	RADIOACTIVE 6570 YR .500 MeV → 10.0 MeV	10. %		ANL Smith	RSDT	86065
						Angle-integrated accuracy.		
^{240}Pu	$\sigma_{n,n'} (E,E_n)$	3	RADIOACTIVE 6570 YR Thresh → 5.00 MeV	10. → 15. %		ANL Smith	RSDT	86066

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{240}Pu	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 6570 YR .500 keV $\rightarrow$ 1.00 MeV	15. %		ANL Smith	RSDT	69389
		1	Thermal $\rightarrow$.100 keV	2. %		Accuracy of 15% would be useful. For fast reactor calculations. DOE Hemmig	RSDT	82020
						Improved precision needed for thermal reactors.		
^{240}Pu	$\sigma_{n,f}$ (E)	3	RATIO 6570 YR 1.00 keV $\rightarrow$.100 MeV	3. %		DOE Hemmig	RSDT	72090
						Ratio to $^{10}\text{B}(n,\alpha)$ or $^6\text{Li}(n,\alpha)$ wanted. Accuracy of 5% useful.		
^{240}Pu	Resonance Parameters	2	RADIOACTIVE 6570 YR 20.0 eV $\rightarrow$ 10.0 keV	10. %		DOE Hemmig	RSDT	69391
		2	1.00 eV	0.5 %		To resolve discrepancies in existing data. For fast reactor calculations, including Doppler effect. DOE Hemmig	RSDT	82021
						Resonance strongly influences thermal cross section evaluation. There is discrepancy between differential and integral data.		
^{241}Pu	$\sigma_{n,\text{tot}}$ (E)	1	RADIOACTIVE 14.4 YR 1.00 mV $\rightarrow$ 1.00 eV	0.5 %		DOE Hemmig	RSDT	82010
						Needed to determine the thermal shape accurately.		
^{241}Pu	$\sigma_{n,n}$ (E)	2	RADIOACTIVE 14.4 YR 1.00 mV $\rightarrow$ 1.00 eV	5. %		NBS Carlson	RSDT	86073
						Suitable measurements at thermal may be acceptable. Well-characterized samples must be used. Extinction effects must be determined. For determination of the thermal constants.		
^{241}Pu	$\sigma_{n,f}$ (E)	2	RADIOACTIVE 14.4 YR 10.0 eV $\rightarrow$ 30.0 keV	2. %		WEW Doncals	RSDT	76042
		2	Thermal $\rightarrow$ 10.0 eV	2. %		DOE Hemmig	RSDT	82022
		2	20.0 keV $\rightarrow$.400 MeV	3.0 %		Ratio to ^{235}U and ^{239}Pu would be useful. DOE Hemmig	RSDT	82023
^{241}Pu	Alpha (E)	2	RADIOACTIVE 14.4 YR 1.00 keV $\rightarrow$ 2.00 MeV	6.0 %		DOE Hemmig	RSDT	69332
		2	10.0 mV $\rightarrow$ 1.00 keV	2. $\rightarrow$ 4. %		ORL Weston	RSDT	86173
						2% accuracy desired from .01 eV to 1.0 eV.		
^{243}Am	$\sigma_{n,f}$ (E)	3	RADIOACTIVE 7380 YR Thermal $\rightarrow$ 14.0 MeV	10. $\rightarrow$ 15. %		NBS Carlson	RSDT	86074
						Previous measurements are not consistent.		
^{242}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 163 DAY 10.0 keV $\rightarrow$ 1.00 MeV	10. $\rightarrow$ 20. %		ANL Smith	RSDT	86067
						Needed for fuel cycle calculations.		

DOE-NDC Compilation of Requests for Nuclear Data 1986

Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Requesting Agency	No.
^{244}Cm	$\sigma_{n,\gamma} (E)$	2	RADIOACTIVE 18.1 YR 10.0 keV $\rightarrow$ 1.00 MeV	10. $\rightarrow$ 20. %		ANL Smith Needed for fuel cycle calculations.	RSdT	86068

APPENDIX A

REACTION TABLES FOR DOE-NDC REQUEST LIST

<u>QUANTITY SYMBOL</u>	<u>DEFINITION</u>
<u>A. Structure Information</u>	
Half-life	Half life
Half-life (alpha decay)	Alpha half life
Half-life (fission)	Fission half life
Spon. $\bar{\nu}$	Average number of neutrons emitted per fission
Prompt $\bar{\nu}$	Average number of prompt neutrons per fission
$N_{\text{spon},f}(E_n)$	Energy distribution of fission neutrons
<u>B. Gamma-ray Interactions</u>	
$\sigma_{\gamma,n}(E)$	Neutron production cross section
$\sigma_{\gamma,p}(E)$	Proton production cross section
<u>C. Neutron Interactions</u>	
$\sigma_{n,\text{tot}}(E)$	Total cross section
$\sigma_{n,n}(E)$	Elastic cross section
$\sigma_{n,n}(E,\theta)$	Angular distribution of elastically scattered particles
$\sigma_{n,n'}(E)$	Inelastic cross section
$\sigma_{n,n'}(E,\theta)$	Angular distribution of inelastically scattered particles
$\sigma_{n,n'}(E,E_n')$	Energy distribution of inelastic particles
$\sigma_{n,n'}(E,\theta,E_n')$	Double differential (energy,angle) inelastic cross section
$\sigma_{n,\text{scat}}(E)$	Total scattering cross section (elastic + inelastic)
$\sigma_{n,\text{non}}(E)$	Non-elastic cross section
$\sigma_{n,\text{abs}}(E)$	Absorption cross section
$\sigma_{n,\gamma}(E)$	Capture cross section
$N_{n,\gamma}(E,E_\gamma)$	Capture gamma ray spectra
$\sigma_{n,n'\gamma}(E,\theta_\gamma)$	Angular distribution of photons from inelastic scattering
$\sigma_{n,X\gamma}(E)$	Total photon production cross section from all photon-emitting processes
$\sigma_{n,X\gamma}(E,E_\gamma)$	Energy distribution of photons from all photon emitting processes
$\sigma_{n,X\gamma}(E,\theta_\gamma,E_\gamma)$	Double differential (energy,angle) total photon emission cross section
$\sigma_{n,2n}(E)$	Two neutron production cross section
$\sigma_{n,3n}(E)$	Three neutron production cross section
$\sigma_{n,4n}(E)$	Four neutron production cross section
$\sigma_{n,5n}(E)$	Five neutron production cross section
$\sigma_{n,Xn}(E)$	Total neutron production cross section from all neutron emitting processes
$\sigma_{n,Xn}(E,E_n')$	Energy distribution of neutrons from all neutron emitting processes
$\sigma_{n,Xn}(E,\theta,E_n')$	Double differential (energy,angle) neutron emission cross section
$\sigma_{n,p}(E)$	Proton production cross section
$\sigma_{n,n'p}(E)$	Neutron and proton production cross section
$\sigma_{n,n'2p}(E)$	Neutron and 2-proton production cross section
$\sigma_{n,2p}(E)$	Two proton production

APPENDIX A

<u>QUANTITY SYMBOL</u>	<u>DEFINITION</u>
C. <u>Neutron Interactions</u>	
$\sigma_{n,xp}$ (E)	Total proton production cross section from all processes
$\sigma_{n,xp}$ (E, θ , E_p)	Double differential (energy,angle) proton emission cross section
$\sigma_{n,d}$ (E)	Deuteron production cross section
$\sigma_{n,nd}$ (E)	Neutron and deuteron production cross section
$\sigma_{n,t}$ (E)	Triton production cross section
$\sigma_{n,t}$ (E, θ)	Angular distribution of tritons
$\sigma_{n,n't}$ (E)	Neutron and triton production cross section
$\sigma_{n,\alpha}$ (E)	Alpha production cross section
$\sigma_{n,\alpha}$ (E, θ)	Angular distribution of alpha particles
$\sigma_{n,n'\alpha}$ (E)	Neutron and alpha production cross section
$\sigma_{n,n'3\alpha}$ (E)	Emission of a neutron and three alpha particles
$\sigma_{n,n'4\alpha}$ (E)	Emission of a neutron and four alpha particles
$\sigma_{n,X\alpha}$ (E)	Total alpha production cross section from all processes
$\sigma_{n,X\alpha}$ (E, θ , E_{α})	Double differential (energy,angle) alpha emission cross section
$\sigma_{n,X}$ (E)	Special quantity further defined in comments
$\sigma_{n,f}$ (E)	Fission cross section
Alpha (E)	Capture to fission ratio e.g. $\sigma(n,\gamma)/\sigma(n,f)$
Eta (E)	Number of neutrons emitted per neutron absorption
$\bar{\nu}$ (E)	Average number of neutrons emitted per fission
$\bar{\nu}$ (E) (delayed)	Average number of delayed neutrons emitted per fission
$N_{n,f}$ (E, E_n)	Energy distribution of fission neutrons
$N_{n,f}$ (E, E_n) (delayed)	Energy distribution of delayed fission neutrons
$N_{n,f}$ (E, E_γ) (delayed)	Spectrum of delayed gamma rays emitted in fission
$Y_{n,f}$ (E,nucleide)	Fission product mass yield spectrum
Resonance Parameters	Resonance parameters
Capture R1	Capture resonance integral
D. <u>Proton Interactions</u>	
$\sigma_{p,\gamma}$ (E)	Capture cross section
$\sigma_{p,n}$ (E)	Neutron production cross section
$\sigma_{p,p}$ (E)	Proton production cross section
$\sigma_{p,3\alpha}$ (E)	Production of three alpha particles
$\sigma_{p,X\alpha}$ (E, θ , E_{α})	Double differential (energy,angle) alpha emission cross section
E. <u>Deuteron Interactions</u>	
$\sigma_{d,2n}$ (E)	Two neutron production cross section
$\sigma_{d,p}$ (E)	Proton production cross section
$\sigma_{d,d}$ (E)	Deuteron production cross section
$\sigma_{d,\alpha}$ (E)	Alpha production cross section

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<u>QUANTITY SYMBOL</u>	<u>DEFINITION</u>
<u>F. Triton Interactions</u>	
$\sigma_{t,2n} (E)$	Two neutron production cross section
$\sigma_{t,3n} (E)$	Three neutron production cross section
$\sigma_{t,p} (E)$	Proton production cross section
$\sigma_{t,t} (E)$	Triton production cross section
$\sigma_{t,\alpha} (E)$	Alpha production cross section
<u>G. Helium-3 Interactions</u>	
$\sigma_{He-3,p} (E)$	Proton production cross section
$\sigma_{He-3,2p} (E)$	Two proton production
$\sigma_{He-3,He-3} (E)$	Helium-3 production cross section
$\sigma_{He-3,x} (E)$	Special quantity further defined in comments
<u>H. Alpha Interactions</u>	
$\sigma_{\alpha,\alpha} (E)$	Elastic cross section
$\sigma_{\alpha,n} (E)$	Neutron production cross section
$\sigma_{\alpha,p} (E)$	Proton production cross section
<u>J. Lithium-6 Interactions</u>	
$\sigma_{Li-6,x} (E)$	Special quantity further defined in comments

APPENDIX B

LIST OF REQUESTERS

<u>NAME</u>	<u>LAB</u>	<u>AGENCY</u>	<u>PHONE</u>	<u>ADDRESS</u>
Dr. David Bartine	ORL	RS DT	615-574-6100	Oak Ridge National Laboratory P. O. Box X Bldg. 9201-3, Mail Stop 2 Oak Ridge, TN 37831
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Dr. Randall S. Caswell	NBS	OH ER	301-975-5525	National Bureau of Standards Chief, Ionizing Radiation Division Bldg. 245, Room C-210 Gaithersburg, MD 20899
Dr. E. T. Cheng	GA	OF E	619-455-4221	GA Technologies, Inc. Mail Stop 13/167 P. O. Box 85608 San Diego, CA 92138
Dr. D. E. Dei	BET	DNR	412-476-5139	Bettis Atomic Power Laboratory P. O. Box 79, Zap 34-F West Mifflin, PA 15122-0079
Mr. R. A. Doncals	WEW	RS DT	412-722-5271	Westinghouse Electric Corporation Advanced Energy Systems Division Waltz Mill Site, Mail Stop 10 P. O. Box 158 Madison, PA 15663
Dr. Frank Feiner	KAP	DNR	518-395-4611	Knolls Atomic Power Laboratory Bldg. F, Room 20 P. O. Box 1072 Schenectady, NY 12301

APPENDIX B.

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Dr. D. M. Gilliam	NBS	NBS	301-975-6206	National Bureau of Standards Reactor Building 235, A-106 Gaithersburg, MD 20899
Dr. G. M. Hale	LAS	RSDT	505-667-7738	Los Alamos National Laboratory Group T2, Mail Stop B-243 Los Alamos, NM 87545
Mr. P. B. Hemmig	DOE	RSDT	301-353-3579	U. S. Department of Energy Advanced Reactor Technology NE-542/GTN Washington, DC 20545
Dr. Duane Larson	ORL	RSDT	615-574-6119	Oak Ridge National Laboratory Engineering Physics Division Bldg. 6010 P. O. Box X Oak Ridge, TN 37831-6354
Dr. D. Mathews	GA	RSDT	619-455-2405	GA Technologies, Inc. Room 15-250A P. O. Box 85608 San Diego, CA 92138
Dr. E. Dale McGarry	NBS	NBS	301-975-6205	National Bureau of Standards Nuclear Radiation Division Reactor Building 235, A-106 Gaithersburg, MD 20899
Dr. R. W. Peelle	ORL	RSDT	615-574-6113	Oak Ridge National Laboratory Building 6010 P. O. Box X Oak Ridge, TN 37831-6354
Dr. R. W. Roussin	ORL	RSDT	615-574-6176	Oak Ridge National Laboratory Radiation Shielding Information Center P. O. Box X Oak Ridge, TN 37831-6362

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Dr. Roger M. White	LLL	OMA	415-422-9668	Lawrence Livermore National Laboratory Physics Department P. O. Box 808 Livermore, CA 94550
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APPENDIX B

Requesting Agency Codes

ANSP Advanced Nuclear Systems Program

DNA Defense Nuclear Agency

DNR Division of Naval Research

DSS Division of Safeguards & Security

NBS National Bureau of Standards

NMPO Nuclear Materials & Production Office

OFE Office of Fusion Energy

OHER Office of Health & Environmental Research

OMA Office of Military Applications

RSdT Reactor Systems Development & Technology

APPENDIX C

LIST OF MATERIALS AND EVALUATORS

Material	Principal Evaluator(s)	Laboratory
1-H-1	D.C.Dodder	LAS
1-H-2	L.Stewart	LAS
1-H-3	L.Stewart	LAS
2-He-3	L.Stewart	LAS
2-He-4	G.M.Hale	LAS
3-Li-0,8	G.M.Hale	LAS
3-Li-7	P.G.Young	LAS
4-Be-9	S.T.Perkins,A.B.Smith,R.Lane	LLL,ANL,OMO
5-B-10	G.M.Hale	LAS
5-B-11	P.G.Young	LAS
6-C	E.J.Axton	NBS
7-N-0,14	P.G.Young	LAS
7-N-15	E.D.Arthur	LAS
8-O	P.G.Young	LAS
9-F-19	D.C.Larson	ORL
11-Na-23	D.C.Larson	ORL
12-Mg	D.C.Larson	ORL
13-Al-27	P.G.Young	LAS
14-Si	D.C.Larson	ORL
15-P-31	S.T.Perkins	LLL
16-S	S.T.Perkins,M.Divadeenam	LLL,BNL
17-Cl	M.K.Drake	SAI
18-Ar	F.M.Mann	HED
19-K	D.C.Larson	ORL
20-Ca	C.Y.Fu	ORL
21-Sc	S.Mughabghab	BNL
22-Ti	A.B.Smith	ANL
23-V	A.B.Smith	ANL
24-Cr	D.M.Hetrick	ORL
25-Mn-55	K.Shibata	ORL
26-Fe	C.Y.Fu	ORL
27-Co	D.L.Smith	ANL
28-Ni	D.M.Hetrick	ORL
29-Cu	D.M.Hetrick	ORL
30-Zn	R.E.Schenter	HED
31-Ga	P.G.Young	LAS
32-Ge	R.E.Schenter	HED
33-As-75	R.E.Schenter	HED
34-Se	R.E.Schenter	HED
35-Br	R.E.Schenter	HED
36-Kr	R.E.Schenter	HED
37-Rb	R.E.Schenter	HED
38-Sr	R.E.Schenter	HED
39-Y-89	A.B.Smith	ANL
40-Zr	A.B.Smith	ANL
41-Nb	A.B.Smith	ANL
42-Mo	R.E.Schenter	HED
43-Tc-99	R.E.Schenter	HED
44-Ru	R.E.Schenter	HED
45-Rh-103	R.E.Schenter	HED
46-Pd	R.E.Schenter	HED
47-Ag	R.E.Schenter	HED
48-Cd	R.E.Schenter	HED

Material	Principal Evaluator(s)	Laboratory
49-In	R.E.Schenter	HED
50-Sn	R.E.Schenter	HED
51-Sb	R.E.Schenter	HED
52-Te	R.E.Schenter	HED
53-I	R.E.Schenter	HED
54-Xe	R.E.Schenter	HED
55-Cs	R.E.Schenter	HED
56-Ba	R.J.Howerton	LLL
57-La-139	R.E.Schenter	HED
58-Ce	R.E.Schenter	HED
59-Pr	R.E.Schenter	HED
60-Nd	R.E.Schenter	HED
61-Pm	R.E.Schenter	HED
62-Sm	R.E.Schenter	HED
63-Eu (odd A)	P.G.Young	LAS
63-Eu (evn A)	R.E.Schenter	HED
64-Gd (odd A)	P.G.Young	LAS
64-Gd (evn A)	R.E.Schenter	HED
65-Tb	R.E.Schenter	HED
66-Dy	R.E.Schenter	HED
67-Ho	P.G.Young	LAS
68-Er	R.E.Schenter	HED
69-Tm	P.G.Young	LAS
71-Lu	R.E.Schenter	HED
72-Hf	R.J.LaBauve,J.Hardy	LAS,BET
73-Ta	S.T.Perkins	LLL
74-W	E.D.Arthur	LAS
75-Re	P.G.Young	LAS
76-Os	W.B.Henderson	WES
77-Ir	P.G.Young	LAS
78-Pt	W.B.Henderson	WES
79-Au	P.G.Young	LAS
82-Pb	C.Y.Fu	ORL
83-Bi	D.L.Smith	ANL
90-Th	W.P.Poenitz,D.Olson	ANL,ORL
91-Pa	F.M.Mann	HED
92-U-232	L.Stewart	LAS
92-U-233	L.Stewart	LAS
92-U-234	L.Stewart,W.B.Henderson	LAS,WES
92-U-235	W.P.Poenitz,G.DeSaussure,P.G.Young	ANL,ORL,LAS
92-U-236	W.P.Poenitz	ANL
92-U-238	W.P.Poenitz,D.Olson,P.G.Young	ANL,ORL,LAS
93-Np-237	E.D.Arthur	LAS
94-Pu-238	F.M.Mann	HED
94-Pu-239	E.D.Arthur,G.DeSaussure,W.P.Poenitz	LAS,ORL,ANL
94-Pu-240	L.W.Weston	ORL
94-Pu-241	L.W.Weston	ORL
94-Pu-242	F.M.Mann	HED
95-Am	F.M.Mann	HED
96-Cm	L.W.Weston	HED
97-Bk	L.W.Weston	HED
98-Cf	L.W.Weston	HED
99-Es	L.W.Weston	HED