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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

March 1981

BROOKHAVEN NATIONAL LABORATORY
ASSOCIATED UNIVERSITIES, INC.
UPTON, LONG ISLAND, NEW YORK 11973

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NATIONAL NUCLEAR DATA CENTER

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I. INTRODUCTION

The purpose of this compilation is to summarize the current needs of U. S. Nuclear Energy programs and other applied technologies for nuclear data. It is the result of a biennial review in which the Department of Energy (DOE) and contractors, Department of Defense Laboratories and contractors, and other interested groups have been asked to review and revise their requests for nuclear data. It was felt that the evaluators of cross section data and the users of these evaluations should be involved in the review of the data requests to make this compilation more useful. Hence, the following review procedure was adopted for the current edition of the Data Request List; retrievals of requests from the 1979 edition pertaining to the following three categories of reviewers were sent for comments to:

1. Originators of data requests
2. Evaluators of ENDF/B-V
3. Members of the Data Testing Subcommittee of the Cross Section Evaluation Working Group (CSEWG).

Out of a group of 72, some 41 replied with their comments and suggestions. These included recommendations for deleting requests which had been satisfied by recent measurements or evaluations. The changing priorities of some applied programs also suggested the omission of some requests and the inclusion of new ones. The comments received from all the reviewers were scrutinized by the Data Requests and Status Subcommittee of CSEWG and a Request List based on its recommendations adopted. Future changes in the review process to make it more efficient are also being considered. Any relevant suggestions are welcome.

Because of the changing and continuing character of the need for the 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 on a continuous access basis as a data base by the National Nuclear Data Center (NNDC).

The present request list is produced from a computerized data file by the NNDC. The system permits full use of upper case, lower case, Greek letters, subscripts and superscripts. The contents of this document, except for requests withheld by sponsoring organizations, will be included in the forthcoming edition of WREND, published by the International Atomic Energy Agency.

This 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. In the column headed 'Year', the year of the last revision to the request is given. All requests for a given Isotope and Quantity are grouped (or blocked) together. The requests in a block are followed by any status comments.

Each request has a unique Isotope, Quantity and Requester. The requester is identified by laboratory, last name, and sponsoring U. S. government agency, e.g. BET, STEEN, DNR. All requesters, together with their addresses and phone numbers, are given in appendix B. A list of the evaluators responsible for ENDF/B-V evaluations with their affiliation appears in appendix C.

All requests must give the energy (or range of energy) for the incident particle when 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 energy resolution in percent is sometimes given.

II. PROCEDURES FOR SUBMITTING REQUESTS

Requests for measurements of nuclear data should be transmitted by the requesting laboratories to the National Nuclear Data Center (NNDC) at Brookhaven National Laboratory. Requesters' comments should include statements as to the importance and application of the request. Data requests should be submitted to the designated representative who will coordinate the requests originating from each laboratory and do an initial screening. If your institution does not have a designated representative, requests may be submitted directly to the NNDC.

In accepting a request for nuclear data, the DOE/NDC assumes that the originator or the sponsoring 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. Originators of data requests must be realistic and exercise good sense and moderation, as well as a sense of proportion, in assembling their list. Requests should be ordered in terms of priority, in consultation with the program sponsors, to judge the importance of requests from the viewpoint of the whole program. From this list, a few of the most important requests should be chosen and submitted for the Data Request Compilation. This will prevent the Compilation from becoming an exercise in wishful thinking in which most of the requests do not stand an appreciable chance of ever being fulfilled.

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, 1979 - June 30, 1981)

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DOE-NDC Compilation of Requests for Nuclear Data 1980

Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^1H	$\sigma_{n,\text{tot}}$ (E)	2	1.00 keV $\rightarrow$ 1.00 MeV	.3 %		LAS Stewart To check on primary standard in largely unmeasured regions.	RRT	78175
^1H	$\sigma_{n,n}$ (E, θ)	1	10.0 MeV $\rightarrow$ 50.0 MeV	1. %		LAS Stewart To confirm or improve present evaluation.	RRT	80289
^1H	$\sigma_{n,\gamma}$ (E)		Thermal	.3 %		BET Steen To help resolve discrepancies in thermal criticality parameters.	DNR	78179
		2	10.0 mV $\rightarrow$ 10.0 eV	1. %		LAS Stewart To check 1/v behavior of capture cross section.	RRT	80288
^2H	$\sigma_{n,\text{tot}}$ (E)	1	1.00 eV $\rightarrow$ 1.00 keV	.5 %		BET Steen	DNR	72002
		1	1.00 keV $\rightarrow$ 10.0 MeV	5. %		BET Steen Need free atom scattering cross section. For thermal reactor analysis.	DNR	
^2H	$\sigma_{n,n}$ (E)	3	1.00 eV $\rightarrow$ 1.00 keV	1. %		CBE Visner For thermal HWR applications.	RRT	76072
^2H	$\sigma_{n,2n}$ (E)	1	Thresh $\rightarrow$ 20.0 MeV	5. %		LAS Stewart	OMA	76043
		1	Thresh $\rightarrow$ 20.0 MeV	5. %		BET Steen For thermal reactor analysis.	DNR	78180
^2H	$\sigma_{\alpha,\alpha}$ (E)	1	50.0 keV $\rightarrow$ 2.00 MeV	10. $\rightarrow$ 30. %		DOE Ng Accuracy 10.0 % relative, 30.0 % absolute required. Required to calculate heating of plasma fuel by fusion product alphas.	OFE	78071
^3H	$\sigma_{d,d}$ (E)	1	10.0 keV $\rightarrow$ 5.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80283
^3H	$\sigma_{d,\alpha}$ (E)	1	RADIOACTIVE 12.33 YR $\rightarrow$ 10.0 keV	10. $\rightarrow$ 30. %		DOE Ng Accuracy 10.0 % relative, 30.0 % absolute required.	OFE	78069

DOE-NDC Compilation of Requests for Nuclear Data 1980

Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^3H	$\sigma_{t,\alpha}$ (E)	1	RADIOACTIVE 12.33 YR → 10.0 keV	10. → 30. %		DOE Ng Accuracy 10.0 % relative, 30.0 % absolute required. Data required to analyze background neutrons and estimate tritium ion temperatures.	OFE	78070
^3H	$\sigma_{\alpha,\alpha}$ (E)	1	RADIOACTIVE 12.33 YR 50.0 keV → 2.00 MeV	10. → 30. %		DOE Ng Accuracy 10.0 % relative, 30.0 % absolute required. Required to calculate heating of plasma fuel by fusion product alphas.	OFE	78072
^3He	$\sigma_{n,p}$ (E)	2	10.0 keV → 3.00 MeV	1. %		DOE Hemmig Absolute values required. Intermediate accuracy useful. For use as secondary standard.	RRT	69001
		1	5.00 keV → .200 MeV	2. %		LAS Stewart	RRT	69003
		1	.200 MeV → 3.00 MeV	3. %		LAS Stewart Absolute values required. Increasingly useful as a standard and for spectrometers.	RRT	
		1	2.00 MeV → 40.0 MeV	10. %		HED McElroy Accuracy 20% above 30 MeV. For FMIT dosimetry.	OFE	80234
^3He	$\sigma_{n,n'p}$ (E)	1	Thresh → 40.0 MeV	10. %		HED McElroy Accuracy 20% above 30 MeV. For FMIT dosimetry.	OFE	80235
^3He	$\sigma_{n,2p}$ (E)	1	Thresh → 40.0 MeV	10. %		HED McElroy Accuracy 20% above 30 MeV. For FMIT dosimetry.	OFE	80233
^3He	$\sigma_{d,p}$ (E)	1	2.00 MeV → 5.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80285
^3He	$\sigma_{d,d}$ (E)	1	.500 MeV → 1.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80284

DOE-NDC Compilation of Requests for Nuclear Data 1980

Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^4He	$\sigma_{\text{He-3,He-3}} (E)$	2	50.0 keV $\rightarrow$ 8.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80075
$^{\text{nat}}\text{Li}$	$\sigma_{\text{n,xp}} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Total hydrogen production. Radiation damage calculations.	OFE	80040
$^{\text{nat}}\text{Li}$	$\sigma_{\text{n,xp}} (E, \theta, E_p)$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	80093
$^{\text{nat}}\text{Li}$	$\sigma_{\text{n,x}\alpha} (E, \theta, E_\alpha)$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	80094
$^{\text{nat}}\text{Li}$	$\sigma_{\alpha, \text{n}} (E)$	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	$\sigma_{\text{n,n}'} (E)$	1	10.0 keV $\rightarrow$ 40.0 MeV	10. %		HED McElroy Accuracy 20% above 30 MeV. For FMIT dosimetry.	OFE	80230
^6Li	$\sigma_{\text{n,2n}} (E)$	1	10.0 keV $\rightarrow$ 40.0 MeV	10. %		HED McElroy Accuracy 20% above 30 MeV. For FMIT dosimetry.	OFE	80231
^6Li	$\sigma_{\text{n,xp}} (E)$	1	$\rightarrow$ 40.0 MeV	10. %		HED McElroy Accuracy 20% above 30 MeV. Required for FMIT dosimetry.	OFE	80295

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.	
${}^6\text{Li}$	$\sigma_{n,t} (E)$	1	1.00 keV $\rightarrow$ 3.00 MeV	1. %		ANL Smith	RRT	69009	
		1	1.00 keV $\rightarrow$ 3.00 MeV	1. %		DOE Hemmig	RRT		
		2	.500 keV $\rightarrow$ 3.00 MeV	1. $\rightarrow$ 3. %		LAS Hale	RRT		
						Absolute values required. Accuracy of 3% useful. Energy resolution must reproduce true shape. For use as standard.			
		2	9.00 MeV $\rightarrow$ 13.0 MeV	3. $\rightarrow$ 5. %		LAS Motz	OMA	72008	
						Absolute values required.			
		1	10.0 eV $\rightarrow$.100 MeV	1. %		LAS Hale	RRT	72009	
						For use as standard below 1 MeV.			
		1	.500 MeV $\rightarrow$ 5.00 MeV	10. %		DOE Ng	OFE	78160	
						Needed to describe breeding in D-T systems.			
						NBS Carlson	RRT	80290	
						To study atomic binding and related effects.			
<hr/>									
<u>STATUS:</u>		LAS	This has been measured by several groups at NBS, ORNL and BNL which may satisfy this. Hale.						
${}^6\text{Li}$	$\sigma_{n,t} (E,\theta)$	1	.500 keV $\rightarrow$.100 MeV	5. %		LAS Hale	RRT	80291	
						Absolute cross section as a function of angle. Needed for use of $\text{Li}^6(n,\alpha)$ as standard.			
${}^6\text{Li}$	$\sigma_{n,\alpha} (E)$	1	10.0 keV $\rightarrow$ 40.0 MeV	10. %		HED McElroy	OFE	80228	
						Accuracy 20% above 30 MeV. For FMIT dosimetry.			
${}^6\text{Li}$	$\sigma_{n,X\alpha} (E)$	1	Thresh $\rightarrow$ 40.0 MeV	10. %		HED McElroy	OFE	80205	
						Total He production for mass spectrometry. Accuracy 20% above 25 MeV. For FMIT dosimetry. For use as a fluence monitor.			
${}^6\text{Li}$	$\sigma_{\text{He-3,He-3}} (E)$	2	.150 MeV $\rightarrow$ 5.00 MeV			DOE Ng	OFE	80074	
						Accuracy 10% relative. 30% absolute. Cross sections for alternate fuel cycles.			
${}^6\text{Li}$	$\sigma_{\text{He-3,X}} (E)$	2	$\rightarrow$ 5.00 MeV			DOE Ng	OFE	80076	
						Branching ratios for other reactions. Accuracy 10% relative. 30% absolute. Cross sections for alternate fuel cycles.			

DOE-NDC Compilation of Requests for Nuclear Data 1980

Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
${}^6\text{Li}$	$\sigma_{\text{Li-6,X}} (E)$	2	.500 MeV $\rightarrow$ 2.00 MeV	10. $\rightarrow$ 30. %		DOE Ng Cross section for all significant charged particle reactions wanted. Accuracy 10.0 % relative, 30.0 % absolute required. For advanced fuel fusion devices.	OFE	78074
${}^7\text{Li}$	$\sigma_{\text{n,Xn}} (E,\theta,E_n)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng For shielding and transport studies of next generation D-T reactor designs.	OFE	78042
<u>STATUS :</u>			LAS Measurements made at LASL (LA-8342(1980)) and at ORNL (ORNL/TM-6247) from 1-20 MeV.					
${}^7\text{Li}$	$\sigma_{\text{n,Xp}} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Total hydrogen production wanted. For radiation damage studies of next generation D-T reactor designs.	OFE	78051
${}^7\text{Li}$	$\sigma_{\text{n,Xp}} (E,\theta,E_p)$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78135
${}^7\text{Li}$	$\sigma_{\text{n,n't}} (E)$	1	5.00 MeV $\rightarrow$ 16.0 MeV	5. $\rightarrow$ 10. %		DOE Ng Needed to describe breeding in D-T systems.	OFE	78159
${}^7\text{Li}$	$\sigma_{\text{n,Xa}} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Total helium production wanted. For radiation damage studies of next generation D-T reactor designs.	OFE	78060
${}^7\text{Li}$	$\sigma_{\text{n,Xa}} (E,\theta,E_a)$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78114
${}^7\text{Be}$	$\sigma_{\text{d,p}} (E)$	1	RADIOACTIVE 53.3 DAY $\rightarrow$ 2.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80080

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^7Be	$\sigma_{\text{He-3,p}} (E)$	2	RADIOACTIVE 53.3 DAY → 3.00 MeV			DOE Ng	OFE	80077
						Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.		
^9Be	$\sigma_{n,2n} (E)$	1	→ 15.0 MeV	10. %		GA Engholm	OFE	80020
						Data for neutron multiplier.		
^9Be	$\sigma_{n,3n} (E)$	3	Thresh → 15.0 MeV	20. %		GA Engholm	OFE	80012
						Total cross section and secondary neutron spectrum. For fission-suppressed hybrid reactor blanket designs.		
^9Be	$\sigma_{n,Xn} (E,\theta,E_n)$	2	1.80 MeV → 5.00 MeV	15. %	5. %	DOE Hemmig	RRT	62002
						Must record neutrons down to a few hundred keV. Accuracy 50 mb at 2 - 3 MeV. Resolution on E_n - 500 keV. For Be moderated fast spectrum reactors and for thermal breeders or converters and neutron economy calculations.		
^9Be	$\sigma_{n,Xp} (E)$	2	9.00 MeV → 15.0 MeV	10. %		DOE Ng	OFE	78103
						Total hydrogen production wanted. For radiation damage calculations.		
^9Be	$\sigma_{n,Xp} (E,\theta,E_p)$	2	15.0 MeV			DOE Ng	OFE	78145
						Accuracy to be determined. Data required for radiation damage calculations.		
^9Be	$\sigma_{n,X\alpha} (E)$	2	9.00 MeV → 15.0 MeV	10. %		DOE Ng	OFE	78091
						For radiation damage calculations.		
^9Be	$\sigma_{n,X\alpha} (E,\theta,E_\alpha)$	2	15.0 MeV			DOE Ng	OFE	78124
						Accuracy to be determined. Data required for radiation damage calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^9Be	$\sigma_{n,x} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.	OFE	80089
^9Be	$\sigma_{\alpha,n} (E)$	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	78168
^{10}Be	$\sigma_{n,n'\alpha} (E)$	3	RADIOACTIVE 1.6X(10**6) YR 14.0 MeV	25. %		LAS Muir Production of He^6 wanted, radioactive target. Needed for activation of graphite structures.	OFE	80116
^{nat}B	$\sigma_{n,tot} (E)$	2	4.50 MeV $\rightarrow$ 15.0 MeV	3. $\rightarrow$ 4. %		DOE Hemmig For shielding effect of B_4C .	RRT	74001
^{nat}B	$\sigma_{n,n} (E,\theta)$	2	4.50 MeV $\rightarrow$ 15.0 MeV	15. %		DOE Hemmig	RRT	74003
^{nat}B	$\sigma_{n,n'} (E,\theta,E_{n'})$	2	Thresh $\rightarrow$ 15.0 MeV	10. %	10. %	DOE Hemmig 15% in energy spectra. 20% in angular distribution if not isotropic. $\Delta E_{n'} - 10\%$.	RRT	74005
^{nat}B	$\sigma_{n,x\gamma} (E,\theta_\gamma,E_\gamma)$	2	1.00 keV $\rightarrow$ 15.0 MeV	15. %	10. %	DOE Hemmig 20% in angular distribution if not isotropic. $\Delta E_\gamma - 10\%$.	RRT	74007
^{10}B	$\sigma_{n,x\gamma} (E,\theta_\gamma,E_\gamma)$	2	.750 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Data needed for blanket, shield and magnet heat deposition calculations.	OFE	78156
^{10}B	$\sigma_{n,xn} (E,\theta,E_{n'})$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Data needed for shielding and neutron transport calculations.	OFE	78088

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{10}B	$\sigma_{n,xp} (E)$	2	9.00 MeV $\rightarrow$ 14.0 MeV	10. $\rightarrow$ 50. %		DOE Ng	OFE	78112
						Accuracy to be determined from sensitivity studies. For radiation damage calculations.		
^{10}B	$\sigma_{n,xp} (E, \theta, E_p)$	2	15.0 MeV			DOE Ng	OFE	78154
						Accuracy to be determined. Data required for radiation damage calculations.		
^{10}B	$\sigma_{n,\alpha} (E)$	1	30.0 keV $\rightarrow$.100 MeV	1. %		ANL Smith	RRT	69373
		1	30.0 keV $\rightarrow$.100 MeV	1. %		DOE Hemmig	RRT	
		1	.100 MeV $\rightarrow$.300 MeV	3. %		ANL Smith	RRT	
		1	.100 MeV $\rightarrow$.300 MeV	3. %		DOE Hemmig	RRT	
		1	.300 MeV $\rightarrow$ 10.0 MeV	5. %		ANL Smith	RRT	
		1	.300 MeV $\rightarrow$ 10.0 MeV	5. %		DOE Hemmig	RRT	
						Absolute values required for 480 keV γ . 3% accuracy useful to 100 keV, 10% above. For use as standard.		
		1	50.0 keV $\rightarrow$.200 MeV	1. %		LAS Hale	RRT	72028
						Both total(n, α) and (n, α_1) cross sections required.		
		2	10.0 mV $\rightarrow$ 10.0 eV	1. %		NBS Carlson	NBS	78176
						To check for molecular binding effects.		
^{10}B	$\sigma_{n,\alpha} (E)$		RATIO					
		1	1.00 keV $\rightarrow$.100 MeV	1. %		ANL Smith	RRT	69364
		1	1.00 keV $\rightarrow$.100 MeV	1. %		DOE Hemmig	RRT	
		1	.100 MeV $\rightarrow$.300 MeV	3. %		ANL Smith	RRT	
		1	.100 MeV $\rightarrow$.300 MeV	3. %		DOE Hemmig	RRT	
		1	.300 MeV $\rightarrow$ 10.0 MeV	5. %		ANL Smith	RRT	
		1	.300 MeV $\rightarrow$ 10.0 MeV	5. %		DOE Hemmig	RRT	
						Absolute values required. α_0/α_1 ratio needed for both α and γ detection. 3% accuracy useful to 100 keV, 10% accuracy useful above 100 keV. For use as standard.		
^{10}B	$\sigma_{n,\alpha} (E, \theta)$	2	50.0 keV $\rightarrow$.200 MeV	5. %		LAS Hale	RRT	80293
						Needed for R-matrix fit.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{10}B	$\sigma_{n,\alpha} (E)$	2	9.00 MeV $\rightarrow$ 14.0 MeV	10. $\rightarrow$ 50. %		DOE Ng	OFE	78100
		1	Thresh $\rightarrow$ 40.0 MeV	10. %		DOE Ng Accuracy to be determined from sensitivity studies. For radiation damage calculations. HED McElroy	OFE	80238
						Total He production for mass spectrometry. Accuracy 20% above 25 MeV. For FMIT dosimetry. For use as fluence monitor.		
^{10}B	$\sigma_{n,\alpha} (E, \theta, E_{\alpha})$	2	15.0 MeV			DOE Ng	OFE	78133
						Accuracy to be determined. Data required for radiation damage calculations.		
^{10}B	$\sigma_{n,x} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80048
						All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.		
^{11}B	$\sigma_{n,\gamma} (E, \theta_{\gamma}, E_{\gamma})$	2	2.10 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78157
						Data needed for blanket, shield and magnet heat deposition calculations.		
^{11}B	$\sigma_{n,xn} (E, \theta, E_n)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78047
						For shielding and transport studies of next generation D-T reactor designs.		
^{11}B	$\sigma_{n,xp} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78056
						Total hydrogen production wanted. For radiation damage studies of next generation D-T reactor designs.		
^{11}B	$\sigma_{n,xp} (E, \theta, E_p)$	2	15.0 MeV			DOE Ng	OFE	78140
						Accuracy to be determined. Data required for radiation damage calculations.		
^{11}B	$\sigma_{n,\alpha} (E)$	2	Thresh $\rightarrow$ 40.0 MeV	10. %		HED McElroy	OFE	80221
						Activation is required. Accuracy 20% above 25 MeV. For FMIT dosimetry.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{11}B	$\sigma_{n,\alpha} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Total helium production wanted. For radiation damage studies of next generation D-T reactor designs.	OFE	78065
^{11}B	$\sigma_{n,\alpha} (E, \theta, E_{\alpha})$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78119
^{11}B	$\sigma_{n,x} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.	OFE	80084
^{11}B	$\sigma_{p,\gamma} (E)$	2	.200 MeV $\rightarrow$ 2.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80079
^{11}B	$\sigma_{p,n} (E)$	1	4.00 MeV $\rightarrow$ 10.0 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80287
^{11}B	$\sigma_{p,p} (E)$	2	.200 MeV $\rightarrow$ 2.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80081
^{11}B	$\sigma_{p,3\alpha} (E)$	1	1.60 MeV $\rightarrow$ 5.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80236
^{11}B	$\sigma_{p,\alpha} (E, \theta, E_{\alpha})$	2	.200 MeV $\rightarrow$ 2.00 MeV			DOE Ng Accuracy 10% relative, 30% absolute. Cross sections for alternate fuel cycles.	OFE	80078
^{11}B	$\sigma_{\alpha,n} (E)$	2	.500 MeV $\rightarrow$ 2.00 MeV	10. $\rightarrow$ 30. %		DOE Ng Accuracy 10.0 % relative, 30.0 % absolute required. For advanced fuel fusion devices.	OFE	78077

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{11}B	$\sigma_{\alpha,p} (E)$	2	.500 MeV $\rightarrow$ 2.00 MeV	10. $\rightarrow$ 30. %		DOE Ng Accuracy 10.0 % relative, 30.0 % absolute required. For advanced fuel fusion devices.	OFE	78076
^{nat}C	$\sigma_{n,n} (E,\theta)$	1	20.0 MeV $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 15. %		DOE Ng For shield design in FMIT facility.	OFE	78006
<p><u>STATUS :</u> ORL Larson-Ohio University preliminary data 24 MeV. Michigan State University 40.0 MeV data- R. DeVito thesis (1979).</p>								
^{nat}C	$\sigma_{n,non} (E)$	1	20.0 MeV $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 15. %		DOE Ng For shield design in FMIT facility.	OFE	78009
^{nat}C	$\sigma_{n,n'\gamma} (E,\theta_\gamma)$	1	5.00 MeV $\rightarrow$ 20.0 MeV	5. %		ORL Fu For 4.43 MeV γ 's only. Measure for at least four angles.	RRT	74177
^{nat}C	$\sigma_{n,xn} (E,\theta,E_n')$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng For shielding and transport studies of next generation D-T reactor designs.	OFE	78043
^{nat}C	$\sigma_{n,p} (E)$	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng For track recorders for FMIT dosimetry.	OFE	80179
^{nat}C	$\sigma_{n,xp} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng For radiation damage studies of next generation D-T reactor designs.	OFE	78052
^{nat}C	$\sigma_{n,xp} (E,\theta,E_p')$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78136
^{nat}C	$\sigma_{n,o} (E)$	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng For track recorders for FMIT dosimetry.	OFE	80180

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}C	$\sigma_{n,\alpha} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng For radiation damage studies of next generation D-T reactor designs.	OFE	78061
^{nat}C	$\sigma_{n,\alpha} (E, \theta, E_{\alpha})$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78115
^{nat}C	$\sigma_{n,x} (E)$	1	1.00 MeV $\rightarrow$ 15.0 MeV	10. %		GA Engholm Damage cross section. Damage to graphite armor.	OFE	80016
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.	OFE	80051
^{nat}C	$\sigma_{\alpha,n} (E)$	2	1.00 MeV $\rightarrow$ 6.50 MeV	6. %		LAS Walton Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.	DSS	78169
^{12}C	$\sigma_{n,\alpha} (E)$	2	15.0 MeV $\rightarrow$ 50.0 MeV	10. %		NES 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	76111

STATUS: ORL Accuracy requirement is probably met by ENDF/B-V
evaluation below 15 MeV.

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{12}C	$\sigma_{n,n'\alpha} (E)$	1	Thresh $\rightarrow$ 20.0 MeV	15. %		ORL Pu	RRT	74174
		2	14.0 MeV	10. %		LAS Stewart	OMA	74223
						Spectra at several angles required. Must record neutrons down to a few hundred keV.		
		1	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell	OHER	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 20 MeV neutron energy between experimental data and theoretical calculations of secondary particle energy deposition spectra.		
^{13}C	$\sigma_{n,\alpha} (E)$	3	5.00 MeV $\rightarrow$ 15.0 MeV	15. %		LAS Muir	OFE	80117
						Production of Be^{10} wanted. 25% accuracy adequate below 10 MeV. Needed for activation and parasitic absorption in graphite structures.		
^{nat}N	$\sigma_{n,n} (E,\theta)$	2	3.50 MeV $\rightarrow$ 6.00 MeV	5. %		LAS Young	OMA	74157
		2	14.0 MeV	5. %		LAS Young	OMA	76046
						At several energies covering the cross section minimum. Complete angular distribution required.		
^{nat}N	$\sigma_{n,\gamma} (E)$	2	1.00 keV $\rightarrow$ 1.00 MeV	10. %	20. %	DOE Hemmig	RRT	74009
						Resonance parameters needed.		
^{nat}N	$\sigma_{n,p} (E)$	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80183
						For track recorders for FMIT dosimetry.		
^{nat}N	$\sigma_{n,xp} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78109
						For radiation damage calculations.		
^{nat}N	$\sigma_{n,xp} (E,\theta,E_p)$	2	15.0 MeV			DOE Ng	OFE	78151
						Accuracy to be determined. Data required for radiation damage calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}N	$\sigma_{n,\alpha}$ (E)	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng For track recorders for FMIT dosimetry.	OFE	80184
^{nat}N	$\sigma_{n,X\alpha}$ (E)	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng For radiation damage calculations.	OFE	78097
^{nat}N	$\sigma_{n,X\alpha}$ (E, θ , E_{α})	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78130
^{nat}N	$\sigma_{n,X}$ (E)	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.	OFE	80041
<p><u>STATUS :</u> LAS Young: Present ENDF/B-V evaluation has not been updated in approximately 7 to 8 years. A number of new measurements are available that could be incorporated. There have been several requests for evaluated data up to the 50-60 MeV region for cancer radiotherapy, radiobiology, and space-shielding applications.</p>								
^{14}N	$\sigma_{n,Xn}$ (E, θ , E_n)	2	11.0 MeV $\rightarrow$ 14.0 MeV	10. %		LAS Stewart Spectra at several angles required. Must record neutrons down to a few hundred keV.	OMA	74213
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Data needed for shielding and neutron transport calculations.	OFE	78085
^{nat}O	$\sigma_{n,n}$ (E)	1	5.00 keV $\rightarrow$ 10.0 MeV	5. %		BET Steen To resolve discrepancies between calculated and measured multiplication factors in small critical facilities.	DNR	76050

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}O	$\sigma_{n,n}(E,\theta)$	1	10.0 keV $\rightarrow$ 20.0 MeV	5. %		DOE Hemmig	RRT	66028
		2	2.35 MeV	5. %		Needed for fast reactor reflector worths. LAS Young	OMA	74159
		2	14.0 MeV	5. %		At several energies near minimum. LAS Young	OMA	76047
		1	5.00 keV $\rightarrow$ 10.0 MeV	5. %		Complete angular distribution required. BET Steen	DNR	76051
						To resolve discrepancies between calculated and measured multiplication factors in small critical facilities.		
		1	20.0 MeV $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 15. %		DOE Ng	OFE	78206
						For shield design in FMIT facility.		
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	<u>STATUS :</u>	ORL	Larson-Ohio University measurement at 24MeV by Grabmeyer et al. submitted to NP.					
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^{nat}O	$\sigma_{n,Xn}(E,\theta,E_n)$	2	11.0 MeV $\rightarrow$ 14.0 MeV	10. %		LAS Stewart	OMA	74214
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		Spectra at several angles required. Must record neutrons down to a few hundred keV. DOE Ng	OFE	78089
						Data needed for shielding, activation and neutron transport calculations.		
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^{nat}O	$\sigma_{n,p}(E)$	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80181
						For track recorders for FMIT dosimetry.		
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^{nat}O	$\sigma_{n,Xp}(E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78113
						For radiation damage calculations.		
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^{nat}O	$\sigma_{n,Xp}(E,\theta,E_p)$	2	15.0 MeV			DOE Ng	OFE	78155
						Accuracy to be determined. Data required for radiation damage calculations.		
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^{nat}O	$\sigma_{n,\alpha}(E)$	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80182
						For track recorders for FMIT dosimetry.		
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^{nat}O	$\sigma_{n,X\alpha}(E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78101
						For radiation damage calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}O	$\sigma_{n,\alpha} (E, \theta, E_\alpha)$	2	15.0 MeV			DOE Ng	OFE	78134
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}O	$\sigma_{n,x} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80042
						All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.		
^{nat}O	$\sigma_{\alpha,n} (E)$	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %		LAS Walton	DSS	78170
						Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.		
^{18}O	$\sigma_{n,n'} (E, \theta)$	2	14.0 MeV	10. %		LAS Stewart	OMA	74222
						Cross section for first two levels in O^{18} required (need not be separated). Measurements needed at several angles.		
^{18}O	$\sigma_{n,\alpha} (E)$	2	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell	OHER	76113
						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.		
		1	$\rightarrow$ 15.0 MeV			DOE Ng	OFE	80069
						Accuracy to 10% near 15 MeV and 50% near 2.5 MeV. Data needed for diagnostics.		
^{18}O	$\sigma_{n,n'\alpha} (E)$	2	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell	OHER	76114
						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.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{16}O	$\sigma_{n,n'\alpha} (E)$	1	Thresh $\rightarrow$ 50.0 MeV	10. %		NBS Caswell At least one measurement urgently 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 Steen Needed for intrinsic source.	DNR	66010
^{19}F	$\sigma_{n,n'} (E, \theta, E_n')$	1	.100 MeV $\rightarrow$ 20.0 MeV	15. %		ORL Fu Only data at 14 MeV and below 3.6 MeV.	RRT	74169
^{19}F	$\sigma_{n,abs} (E)$	1	2.00 MeV $\rightarrow$ 20.0 MeV	5. %		ORL Fu	RRT	74170
^{19}F	$N_{n,\gamma} (E, E_\gamma)$	2	10.0 keV $\rightarrow$ 1.00 MeV	5. %		ORL Fu	DNA	74180
^{19}F	$\sigma_{n,xn} (E, \theta, E_n')$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Data needed for shielding, activation and neutron transport calculations.	OFE	78087
^{19}F	$\sigma_{n,xp} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Total hydrogen production wanted. For radiation damage calculations.	OFE	78111
^{19}F	$\sigma_{n,xp} (E, \theta, E_p')$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78153
^{19}F	$\sigma_{n,x\alpha} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Total helium production wanted. For radiation damage calculations.	OFE	78099
^{19}F	$\sigma_{n,x\alpha} (E, \theta, E_{\alpha'})$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78132

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{19}F	$\sigma_{n,x} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.	OFE	80083
^{19}F	$\sigma_{\alpha,n} (E)$	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	78171
^{23}Na	$\sigma_{n,x} (E)$	1	$\rightarrow$ 40.0 MeV			DOE Ng All significant activation reaction cross sections. Contact FMIT project at Hanford for accuracy. For FMIT project.	OFE	80203
^{23}Na	$\sigma_{n,n} (E,\theta)$	2	10.0 keV $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig 15% in angular distribution.	RRT	74012
<u>STATUS :</u>			ORL	Larson-550 keV to 2 MeV high resolution data at 5 angles done at ORELA. Kinney private communication. 440 keV inelastic level must be resolved at higher energies.				
^{23}Na	$\sigma_{n,n'} (E,E_n')$	2	2.00 MeV $\rightarrow$ 10.0 MeV	10. %	10. %	ANL Smith Total integral over 4π required. Spectra at several angles if significantly anisotropic. $\Delta E_n \leq 10\%$.	RRT	62006
^{23}Na	$\sigma_{n,n'} (E,\theta,E_n')$	2	Thresh $\rightarrow$ 2.00 MeV	5. %	10. %	DOE Hemmig	RRT	74014
		2	2.00 MeV $\rightarrow$ 15.0 MeV	10. %	10. %	DOE Hemmig Accuracy of 15% in energy spectra. $\Delta E_n = 10\%$.	RRT	
		2	15.0 MeV $\rightarrow$ 35.0 MeV	15. %		HED Carter For material damage calculations for FMIT with Na-K coolant.	OFE	80113

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{23}Na	$\sigma_{n,\gamma}$ (E)	2	.500 MeV $\rightarrow$ 40.0 MeV	10. %		HED McElroy Activation is required. Accuracy 20% above 22 MeV. For FMIT dosimetry.	OFE	80222
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		<u>STATUS :</u>	ORL Larson See NSE 63,55(1977) and Proc.Harwell Conf. p426(1978).					
^{23}Na	$N_{n,\gamma}$ (E, E_γ)	2	3.00 keV	10. %		ANL Smith Sufficient accuracy in E_γ (3 keV) to compare with E_γ (thermal).	RRT	72032
^{23}Na	$\sigma_{n,2n}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	15. %		DOE Hemmig Needed for coolant activation.	RRT	74020
		1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng Accuracy 10-20%, 20% above 25 MeV. Dosimetry for FMIT facility.	OFE	80027
^{23}Na	$\sigma_{n,p}$ (E)	2	$\rightarrow$ 20.0 MeV	10. %		ORL Larson Activation measurement to guide model calculations.	RRT	80262
^{23}Na	$\sigma_{n,\alpha}$ (E)	1	$\rightarrow$ 20.0 MeV	10. %		ORL Larson Activation measurement to guide model calculations.	RRT	80263
^{23}Na	Resonance Parameters	1	2.95 keV	10. %		ANL Smith Elastic and γ widths wanted.	RRT	62008
^{nat}Mg	$N_{n,\gamma}$ (E, E_γ)	2	10.0 keV $\rightarrow$ 1.00 MeV	20. %		ORL Larson	DNA	74181
^{nat}Mg	$\sigma_{n,xp}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	20. %		ORL Larson Accuracy of 20% needed. Quantity needed is spectrum data of protons.	DNA	74189
^{nat}Mg	$\sigma_{n,x\alpha}$ (E)	2	Thresh $\rightarrow$ 20.0 MeV	20. %		ORL Larson Accuracy of 20% needed. Quantity needed is spectrum data of α 's.	DNA	74190

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{24}Mg	$\sigma_{\alpha,n}$ (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	78174
^{24}Mg	$\sigma_{n,p}$ (E)	1	Thresh $\rightarrow$ 40.0 MeV	10. %		HED McElroy Activation is required. Accuracy 20% above 20 MeV. For FMIT dosimetry.	OFE	80224
^{27}Al	$\sigma_{n,n}$ (E, θ)	2	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng For materials damage calculations.	OFE	80061
^{27}Al	$\sigma_{n,2n}$ (E)	2	Thresh $\rightarrow$ 16.0 MeV	15. %		LAS Young (n,2n) cross section for production of 6-sec. isomer. Needed to resolve experimental discrepancies and for potential use in fusion diagnostics.	OFE	80119
^{27}Al	$\sigma_{n,xn}$ (E, θ , E_n)	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Data needed for shielding, activation and neutron transport calculations.	OFE	78078
		2	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng For materials damage calculations.	OFE	80054
<u>STATUS:</u>		ORL	Larson-ORELA (n,xn) measurement probably OK. One angle,1-20 MeV. ORNL/TM-5241 (1976).					
^{27}Al	$\sigma_{n,xp}$ (E)	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng Materials damage calculations.	OFE	80057
<u>STATUS:</u>		LAS	Data available near 14 MeV from measurements of Grimes, et al. (Nucl.Sci. Eng. 62, 187(1977)).					
^{27}Al	$\sigma_{n,\alpha}$ (E)	1	9.00 MeV $\rightarrow$ 40.0 MeV	10. %		DOE Ng Materials damage calculations and dosimetry.	OFE	80056
<u>STATUS:</u>		LAS	Data available near 14 MeV from measurements of Grimes, et al.(Nucl. Sci. Eng. 62, 187(1977)).					

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{27}Al	$\sigma_{n,x} (E)$	1	9.00 MeV $\rightarrow$ 40.0 MeV	10. %		DOE Ng	OFE	80053
						All significant activation reaction cross sections. Contact FMIT project at Hanford for accuracy required for 40 MeV data. Data needed for shielding, activation and neutron transport calculations. For FMIT project.		
^{27}Al	$\sigma_{a,n} (E)$	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %	100K	LAS Walton	DSS	78172
						Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.		
^{nat}Si	$\sigma_{n,xn} (E,\theta,E_n)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78045
						For shielding and transport studies of next generation D-T reactor designs.		
^{nat}Si	$\sigma_{n,xp} (E)$	2	Thresh $\rightarrow$ 20.0 MeV	10. %		ORL Larson	DNA	74191
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78054
						For radiation damage studies of next generation D-T reactor designs.		
^{nat}Si	$\sigma_{n,xp} (E,\theta,E_p)$	2	15.0 MeV			DOE Ng	OFE	78138
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}Si	$\sigma_{n,x\alpha} (E)$	2	Thresh $\rightarrow$ 20.0 MeV	10. %		ORL Larson	DNA	74192
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78063
						For radiation damage studies of next generation D-T reactor designs.		
^{nat}Si	$\sigma_{n,x\alpha} (E,\theta,E_{\alpha})$	2	15.0 MeV			DOE Ng	OFE	78117
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}Si	$\sigma_{n,x} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80044
						All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}S	$\sigma_{n,tot} (E)$	2	10.0 keV $\rightarrow$.500 MeV	3. %		DOE Hemmig	RRT	74021
		2	1.00 MeV $\rightarrow$ 40.0 MeV	10. %		For shielding effect of concrete. BNL Divadeenam	OFE	80144
						For evaluation and model testing purposes.		
^{nat}S	$\sigma_{n,\gamma} (E)$	2	10.0 keV $\rightarrow$.500 MeV	10. %		DOE Hemmig	RRT	74023
		2	25.3 mV	10. %		For shielding effect of concrete. BNL Divadeenam	RRT	80145
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		For evaluation needs. Thermal capture for manganese bath experiments. BNL Divadeenam	RRT	80146
						For evaluation needs.		
^{nat}S	$N_{n,\gamma} (E,E_\gamma)$	2	10.0 keV $\rightarrow$.500 MeV	15. %		DOE Hemmig	RRT	74025
						For shielding effect of concrete.		
^{nat}K	$\sigma_{n,n'} (E,\theta,E_{n'})$	2	15.0 MeV $\rightarrow$ 35.0 MeV	15. %		HED Carter	OFE	80114
						For material damage calculations for FMIT with Na-K coolant.		
^{nat}K	$\sigma_{n,x} (E)$	1	$\rightarrow$ 40.0 MeV			DOE Ng	OFE	80204
						All significant activation reaction cross sections. Contact FMIT project at Hanford for accuracy. For FMIT project.		
^{nat}Ca	$\sigma_{n,\gamma} (E)$	2	1.00 keV $\rightarrow$.500 MeV	10. %		DOE Hemmig	RRT	74029
						For shielding effect of concrete.		
^{nat}Ca	$N_{n,\gamma} (E,E_\gamma)$	2	2.00 keV $\rightarrow$ 1.00 MeV	5. %		ORL Fu	DNA	74183
^{nat}Ca	$\sigma_{\alpha,n} (E)$	2	.100 MeV $\rightarrow$ 6.50 MeV	6. %	100K	LAS Walton	DSS	78173
						Thick target yields required. Relative error of 3.0% needed. α energy resolution 100 keV.		
^{45}Sc	$\sigma_{n,\gamma} (E)$	2	.100 MeV $\rightarrow$ 18.0 MeV	10. %		HED McElroy	RRT	69065
						Activation is required. For use as fluence monitor.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}Ti	$\sigma_{\gamma,p} (E)$	1	$\rightarrow 20.0 \text{ MeV}$	50. %		DOE Ng Reaction used to identify runaway electrons that hit PDX limiters.	OFE	80072
^{nat}Ti	$\sigma_{n,tot} (E)$	1	$35.0 \text{ MeV} \rightarrow 50.0 \text{ MeV}$	5. %		DOE Ng Data needed to validate calculations or measurements made for FMIT project.	OFE	80194
^{nat}Ti	$\sigma_{n,n} (E,\theta)$	1	$15.0 \text{ MeV} \rightarrow 35.0 \text{ MeV}$	10. $\rightarrow$ 40. %		DOE Ng Accuracy to be determined from sensitivity studies. For material damage calculations.	OFE	78033
		1	$35.0 \text{ MeV} \rightarrow 50.0 \text{ MeV}$	5. %		DOE Ng Data needed to validate calculations or measurements made for FMIT project.	OFE	80187
^{nat}Ti	$\sigma_{n,xn} (E,\theta,E_n')$	1	$15.0 \text{ MeV} \rightarrow 35.0 \text{ MeV}$	10. $\rightarrow$ 40. %		DOE Ng Accuracy to be determined from sensitivity studies. For material damage calculations.	OFE	78039
^{nat}Ti	$\sigma_{n,xp} (E)$	1	$9.00 \text{ MeV} \rightarrow 35.0 \text{ MeV}$	10. %		DOE Ng For material damage calculations.	OFE	78027
^{nat}Ti	$\sigma_{n,xp} (E,\theta,E_p')$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78146
^{nat}Ti	$\sigma_{n,\alpha} (E)$	1	$9.00 \text{ MeV} \rightarrow 40.0 \text{ MeV}$	10. %		DOE Ng For material damage calculations and dosimetry.	OFE	78212
^{nat}Ti	$\sigma_{n,\alpha} (E,\theta,E_\alpha')$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78125

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat} Ti	$\sigma_{n,x}$ (E)	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80082
						All significant activation reaction cross sections.		
		1	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80100
						Data needed for shielding, activation and neutron transport calculations.		
						Activation cross section.		
		1	$\rightarrow$ 40.0 MeV			Fusion reactor shutdown dose rates.		
						DOE Ng	OFE	80201
						All significant activation reaction cross sections.		
						Contact FMIT project at Hanford for accuracy.		
^{nat} V	$\sigma_{n,n}$ (E, θ)	3	1.40 MeV $\rightarrow$ 10.0 MeV	10. %	500K	ANL Smith	RRT	62009
		3	1.40 MeV $\rightarrow$ 10.0 MeV	10. %	500K	DOE Hemmig	RRT	
						Angular resolution 10°.		
		1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78032
						Accuracy to be determined from sensitivity studies.		
						For material damage calculations.		
^{nat} V	$\sigma_{n,n'}$ (E,E _{n'})	3	1.50 MeV $\rightarrow$ 10.0 MeV	15. %		ANL Smith	RRT	62011
		3	1.50 MeV $\rightarrow$ 10.0 MeV	15. %		DOE Hemmig	RRT	
						Total integral over 4 π required.		
						Spectra at several angles if significantly anisotropic.		
^{nat} V	$\sigma_{n,abs}$ (E)	3	1.00 keV $\rightarrow$ 150 MeV	10. %	10. %	ANL Smith	RRT	62015
		3	1.00 keV $\rightarrow$ 150 MeV	10. %	10. %	DOE Hemmig	RRT	
						To resolve discrepancies in existing data.		
^{nat} V	$\sigma_{n,xn}$ (E, θ ,E _{n'})	2	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78038
						Accuracy to be determined from sensitivity studies.		
						For material damage calculations.		
		2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78086
						Data needed for shielding and neutron transport calculations.		
^{nat} V	$\sigma_{n,xp}$ (E)	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78026
						For material damage calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}V	$\sigma_{n,xp}(E, \theta, E_p)$	2	15.0 MeV			DOE Ng	OFE	78152
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}V	$\sigma_{n,\alpha}(E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78211
						For material damage calculations.		
^{nat}V	$\sigma_{n,\alpha}(E, \theta, E_{\alpha'})$	2	15.0 MeV			DOE Ng	OFE	78131
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}V	$\sigma_{n,x}(E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80085
						All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.		
^{nat}Cr	$\sigma_{n,tot}(E)$	2	1.00 keV $\rightarrow$ 20.0 MeV	3. %		DOE Hemmig	RRT	72035
						5% accuracy minima. Energy resolution - sufficient to resolve major structure.		
^{nat}Cr	$\sigma_{n,n}(E, \theta)$	3	.100 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig	RRT	74032
		1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78217
						Accuracy to be determined from sensitivity studies. For material damage calculations.		
		1	35.0 MeV $\rightarrow$ 50.0 MeV	5. %		DOE Ng	OFE	80188
						Data needed to validate calculations or measurements made for FMIT project.		
^{nat}Cr	$\sigma_{n,n'}(E, E_{n'})$	2	.500 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig	RRT	66012
						Total integral over 4π required. Spectra at several angles if significantly anisotropic. Energy resolution required to determine major structure.		
^{nat}Cr	$\sigma_{n,\gamma}(E)$	2	1.00 keV $\rightarrow$.200 MeV	15. %	20. %	DOE Hemmig	RRT	72036
						Resonance parameters needed, especially γ widths.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}Cr	$\sigma_{n,xn}(E,\theta,E_n)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78049
						For shielding and transport studies of next generation D-T reactor designs.		
		1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78218
						Accuracy to be determined from sensitivity studies. For material damage calculations.		
^{nat}Cr	$\sigma_{n,xp}(E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78058
						For radiation damage studies of next generation D-T reactor designs.		
		2	15.0 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78215
						For material damage calculations.		
^{nat}Cr	$\sigma_{n,xp}(E,\theta,E_p)$	2	15.0 MeV			DOE Ng	OFE	78142
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}Cr	$\sigma_{n,\alpha}(E)$	2	Thresh $\rightarrow$ 14.0 MeV	20. %		BNL Prince	RRT	80125
						Helium production evaluation.		
^{nat}Cr	$\sigma_{n,x\alpha}(E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78067
						For radiation damage studies of next generation D-T reactor designs.		
		2	15.0 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78216
						For material damage calculations.		
^{nat}Cr	$\sigma_{n,x\alpha}(E,\theta,E_\alpha)$	2	15.0 MeV			DOE Ng	OFE	78121
						Accuracy to be determined. Data required for radiation damage calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{54}Cr	$\sigma_{n,x}$ (E)	1	1.00 MeV $\rightarrow$ 15.0 MeV	10. %		GA Engholm	OFE	80013
						Damage cross section.		
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80046
						Damage to stainless steel first wall.		
^{50}Cr	$\sigma_{n,\gamma}$ (E)					All significant activation reaction cross sections.		
		1	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80098
						Data needed for shielding, activation and neutron transport calculations.		
		1	$\rightarrow$ 40.0 MeV			Fusion reactor shutdown dose rates.		
^{50}Cr	$\sigma_{n,2n}$ (E)					DOE Ng	OFE	80197
						All significant activation reaction cross sections.		
						Contact FMIT project at Hanford for accuracy.		
^{50}Cr	Resonance Parameters	2	$\rightarrow$.300 MeV	10. %		BNL Prince	RRT	74033
						Energy requested is a maximum value only.		
						Neutron width, γ -width, spin and parity wanted.		
^{52}Cr	$\sigma_{n,2n}$ (E)	1	14.0 MeV $\rightarrow$ 20.0 MeV	20. %		BNL Prince	RRT	80122
						Activation file.		
^{52}Cr	$\sigma_{n,p}$ (E)	2	7.00 MeV $\rightarrow$ 18.0 MeV	25. %		BNL Prince	RRT	80126
						Hydrogen production evaluation.		
^{52}Cr	Resonance Parameters	2	$\rightarrow$.300 MeV	10. %		BNL Prince	RRT	74034
						Energy requested is a maximum value only.		
						Neutron width, γ -width, spin and parity wanted.		
^{53}Cr	Resonance Parameters	2	$\rightarrow$.300 MeV	10. %		BNL Prince	RRT	74035
						Energy requested is a maximum value only.		
						Neutron width, γ -width, spin and parity wanted.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab	Requester	Sponsor	No.
^{nat} Mn	$\sigma_{n,x}$ (E)	2	2.50 eV → 15.0 MeV	20. %		GA	Engholm	OFE	80101
		2	→ 40.0 MeV				Activation cross section. Fusion reactor shutdown dose rates. DOE Ng All significant activation reaction cross sections. Contact FMIT project at Hanford for accuracy.	OFE	80198
⁵⁵ Mn	$\sigma_{n,tot}$ (E)	2		4. %		ORL	Fu	RRT	74195
							Need values in Fe windows.		
⁵⁵ Mn	$\sigma_{n,\gamma}$ (E)	2	1.00 mV → .500 eV	1. %		BET	Steen	DNR	76052
							Needed to interpret manganese bath measurements of $\bar{\nu}$ and η .		
⁵⁵ Mn	$\sigma_{n,2n}$ (E)	1	Thresh → 50.0 MeV	10. - 20. %		DOE	Ng	OFE	80022
							Dosimetry for FMIT facility.		
⁵⁵ Mn	Capture RI	2	.500 eV	5. %		BET	Steen	DNR	74036
							Energy requested is a minimum value only. Needed for analysis of manganese bath experiments.		
^{nat} Fe	$\sigma_{n,n}$ (E, θ)	1	.500 MeV → 3.00 MeV	5. %	1. %	ORL	Bartine	RRT	69085
							Required at several peaks and in valleys. Required in valleys for shielding.		
		1	1.00 keV → 15.0. MeV	10. %		ANL	Smith	RRT	69086
							Energy resolution - to at least resolve intermediate structure.		
		1	1.00 keV → 15.0 MeV	10. %		DOE	Hemmig	RRT	69087
		1	15.0 MeV → 35.0 MeV	10. - 40. %		DOE	Ng	OFE	78030
							Accuracy to be determined from sensitivity studies. For material damage calculations.		
		1	20.0 MeV → 50.0 MeV	10. - 15. %		DOE	Ng	OFE	78205
							For shield design in FMIT facility.		
		1	35.0 MeV → 50.0 MeV	5. %		DOE	Ng	OFE	80190
							Data needed to validate calculations or measurements made for FMIT project.		

STATUS : ORL Larson-Ohio University 20,26MeV data.10-40MeV Symp.BNL

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}Fe	$\sigma_{n,n'}(E, E_{n'})$	2	2.00 MeV $\rightarrow$ 5.00 MeV	10. %	20K	DOE Hemmig	RRT	66016
						Total integral over 4π required. Spectra at several angles if significantly anisotropic. $\Delta E_{n'} = 20$ keV		
		2	2.00 MeV $\rightarrow$ 15.0 MeV	10. %		ORL Bartine	RRT	76075
						To resolve spectra measurements from stainless steel.		
^{nat}Fe	$\sigma_{n,non}(E)$	1	20.0 MeV $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 15. %		DOE Ng	OFE	78207
						For shield design in FMIT facility.		
^{nat}Fe	$N_{n,\gamma}(E, E_{\gamma})$	1	24.0 keV	10. %		ORL Fu	RRT	74179
		2	1.00 keV $\rightarrow$ 1.00 MeV	5. %		No measurements available in 24 keV iron window.		
		1	1.00 keV $\rightarrow$ 5.00 keV	5. %		ORL Fu	RRT	74184
						WEW Doncals	RRT	76039
^{nat}Fe	$\sigma_{n,xn}(E, \theta, E_{n'})$	1	11.0 MeV $\rightarrow$ 14.0 MeV	10. %		LAS Stewart	OMA	74216
						Spectra at several angles required. Must record neutrons down to a few hundred keV.		
		1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78036
						Accuracy to be determined from sensitivity studies. For material damage calculations.		
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78048
						For shielding and transport studies of next generation D-T reactor designs.		
^{nat}Fe	$\sigma_{n,xp}(E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78024
						For material damage calculations. For radiation damage studies of next generation D-T reactor designs.		
^{nat}Fe	$\sigma_{n,xp}(E, \theta, E_{p'})$	2	15.0 MeV			DOE Ng	OFE	78141
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}Fe	$\sigma_{n,x\alpha}(E)$	1	9.00 MeV $\rightarrow$ 40.0 MeV	10. %		DOE Ng	OFE	80066
						Total helium production cross section for dosimetry and radiation damage studies.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}Fe	$\sigma_{n,\alpha} (E, \theta, E_\alpha)$	2	15.0 MeV			DOE Ng	OFE	78120
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat}Fe	$\sigma_{n,x} (E)$	1	1.00 MeV $\rightarrow$ 15.0 MeV	10. %		GA Engholm	OFE	80014
						Damage cross section. Damage to stainless steel first wall.		
		1	9.00 MeV $\rightarrow$ 40.0 MeV	10. %		DOE Ng	OFE	80047
						All significant activation reaction cross sections. Contact FMIT project at Hanford for accuracy. Data needed for shielding and neutron transport calculations.		
		1	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80097
						Activation cross section. Fusion reactor shutdown dose rates.		
^{54}Fe	$\sigma_{n,p} (E)$	1	18.0 MeV $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	78018
						Dosimetry for FMIT facility.		
^{54}Fe	$\sigma_{n,t} (E)$	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80038
						Dosimetry for FMIT facility.		
^{54}Fe	$\sigma_{n,\alpha} (E)$	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	78019
						Dosimetry for FMIT facility.		
^{54}Fe	Resonance Parameters	2	$\rightarrow$.100 MeV	10. %		ORL Fu	RRT	74043
		2	$\rightarrow$.100 MeV ^a	10. %		DOE Hemmig	RRT	
		2	$\rightarrow$.100 MeV	10. %		ANL Smith	RRT	
						Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted.		
^{56}Fe	$\sigma_{n,t} (E)$	2	12.0 MeV $\rightarrow$ 40.0 MeV	20. %		HED Schenter	OFE	80007
						All reactions leading to Mn^{54} needed. Needed for FMIT dosimetry and activation.		
^{56}Fe	Resonance Parameters	1	$\rightarrow$.400 MeV	10. %		ORL Fu	RRT	74046
		1	$\rightarrow$.400 MeV	10. %		DOE Hemmig	RRT	
		1	$\rightarrow$.400 MeV	10. %		ANL Smith	RRT	
						Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
⁵⁷ Fe	Resonance Parameters	2	→ .100 MeV	10. %		ORL Fu	RRT	74049
		2	→ .100 MeV	10. %		DOE Hemmig	RRT	
		2	→ .100 MeV	10. %		ANL Smith	RRT	
		Energy requested is a maximum value only. Neutron width, γ-width, spin and parity wanted.						
⁵⁸ Co	σ _{n,γ} (E)	2	RADIOACTIVE 71.3 DAY	10. %		BET Steen	DNR	72046
						Thermal cross section most important. Resonance integral also needed. For interpretation of Ni ⁵⁸ (n,p) fluence monitor data.		
⁵⁸ Co	σ _{n,γ} (E)	2	METASTABLE 9.1 HR	10. %		BET Steen	DNR	72045
						Thermal cross section most important. Resonance integral also needed. For interpretation of Ni ⁵⁸ (n,p) fluence monitor data.		
⁵⁹ Co	σ _{n,γ} (E)	2	1.00 keV → 18.0 MeV	10. %		HED McElroy	RRT	69106
						Activation is required. To ground and metastable states. For use as a fluence monitor.		
⁵⁹ Co	σ _{n,2n} (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng	OFE	78014
						Dosimetry for FMIT facility.		
⁵⁹ Co	σ _{n,3n} (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng	OFE	78015
						Dosimetry for FMIT facility.		
⁵⁹ Co	σ _{n,4n} (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng	OFE	78016
						Dosimetry for FMIT facility.		
⁵⁹ Co	σ _{n,p} (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng	OFE	78017
						Dosimetry for FMIT facility.		
⁵⁹ Co	σ _{n,Xα} (E)	1	15.0 MeV → 40.0 MeV	20. %		HED Schenter	OFE	80004
						Only selected energies needed. Needed for FMIT dosimetry.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{59}Co	$\sigma_{n,x} (E)$	1	$\rightarrow 40.0 \text{ MeV}$			DOE Ng All significant activation reaction cross sections. Contact FMIT project at Hanford for accuracy.	OFE	80202
^{nat}Ni	$\sigma_{n,tot} (E)$	2	1.00 keV $\rightarrow$ 20.0 MeV	3. %		DOE Hemmig Accuracy needed to 3-5% in deep minima. Energy resolution sufficient to resolve major structure. For use in Inconel shield calculations.	RRT	72047
^{nat}Ni	$\sigma_{n,n} (E,\theta)$	2	.100 MeV $\rightarrow$ 15.0 MeV	5. $\rightarrow$ 10. %		ANL Smith	RRT	72048
		2	.100 MeV $\rightarrow$ 15.0 MeV	5. $\rightarrow$ 10. %		DOE Hemmig Energy resolution - resolution of intermediate structure probably adequate.	RRT	
		1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng Accuracy to be determined from sensitivity studies. For material damage calculations.	OFE	78031
		1	35.0 MeV $\rightarrow$ 50.0 MeV	5. %		DOE Ng Data needed to validate calculations for measurements made for FMIT project.	OFE	80189
		<hr/>						
<u>STATUS :</u>		ORL	Larson-24MeV Ohio Univ.data Yamanouti et al,Knoxville.					
^{nat}Ni	$\sigma_{n,n'} (E,E_{n'})$	2	Thresh $\rightarrow$ 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.	RRT	66024
^{nat}Ni	$\sigma_{n,\gamma} (E)$	2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		BNL Divadeenam	RRT	74053
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		DOE Hemmig	RRT	
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		ANL Smith	RRT	
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		WEW Doncals	RRT	
^{nat}Ni	$\sigma_{n,x\gamma} (E,E_{\gamma})$	1	Thermal $\rightarrow$.600 MeV	20. %		DOE Hemmig All γ 's are of interest. For shielding and γ heating calculations.	RRT	72052

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}Ni	$\sigma_{n,xn}(E)$	2	14.0 MeV $\rightarrow$ 40.0 MeV	20. %		BNL Divadeenam	OFE	80131
						For evaluation and model testing purposes. Measurements at a few energies.		
^{nat}Ni	$\sigma_{n,xn}(E,\theta,E_n')$	1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78037
						Accuracy to be determined from sensitivity studies.		
						For material damage calculations.		
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78044
						For shielding and transport studies of next generation D-T reactor designs.		
^{nat}Ni	$\sigma_{n,xp}(E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78025
						For material damage calculations and next generation D-T reactor designs.		
^{nat}Ni	$\sigma_{n,xp}(E,\theta,E_p')$	2	15.0 MeV			DOE Ng	OFE	78137
						Accuracy to be determined.		
						Data required for radiation damage calculations.		
^{nat}Ni	$\sigma_{n,\alpha}(E)$	2	Thermal $\rightarrow$ 20.0 MeV	10. %		BNL Divadeenam	RRT	80147
						For evaluation and model testing purposes.		
^{nat}Ni	$\sigma_{n,\alpha\alpha}(E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78062
						For radiation damage studies of next generation D-T reactor designs.		
		1	$\rightarrow$ 40.0 MeV	5. %		DOE Ng	OFE	80064
						Total helium production cross section for dosimetry.		
^{nat}Ni	$\sigma_{n,\alpha\alpha}(E,\theta,E_{\alpha'})$	2	15.0 MeV			DOE Ng	OFE	78116
						Accuracy to be determined.		
						Data required for radiation damage calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{64}Ni	$\sigma_{n,x}$ (E)	1	1.00 MeV $\rightarrow$ 15.0 MeV	10. %		GA Engholm	OFE	80015
						Damage cross section.		
		1	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80019
						Activation cross section.		
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		Fusion reactor shutdown dose rates.		
						DOE Ng	OFE	80050
						All significant activation reaction cross sections.		
		1	$\rightarrow$ 40.0 MeV			Data needed for shielding, activation and neutron transport calculations.		
						DOE Ng	OFE	80200
						All significant activation reaction cross sections.		
						Contact FMIT project at Hanford for accuracy.		
						For FMIT project.		
^{58}Ni	$\sigma_{n,\gamma}$ (E)	2	1.00 keV $\rightarrow$ 2.00 MeV	10. %		BNL Divadeenam	RRT	80136
						For evaluation needs.		
						Average capture cross section.		
						For helium build-up via $\text{Ni}^{59}(\text{n},\alpha)$ reaction.		
^{58}Ni	$\sigma_{n,2n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	78020
						Dosimetry for FMIT facility.		
^{58}Ni	$\sigma_{n,3n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DCE Ng	OFE	78021
						Dosimetry for FMIT facility.		
^{58}Ni	$\sigma_{n,p}$ (E)	3	Thresh $\rightarrow$ 15.0 MeV	5. %		BET Steen	DNR	72055
						For use as fluence monitor.		
		1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DCE Ng	OFE	78022
						Dosimetry for FMIT facility.		
^{58}Ni	$\sigma_{n,t}$ (E)	1	15.0 MeV $\rightarrow$ 40.0 MeV	20. %		HED Schenter	OFE	80003
						All reactions leading to Co-56 are needed.		
						Needed for FMIT activation and dosimetry.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
⁵⁸ Ni	Resonance Parameters	2	→ .100 MeV	10. %		DOE Hemmig	RRT	74056
		2	→ .100 MeV	10. %		ANL Smith	RRT	
		2	.100 MeV → .700 MeV	10. %		Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted. BNL Divadeenam	RRT	80135
						For evaluation needs. Precise capture cross section necessary for estimating helium build-up via $Ni^{58}(n,\alpha)$		
⁵⁹ Ni	$\sigma_{n,\alpha}$ (E)	2	RADIOACTIVE 7.5X(10**4) YR 5.00 keV → 14.0 MeV	10. %		BNL Divadeenam	RRT	80128
						α channel is open at zero neutron energy. Important for helium production.		
⁵⁹ Ni	Resonance Parameters	2	RADIOACTIVE 7.5x(10**4) YR 25.3 mV → .500 MeV	10. %		BNL Divadeenam	RRT	80127
						Elastic, γ , α and proton widths. reaction.		
⁶⁰ Ni	$\sigma_{n,p}$ (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng	OFE	78023
						Dosimetry for FMIT facility.		
⁶⁰ Ni	$\sigma_{n,t}$ (E)	2	15.0 MeV → 40.0 MeV	20. %		HED Schenter	OFE	80009
						All reactions leading to Co ⁵⁸ are needed. Needed for FMIT dosimetry and activation.		
⁶⁰ Ni	Resonance Parameters	2	→ .100 MeV	10. %		DOE Hemmig	RRT	74059
		2	→ .100 MeV	10. %		ANL Smith	RRT	
		2	.100 MeV → .700 MeV	10. %		Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted. BNL Divadeenam	RRT	80141
						For evaluation needs.		
<u>STATUS :</u>		BNL	Divadeenam - analysis of ORNL data in progress.					
⁶¹ Ni	Resonance Parameters	3	→ .100 MeV	10. %		DOE Hemmig	RRT	74062
		3	→ .100 MeV	10. %		ANL Smith	RRT	
		3	.100 MeV → .700 MeV	10. %		Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted. BNL Divadeenam	RRT	80142
						For evaluation needs.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{62}Ni	Resonance Parameters	3	$\rightarrow .100 \text{ MeV}$	10. %		DOE Hemmig	RRT	74065
		3	$\rightarrow .100 \text{ MeV}$	10. %		ANL Smith	RRT	
		Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted.						
		2	.100 MeV $\rightarrow$.700 MeV	10. %		BNL Divadeenam	RRT	80157
For evaluation needs.								
^{63}Ni	Half-life	2	RADIOACTIVE 100 YR	10. %		BET Steen	DNR	76054
Flux monitor from Cu(n,p) reaction.								
^{63}Ni	$\sigma_{n,\gamma} (E)$	2	RADIOACTIVE 100 YR 1.00 mV $\rightarrow$ 10.0 MeV	10. %		BET Steen	DNR	76053
Flux monitor from Cu(n,p) reaction.								
^{64}Ni	Resonance Parameters	3	$\rightarrow .100 \text{ MeV}$	10. %		DOE Hemmig	RRT	74068
		3	$\rightarrow .100 \text{ MeV}$	10. %		ANL Smith	RRT	
		Energy requested is a maximum value only. Neutron width, γ -width, spin and parity wanted.						
		3	.100 MeV $\rightarrow$.700 MeV	10. %		BNL Divadeenam	RRT	80143
For evaluation needs.								
^{nat}Cu	$\sigma_{n,n} (E,\theta)$	1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78034
Accuracy to be determined from sensitivity studies. For material damage calculations.								
^{nat}Cu	$\sigma_{n,xn} (E,\theta,E_n')$	1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78040
		Accuracy to be determined from sensitivity studies. For material damage calculations.						
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78046
For shielding and transport studies of next generation D-T reactor designs.								
^{nat}Cu	$\sigma_{n,xp} (E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	78028
For material damage calculations and next generation D-T reactor designs.								
^{nat}Cu	$\sigma_{n,xp} (E,\theta,E_p')$	2	15.0 MeV			DOE Ng	OFE	78139
Accuracy to be determined. Data required for radiation damage calculations.								

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat} Cu	$\sigma_{n,\alpha}$ (E)	1	9.00 MeV → 35.0 MeV	10. %		DOE Ng	OFE	78064
		1	→ 40.0 MeV	5. %		For radiation damage studies of next generation D-T reactor designs. DOE Ng	OFE	80063
						Total helium production cross section for dosimetry.		
^{nat} Cu	$\sigma_{n,\alpha}$ (E, θ , E_α)	2	15.0 MeV			DOE Ng	OFE	78118
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat} Cu	$\sigma_{n,\gamma}$ (E)	1	9.00 MeV → 15.0 MeV	10. %		DOE Ng	OFE	80049
		1	2.50 eV → 15.0 MeV	20. %		All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations. GA Engholm	OFE	80096
		1	→ 40.0 MeV			Activation cross section. Fusion reactor shutdown dose rates. DOE Ng	OFE	80195
						All significant activation reaction cross sections. Contact FMIT project at Hanford for accuracy.		
⁶³ Cu	$\sigma_{n,\gamma}$ (E)	2	Thermal → 1.00 keV	2. → 5. %		DOE Hemmig	RRT	67001
		2	1.00 keV → 18.0 MeV	10. %		Accuracy - 2% near thermal, 5% above thermal. For detector applications. HED McElroy	RRT	69132
		2	1.00 mV → 15.0 MeV	5. %		Activation of Cu ⁶⁴ is required. For use as fluence monitor. BET Steen	DNR	76056
						Needed for long term flux monitor.		
⁶³ Cu	$\sigma_{n,p}$ (E)	2	Thresh → 15.0 MeV	5. %		BET Steen	DNR	76055
						Needed for long term flux monitor.		
⁶⁵ Cu	$\sigma_{n,\gamma}$ (E)	2	Thermal → 1.00 keV	2. → 5. %		DOE Hemmig	RRT	67002
						Accuracy - 2% near thermal, 5% above thermal. For detector applications.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{64}Zn	$\sigma_{n,p}$ (E)	1	Thresh $\rightarrow$ 15.0 MeV			DOE Ng	OFE	80070
						Accuracy to 10% near 15 MeV and 50% near 2.5 MeV. Data needed for diagnostics.		
^{nat}Br	$\sigma_{n,p}$ (E)	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80177
						For track recorders for FMIT dosimetry.		
^{nat}Br	$\sigma_{n,\alpha}$ (E)	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80178
						For track recorders for FMIT dosimetry.		
^{81}Br	$\sigma_{n,\gamma}$ (E)	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter	RRT	80111
						Need better measurements of resonance parameters from thermal to 10 keV for isotopes in which capture leads to build-up of gas-tag isotopes for FFTF.		
^{nat}Kr	Resonance Parameters	2	$\rightarrow$ 1.00 keV	10. %		BNL Prince	RRT	80121
						Calculation of (n, γ) cross section and resonance integral. Data needed for tagging material study. Also important for fission product files.		
^{78}Kr	$\sigma_{n,\gamma}$ (E)	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter	RRT	80104
						Need better measurements of resonance parameters from thermal to 10 keV for isotopes used in gas-tagging of FFTF.		
^{80}Kr	$\sigma_{n,\gamma}$ (E)	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter	RRT	80105
						Need better measurements of resonance parameters from thermal to 10 keV for isotopes used in gas-tagging of FFTF.		
^{82}Kr	$\sigma_{n,\gamma}$ (E)	1	40.0 eV	10. %		NBS Bowman	NBS	76116
						Values for a few higher resonances also needed. Needed to ground, first and second excited states for γ -ray laser.		
		2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter	RRT	80106
						Need better measurements of resonance parameters from thermal to 10 keV for isotopes used in gas-tagging of FFTF.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
⁸³ Kr	Resonance Parameters	2	1.00 mV → 1.00 keV	10. %		BET Steen	DNR	67190
		2	1.00 mV → 1.00 keV	10. %	KAP Feiner	DNR		
		For fission product absorption calculation.						
⁸⁹ Y	$\sigma_{n,2n}$ (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng Dosimetry for FMIT facility.	OFE	80033
⁸⁹ Y	$\sigma_{n,3n}$ (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng Dosimetry for FMIT facility.	OFE	80032
⁸⁹ Y	$\sigma_{n,p}$ (E)	1	Thresh → 50.0 MeV	10. → 20. %		DOE Ng Dosimetry for FMIT facility.	OFE	80034
^{nat} Zr	$\sigma_{n,\gamma}$ (E)	2	Thermal → 1.00 keV	5. %		RL Orton	NMPO	67005
						For reactor moderation and reactivity effects.		
		2	1.00 mV → 50.0 keV	10. %		BET Steen	DNR	76057
						Low resolution measurement above thermal desired. Want 2% accuracy in thermal value. For verification of recent measurements.		
^{nat} Zr	$\sigma_{n,xn}$ (E, θ , E_n)	1	3.00 MeV → 14.0 MeV	10. %	10. %	KAP Feiner	DNR	67003
						$\Delta E_n = 10\%$. For design of pressurized water reactors using Zr.		
		1	3.00 MeV → 14.0 MeV	10. %	10. %	ANL Smith	RRT	67004
						$\Delta E_n = 10\%$.		
^{nat} Zr	$\sigma_{n,x}$ (E)	1	→ 40.0 MeV	10. %		HED McElroy Activation is required. Reaction to Zr ⁸⁹ . Accuracy 20% above 26 MeV. For FMIT dosimetry.	OFE	80207
^{nat} Zr	Capture RI	1	.500 eV	2. %		KAP Feiner	DNR	69143
		1	.500 eV	2. %	BET Steen	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.						

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
⁹⁰ Zr	$\sigma_{n,2n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng Dosimetry for FMIT facility.	OFE	80036
⁹⁰ Zr	$\sigma_{n,3n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng Dosimetry for FMIT facility.	OFE	80035
⁹⁰ Zr	$\sigma_{n,p}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng Dosimetry for FMIT facility.	OFE	80037
⁹¹ Zr	Resonance Parameters	2	.290 keV			KAP Feiner Geel-Bologna measurements disagree with previous work on spin assignment. The spin is important in determining shielded resonance integrals. Need to know if J is 2 or 3.	DNR	80120
⁹³ Zr 93Zr	$\sigma_{n,\gamma}$ (E)	2	10.0 keV $\rightarrow$.100 MeV	30. %		HED Schenter Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.	RRT	80266
⁹⁵ Zr	$\sigma_{n,\gamma}$ (E)	3 2	RADIOACTIVE 64.0 DAY 1.00 eV $\rightarrow$ 10.0 keV .500 eV $\rightarrow$ 10.0 keV	20. % 10. $\rightarrow$ 20. %		BET Steen KAP Feiner 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.	DNR DNR	67010
		2	10.0 keV $\rightarrow$.100 MeV	30. %		HED Schenter Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.	RRT	80267
⁹⁶ Zr	Resonance Parameters	1	.300 keV	10. %		KAP Feiner Neutron and γ - widths required. Needed to verify measurement on 300 eV resonance and remove discrepancies.	DNR	74074

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{93}Nb	$\sigma_{n,n}(E,\theta)$	1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 50. %		DOE Ng Accuracy to be determined from sensitivity studies. For material damage calculations.	OFE	78221
^{93}Nb	$\sigma_{n,n'}(E)$	1	$\rightarrow$ 40.0 MeV	10. %		HED McElroy Activation is required. Reaction to isomeric state. Accuracy 20% above 15 MeV. For FMIT dosimetry.	OFE	80260
^{93}Nb	$\sigma_{n,\gamma}(E)$	2 2	1.00 keV $\rightarrow$.100 MeV 1.00 keV $\rightarrow$.100 MeV	10. % 10. %		DOE Hemmig ANL Smith Accuracy - 5% in calculated dilute and self-shielded resonance integral. For fast reactor calculations, to resolve discrepancies in thermionic reactor worths.	RRT RRT	62049
^{93}Nb	$\sigma_{n,2n}(E)$	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng Dosimetry for FMIT facility.	OFE	80028
^{93}Nb	$\sigma_{n,xn}(E,\theta,E_n')$	1	20.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 50. %		DOE Ng Accuracy to be determined from sensitivity studies. For material damage calculations.	OFE	78222
^{93}Nb	$\sigma_{n,xp}(E)$	2 1	9.00 MeV $\rightarrow$ 14.0 MeV 15.0 MeV $\rightarrow$ 35.0 MeV	10. % 10. $\rightarrow$ 50. %		DOE Ng For radiation damage calculations. DOE Ng Accuracy to be determined from sensitivity studies. For material damage calculations.	OFE OFE	78105 78219
^{93}Nb	$\sigma_{n,xp}(E,\theta,E_p')$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78147
^{93}Nb	$\sigma_{n,xa}(E)$	2 1	9.00 MeV $\rightarrow$ 15.0 MeV 15.0 MeV $\rightarrow$ 35.0 MeV	10. % 10. $\rightarrow$ 50. %		DOE Ng For radiation damage calculations. DOE Ng Accuracy to be determined from sensitivity studies. For material damage calculations.	OFE OFE	78093 78220

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{93}Nb	$\sigma_{n,\alpha} (E, \theta, E_{\alpha})$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78126
^{93}Nb	$\sigma_{n,x} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.	OFE	80088
^{93}Nb	$\sigma_{n,\gamma} (E)$	2	RADIOACTIVE 35.1 DAY Thermal	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	$\sigma_{n,n'} (E, E_{n'})$	3 3	1.50 MeV $\rightarrow$ 3.00 MeV 1.50 MeV $\rightarrow$ 3.00 MeV	20. % 20. %	20. % 20. %	ANL Smith DOE Hemmig Total integral over 4π is required. Spectra at several angles if significantly anisotropic. $\Delta E_{n'} = 20\%$.	RRT RRT	72070
^{nat}Mo	$\sigma_{n,\gamma} (E)$	3	1.00 keV $\rightarrow$ 1.00 MeV	10. %		DOE Hemmig To resolve discrepancy in reactivity worth measurements.	RRT	72072
^{nat}Mo	$\sigma_{n,xn} (E, \theta, E_{n'})$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng Data needed for shielding and neutron transport calculations.	OFE	78084
^{nat}Mo	$\sigma_{n,xp} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng For radiation damage calculations.	OFE	78108
^{nat}Mo	$\sigma_{n,xp} (E, \theta, E_{p'})$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78150
^{nat}Mo	$\sigma_{n,\alpha} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng For radiation damage calculations.	OFE	78096

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{94}Mo	$\sigma_{n,\alpha} (E, \theta, E_\alpha)$	2	15.0 MeV			DOE Ng	OFE	78129
						Accuracy to be determined. Data required for radiation damage calculations.		
^{94}Mo	$\sigma_{n,x} (E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80086
						All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.		
		1	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80102
						Activation cross section. Fusion reactor shutdown dose rates.		
^{95}Mo	Capture RI	3	.500 eV $\rightarrow$ 10.0 keV	10. %		BET Steen	DNR	74075
						Major fission product for thermal reactors.		
^{97}Mo	$\sigma_{n,\gamma} (E)$	2	.100 MeV $\rightarrow$ 1.00 MeV	20. %		HED Schenter	RRT	80268
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{99}Mo	$\sigma_{n,\gamma} (E)$	3	RADIOACTIVE 66 HR 1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		BET Steen	DNR	67013
		3	1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		KAP Feiner	DNR	
						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.		
^{99}Tc	$\sigma_{n,\gamma} (E)$	2	20.0 keV $\rightarrow$ 1.00 MeV	10. %		HED Schenter	RRT	80269
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{99}Tc	$\sigma_{n,\gamma} (E)$	2	RADIOACTIVE 2.14X(10**5) YR 1.00 mV $\rightarrow$ 10.0 keV	10. %		BET Steen	DNR	74076
						Thermal cross section and RI wanted. Important fission product for thermal reactors.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{101}Ru	$\sigma_{n,\gamma}$ (E)	3	1.00 mV $\rightarrow$ 10.0 keV	10. %		BET Steen	DNR	74077
						Thermal cross section and RI wanted. Calculation of fission product poison for thermal reactors.		
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		HED Schenter	RRT	80270
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{102}Ru	$\sigma_{n,\gamma}$ (E)	2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		HED Schenter	RRT	80271
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{103}Ru	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 39.4 DAY					
		3	1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		BET Steen	DNR	67015
		3	1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		KAP Feiner	DNR	
						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.		
		2	10.0 keV $\rightarrow$ 1.00 MeV	30. %		HED Schenter	RRT	80272
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{106}Ru	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 367 DAY					
		2	1.00 keV $\rightarrow$ 1.00 MeV	20. %		HED Schenter	RRT	80273
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{103}Rh	$\sigma_{n,n'}$ (E)	1	$\rightarrow$ 40.0 MeV	10. %		HED McElroy	OFE	80258
						Activation is required. Reaction to isomeric state. Accuracy 20% above 15 MeV. For FMIT dosimetry.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{107}Pd	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 6.5X(10**6) YR 1.00 keV $\rightarrow$ 1.00 MeV	10. %		HED Schenter	RRT	80274
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
$^{\text{nat}}\text{Ag}$	$\sigma_{n,p}$ (E)	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80176
						For track recorders for FMIT dosimetry.		
$^{\text{nat}}\text{Ag}$	$\sigma_{n,\alpha}$ (E)	1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80175
						For track recorders for FMIT dosimetry.		
^{107}Ag	$\sigma_{n,2n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80026
						Dosimetry for FMIT facility.		
^{107}Ag	$\sigma_{n,3n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80025
						Dosimetry for FMIT facility.		
^{109}Ag	$\sigma_{n,\gamma}$ (E)	2	1.00 keV $\rightarrow$ 1.00 MeV	20. %		HED Schenter	RRT	80275
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
$^{\text{nat}}\text{Sn}$	$\sigma_{n,n}$ (E, θ)	1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78035
						Accuracy to be determined from sensitivity studies. For material damage calculations.		
<u>STATUS :</u>		ORL	Larson-Ohio University data on Sn isotopes 24 MeV. NPA338,45,1980 and submitted to NP.					
$^{\text{nat}}\text{Sn}$	$\sigma_{n,xn}$ (E, θ ,E $_n$)	1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	78041
						Accuracy to be determined from sensitivity studies. For material damage calculations.		
		2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78083
						Data needed for shielding and neutron transport calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat}Sn	$\sigma_{n,Xp}(E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng For material damage calculations.	OFE	78029
^{nat}Sn	$\sigma_{n,Xp}(E,\theta,E_p)$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78149
^{nat}Sn	$\sigma_{n,X\alpha}(E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng For material damage calculations.	OFE	78214
^{nat}Sn	$\sigma_{n,X\alpha}(E,\theta,E_{\alpha'})$	2	15.0 MeV			DOE Ng Accuracy to be determined. Data required for radiation damage calculations.	OFE	78128
^{nat}Sn	$\sigma_{n,X}(E)$	2	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.	OFE	80087
^{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
^{127}I	$\sigma_{n,\gamma}(E)$	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter Need better measurements of resonance parameters from thermal to 10 keV for isotopes in which capture leads to build-up of gas-tag isotopes for FFTF.	RRT	80112
^{129}I	$\sigma_{n,\gamma}(E)$	2	RADIOACTIVE 1.6X(10**7) YR 10.0 keV $\rightarrow$.100 MeV	30. %		HED Schenter Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.	RRT	80276

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{133}I	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 20.8 HR 1.00 mV $\rightarrow$ 1.00 keV	20. %		BET Steen 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.	DNR	67024
^{124}Xe	$\sigma_{n,\gamma}$ (E)	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter Need better measurements of resonance parameters from thermal to 10 keV for isotopes used in gas-tagging of FFTF.	RRT	80107
^{126}Xe	$\sigma_{n,\gamma}$ (E)	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter Need better measurements of resonance parameters from thermal to 10 keV for isotopes used in gas-tagging of FFTF.	RRT	80108
^{128}Xe	$\sigma_{n,\gamma}$ (E)	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter Need better measurements of resonance parameters from thermal to 10 keV for isotopes used in gas-tagging of FFTF.	RRT	80109
^{129}Xe	$\sigma_{n,\gamma}$ (E)	2	25.3 mV $\rightarrow$ 10.0 keV	10. %		HED Carter Need better measurements of resonance parameters from thermal to 10 keV for isotopes used in gas-tagging of FFTF.	RRT	80110
^{131}Xe	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Steen Thermal cross section and RI wanted. Energies above 1 eV of interest to give RI to 10%. Important fission product poison.	DNR	67025
		2	1.00 keV $\rightarrow$ 1.00 MeV	20. %		HED Schenter Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.	RRT	80277
^{133}Xe	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 5.29 DAY 1.00 mV $\rightarrow$ 5.00 keV	10. %		BET Steen Thermal cross section and RI wanted. For fission product poison calculations.	DNR	74088

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{135}Xe	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 9.17 HR					
		1	1.00 mV $\rightarrow$ 5.00 eV	2. %		BET Steen	DNR	74089
		2	1.00 mV $\rightarrow$ 5.00 eV	3. %		KAP Feiner	DNR	
		1	5.00 eV $\rightarrow$ 5.00 keV	5. %		BET Steen	DNR	
						Thermal cross section wanted to 2%. For fission product poison calculations.		
^{135}Xe	$\sigma_{n,\gamma}$ (E,E $_{\gamma}$)	2	RADIOACTIVE 9.17 HR Thermal	10. $\rightarrow$ 20. %		KAP Feiner	DNR	67029
						For γ energies 1-8 MeV. γ -energy resolution - 10-20%. For γ shielding and heat calculations.		
^{135}Cs	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 3.0X(10**6) YR 1.00 mV $\rightarrow$ 10.0 keV	10. %		BET Steen	DNR	74090
		2	1.00 keV $\rightarrow$ 1.00 MeV	20. %		HED Schenter	RRT	80278
						Thermal cross section and RI wanted. For fission product poison calculations. Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{144}Ce	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 284 DAY 10.0 keV $\rightarrow$ 1.00 MeV	30. %		HED Schenter	RRT	80279
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{143}Nd	Capture RI	1	.500 eV $\rightarrow$ 1.00 keV	5. %		BET Steen	DNR	67034
						For calculation of fission product poisons.		
^{145}Nd	Capture RI	1	.500 eV $\rightarrow$ 1.00 keV	10. %		BET Steen	DNR	67036
						For calculation of fission product poisons.		
^{147}Nd	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE 11 DAY 1.00 mV $\rightarrow$ 1.00 keV	5. $\rightarrow$ 10. %		BET Steen	DNR	67040
		2	1.00 mV $\rightarrow$ 1.00 keV	5. $\rightarrow$ 10. %		KAP Feiner	DNR	
						Thermal cross section and RI wanted.		
^{147}Pm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 2.6234 YR 1.00 keV $\rightarrow$ 1.00 MeV	10. %		HED Schenter	RRT	80280
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{148}Pm	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 537 DAY					
		2	1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Steen	DNR	67046
		2	1.00 mV $\rightarrow$ 1.00 eV	10. %		KAP Feiner	DNR	
						Thermal cross section and RI wanted. Look for 1/v above 1 eV. For calculation of fission product poisons.		
^{148}Pm	$\sigma_{n,\gamma}$ (E)		METASTABLE 41.3 DAY					
		2	1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Steen	DNR	67044
						Thermal cross section and RI wanted. Energies above 1 eV of interest to give RI to 10%. For calculation of fission product poisons.		
^{149}Pm	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 53.1 HR					
		2	1.00 mV $\rightarrow$ 1.00 keV	10. - 20. %		BET Steen	DNR	67049
		2	1.00 mV $\rightarrow$ 1.00 eV	10. - 20. %		KAP Feiner	DNR	
						Thermal cross section and RI wanted. Accuracy - 10% if $\sigma > 1000$ barns, 20% if from 10-1000 barns. Energies above 1 eV of interest to give - 10% in RI if $> 10,000$ barns, 20% if 1000-10,000 barns.		
^{151}Pm	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 28.4 HR					
		2	1.00 mV $\rightarrow$ 1.00 keV	10. %		BET Steen	DNR	67057
						Thermal cross section and RI wanted. Energies above 1 eV of interest to give RI to 10%. For calculation of fission product poisons.		
^{149}Sm	$\sigma_{n,\gamma}$ (E)							
		2	1.00 mV $\rightarrow$.500 eV	10. %		BET Steen	DNR	76058
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		HED Schenter	RRT	80281
						Important thermal fission product. Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{151}Sm	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 93 YR					
		2	1.00 mV $\rightarrow$ 1.00 keV	5. %	5. %	BET Steen	DNR	67054
						Thermal cross section and RI wanted. Energies above 1 eV of interest to give RI to 10%. For calculation of fission product poisons.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{151}Sm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 90 YR 1.00 keV $\rightarrow$ 1.00 MeV	20. %		HED Schenter	RRT	80282
						Accuracy determination should reflect fast reactor flux weighting spectrum. For calculations of reactivity and burn-up in fast reactors.		
^{153}Sm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 46.5 HR 1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		BET Steen	DNR	67061
		2	1.00 mV $\rightarrow$ 1.00 keV	10. $\rightarrow$ 20. %		KAP Feiner	DNR	
						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.		
^{nat}Eu	$\sigma_{n,tot}$ (E)	2	1.00 eV $\rightarrow$ 15.0 MeV	15. %		DOE Hemmig	RRT	74097
						Needed for resonance self-shielding.		
^{151}Eu	$\sigma_{n,\gamma}$ (E)	1	1.00 keV $\rightarrow$ 1.00 MeV	5. %		DOE Hemmig	RRT	74099
		1	.500 eV $\rightarrow$ 5.00 keV	5. %		BNL Mughabghab	RRT	76076
^{151}Eu	$\sigma_{n,\gamma}$ (E)	2	RATIO 1.00 keV $\rightarrow$ 1.00 MeV	10. %		DOE Hemmig	RRT	74102
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		ORL Fu	RRT	
						Ratio ground state to isomer capture wanted.		
^{151}Eu	$N_{n,\gamma}$ (E, E_γ)	2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		DOE Hemmig	RRT	74100
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		ORL Fu	RRT	
^{152}Eu	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE 13 YR 1.00 mV $\rightarrow$ 1.00 keV	10. %		BNL Mughabghab	RRT	76077
						Also require resonance parameters and resonance integral.		
^{153}Eu	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 5.00 keV	2. $\rightarrow$ 5. %		BNL Mughabghab	RRT	67064
						Accuracy - 2% near thermal, 5% above. Energies above 1 eV of interest to give RI to 10%. For calculation of fission product poisons.		
		1	1.00 keV $\rightarrow$ 1.00 MeV	5. %		DOE Hemmig	RRT	74105
^{153}Eu	$N_{n,\gamma}$ (E, E_γ)	2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		DOE Hemmig	RRT	74106
		2	1.00 keV $\rightarrow$ 1.00 MeV	10. %		ORL Fu	RRT	

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{166}Er	$\sigma_{n,\gamma}$ (E)	2	1.00 mV $\rightarrow$ 1.00 keV	5. %		HED Schenter	RRT	78199
						Resonance parameters of interest. For thermal and intermediate spectrum reactors.		
^{167}Er	$\sigma_{n,\gamma}$ (E)	2	$\rightarrow$ 2.00 eV	3. %		GA Dahlberg	ANSP	74133
						Energy requested is a maximum value only. Needed for burnable poison in Triga reactors.		
		1	1.00 mV $\rightarrow$ 1.00 eV	2. %		HED Schenter	RRT	78202
						Resonance parameters of interest. For thermal and intermediate spectrum reactors.		
^{168}Er	$\sigma_{n,\gamma}$ (E)	2	1.00 mV $\rightarrow$ 1.00 keV	5. %		HED Schenter	RRT	78200
						Resonance parameters of interest. For thermal and intermediate spectrum reactors.		
^{169}Tm	$\sigma_{n,2n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80031
						Dosimetry for FMIT facility.		
^{169}Tm	$\sigma_{n,3n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80030
						Dosimetry for FMIT facility.		
^{169}Tm	$\sigma_{n,4n}$ (E)	1	$\rightarrow$ 40.0 MeV	20. %		HED McElroy	OFE	80251
						Activation is required. For FMIT dosimetry.		
^{169}Tm	$\sigma_{n,5n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80029
						Dosimetry for FMIT facility.		
^{170}Yb	$\sigma_{n,\gamma}$ (E)	2	1.00 mV $\rightarrow$ 1.00 keV	5. %		HED Schenter	RRT	78201
						Resonance parameters of interest. For thermal and intermediate spectrum reactors.		
^{nat}Hf	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 1.00 eV	2. %		BET Steen	DNR	62024
		1	1.00 mV $\rightarrow$ 1.00 eV	2. %		KAP Feiner	DNR	
						To resolve discrepancies in thermal data. For Monte Carlo calculations of burn-up in thermal reactors.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{176}Hf	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 5.00 keV	10. $\rightarrow$ 40. %		BET Steen	DNR	62026
		1	1.00 mV $\rightarrow$ 5.00 keV	10. $\rightarrow$ 40. %		KAP Feiner	DNR	
		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.						
^{177}Hf	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 5.00 keV	4. $\rightarrow$ 20. %		BET Steen	DNR	62028
		1	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%, - 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.						
^{178}Hf	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 5.00 keV	3. $\rightarrow$ 20. %		BET Steen	DNR	62030
		1	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)	1	1.00 mV $\rightarrow$ 5.00 keV	5. $\rightarrow$ 20. %		BET Steen	DNR	62032
		1	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.						

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{180}Hf	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 5.00 keV	4. $\rightarrow$ 20. %		BET Steen	DNR	67080
		1	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 fn. to 20%. To resolve discrepancies in RI. For Monte Carlo burn-up calculations.						
^{nat}Ta	$\sigma_{n,X\gamma}$ (E, E_γ)	2	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80018
						Capture γ spectrum also needed. Use as advanced shielding material.		
^{nat}Ta	$\sigma_{n,Xn}$ (E, θ , E_n)	2	5.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80017
						Neutron spectrum also needed. Use as advanced shielding material.		
^{nat}Ta	$\sigma_{n,X}$ (E)	1	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80099
						Activation cross section. Fusion reactor shutdown dose rates.		
^{181}Ta	$\sigma_{n,\gamma}$ (E)	2	1.00 eV $\rightarrow$ 1.00 keV	10. %		DOE Hemmig	RRT	69192
		2	1.00 keV $\rightarrow$.150 MeV	5. %		DOE Hemmig	RRT	
		2	.150 MeV $\rightarrow$.500 MeV	10. %		DOE Hemmig	RRT	
						Double accuracy useful. Fast breeder control and burn-up calculations.		
^{181}Ta	$\sigma_{n,X\gamma}$ (E)	2	1.00 eV $\rightarrow$ 16.0 MeV	15. %		DOE Hemmig	RRT	74111
						γ -rays below 1 MeV important.		
^{nat}W	$\sigma_{n,n}$ (E, θ)	1	15.0 MeV $\rightarrow$ 35.0 MeV	10. $\rightarrow$ 40. %		DOE Ng	OFE	80060
						For materials damage calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{nat} W	$\sigma_{n,xn} (E, \theta, E_n')$	2	4.00 MeV $\rightarrow$ 16.0 MeV	5. %	5%	ORL Bartine	RRT	66040
						Low energy neutrons should be included. Spectra at a few angles may suffice. Angular resolution, 10°. $\Delta E_n' = 500$ keV		
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	78082
						Data needed for shielding and neutron transport calculations.		
		1	15.0 MeV $\rightarrow$ 35.0 MeV			DOE Ng	OFE	80055
						For materials damage calculations.		
^{nat} W	$\sigma_{n,xp} (E)$	1	9.00 MeV $\rightarrow$ 35.0 MeV	10. %		DOE Ng	OFE	80058
						Materials damage calculations.		
^{nat} W	$\sigma_{n,xp} (E, \theta, E_p')$	2	15.0 MeV			DOE Ng	OFE	78148
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat} W	$\sigma_{n,xa} (E)$	1	9.00 MeV $\rightarrow$ 40.0 MeV	10. %		DOE Ng	OFE	80059
						Materials damage calculations and dosimetry.		
^{nat} W	$\sigma_{n,xa} (E, \theta, E_a')$	2	15.0 MeV			DOE Ng	OFE	78127
						Accuracy to be determined. Data required for radiation damage calculations.		
^{nat} W	$\sigma_{n,x} (E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80043
						All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.		
		1	2.50 eV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80103
						Activation cross sections. Fusion reactor shutdown dose rates.		
^{nat} Pt	$\sigma_{n,n} (E, \theta)$	1	10.0 mV $\rightarrow$ 10.0 eV	10. %		NBS Eisenhower	NBS	78177
						For scattering corrections in Pt fission deposit backings.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{197}Au	$\sigma_{n,\gamma}$ (E)	2	.500 eV $\rightarrow$ 1.00 keV	1. %		BET Steen	DNR	67082
		1	10.0 keV $\rightarrow$ 1.00 MeV	2. %		Individual and average resonance parameters required. Energies above 0.5 eV wanted so as to give infinite dilute RI to 1%. For use as standard. BNL Mughabghab	RRT	72073
^{197}Au	$\sigma_{n,2n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	78010
						Dosimetry for FMIT facility.		
^{197}Au	$\sigma_{n,3n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	78011
						Dosimetry for FMIT facility.		
^{197}Au	$\sigma_{n,4n}$ (E)	1	Thresh $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	78012
						Dosimetry for FMIT facility.		
^{197}Au	$\sigma_{n,5n}$ (E)	1	Thresh $\rightarrow$ 40.0 MeV	20. %		DOE Ng	OFE	78013
						Dosimetry for FMIT facility.		
^{197}Au	$\sigma_{n,X\alpha}$ (E)	1	$\rightarrow$ 40.0 MeV	5. %		DOE Ng	OFE	80065
						Total helium production cross section for dosimetry.		
^{nat}Pb	$N_{n,\gamma}$ (E,E $_{\gamma}$)	2	2.00 keV $\rightarrow$.600 MeV	5. %		ORL Fu	OFE	74186
^{nat}Pb	$\sigma_{n,2n}$ (E)	2	$\rightarrow$ 15.0 MeV	10. %		GA Engholm	OFE	80021
						Secondary neutron spectra required.		
^{nat}Pb	$\sigma_{n,3n}$ (E)	3	5.00 MeV $\rightarrow$ 15.0 MeV	20. %		GA Engholm	OFE	80011
						Total cross section and secondary neutron spectrum. For fission-suppressed hybrid reactor blanket designs.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{208}Pb	$\sigma_{n,xn}(E, \theta, E_n)$	3	2.00 MeV $\rightarrow$ 16.0 MeV	5. %	250K	ORL Bartine	RRT	63005
		1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		Angular dependence only if significantly anisotropic. Energy intervals - 500 keV. Angular resolution - 3° in 10° intervals. DOE Ng OFE		78050
						For shielding, activation and transport studies of next generation D-T reactor designs.		
^{208}Pb	$\sigma_{n,x}(E)$	1	9.00 MeV $\rightarrow$ 15.0 MeV	10. %		DOE Ng	OFE	80045
						All significant activation reaction cross sections. Data needed for shielding, activation and neutron transport calculations.		
^{209}Bi	$\sigma_{n,3n}(E)$	3	14.0 MeV $\rightarrow$ 16.0 MeV	25. %		LAS Muir	OFE	80115
						Measurement should include several energies below 15 MeV. Accuracy 25% or 1 mb. Needed for activation of Bi neutron multipliers.		
^{230}Th	$\sigma_{n,\gamma}(E)$	2	RADIOACTIVE 8.0x(10**4) YR Thermal $\rightarrow$ 1.00 MeV	10. %		ORL Bartine	RRT	78196
						Key reaction for production of U^{232} .		
^{232}Th	$\sigma_{n,tot}(E)$	2	1.00 mV $\rightarrow$ 6.00 eV	.5 %		BNW Leonard	RRT	76080
		2	1.00 mV $\rightarrow$ 20.0 eV	.5 %		BET Steen	DNR	78181
		1	60.0 eV $\rightarrow$.100 MeV	2. %		ORL Peelle	RRT	78197
						For resolved resonance parameter evaluation.		
^{232}Th	$\sigma_{n,n}(E, \theta)$	3	1.00 MeV $\rightarrow$ 5.00 MeV	10. %		ANL Smith	RRT	72074
^{232}Th	$\sigma_{n,n'}(E, E_n)$	3	1.00 MeV $\rightarrow$ 4.00 MeV	5. %	20. %	ANL Smith	RRT	72075
						$\Delta E_n = 20\%$. Accuracy of 20% in $(1-\cos\theta)$, if anisotropic.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.	
^{232}Th	$\sigma_{n,\gamma}$ (E)	1	1.00 mV $\rightarrow$ 20.0 eV	2. %		BET Steen	DNR	62034	
		1	20.0 eV $\rightarrow$ 5.00 keV	5. %		BET Steen	DNR		
							Thick sample transmission and self-indication experiments desirable.		
							Resonance parameters and resonance integral also needed.		
							Need thermal value to 0.5 %.		
						Need accuracy of 5% in resonance parameters.			
						Thermal shape important for thermal breeder calculations.			
		2	Thermal $\rightarrow$ 20.0 MeV	3. %		CBE Visner	RRT	76079	
						For thermal reactor fuel cycle evaluation.			
<hr/>									
<u>STATUS :</u>			RPI	RPI has measured from 0.to 10 eV.					
<hr/>									
^{232}Th	$\sigma_{n,2n}$ (E)	2	Thresh $\rightarrow$ 15.0 MeV	5. %		BET Steen	DNR	76065	
						For calculation of fuel activity in Th^{232} cycle reactors.			
		2	11.0 MeV $\rightarrow$ 14.0 MeV	10. %		DOE Ng	OFE	78161	
						For hybrid system design.			
^{232}Th	$\sigma_{n,3n}$ (E)	2	11.0 MeV $\rightarrow$ 14.0 MeV	10. %		DOE Ng	OFE	78162	
						For hybrid system design.			
^{232}Th	$\sigma_{n,f}$ (E)	1	20.0 MeV $\rightarrow$ 40.0 MeV	10. %		HED McElroy	OFE	80243	
						Accuracy 20% above 25 MeV. For FMIT dosimetry.			
^{232}Th	$N_{n,f}$ (E, $E_{n'}$) (delayed)	1		2. %		BET Steen	DNR	78182	
						Need fast group yields and spectra. To verify existing evaluations.			
^{231}Pa	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 3.28X(10**4) YR Thermal $\rightarrow$ 10.0 MeV	10. %		BNW Leonard	RRT	69219	
						For control of U^{232} production.			
		2	1.00 mV $\rightarrow$ 1.00 keV	5. $\rightarrow$ 10. %		BET Steen	DNR	76066	
						Also need resonance parameters and resonance integral.			
						For calculation of fuel activity in Th^{232} cycle reactors.			

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{231}Pa	$N_{n,f}(E, E_n)$ (delayed)	1	RADIOACTIVE 3.28X(10**4) YR	5. %		BET Steen Need fast group yields and spectra. To verify existing evaluations.	DNR	78183
^{233}Pa	$\sigma_{n,tot}(E)$	2	RADIOACTIVE 27.0 DAY → 3.00 MeV	3. %		ORL Peelle For thorium cycle reactor evaluation.	RRT	78198
^{233}Pa	$\sigma_{n,\gamma}(E)$	2	RADIOACTIVE 27.0 DAY 1.00 mV → .100 keV	5. %		BET Steen Resonance parameters also desired. Needed for analysis of Th 232 cycle thermal reactors.	DNR	76059
^{232}U	$\sigma_{n,\gamma}(E)$	2	RADIOACTIVE 72 YR 1.00 mV → 1.00 keV	2. → 5. %		BET Steen Also need resonance parameters and resonance integral. For calculation of fuel activity in Th 232 cycle reactors.	DNR	76067
^{233}U	Half-life	1	RADIOACTIVE 1.592X(10**5) YR	.5 %		BET Steen Verification of latest measurements desired.	DNR	74115
^{233}U	Half-life (alpha decay)	1	RADIOACTIVE 1.592X(10**5) YR	1. %		NBS Gilliam For mass determination of fissionable deposits.	NBS	76119
^{233}U	Prompt $\bar{\nu}$	2	RADIOACTIVE 1.592X(10**5) YR 14.0 MeV	2. %		LAS Young Prompt $\bar{\nu}$ wanted. Needed for multipurpose evaluation.	OMA	78164
^{233}U	$\sigma_{n,tot}(E)$	2	RADIOACTIVE 1.592X(10**5) YR 1.00 mV → 2.00 eV	.5 %		BNW Leonard Needed for thermal cross section evaluation.	RRT	76082
		1	60.0 eV → .100 MeV	3. %		LAS Stewart Needed to cover the unresolved range and overlap the recent ANL data which begins at 42 keV.	RRT	79001
^{233}U	$\sigma_{n,n'}(E, E_n)$	2	RADIOACTIVE 1.592X(10**5) YR 40.0 keV → 7.00 MeV	10. → 20. %		ANL Smith Accuracy of 5-10% above 0.5 MeV.	RRT	67086

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{233}U	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 1.592X(10**5) YR					
		1	1.00 mV $\rightarrow$.500 eV	1. %		BET Steen	DNR	74112
		1	.500 eV $\rightarrow$ 2.00 eV	2. %		BET Steen	DNR	
		1	.100 keV $\rightarrow$ 1.50 MeV	5. $\rightarrow$ 10. %		Verification of recent ORNL results desired. ORL Peelle	RRT	76081
		1	60.0 eV $\rightarrow$.500 MeV	5. $\rightarrow$ 8. %		Most important below 0.5 MeV. LAS Stewart	RRT	79002
						Needed to cover the unresolved range and to extend to higher energies. No data available above 2 keV except α measurements of Diven.		
^{233}U	$\sigma_{n,2n}$ (E)	2	RADIOACTIVE 1.592X(10**5) YR Thresh $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig	RRT	67088
						For contamination of U^{233} by U^{232} .		
^{233}U	$\sigma_{n,xn}$ (E, θ , E_n)	2	RADIOACTIVE 1.592X(10**5) YR .100 MeV	5. $\rightarrow$ 10. %		LAS Stewart	RRT	79004
						Absolute cross sections required. Measure at several angles and detect low energy neutrons.		
^{233}U	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 1.592X(10**5) YR 1.00 mV $\rightarrow$ 20.0 MeV	1. $\rightarrow$ 5. %		BET Steen	DNR	78184
		1	60.0 eV $\rightarrow$.100 MeV	5. $\rightarrow$ 8. %		Accuracy wanted - 1 percent below 100 eV, 5 percent above. For thermal reactor analysis. LAS Stewart	RRT	79003
						Measurements relative to U^{235} not desired due to large cross section fluctuations. Needed to cover the unresolved range and overlap the ratio measurements of Carlson.		
^{233}U	$\sigma_{n,f}$ (E)	1	RATIO 1.592X(10**5) YR 1.00 keV $\rightarrow$ 10.0 MeV	1. %	3. %	DOE Hemmig	RRT	89226
						Ratio to U^{235} fission wanted. Accuracy of 2-3% useful. Energy calibration		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{233}U	Alpha (E)		RADIOACTIVE	1.592X(10**5) YR				
		1	5.00 mV $\rightarrow$.500 eV	2. $\rightarrow$ 8. %		BET Steen	DNR	62041
		2	.500 eV $\rightarrow$ 10.0 keV	3. %		BET Steen	DNR	
		2	10.0 keV $\rightarrow$ 20.0 MeV	5. $\rightarrow$ 10. %		BET Steen	DNR	
						Capture cross section equally useful. Integral experiments needed to resolve discrepancies. Want η to $\sim$ 0.25% below 3 eV (1% useful below 1 eV), 1% from 30 eV to 1 keV (5% useful). Want η to 2% from 1 - 30 keV. Want verification of recent ORNL and Bettis work. ANL Smith RRT		
		1	1.00 keV $\rightarrow$ 3.00 MeV	10. $\rightarrow$ 20. %				62043
						Capture cross section equally useful. Want η to 2% from 1 - 30 keV.		
^{233}U	Alpha (E)		RADIOACTIVE	1.592x(10**5) YR				
		2	1.00 keV $\rightarrow$ 3.00 MeV	10. $\rightarrow$ 20. %		DOE Hemmig	RRT	67090
						Capture cross section equally useful. Want η to 2% from 1 - 30 keV.		
^{233}U	Eta (E)		RADIOACTIVE	1.592X(10**5) YR				
		1	1.00 mV $\rightarrow$ 1.00 eV	.4 %		BET Steen	DNR	74113
						Thermal value and shape needed. To verify manganese bath results.		
^{233}U	$\bar{\nu}$ (E)		RADIOACTIVE	1.592X(10**5) YR				
		1	1.00 mV $\rightarrow$ 30.0 eV	.25 %		BET Steen	DNR	69443
		1	30.0 eV $\rightarrow$ 1.00 keV	1. %		BET Steen	DNR	
		1	1.00 keV $\rightarrow$ 10.0 keV	2. %		BET Steen	DNR	
						Measurement relative to U^{235} and Pu^{239} preferred. Low energy structure may be important. Needed to resolve discrepancies in thermal parameters and breeding prediction.		
^{233}U	$\bar{\nu}$ (E) (delayed)		RADIOACTIVE	1.592X(10**5) YR				
		1	Thermal	5. %		BET Steen	DNR	74116
						To resolve discrepancies.		
^{233}U	$\text{N}_{n,r}$ (E, E_n)		RADIOACTIVE	1.592X(10**5) YR				
		1	Thermal	1. %		BET Steen	DNR	78185
						Need shape of neutron energy distribution from 100 keV to 15 MeV. Relative peak to 1%. Needed for criticality calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{233}U	$Y_{n,f}$ (E,nuclide)		RADIOACTIVE 1.592X(10**5) YR					
		1	Thermal	1. %		BET Steen	DNR	78191
		1	Thermal	1. %		KAP Feiner	DNR	
						Nuclides of interest are $Y^{90}, Sr^{90}, Mo^{95},$ $Tc^{99}, Rh^{103}, Rh^{105}, Xe^{135}, Cs^{135},$ $Xe^{136}, Cs^{137}, La^{139}, Pr^{141}, Pm^{147},$ $Nd^{147}, Sm^{149}, Sm^{151}, Sm^{152}$ and $Eu^{153}.$ Data needed to improve accuracy of predicted fission product poisons.		
^{233}U	Resonance Parameters		RADIOACTIVE 1.592X(10**5) YR					
		3	Thermal $\rightarrow$.100 keV	10. %		ANL Smith	RRT	67195
		3	Thermal $\rightarrow$.100 keV	10. %		DOE Hemmig	RRT	
		3	.100 keV $\rightarrow$ 5.00 keV	20. $\rightarrow$ 30. %		ANL Smith	RRT	
		3	.100 keV $\rightarrow$ 5.00 keV	20. $\rightarrow$ 30. %		DOE Hemmig	RRT	
						Multilevel parameters, statistical distributions in eV range. For thermal breeder calculations.		
^{234}U	Half-life (alpha decay)	1		.3 %		NBS Gilliam	NBS	76120
						For mass determination of fissionable deposits.		
^{234}U	$\sigma_{n,\gamma}$ (E)							
		2	1.00 mV $\rightarrow$ 2.00 eV	3. %		ANL Smith	RRT	69400
		2	2.00 eV $\rightarrow$ 10.0 keV	6. %		ANL Smith	RRT	
		2	10.0 keV $\rightarrow$ 1.00 MeV	10. %		ANL Smith	RRT	
		2	1.00 MeV $\rightarrow$ 10.0 MeV	20. %		ANL Smith	RRT	
						To evaluate isotope buildup in thermal reactors.		
^{234}U	$N_{n,f}$ (E, E_n) (delayed)	1		5. %		BET Steen	DNR	78187
						Need fast group yields and spectra. No measurements available. For non-destructive assay of $U^{233}-Th^{232}$ fuel.		
^{235}U	Half-life (alpha decay)	1		.3 %		NBS Gilliam	NBS	76121
						For mass determination of fissionable deposits.		
^{235}U	$\sigma_{n,tot}$ (E)	1	1.00 mV $\rightarrow$ 1.00 eV	.5 %		BNW Leonard	RRT	76083
						Needed for thermal cross section evaluation.		
^{235}U	$\sigma_{n,n}$ (E, θ)	2	1.00 MeV $\rightarrow$ 5.00 MeV	20. %	.5M	ANL Smith	RRT	69237
		2	1.00 MeV $\rightarrow$ 5.00 MeV	20. %	.5M	DOE Hemmig	RRT	
						Needed for analyzing fast critical experiments.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{235}U	$\sigma_{n,n'} (E, E_{n'})$	2	50.0 keV $\rightarrow$ 6.00 MeV	10. %	10. %	ANL Smith	RRT	72076
		2	50.0 keV $\rightarrow$ 6.00 MeV	10. %	10. %	DOE Hemmig	RRT	
		Absolute spectra at 30# and 75# may suffice. Low energy (<300 keV) neutrons must be included. $\Delta E_{n'} = 10\%$.						
^{235}U	$\sigma_{n,\gamma} (E)$	1	1.00 mV $\rightarrow$ 1.00 eV	1. %		BET Steen	DNR	74117
						Shape especially important at low energy. To resolve discrepancies in thermal parameters.		
^{235}U	$\sigma_{n,xn} (E, \theta, E_{n'})$	1	14.0 MeV	10. %		LAS Stewart	OMA	74217
						Spectra at several angles required. Must record neutrons down to a few hundred keV.		
^{235}U	$\sigma_{n,f} (E)$	2	1.00 eV $\rightarrow$ 1.00 keV	3. %		BNL Bhat	RRT	69241
						For use as a standard at higher energies.		
		1	10.0 keV $\rightarrow$ 20.0 MeV	1. %		ANL Poenitz	RRT	69245
						Excitation function with absolute calibration at several energies.		
		1	1.00 keV $\rightarrow$ 20.0 keV	2. %		DOE Hemmig	RRT	69449
		1	1.00 keV $\rightarrow$ 20.0 keV	2. %		WEW Doncals	RRT	
		1	20.0 keV $\rightarrow$ 3.00 MeV	1. %		DOE Hemmig	RRT	
		1	20.0 keV $\rightarrow$ 3.00 MeV	1. %		WEW Doncals	RRT	
		1	3.00 MeV $\rightarrow$ 14.0 MeV	2. %		DOE Hemmig	RRT	
		1	3.00 MeV $\rightarrow$ 14.0 MeV	2. %		WEW Doncals	RRT	
						Absolute values required. Accuracy of 3-5% useful. For fast reactor calculations and for use as standard.		
		1	1.00 mV $\rightarrow$ 1.00 eV	5. %		BET Steen	DNR	74118
						Shape especially important at low energy.		
		1	5.00 mV $\rightarrow$ 1.00 eV	1. %		NBS Carlson	NBS	76107
						Needed as a reference standard for cross section measurement for thermal reactors.		
		1	7.50 eV $\rightarrow$ 11.5 eV	1. %		NBS Carlson	NBS	76108
						For normalization of U^{235} measurements.		
		1	14.0 MeV $\rightarrow$ 40.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80185
						For track recorders for FMIT dosimetry.		
		1	7.50 eV $\rightarrow$ 30.0 keV	1. %		NBS Carlson	RRT	80294
						To resolve discrepancy in recent cross section measurements.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
²³⁵ U	$\sigma_{n,r}$ (E)		RATIO					
		1	1.00 keV $\rightarrow$ 14.0 MeV	1. %		ANL Smith	RRT	69246
		1	1.00 keV $\rightarrow$ 14.0 MeV	1. %		DOE Hemmig	RRT	
						Ratio to H(n,p) and B ¹⁰ (n, α) wanted.		
²³⁵ U	Alpha (E)	2	1.00 mV $\rightarrow$ 7.00 MeV	5. $\rightarrow$ 10. %		ANL Smith	RRT	69249
		2	1.00 mV $\rightarrow$ 7.00 MeV	5. $\rightarrow$ 10. %		DOE Hemmig	RRT	
		Capture cross section equally useful.						
		Experimental uncertainties need verification.						
		1	1.00 mV $\rightarrow$ 1.00 eV	1. %		BET Steen	DNR	72077
Capture cross section equally useful.								
Experimental uncertainties need verification.								
²³⁵ U	Eta (E)	2	Thermal $\rightarrow$ 50.0 keV	.5 $\rightarrow$ 2. %		ANL Smith	RRT	67100
		2	Thermal $\rightarrow$ 50.0 keV	.5 $\rightarrow$ 2. %		DOE Hemmig	RRT	
		Accuracy 0.5% at thermal, 2% elsewhere.						
		1	1.00 mV $\rightarrow$ 1.00 eV	.4 %		BET Steen	DNR	74119
Shape especially important at low energy.								
Use technique other than manganese bath.								
²³⁵ U	$\bar{\nu}$ (E)	1	Thermal $\rightarrow$ 3.00 MeV	1. %		ANL Smith	RRT	69253
		1	Thermal $\rightarrow$ 3.00 MeV	1. %		DOE Hemmig	RRT	
		Better than .5% required at thermal.						
To cross check with other isotopes.								
²³⁵ U	$\bar{\nu}$ (E)		RATIO					
		1	1.00 mV $\rightarrow$ 1.00 eV	.2 %		BET Steen	DNR	78189
Measurements relative to U ²³³ and Pu ²³⁹ wanted.								
²³⁵ U	$\bar{\nu}$ (E) (delayed)							
		1		3. %		BET Steen	DNR	74120
For the entire energy range.								
To resolve uncertainties in available data.								
²³⁵ U	$N_{n,r}$ (E,E _n)	2	Thermal $\rightarrow$ 3.00 MeV	5. %		ANL Smith	RRT	69256
		2	Thermal $\rightarrow$ 3.00 MeV	5. %		DOE Hemmig	RRT	
		Verification of fission spectrum.						
		1	Thermal	1. %		BET Steen	DNR	72080
Need shape of neutron energy distribution from								
100 keV to 15 MeV.								
Relative peak to 1%.								
Needed for criticality calculations.								

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{235}U	$N_{n,f}(E, E_n)$ (delayed)	2	Thermal $\rightarrow$ 5.00 MeV	5. %		DOE Hemmig Yield, half-life and energy needed. For analysis of fast criticals and to check existing data.	RRT	69260
^{235}U	$N_{n,f}(E, E_\gamma)$ (delayed)	3	Thermal	15. %		LAS Walton Spectra 0.25-5 MeV and time-dependent yield 1 msec-12 hr. Associate gammas with fission products. Ge(Li) resolution - 2.5 keV at 1.2 MeV. For non-destructive assays of U^{235} .	DSS	70029
^{235}U	$Y_{n,f}(E, \text{nuclide})$	1 1	Thermal Thermal	1. % 1. %		BET Steen KAP Feiner Nuclides of interest are $\text{Rh}^{103}, \text{Xe}^{135}, \text{Cs}^{135}, \text{Cs}^{137}, \text{Nd}^{147}, \text{Sm}^{149}$ and Eu^{153} . Data needed to improve accuracy of predicted fission product poisoning.	DNR DNR	78192
^{235}U	Resonance Parameters	1 1 2	Thermal $\rightarrow$.200 keV Thermal $\rightarrow$.200 keV Thermal $\rightarrow$.200 keV	10. % 10. % 10. %		ANL Smith DOE Hemmig Multilevel fit where feasible. For extrapolation to unresolved resonance region. BET Steen Multilevel fit where feasible. Verification of existing data useful.	RRT RRT DNR	69262 69263
^{238}U	$N_{n,f}(E, E_n)$ (delayed)	1	RADIOACTIVE 2.342X(10**7) YR	5. %		BET Steen Need fast group yields and spectra. No measurements available. For non-destructive assay of $\text{U}^{233}\text{-Th}^{232}$ fuel.	DNR	78188
^{238}U	$\sigma_{n,n}(E, \theta)$	1 1 1 1 1 1	1.00 keV $\rightarrow$.300 MeV .300 MeV $\rightarrow$ 2.00 MeV .300 MeV $\rightarrow$ 2.00 MeV 2.00 MeV $\rightarrow$ 10.0 MeV 2.00 MeV $\rightarrow$ 10.0 MeV .300 MeV $\rightarrow$ 10.0 MeV	10. % 5. % 5. % 5. % 5. % 10. %		DOE Hemmig ANL Smith DOE Hemmig ANL Smith DOE Hemmig ANL Smith	RRT RRT RRT RRT RRT RRT	69407 69468

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{238}U	$\sigma_{n,n'} (E, E_{n'})$	1	50.0 keV $\rightarrow$ 10.0 MeV	5. %	5. %	ANL Smith	RRT	69270
		1	50.0 keV $\rightarrow$ 10.0 MeV	5. %	5. %	DOE Hemmig	RRT	
		Emission cross sections instead of inelastic and (n,2n) might be useful.						
^{238}U	$\sigma_{n,\gamma} (E)$	1	.500 keV $\rightarrow$ 1.00 keV	6. %		DOE Hemmig	RRT	69419
		1	1.00 keV $\rightarrow$.300 MeV	1. %		ANL Smith	RRT	
		1	1.00 keV $\rightarrow$.300 MeV	2. %		DOE Hemmig	RRT	
		1	.300 MeV $\rightarrow$.500 MeV	1.5 %		ANL Smith	RRT	
		1	.300 MeV $\rightarrow$.500 MeV	3. %		DOE Hemmig	RRT	
		1	.500 MeV $\rightarrow$ 10.0 MeV	2.5 %		ANL Smith	RRT	
		1	.500 MeV $\rightarrow$ 10.0 MeV	5. %		DOE Hemmig	RRT	
		For fast reactor calculations.						
			1.00 keV $\rightarrow$ 10.0 MeV	2. %		ANL Smith	RRT	69469
		Above 10 kev, 10% accuracy useful.						
		For fast reactor calculations.						
		1	10.0 keV $\rightarrow$ 10.0 MeV	1.5 %		ANL Smith	RRT	69470
		Primary ratio should be to U^{235} fission. Other ratios to recognized standards desirable.						
		Ratio data discrepant with absolute measurements.						
1	1.00 eV $\rightarrow$ 20.0 keV	5. %		BET Steen	DNR	74123		
Need parameters for lowest resonances.								
Thick sample transmission and self-indication measurements desirable.								
To resolve discrepancies among integral and differential experiments when strong self-shielding exists.								
1	.100 eV $\rightarrow$ 6.00 eV	.5 %		BNW Leonard	RRT	76085		
For thermal cross section evaluation.								
^{238}U	$\sigma_{n,\gamma} (E)$		RATIO					
		1	10.0 keV $\rightarrow$.300 MeV	1.5 %		ANL Smith	RRT	69435
		1	10.0 keV $\rightarrow$.300 MeV	1.5 %		DOE Hemmig	RRT	
		1	.300 MeV $\rightarrow$ 10.0 MeV	2. %		ANL Smith	RRT	
		1	.300 MeV $\rightarrow$ 10.0 MeV	7. %		DOE Hemmig	RRT	
		Primary ratio should be to U^{235} fission, other ratios to recognized standards desirable.						
Ratio data discrepant with absolute measurements.								
^{238}U	$\sigma_{n,\gamma} (E, \theta_{\gamma}, E_{\gamma})$	2	1.00 mV $\rightarrow$ 15.0 MeV	10. %		DOE Hemmig	RRT	72079
For all γ energies.								
γ -energy intervals - 500 keV.								
For shielding and γ heating calculations.								

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{238}U	$\sigma_{n,2n} (E)$	2	14.0 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith	RRT	80001
		1	14.0 MeV $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		Energy resolution 10%. DOE Ng Dosimetry for FMIT facility.	OFE	80024
^{238}U	$\sigma_{n,3n} (E)$	2	14.0 MeV $\rightarrow$ 20.0 MeV	10. %		ANL Smith	RRT	80002
		2	11.0 MeV $\rightarrow$ 14.0 MeV	10. %		Energy resolution 10%. DOE Ng For hybrid system design.	OFE	80090
^{238}U	$\sigma_{n,xn} (E, \theta, E_n)$	1	14.0 MeV	10. %		LAS Stewart	OMA	74218
						Spectra at several angles required. Must record neutrons down to a few hundred keV.		
^{238}U	$\sigma_{n,f} (E)$	1	20.0 MeV $\rightarrow$ 50.0 MeV	10. $\rightarrow$ 20. %		DOE Ng	OFE	80023
						Dosimetry for FMIT facility. For track recorders for FMIT dosimetry from 14-40 MeV.		
^{238}U	$\sigma_{n,f} (E)$		RATIO					
		1	.500 keV $\rightarrow$ 1.30 MeV	4. %	3. %	ANL Smith	RRT	80296
		1	1.30 MeV $\rightarrow$ 5.00 MeV	2. %		ANL Smith	RRT	
		1	5.00 MeV $\rightarrow$ 14.0 MeV	3. %		ANL Smith	RRT	
		2	14.0 MeV $\rightarrow$ 20.0 MeV	5. %		ANL Smith	RRT	
						Ratio to $\text{U}^{235}(n,f)$ wanted. Intermediate accuracy useful. Energy calibration - 1%.		
^{238}U	$\bar{\nu} (E)$	1	RATIO $\rightarrow$ 10.0 MeV	1. %		DOE Hemmig	RRT	69275
						Energy requested is a maximum value only. Ratio to Cf^{252} wanted. To verify measurement of Soleilac.		
^{238}U	$\bar{\nu} (E) \text{ (delayed)}$	3	5.00 MeV $\rightarrow$ 14.0 MeV	5. %		LAS Walton	DSS	70035
		1	Thresh $\rightarrow$ 5.00 MeV	5. %		Calculation of moderating assemblies for U assay. Data needed for extrapolation to 15 MeV. DOE Hemmig	RRT	76087
^{238}U	$N_{n,f} (E, E_n)$	1	Thresh $\rightarrow$ 5.00 MeV			DOE Hemmig	RRT	72145
						Want average secondary energy to 5%. To resolve discrepancies in existing data.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{238}U	Resonance Parameters	1	1.00 eV $\rightarrow$ 20.0 keV	10. %		DOE Hemmig	RRT	69286
		1	1.00 eV $\rightarrow$ 20.0 keV	10. %		ANL Smith	RRT	
						To as high energy as can be measured. For Doppler effect on fast breeders. To resolve questions of missing p-wave levels and uncertainties of γ -widths.		
		1	$\rightarrow$ 5.00 keV	3. %		ORL Peelle	RRT	78193
						Existing data > 1 keV discrepant. Needed to compute capture in highly self-shielded thermal systems.		
^{237}Np	Half-life (alpha decay)	1	RADIOACTIVE 2.14X(10**6) YR	.5 %		NBS Gilliam	NBS	76123
						For mass determination of fissionable deposits.		
^{237}Np	$\sigma_{n,2n}$ (E)	2	RADIOACTIVE 2.14X(10**6) YR Thresh $\rightarrow$ 15.0 MeV	10. %		SRL Sharp	NMPO	67112
						To evaluate contamination of Pu^{238} by Pu^{239} .		
^{237}Np	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 2.14X(10**6) YR 50.0 keV $\rightarrow$ 7.00 MeV	2. %		NBS Gilliam	NBS	78178
		1	20.0 MeV $\rightarrow$ 40.0 MeV	10. %		HED McElroy	OFE	80239
						For materials dosimetry. Accuracy 20% above 23 MeV. For FMIT dosimetry.		
^{238}Pu	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 87.74 YR 10.0 keV $\rightarrow$ 5.00 MeV	3. %		LAS Motz	OMA	66047
						Ratio to $\text{U}^{235}(\text{n},\text{f})$ wanted.		
^{238}Pu	$\sigma_{n,\text{tot}}$ (E)	1	RADIOACTIVE 2.41X(10**4) YR 1.00 eV $\rightarrow$.500 MeV	3. %		GEB Cowan	RRT	74124
						Energy resolution to show secondary structure up to 10 keV.		
		1	.500 eV $\rightarrow$ 5.00 eV	1. %		BNW Leonard	RRT	76088
						Needed for thermal cross section evaluation.		
^{239}Pu	$\sigma_{n,n}$ (E, θ)	2	RADIOACTIVE 2.41X(10**4) YR 1.00 MeV $\rightarrow$ 3.00 MeV	10. %	500K	ANL Smith	RRT	69303
		2	1.00 MeV $\rightarrow$ 3.00 MeV	10. %	500K	DOE Hemmig	RRT	
^{239}Pu	$\sigma_{n,n'} (E,E_n)$	1	RADIOACTIVE 2.41X(10**4) YR 10.0 keV $\rightarrow$ 10.0 MeV	20. %		DOE Hemmig	RRT	72084

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{239}Pu	$\sigma_{n,2n}(E)$	2	RADIOACTIVE 2.41X(10**4) YR 6.00 MeV $\rightarrow$ 10.0 MeV	10. %		DOE Hemmig	RRT	69306
		1	Thresh $\rightarrow$ 15.0 MeV	5. %		To predict buildup of Pu^{238} LLL Howerton	OMA	70040
						Activation is required. Accuracy required at each point.		
^{239}Pu	$\sigma_{n,xn}(E,\theta,E_n)$	1	RADIOACTIVE 2.41X(10**4) YR 14.0 MeV	10. %		LAS Stewart	OMA	74219
						Spectra at several angles required. Must record neutrons down to a few hundred keV.		
^{239}Pu	$\sigma_{n,f}(E)$	1	RADIOACTIVE 2.41X(10**4) YR 1.00 eV $\rightarrow$ 3.00 MeV	2. %		ANL Smith	RRT	69467
		1	1.00 eV $\rightarrow$ 3.00 MeV	2. %		DOE Hemmig	RRT	
		1	3.00 MeV $\rightarrow$ 10.0 MeV	3. %		ANL Smith	RRT	
		1	3.00 MeV $\rightarrow$ 10.0 MeV	3. %		DOE Hemmig	RRT	
						Verification of current accuracy or intermediate accuracy useful. Need related accuracy for 5-10% energy bins. For fast reactor calculations.		
		2	Thermal $\rightarrow$ 1.00 keV	1. %		GEB Cowan	RRT	72085
						Improved precision needed for thermal reactors. Direct measurements disagree. U and Pu half lives should be confirmed as they affect these measurements.		
		1	10.0 keV $\rightarrow$ 14.0 MeV	2. %	3. %	DOE Hemmig	RRT	72086
						Ratio to $\text{U}^{235}(n,f)$ required. Avg. over 10-20% energy intervals		
		2	10.0 keV $\rightarrow$ 1.00 MeV	2. %		GEB Cowan	RRT	74125
						Ratio to $\text{U}^{235}(n,f)$ wanted.		
		1	1.00 eV $\rightarrow$ 20.0 keV	3. %		WEW Doncals	RRT	76040
		1	20.0 keV $\rightarrow$ 3.00 MeV	5. %		WEW Doncals	RRT	
						Needed for fast reactor calculations.		
		2	.100 MeV $\rightarrow$ 20.0 MeV	2. %		GEB Cowan	RRT	76089
						Absolute measurement desired.		
		1	20.0 MeV $\rightarrow$ 40.0 MeV	20. %		HED McElroy	OFE	80240
						For FMIT dosimetry.		
^{239}Pu	Alpha (E)	1	RADIOACTIVE 2.41X(10**4) YR .100 keV $\rightarrow$ 1.00 keV	8. %		ANL Smith	RRT	69314
		1	.100 keV $\rightarrow$ 1.00 keV	8. %		DOE Hemmig	RRT	
		1	1.00 keV $\rightarrow$ 50.0 keV	4. %		ANL Smith	RRT	
		1	1.00 keV $\rightarrow$ 50.0 keV	4. %		DOE Hemmig	RRT	
		1	50.0 keV $\rightarrow$.600 MeV	6. %		ANL Smith	RRT	
		1	50.0 keV $\rightarrow$.600 MeV	6. %		DOE Hemmig	RRT	
		1	.600 MeV $\rightarrow$ 10.0 MeV	10. %		ANL Smith	RRT	
		1	.600 MeV $\rightarrow$ 10.0 MeV	10. %		DOE Hemmig	RRT	
						Capture cross section equally useful.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{239}Pu	$\bar{\nu}$ (E)		RADIOACTIVE 2.41X(10**4) YR					
		1	Thermal $\rightarrow$ 3.00 MeV	.3 %		ANL Smith	RRT	66050
		1	Thermal $\rightarrow$ 3.00 MeV	.3 %		DOE Hemmig	RRT	
						Accuracy of 0.5% useful.		
						For fast reactor calculations.		
		1	Thermal $\rightarrow$ 1.00 keV	1. %		WEW Doncals	RRT	76041
		1	1.00 keV $\rightarrow$ 3.00 keV	.5 %		WEW Doncals	RRT	
		1	3.00 keV $\rightarrow$ 10.0 MeV	1. %		WEW Doncals	RRT	
						Essential for accurate fast reactor calculations.		
^{239}Pu	$\bar{\nu}$ (E)		RATIO 2.41X(10**4) YR					
		1	1.00 mV $\rightarrow$ 1.00 eV	.2 %		BET Steen	DNR	78190
						Measurements relative to U^{233} and U^{235} wanted.		
^{239}Pu	$\bar{\nu}$ (E) (delayed)		RADIOACTIVE 2.41X(10**4) YR					
		2	Thermal $\rightarrow$ 5.00 MeV	5. %		ANL Smith	RRT	76090
^{239}Pu	$N_{n,f}$ (E, E_n)		RADIOACTIVE 2.41X(10**4) YR					
		2	Thermal $\rightarrow$ 20.0 MeV	10. %		GEB Cowan	RRT	76091
		2	Thermal	1. %		BET Steen	DNR	78186
						Need shape of neutron energy distribution from 100 keV to 15 MeV.		
						Relative peak to 1%.		
						Needed for criticality calculations.		
^{239}Pu	$N_{n,f}$ (E, E_n) (delayed)		RADIOACTIVE 2.41X(10**4) YR					
		2	Thermal $\rightarrow$ 5.00 MeV			ANL Smith	RRT	69312
		2	Thermal $\rightarrow$ 5.00 MeV			DOE Hemmig	RRT	
						Half-life and energy spectrum needed.		
						For analysis of fast criticals and fast reactor calculations.		
^{239}Pu	$N_{n,f}$ (E, E_γ) (delayed)		RADIOACTIVE 2.41X(10**4) YR					
		3	Thermal	15. %		LAS Walton	DSS	70043
						Spectra 0.25-5 MeV and time-dependent yield for 1 msec-12 hr.		
						Associate γ 's with fission products, if possible.		
						Ge(Li) resolution - 2.5 keV at 1.2 MeV.		
						For non-destructive assays of Pu^{239} .		

DOE-NDC Compilation of Requests for Nuclear Data 1980

Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{239}Pu	$Y_{n,f}$ (E,nuclide)	2	RADIOACTIVE Thermal 2.41X(10**4) YR	3. %		BET Steen	DNR	67125
						Cumulative and direct yield of Xe^{135} (inclusive of 15-min isomer). Yields of Nd^{147} and Sm^{149} wanted. For calculation of fission product poisons.		
		2	Thermal	1. %		BET Steen	DNR	67126
						Yield of Cs^{137} wanted. For burn-up indicator standard.		
		2	Thermal $\rightarrow$ 15.0 MeV	5. %		GEB Cowan	RRT	74126
						All fission products.		
^{239}Pu	Resonance Parameters	2	RADIOACTIVE Thermal $\rightarrow$.600 keV 2.41X(10**4) YR	10. %		ANL Smith	RRT	69319
		2	Thermal $\rightarrow$.600 keV	10. %		CBE Visner	RRT	
						For thermal reactors, and to determine statistical parameters for extrapolation to higher energy. For fast reactor calculations.		
		2	Thermal $\rightarrow$ 50.0 eV	10. %		DOE Hemmig	RRT	69320
						For thermal reactors, and to determine statistical parameters for extrapolation to higher energy. For fast reactor calculations.		
^{240}Pu	Half-life (alpha decay)	1		1. %		NBS Gilliam	NBS	76125
						For mass determination of fissionable deposits.		
^{240}Pu	$\sigma_{n,\text{tot}}$ (E)	2	RADIOACTIVE 5.00 keV $\rightarrow$ 20.0 MeV 6.57x(10**3) YR	1. %		ORL Weston	RRT	80264
						Needed in evaluation to limit model calculations.		
^{240}Pu	$\sigma_{n,n'}$ (E)	2	RADIOACTIVE 1.50 MeV $\rightarrow$ 10.0 MeV 6.57x(10**3) YR	20. %		DOE Hemmig	RRT	72087
		2	1.50 MeV $\rightarrow$ 10.0 MeV	20. %		ORL Weston	RRT	
						Emission cross section might be equally useful at the higher energies.		
^{240}Pu	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE Thermal $\rightarrow$.100 keV 6.57X(10**3) YR	3. %		ORL Weston	RRT	67194
						Improved precision needed for thermal reactor.		
		1	.500 keV $\rightarrow$.150 MeV	5. %		ANL Smith	RRT	69389
						Accuracy of 15% would be useful. For fast reactor calculations.		
		1	.150 MeV $\rightarrow$ 1.00 MeV	10. %		DOE Hemmig	RRT	69390
						Accuracy of 15% useful. For fast reactor calculations.		
		1	.150 MeV $\rightarrow$ 1.00 MeV	10. %		ORL Weston	RRT	72137
						For fast reactor calculations.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{240}Pu	$\sigma_{n,f}$ (E)		RADIOACTIVE 6.57X(10**3) YR					
		2	.500 MeV $\rightarrow$ 10.0 MeV	5. %		ORL Weston	RRT	72088
		2	.500 keV $\rightarrow$.100 MeV	9. %		For fast reactor calculations. DOE Hemmig	RRT	72089
For fast reactor calculations.								
^{240}Pu	$\sigma_{n,f}$ (E)	3	RATIO 6.57X(10**3) YR 1.00 keV $\rightarrow$.100 MeV	5. %		DOE Hemmig	RRT	72090
						Ratio to $\text{U}^{235}(\text{n},\text{f})$ wanted. Accuracy of 5% useful.		
^{240}Pu	$\bar{\nu}$ (E)		RADIOACTIVE 6.57X(10**3) YR					
		2	Thresh $\rightarrow$ 10.0 MeV	3. %		DOE Hemmig	RRT	69323
		2	Thresh $\rightarrow$ 10.0 MeV	3. %		ANL Smith	RRT	72092
Accuracy of 5% useful.								
^{240}Pu	$\bar{\nu}$ (E) (delayed)	2	RADIOACTIVE 6.57X(10**3) YR Thermal $\rightarrow$ 5.00 MeV	10. %		DOE Hemmig	RRT	76092
^{240}Pu	Resonance Parameters	2	RADIOACTIVE 6.57X(10**3) YR .100 keV $\rightarrow$ 5.00 keV	10. %		ANL Smith	RRT	69391
		2	.100 keV $\rightarrow$ 5.00 keV	10. %		DOE Hemmig	RRT	
						To resolve discrepancies in existing data. For fast reactor calculations, including Doppler effect.		
		2	.100 keV $\rightarrow$ 5.00 keV	10. %		CBE Visner	RRT	76093
						For thermal reactor applications including Doppler effects.		
^{240}Pu		1	1.00 eV	1. %		ORL Weston	RRT	78194
						Resonance strongly influences thermal cross-section evaluation.		
^{241}Pu	$\sigma_{n,\text{tot}}$ (E)	1	RADIOACTIVE 14.4 YR 10.0 mV $\rightarrow$ 3.00 eV	1. %		ORL Weston	RRT	78195
						Total cross-section not consistent with partials.		
		2	1.00 keV $\rightarrow$ 20.0 MeV	1. %		ORL Weston	RRT	80265
Needed in evaluation to limit model calculations.								
^{241}Pu	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE 14.4 YR Thermal $\rightarrow$ 30.0 keV	3. %		ORL Weston	RRT	67132
						α also wanted. Accuracy of 3% in η . Improved precision needed for thermal reactors. Also wanted for fast reactors.		
		3	Thermal $\rightarrow$ 30.0 keV	3. %		CBE Visner	RRT	76094
For thermal reactor calculations.								

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{241}Pu	$\sigma_{n,f}$ (E)		RADIOACTIVE 14.4 YR					
		1	Thermal $\rightarrow$ 10.0 eV	3. %		ANL Smith	RRT	69328
		1	Thermal $\rightarrow$ 10.0 eV	3. %		ORL Weston	RRT	
		1	20.0 keV $\rightarrow$.400 MeV	3. %		Ratio to U^{235} or Pu^{239} would be useful. DOE Hemmig Ratio to $\text{U}^{235}(\text{n},\text{f})$ wanted.	RRT	72094
^{241}Pu	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 14.4 YR 10.0 eV $\rightarrow$ 30.0 keV	10. %		WEW Doncals Ratio to U^{235} or Pu^{239} would be useful.	RRT	76042
^{241}Pu	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 14.4 YR 1.00 mV $\rightarrow$ 3.00 eV	1. %		BNW Leonard For thermal cross section evaluation.	RRT	76095
^{241}Pu	Alpha (E)	1	RADIOACTIVE 14.4 YR 1.00 keV $\rightarrow$ 2.00 MeV	10. %		ORL Weston	RRT	69331
		1	1.00 keV $\rightarrow$ 2.00 MeV	10. %		Capture cross section equally useful. DOE Hemmig	RRT	69332
^{241}Pu	$\bar{\nu}$ (E)	1	RADIOACTIVE 14.4 YR 1.00 keV $\rightarrow$ 1.00 MeV	2. %		DOE Hemmig	RRT	69330
^{241}Pu	Resonance Parameters		RADIOACTIVE 14.4 YR					
		2	Thermal $\rightarrow$.100 keV	5. %		ANL Smith	RRT	72140
		2	.100 keV $\rightarrow$.400 keV	10. %		ANL Smith	RRT	
		2	Thermal $\rightarrow$.400 keV	10. %		CBE Visner	RRT	76096
						For thermal reactor applications at high burn-up.		
^{242}Pu	$\sigma_{n,\gamma}$ (E)		RADIOACTIVE 3.76X(10**5) YR					
		1	1.00 keV $\rightarrow$ 7.00 MeV	15. $\rightarrow$ 20. %		DOE Hemmig	RRT	72098
		1	Thermal $\rightarrow$.100 keV	3. %		For fast breeder calculations, Cm, Cf production. HED Schenter	RRT	72142
		1	.100 keV $\rightarrow$ 1.00 keV	10. %		HED Schenter	RRT	
		2	Thermal $\rightarrow$ 1.00 keV	3. %		Want resonance parameters to 10-20% below 10 keV. For fast breeder calculations, Cm, Cf production. CBE Visner	RRT	76097
						For thermal reactor applications at high burn-up.		
^{242}Pu	$\bar{\nu}$ (E)	2	RADIOACTIVE 3.76X(10**5) YR .500 MeV $\rightarrow$ 10.0 MeV	5. %		DOE Hemmig	RRT	69334

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{241}Am	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 433 YR Thermal $\rightarrow$ 1.00 keV	10. %		RL Orton	NMPO	67136
		1	1.00 keV $\rightarrow$ 2.00 MeV	20. %		Production of both Am^{242} and Am^{242m} wanted. For Pu^{238} program and production of Cm^{244} . DOE Hemmig	RRT	74127
			Thermal $\rightarrow$ 10.0 MeV	10. %		Production of both Am^{242} and Am^{242m} wanted. For spent fuel shielding. CBE Visner	RRT	76098
^{241}Am	$\sigma_{n,f}$ (E)	2	RADIOACTIVE 433 YR 10.0 keV $\rightarrow$ 1.50 MeV	5. $\rightarrow$ 10. %		ORL Peelle	RRT	76099
^{242}Am	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 16.01-HR AND 152-YR ISOMERS Thermal $\rightarrow$ 10.0 keV	10. $\rightarrow$ 20. %		SRL Sharp	NMPO	69341
^{243}Am	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE 7.37X(10**3) YR Thermal $\rightarrow$ 10.0 MeV	10. %		Thermal value and RI wanted For Pu^{238} production.		
		1	1.00 keV $\rightarrow$.200 MeV	30. %		HED Schenter	RRT	72101
			Thermal $\rightarrow$ 10.0 MeV	10. %		Accuracy of 5-10% in thermal value and RI. To determine Cm^{244} production. For long term reactivity calculations and for spent fuel shielding. DOE Hemmig	RRT	74128
^{242}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 163 DAY Thermal	20. %		CBE Visner	RRT	76100
						For spent fuel shielding. Fast reactor applications.		
^{242}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 163 DAY Thermal	20. %		SRL Sharp	NMPO	67139
^{242}Cm	Resonance Parameters	3	RADIOACTIVE 163 DAY Thermal $\rightarrow$ 1.00 keV	20. %		For Pu^{238} production.		
		2	Thermal $\rightarrow$ 1.00 keV	20. %		RL Orton	NMPO	67192
^{244}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 18.11 YR 10.0 keV $\rightarrow$ 10.0 MeV	10. %		Elastic and γ -widths wanted. For Pu^{238} production. CBE Visner	RRT	76101
						For fast breeder applications.		
^{244}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 18.11 YR 10.0 keV $\rightarrow$ 10.0 MeV	10. %		CBE Visner	RRT	76102
^{244}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 18.11 YR 10.0 keV $\rightarrow$ 10.0 MeV	10. %		For spent fuel shielding. Fast reactor applications.		

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{245}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 8.5X(10**3) YR Thermal $\rightarrow$ 10.0 keV	10. %		CBE Visner For fast breeder applications.	RRT	76103
^{245}Cm	$\sigma_{n,f}$ (E)	2	RADIOACTIVE 8.5X(10**3) YR Thermal $\rightarrow$ 10.0 keV	10. %		CBE Visner For fast breeder applications.	RRT	76104
^{246}Cm	$\sigma_{n,\text{tot}}$ (E)	2	RADIOACTIVE 4.7X(10**3) YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp Shape of thermal cross section especially important. Resonance structure needed. Accuracy of 10% in RI.	NMPO	67146
		2	Thermal $\rightarrow$ 10.0 keV	10. %		CBE Visner For fast breeder applications.	RRT	76105
^{246}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 4.7X(10**3) YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp Accuracy of 10% in RI. To evaluate Cf production.	NMPO	69350
^{247}Cm	$\sigma_{n,\gamma}$ (E)	2	RADIOACTIVE 1.6X(10**7) YR Thermal $\rightarrow$ 10.0 keV	5. $\rightarrow$ 10. %		SRL Sharp Shape of thermal cross section especially important. Accuracy of 5-10% in thermal value and RI. To evaluate Cf production.	NMPO	67149
^{247}Cm	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 1.6X(10**7) YR Thermal $\rightarrow$ 10.0 keV	5. $\rightarrow$ 10. %		SRL Sharp Shape of thermal cross section especially important. Accuracy of 5-10% in thermal value and RI.	NMPO	67148
^{247}Cm	Resonance Parameters	1	RADIOACTIVE 1.6X(10**7) YR Thermal $\rightarrow$ 10.0 keV	20. %		SRL Sharp Accuracy of 20% in RI. To evaluate Cf production.	NMPO	67147
^{249}Cf	$\sigma_{n,f}$ (E)	2	RADIOACTIVE 351 YR 10.0 keV $\rightarrow$ 3.00 MeV	10. %		LAS Stewart Needed for evaluation.	OMA	74220
^{250}Cf	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE 13.1 YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp Accuracy of 10% in RI. To evaluate Cf production.	NMPO	69357

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Isotope	Quantity	Priority	Energy Range	Accuracy	ΔE	Lab Requester	Sponsor	No.
^{250}Cf	$\sigma_{n,f}$ (E)	1	RADIOACTIVE 13.1 YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp Accuracy of 10% in RI. To evaluate Cf production.	NMPO	67153
^{250}Cf	Resonance Parameters	2	RADIOACTIVE 13.1 YR Thermal $\rightarrow$ 10.0 keV	20. %		SRL Sharp Accuracy of 20% in RI. To evaluate Cf production.	NMPO	67152
^{251}Cf	$\sigma_{n,\gamma}$ (E)	1	RADIOACTIVE 9.0X(10**2) YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp Accuracy of 10% in RI. To evaluate Cf production.	NMPO	67154
^{251}Cf	$\sigma_{n,f}$ (E)	2	RADIOACTIVE 9.0X(10**2) YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp Thermal cross section shape especially important. 10% in resonance integral. To evaluate Cf production.	NMPO	74132
		2	10.0 keV $\rightarrow$ 3.00 MeV	10. %		LAS Stewart Needed for evaluation.	OMA	74221
^{251}Cf	Resonance Parameters	2	RADIOACTIVE 9.0X(10**2) YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp	NMPO	76106
^{252}Cf	Spon. $\bar{\nu}$	1	RADIOACTIVE 2.64 YR	.25 %		NBS Carlson For use as standard.	NBS	69359
		1		.25 %		DOE Hemmig Accuracy of 1% useful. For use as standard.	RRT	72103
		1		.25 %		BET Steen	DNR	76063
^{252}Cf	$N_{\text{spon},f}$ (E_n)	1	RADIOACTIVE 2.64 YR	5. %		NBS Eisenhower Information at low energies still needed. ΔE_n - 5%.	NBS	72105
		1		1. %		BET Steen Detector efficiency must be determined from well below 1 MeV to above 10 MeV. Mean spectrum energy desired to 1 percent. For interpretation of $\bar{\nu}$ ratio measurements.	DNR	76064
^{252}Cf	$\sigma_{n,f}$ (E)	2	RADIOACTIVE 2.64 YR Thermal $\rightarrow$ 10.0 keV	10. %		SRL Sharp Accuracy of 10% in RI. To evaluate Cf production.	NMPO	74129

APPENDIX A

REACTION TABLES FOR DOE-NDC REQUEST LIST

QUANTITY SYMBOL	DEFINITION
<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>
<u>C. 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
$\sigma_{n,t}$ (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,nuclide)	Fission product mass yield spectrum
Resonance Parameters	Resonance parameters
Capture RI	Capture resonance integral
<u>D. 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
<u>E. Deuteron Interactions</u>	
$\sigma_{d,p}$ (E)	Proton production cross section
$\sigma_{d,d}$ (E)	Deuteron production cross section
$\sigma_{d,\alpha}$ (E)	Alpha production cross section
<u>F. Triton Interactions</u>	
$\sigma_{t,t}$ (E)	Triton production cross section
$\sigma_{t,\alpha}$ (E)	Alpha production cross section

APPENDIX A

<u>QUANTITY SYMBOL</u>	<u>DEFINITION</u>
<u>G. Helium-3 Interactions</u>	
$\sigma_{\text{He-3,p}} (E)$	Proton production cross section
$\sigma_{\text{He-3,2p}} (E)$	Two proton production
$\sigma_{\text{He-3,He-3}} (E)$	Helium-3 production cross section
$\sigma_{\text{He-3,x}} (E)$	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>	
$\sigma_{\text{Li-6,x}} (E)$	Special quantity further defined in comments

APPENDIX B

LIST OF REQUESTERS

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APPENDIX C

LIST OF MATERIALS AND EVALUATORS

Material	Principal Evaluator(s)	Laboratory	Material	Principal Evaluator(s)	Laboratory
1-H-1	L.Stewart	LAS	47-Ag-107	R.Schenter,M.Bhat	HED,BNL
1-H-2	L.Stewart	LAS	47-Ag-109	R.Schenter,M.Bhat	HED,BNL
1-H-3	L.Stewart	LAS	48-Cd	S.Pearlstein	BNL
2-He-3	L.Stewart	LAS	48-Cd-113	S.Pearlstein,F.Mann	BNL,HED
2-He-4	G.M.Hale	LAS	54-Xe	M.R.Bhat	BNL
3-Li-6	G.M.Hale	LAS	54-Xe-135	B.R.Leonard,Jr.	BNW
3-Li-7	R.J.LaBauve	LAS	55-Cs-133	R.Schenter,M.Bhat	HED,BNL
4-Be-9	R.J.Howerton	LLL	56-Ba-138	R.J.Howerton	LLL
5-B-10	G.M.Hale	LAS	62-Sm-149	R.Schenter,B.R.Leonard,Jr.	HED,BNW
5-B-11	C.Cowan	GEB	63-Eu	S.F.Mughabghab	BNL
6-C	C.Y.Fu	ORL	64-Gd	B.A.Magurno	BNL
7-N-14	P.G.Young	LAS	66-Dy-164	B.R.Leonard,Jr.	BNW
7-N-15	E.D.Arthur	LAS	71-Lu	B.R.Leonard,Jr.	BNW
8-O-16	P.G.Young	LAS	72-Hf	M.K.Drake	SAI
8-O-17	B.A.Magurno	BNL	73-Ta-181	R.J.Howerton	LLL
9-F-19	C.Y.Fu	ORL	73-Ta-182	J.Otter	AI
11-Na-23	D.C.Larson	ORL	74-W	J.Otter	AI
12-Mg	D.C.Larson	ORL	75-Re	W.B.Henderson	WAP
13-Al-27	P.G.Young	LAS	79-Au-197	S.F.Mughabghab	BNL
14-Si	D.C.Larson	ORL	82-Pb	C.Y.Fu	ORL
15-P-31	R.J.Howerton	LLL	83-Bi-209	D.Smith,R.J.Howerton	ANL,LLL
16-S	M.Divadeenam	BNL	90-Th-232	Bhat,Smith,Leonard,DeSaussure	BNL,ANL,BNW,ORL
16-S-32	R.J.Howerton	LLL	91-Pa-233	L.F.Mann,C.Reich	HED,INL
17-Cl	M.K.Drake	SAI	92-U-233	L.Stewart,L.Weston,F.Mann	LAS,ORL,HED
19-K	M.K.Drake	SAI	92-U-234	M.Divadeenam,F.Mann,C.Reich	BNL,HED
20-Ca	C.Y.Fu,F.G.Perey	ORL	92-U-235	M.R.Bhat	BNL
22-Ti	C.Philis,A.Smith,R.Howerton	BRC,ANL,LLL	92-U-236	M.Divadeenam,F.Mann,C.Reich	BNL,HED
23-V	A.Smith,H.Howerton,F.Mann	ANL,LLL,HED	92-U-238	E.Pennington	ANL
24-Cr	A.Prince	BNL	93-Np-237	F.Mann,R.Benjamin,A.Smith,C.Reich	HED,SRL,ANL,INL
25-Mn-55	S.F.Mughabghab	BNL	94-Pu-238	F.Mann,C.Dunford	HED,BNL
26-Fe	C.Y.Fu	ORL	94-Pu-239	E.Kujawski,L.Stewart	GEB,LAS
27-Co-59	S.F.Mughabghab	BNL	94-Pu-240	L.W.Weston	ORL
28-Ni	M.Divadeenam	BNL	94-Pu-241	L.W.Weston,R.J.Howerton	ORL,LLL
29-Cu	C.Y.Fu	ORL	94-Pu-242	Mann,Benjamin,Madland,Howerton	HED,SRL,LAS,LLL
31-Ga	R.G.Howerton,P.G.Young	LLL,LAS	95-Am-241	F.Mann,L.W.Weston	HED,ORL
36-Kr	A.Prince	BNL	95-Am-242m	F.Mann,R.Benjamin,R.J.Howerton	HED,SRL,LLL
40-Zr	M.Drake	SAI	95-Am-243	F.Mann,R.Benjamin,R.J.Howerton	HED,SRL,LLL
42-Mo	R.J.Howerton,F.Schmittroth	LLL,HED	96-Cm-243	F.Mann,R.Benjamin,R.J.Howerton	HED,SRL,LLL
43-Tc-99	R.Schenter,Z.Livolsi	HED,B+W	96-Cm-244	F.Mann,R.Benjamin,R.J.Howerton	HED,SRL,LLL
45-Rh-103	R.Schenter,Z.Livolsi	HED,B+W	96-Cm-245	R.W.Benjamin,R.J.Howerton	SRL,LLL
			96-Cm-246	R.Benjamin,R.Howerton,R.Kinsey	SRL,LLL,BNL