WASH-1127
EANDC[US]--120 U
INDC[US]---10 U
INDC-295

Reports to ...

THE AEC NUCLEAR CROSS SECTIONS ADVISORY COMMITTEE

Meeting at

OAK RIDGE NATIONAL LABORATORY
OAK RIDGE, TENNESSEE

April 15-17, 1969

Compiled by ...

M.S. Moore, Secretary, NCSAC
Physics Division

PREFACE

The reports which follow were submitted to the AEC Nuclear Cross Sections Advisory Committee at the meeting held in Oak Ridge, Tennessee on April 15-17, 1969. The reporting laboratories are those which have a substantial effort devoted to the measurement of neutron and nuclear cross sections and other basic data of interest to the applied nuclear energy program of the United States. The reports which have been submitted contain informal statements of recent developments and preliminary data which reflect these interests. Material which may be considered appropriate includes the following:

1. Microscopic neutron cross sections in energy regions corresponding to reactor development or shielding interests, and inverse reactions.

2. Charged particle cross sections, especially as appropriate in the development and testing of nuclear models.

3. Gamma-ray production by nuclear reactions, or radioactive decay, and related theoretical developments concerning nuclear structure.

4. Proton and alpha-particle cross sections at higher energies (up to approximately 1 GeV), of interest to the space program.

In this sense, these reports are not intended to be complete; a number of laboratories, whose research is less programmatically oriented, do not submit reports; and those reports which have been submitted do not cover all the work in the reporting laboratories relating to nuclear cross-section measurements. For the sake of brevity, certain items of general interest appended to the submitted reports have been listed by title in this compilation.

Persons who might make use of these data for serious computations should contact the experimenter directly to ascertain that the data are considered appropriate for such use. The data which appear in these reports should be quoted only by permission of the contributor and should be referenced as such, i.e., a private communication and not by reference to this document.

This compilation has been made almost completely from master copies prepared by the laboratory representatives listed in the Table of Contents. It is a pleasure to acknowledge their contributions.

M. S. Moore
Secretary, NCSAC
Los Alamos Scientific Laboratory
Los Alamos, New Mexico 87544

TABLE OF CONTENTS

Previously submitted Reports to the AEC Nuclear Cross Sections Advisory Committee include the following:

October 1968 Meeting at Columbia University	WASH-1124 EANDC-US-111 U INDC-US-9 U
April 1968 Meeting at Los Alamos, New Mexico	WASH-1093 EANDC-US-105 U INDC-US-2 U
October 1967 Meeting at Idaho Falls, Idaho	WASH-1079 EANDC-US-104 U INDC-US-12 U
April 1967 Meeting at Brookhaven, New York	WASH-1074 EANDC-US-99 U INDC-US-9 U
November 1966 Meeting at Argonne, Illinois	WASH-1071 EANDC-US-91 U INDC-US-5 U
March 1966 Meeting at Washington, D. C.	WASH-1068 EANDC-US-85 U INDC-US-3 U
October 1965 Meeting at Duke University	WASH-1064 EANDC-US-79 U
March 1965 Meeting at National Bureau of Standards	WASH-1056 EANDC-US-72 U
October 1964 Meeting at Oak Ridge National Laboratory	WASH-1053 EANDC-US-70 U
June 1964 Meeting at Columbia University	WASH-1048 EANDC-US-57 U
January 1964 Meeting at Savannah River Laboratory	WASH-1046 EANDC-US-50 U

Summary of measurements described in WASH-1127 pertinent to requests compiled in WASH-1078. For a more nearly complete description of the experimental results which may be of interest to requesters, a CINDA index has been prepared through the efforts of L. T. Whitehead and H. Goldstein, and is found on p. viii.

REQ. NO.	MAT.	XSEC	ENERGY	WASH-1127 PAGE	LAB
1	D-2	DEL	5 MeV - 12 MeV	185	RICE
2	D-2	DEL	3 MeV - 16 MeV	185	RICE
8	He-3	NP	10 keV - 3 MeV	41	GGA
15	Li-6	TOT	Th - 100 keV	5	ANL
32	C-NAT	DEL	7 MeV - 14 MeV	167	ORNL
33	C-NAT	DEL	7 MeV - 14 MeV	167	ORNL
34	C-NAT	DEL	2 MeV - 16 MeV	167	ORNL
36	C-NAT	EM	7 MeV - 16 MeV	167	ORNL
37	C-NAT	GPR	6 MeV - 16 MeV	138	LASL
38	N-NAT	DEL	9 MeV - 15 MeV	189	RICE
39	N-NAT	SIN	8 MeV - 15 MeV	189	RICE
40	N-NAT	GPR	4 MeV - 16 MeV	208	TNC
43	N-NAT	GPR	150 eV - 15 MeV	208	TNC
47	O-NAT	DEL	4 MeV - 16 MeV	189	RICE
48	O-NAT	DEL	10 MeV - 15 MeV	189	RICE
49	O-NAT	DEL	4 MeV - 16 MeV	189	RICE
51	O-NAT	SIN	10 MeV - 15 MeV	189	RICE
58	Na-NAT	SIN	2 MeV - 14 MeV	167	ORNL
59	Na-NAT	RPR	eV - 5 keV	31	COL
61	Al-NAT	DEL	5 MeV - 16 MeV	167	ORNL
62	Al-NAT	SIN	4 MeV - 14 MeV	167	ORNL
63	Al-NAT	SIN	1 MeV - 16 MeV	167	ORNL
65	Al-NAT	GPR	1 MeV - 16 MeV	180	RPI
66	Al-NAT	GPR	150 eV - 15 MeV	180	RPI
67	Si-NAT	DEL	1 MeV - 16 MeV	167	ORNL
68	Si-NAT	SIN	2 MeV - 14 MeV	167	ORNL
69	Si-NAT	SIN	5 MeV - 16 MeV	167	ORNL
71	Si-NAT	GPR	3 MeV - 16 MeV	202	TNC
73	Ca-NAT	TOT	600 keV - 3 MeV	162	ORNL
74	Ca-NAT	EM	3 MeV - 16 MeV	167	ORNL
82	V-NAT	DEL	1 MeV - 14 MeV	1	ANL
83	V-NAT	SIN	MeV - 14 MeV	1, 167	ANL, ORNL
84	V-NAT	NG	1 keV - 150 keV	171	RPI
94	Fe-NAT	DEL	7 MeV - 16 MeV	167	ORNL
95	Fe-NAT	SIN	3 MeV - 16 MeV	167	ORNL
96	Fe-NAT	SIN	4 MeV - 16 MeV	167	ORNL
97	Fe-NAT	SIN	MeV - 10 MeV	167	ORNL
98	Fe-NAT	EM	3 MeV - 16 MeV	167	ORNL
100	Fe-NAT	GPR	eV - 10 MeV	138	LASL
101	Fe-NAT	GPR	4 MeV - 16 MeV	138	LASL

REQ. NO.	MAT.	XSEC	ENERGY	WASH-1127 PAGE	LAB
105	Co-NAT	DEL	1 MeV - 14 MeV	167	ORNL
107	Co-NAT	TOT	132 eV	31	COL
114	Ni-NAT	GPR	eV - 175 keV	180	RPI
122	Y-NAT	DEL	6 MeV - 16 MeV	167	ORNL
124	Zr-NAT	NG	Th - keV	16	BNL
127	Zr-90	DEL	eV - 10 MeV	1	ANL
128	Zr-91	DEL	eV - 10 MeV	1	ANL
129	Zr-92	DEL	eV - 10 MeV	1	ANL
130	Zr-94	DEL	eV - 10 MeV	1	ANL
131	Zr-96	DEL	eV - 10 MeV	1	ANL
135	Zr-91	NG	eV - 10 keV	16, 176	BNL, RPI
137	Zr-91	RPR	eV	16, 176	BNL, RPI
139	Zr-92	NG	eV - 10 keV	176	RPI
142	Zr-94	NG	eV - 10 keV	176	RPI
152	Nb-NAT	NG	1 eV - 10 keV	16	BNL
154	Nb-NAT	GPR	eV - 15 MeV	16	BNL
173	Cs-133	NG	to 1 eV	21	BNL
174	Cs-133	NG	eV	21	BNL
183	Pm-147	NG	to 1 eV	183	RPI
184	Pm-148m	NG	to 1 eV	183	RPI
185	Pm-148m	NG	eV	183	RPI
203	Gd-NAT	DEL	1 MeV - 10 MeV	1	ANL
204	Gd-NAT	SIN	1 MeV - 10 MeV	1	ANL
205	Gd-NAT	NG	100 eV - 200 keV	42	GGA
207	Gd-155	NG	eV	42	GGA
209	Gd-157	NG	eV	42	GGA
219	Hf-NAT	DEL	10 keV - 10 MeV	1	ANL
220	Hf-NAT	SIN	10 keV - 10 MeV	1	ANL
223	Hf-174	NG	eV - 5 keV	182	RPI
224	Hf-176	NG	eV - 5 keV	182	RPI
225	Hf-177	NG	eV - 5 keV	182	RPI
226	Hf-178	NG	eV - 5 keV	182	RPI
227	Hf-179	NG	eV - 5 eV	182	RPI
228	Hf-180	NG	eV - 5 keV	182	RPI
231	W-NAT	GPR	Th - 2 MeV	207	TNC
232	W-NAT	NG	1 keV - 50 keV	176	RPI
233	W-NAT	GPR	150 eV - 15 MeV	176;202,204,207	RPI; TNC
241	Th-NAT	DEL	1 MeV - 5 MeV	2	ANL
242	Th-NAT	SIN	1 MeV - 4 MeV	2	ANL
269	U-234	TOT	Th - 1 keV	165	ORNL
281	U-235	GPR	150 eV - 15 MeV	144	LASL
282	U-235	NG	Th - 30 keV	106	LRL
286	U-235	NF	10 keV - 8 MeV	3, 4	ANL
287	U-235	NF	1 eV - 10 MeV	3, 4	ANL
288	U-235	NF	10 keV - 14 MeV	3, 4	ANL
295	U-235	MIS	Th	4	ANL

REQ. NO.	MAT.	XSEC	ENERGY	WASH-1127 PAGE	LAB
296	U-235	MIS	Th	4	ANL
299	U-236	TOT	Th - 1 keV	60	INC
307	U-238	SIN	1 MeV - 10 MeV	2	ANL
308	U-238	NG	500 eV - 300 keV	3	ANL
309	U-238	NG	300 keV - 10 MeV	3, 207	ANL, TNC
310	U-238	GPR	150 eV - 15 MeV	204, 207	TNC
331	Pu-239	DEL	1 MeV - 7 MeV	2	ANL
332	Pu-239	SIN	keV - 10 MeV	2	ANL
334	Pu-239	NG	500 eV - 150 keV	106	LRL
335	Pu-239	NG	150 keV - 1 MeV	207	TNC
336	Pu-239	NG	1 MeV - 3 MeV	207	TNC
337	Pu-239	RPR	Th - 5 keV	176, 179	RPI
338	Pu-239	GPR	150 eV - 15 MeV	204, 207	TNC
342	Pu-239	NF	500 eV - 100 keV	3	ANL
343	Pu-239	FR	10 keV - 15 MeV	3	ANL
357	Pu-240	NG	1 keV - 3 MeV	172	RPI
358	Pu-240	NG	500 eV - 150 keV	172	RPI
382	Am-243	TOT	Th - 10 keV	60	INC
386	Cm-243	TOT	Th - 10 keV	59	INC
392	Cm-245	TOT	Th - 10 keV	59	INC
395	Cm-246	TOT	Th - 10 keV	59	INC