



JANIS Book

of helion-induced cross-sections

Comparison of evaluated and experimental data from

ENDF/B-VIII.0, TENDL-2017 and EXFOR

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OECD NEA Data Bank

Introduction

This document compares evaluated cross-sections with corresponding experimental data from the EXFOR database for a number of evaluated libraries (Table 1), nuclear reactions and associated reaction products (Table 3). This document was produced using tools based on the NEA Java-based nuclear information software (JANIS) and associated databases; up-to-date plots are available from online JANIS Books [1].

Caveat: When studying plots, please take into account that the energy resolution of experimental data is not always comparable with the resolution of the evaluated data.

Graphical comparison of nuclear data

Experimental data sets are identified by the year and first author of the main reference compiled in EXFOR. The colors give an indication on the publication year, from black/blue for the oldest data to orange/red for the most recent ones (Table 2). All experimental data are plotted on the graph but the legend will ignore all of them if there are more than 20 data sets.

Evaluated data are plotted with full lines for exclusive cross-sections explicitly defined by a MT number, whereas dashed lines indicate residual production cross-sections given in MT5. A star ‘*’ after the name of the library indicates additional operations performed by JANIS, e.g. summation over the ground and metastable yields, reconstruction of residual production cross-sections over the whole energy range.

The data are plotted in log-log scale (on the left hand side) and lin-log scale (on the right hand side). The best representation depends on the Q value of the reaction and/or the magnitude of the variation in the cross-section values.

Table of reactions and Q values

In order to identify individual contributions in residual production cross-sections, reactions leading to the same product are listed along with their associated Q values. The latter are calculated using mass excess from the NUBASE2012 evaluation of nuclear properties [2].

Navigation in this document

The data are sorted by element, then by isotope and finally by reaction. In order to facilitate access to the information, two navigation modes are available in addition to the usual bookmark. At the top of each page, on the first row, the previous (<<) and next (>>) “Isotope links” allow the reader to move from one isotope to another while staying on the same MT reaction. On the second row, the “MT links” allow scanning all reactions of a given isotope. The latter navigation mode is actually similar to the use of the page up and page down keys.

References

- [1] N. Soppera *et al.*, *Nuclear Data Sheets* 120 (2014), 294. See also www.oecd-nea.org/janis.
- [2] G. Audi, *et al.*, *Chinese Physics C*, 36 (12), 1157–1286, 2012.

Table 1: list of databases used in the inter-comparison

Library	Release date
ENDF/B-VIII.0	February 2018
TENDL-2017	December 2017
EXFOR	April 2018

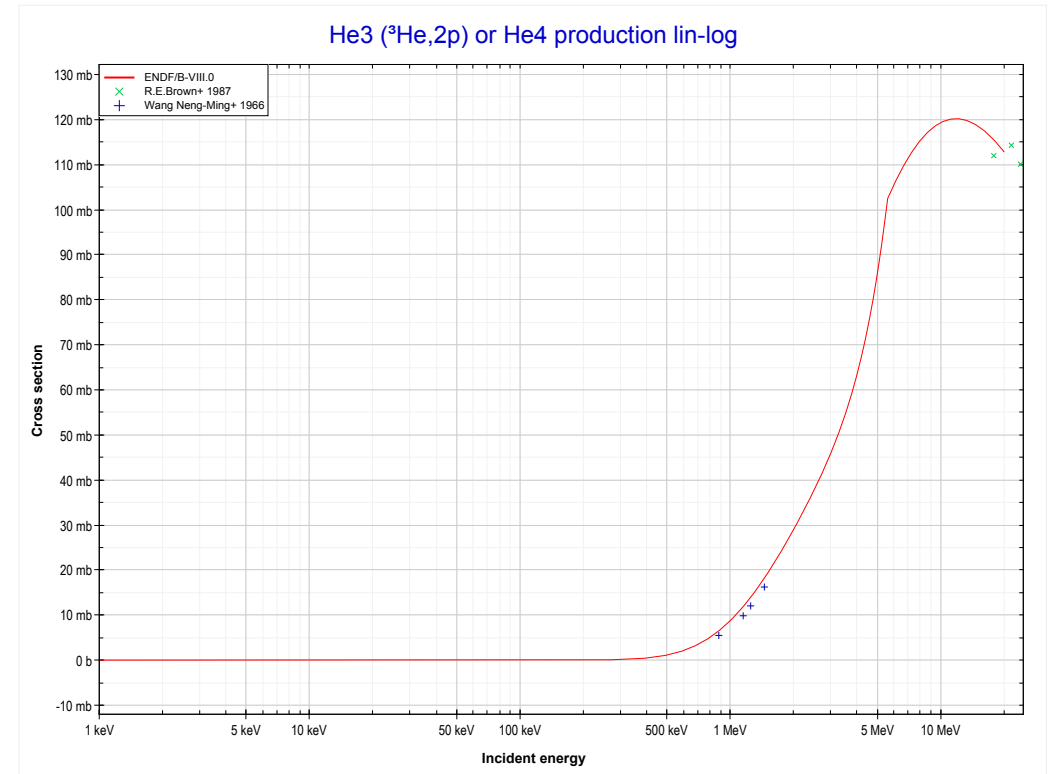
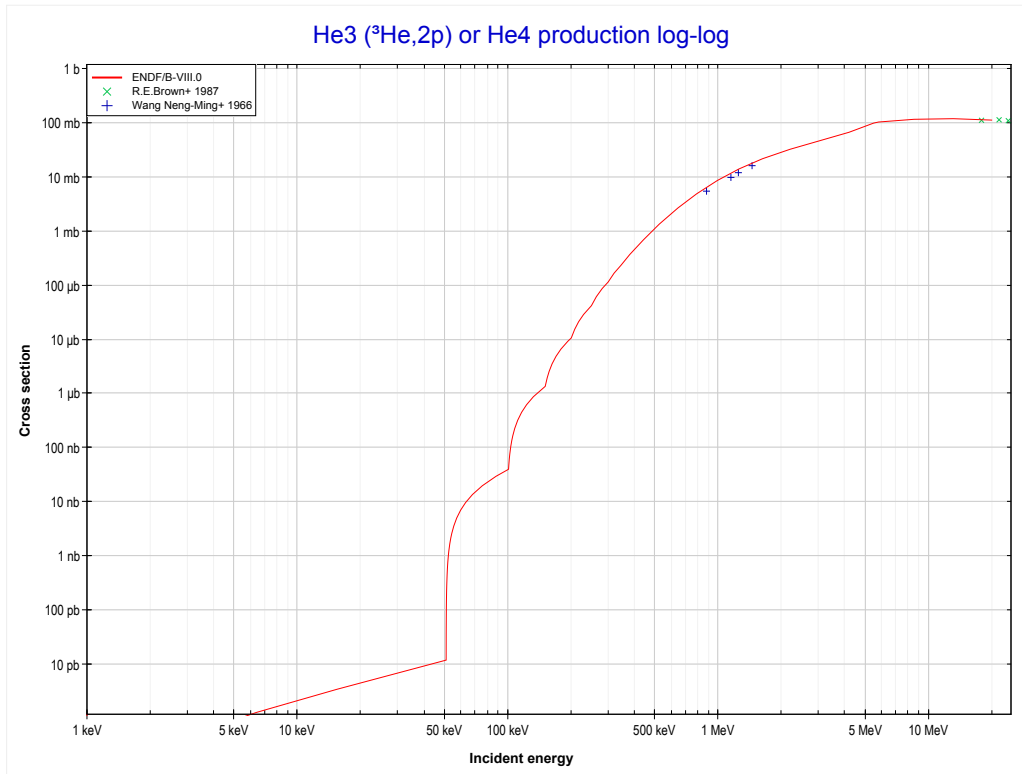
Table 2: experimental data sets color code

Color	Publication year
red	2005 ≤ year
orange	2000 ≤ year < 2005
light orange	1995 ≤ year < 2000
khaki	1990 ≤ year < 1995
light green	1985 ≤ year < 1990
green	1980 ≤ year < 1985
light blue	1970 ≤ year < 1980
dark blue	1960 ≤ year < 1970
black	year < 1960

Table 3: list of exclusive reactions used in the inter-comparison

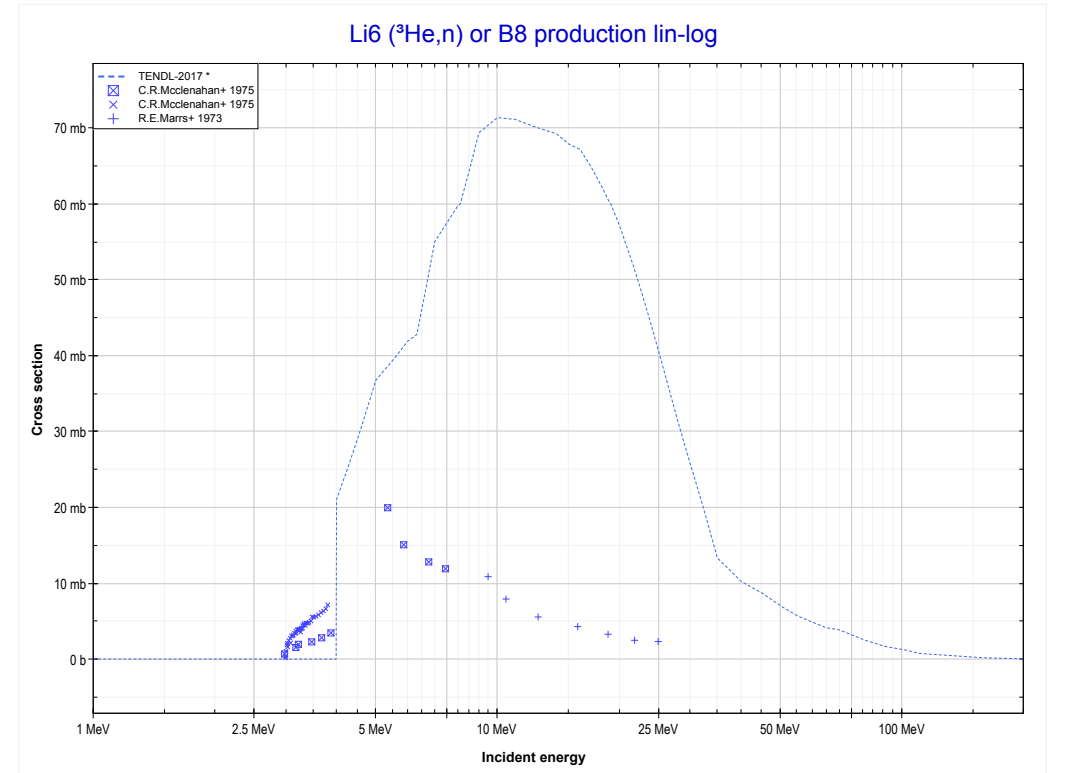
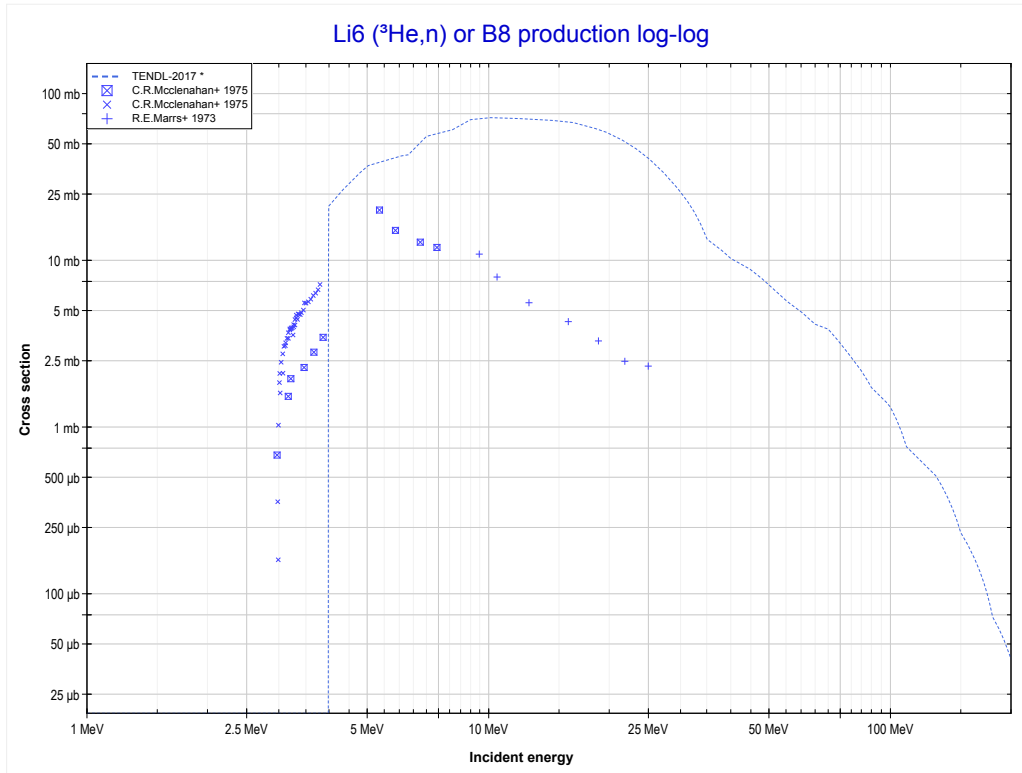
MT	Reaction	MT	Reaction	MT	Reaction	MT	Reaction
4	n	102	gamma	159	2n+p+a	181	3n+p+a
11	2n+d	103	p	160	7n	182	d+t
16	2n	104	d	161	8n	183	n+p+d
17	3n	105	t	162	5n+p	184	n+p+t
18	fission	106	h	163	6n+p	185	n+d+t
22	n+a	107	a	164	7n+p	186	n+p+h
23	n+3a	108	2a	165	4n+a	187	n+d+h
24	2n+a	109	3a	166	5n+a	188	n+t+h
25	3n+a	111	2p	167	6n+a	189	n+t+a
28	n+p	112	p+a	168	7n+a	190	2n+2p
29	n+2a	113	t+2a	169	4n+d	191	p+h
30	2n+2a	114	d+2a	170	5n+d	192	d+h
32	n+d	115	p+d	171	6n+d	193	h+a
33	n+t	116	p+t	172	3n+t	194	4n+2p
34	n+h	117	d+a	173	4n+t	195	4n+2a
35	n+d+2a	152	5n	174	5n+t	196	4n+p+a
36	n+t+2a	153	6n	175	6n+t	197	3p
37	4n	154	2n+t	176	2n+h	198	n+3p
41	2n+p	155	t+a	177	3n+h	199	3n+2p+a
42	3n+p	156	4n+p	178	4n+h	200	5n+2p
44	n+2p	157	3n+d	179	3n+2p		
45	n+p+a	158	n+d+a	180	3n+2a		

	2-He-3	13-Al-27 >>
	MT111 (³He,2p) or MT5 (He4 production)	3-Li-6 MT4 (³He,n) >>



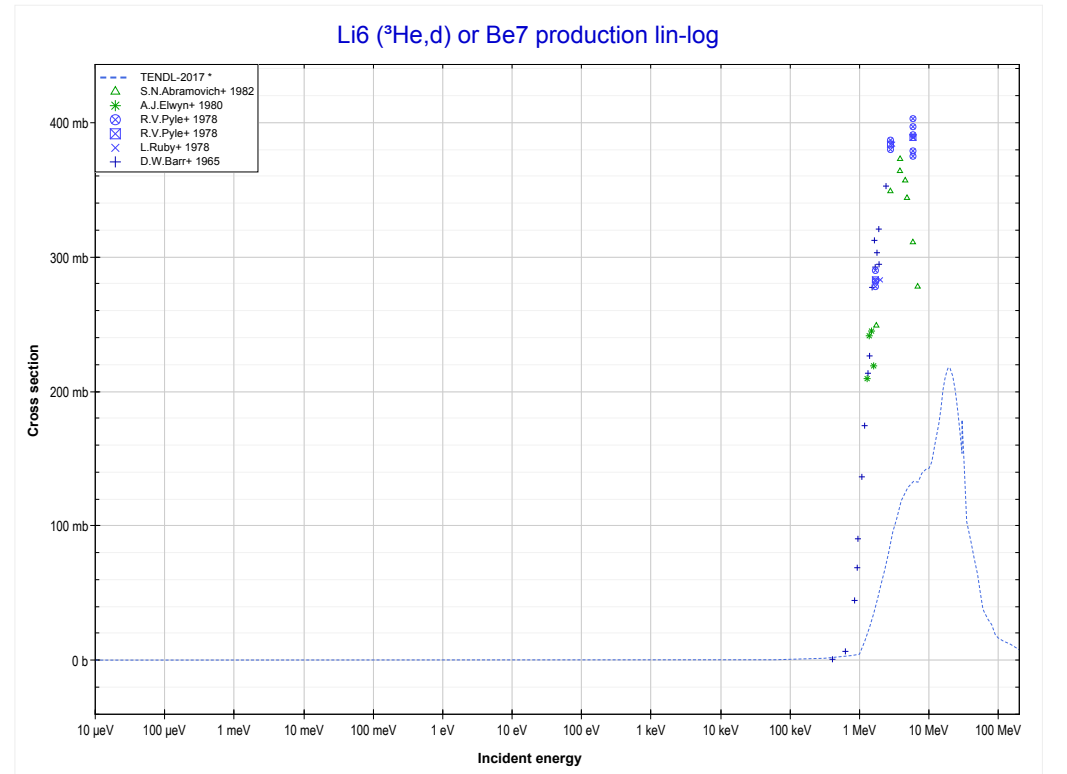
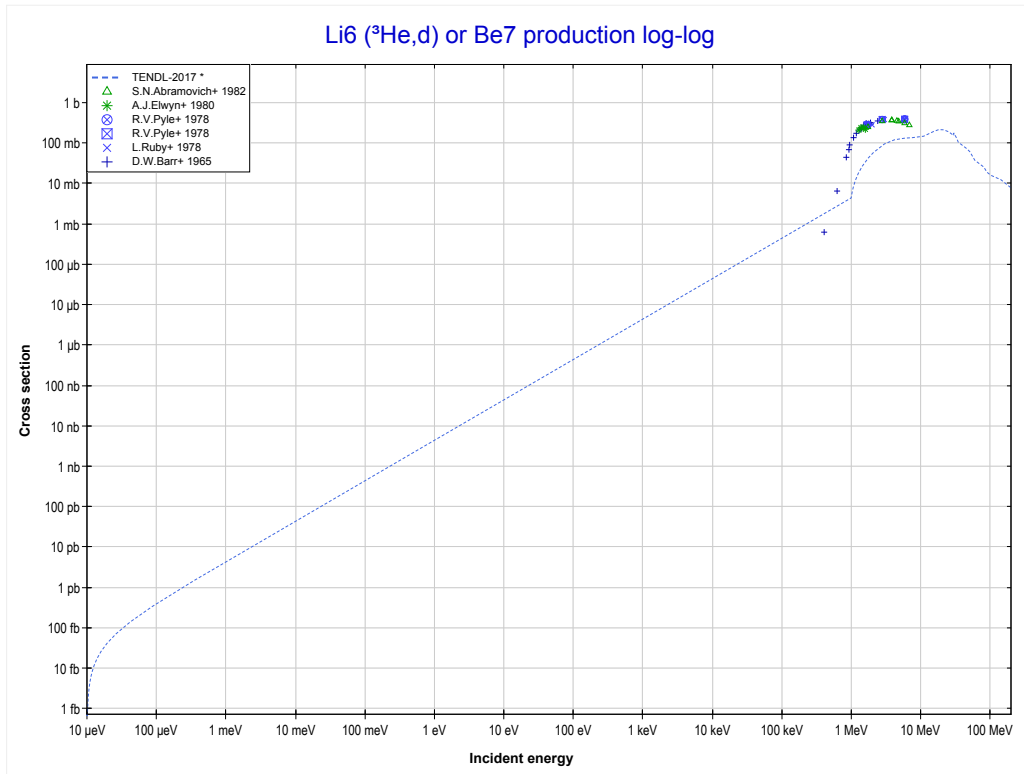
Reaction	Q-Value
He3(He3,2p)He4	12859.57 keV

	3-Li-6	4-Be-9 >>
<< 2-He-3 MT111 (³ He,2p)	MT4 (³He,n) or MT5 (B8 production)	MT104 (³ He,d) >>



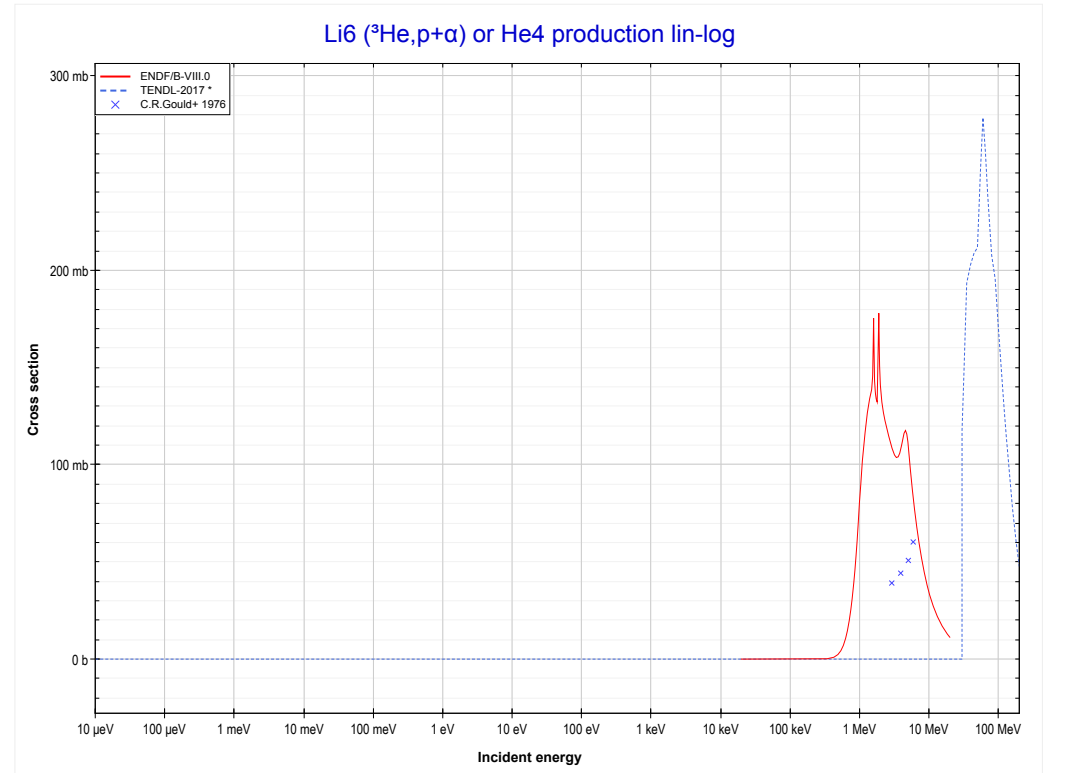
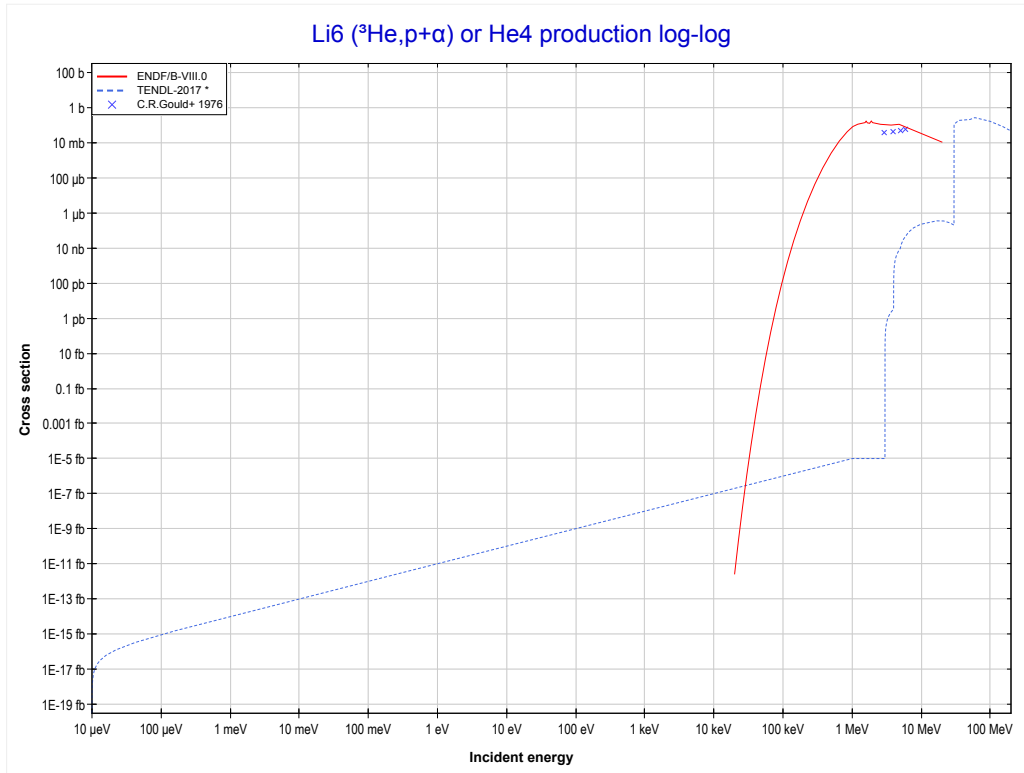
Reaction	Q-Value
Li6(He3,n)B8	-1974.82 keV

	3-Li-6	5-B-10 >>
<< MT4 (³He,n)	MT104 (³He,d) or MT5 (Be7 production)	MT112 (³He,p+α) >>



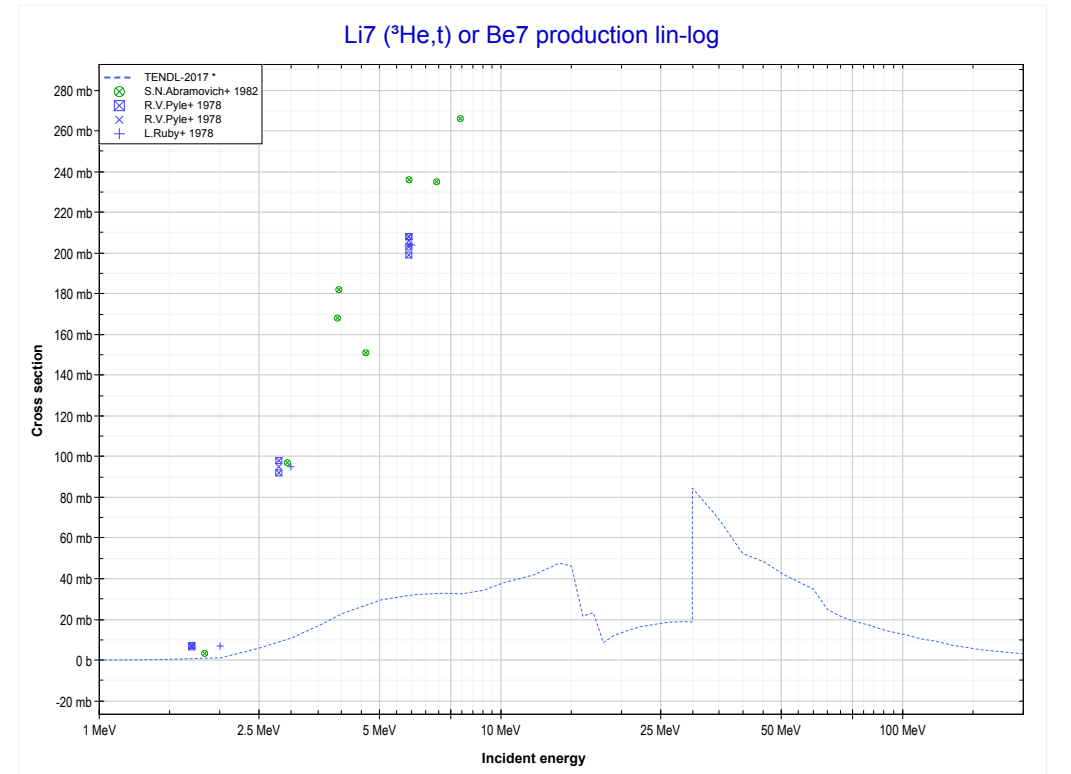
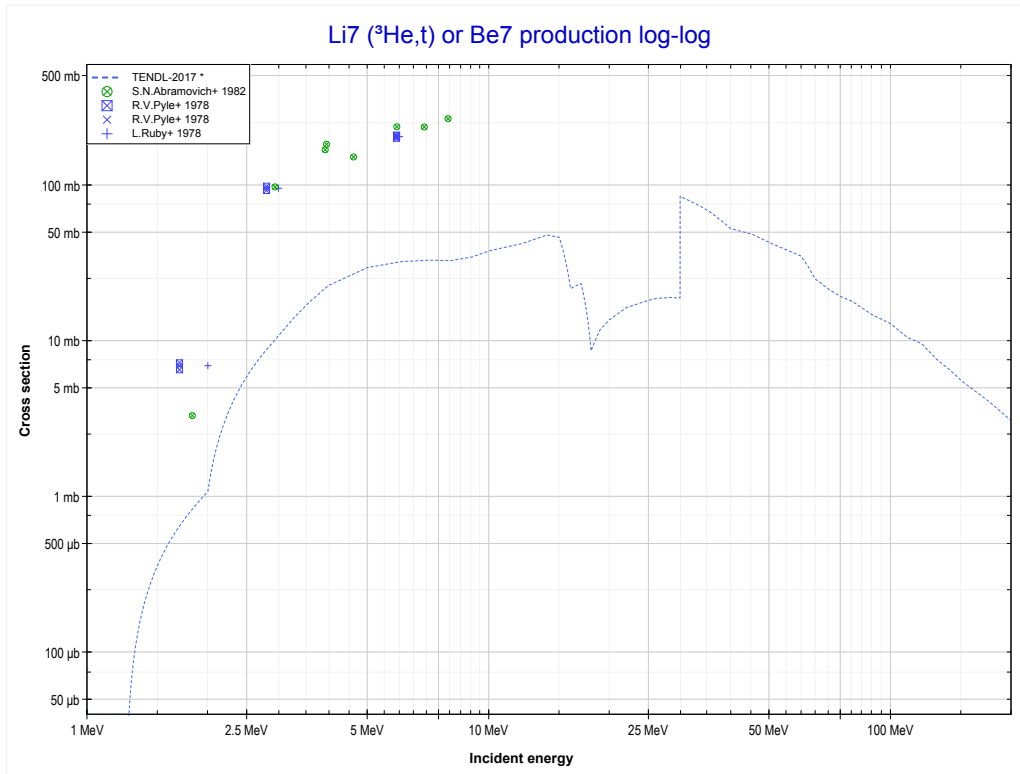
Reaction	Q-Value
Li6(He3,d)Be7	113.37 keV
Li6(He3,n+p)Be7	-2111.19 keV

	3-Li-6	44-Ru-101 >>
<< MT104 (³ He,d)	MT112 (³He,p+α) or MT5 (He4 production)	3-Li-7 MT105 (³ He,t) >>



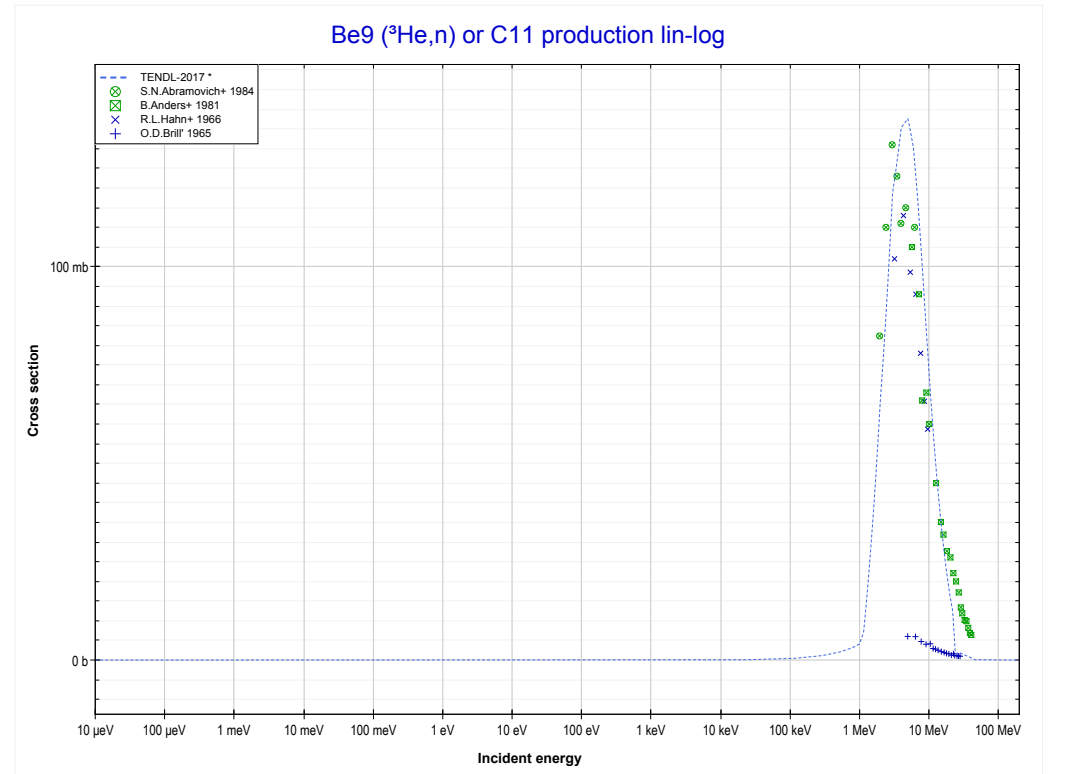
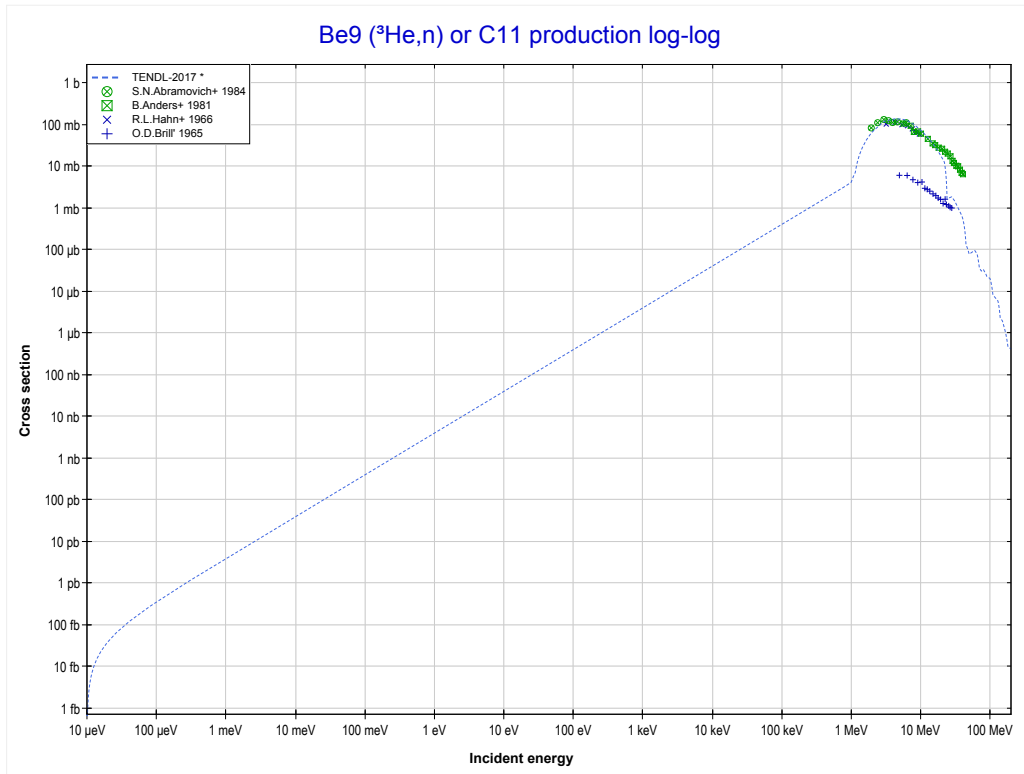
Reaction	Q-Value
Li6(He3,p+α)He4	16879.29 keV
Li6(He3,d+He3)He4	-1473.76 keV
Li6(He3,2p+t)He4	-2934.57 keV
Li6(He3,n+p+He3)He4	-3698.32 keV
Li6(He3,p+2d)He4	-6967.24 keV
Li6(He3,n+2p+d)He4	-9191.80 keV
Li6(He3,2n+3p)He4	-11416.37 keV

	3-Li-7	5-B-10 >>
<< 3-Li-6 MT112 (³ He,p+α)	MT105 (³He,t) or MT5 (Be7 production)	4-Be-9 MT4 (³He,n) >>



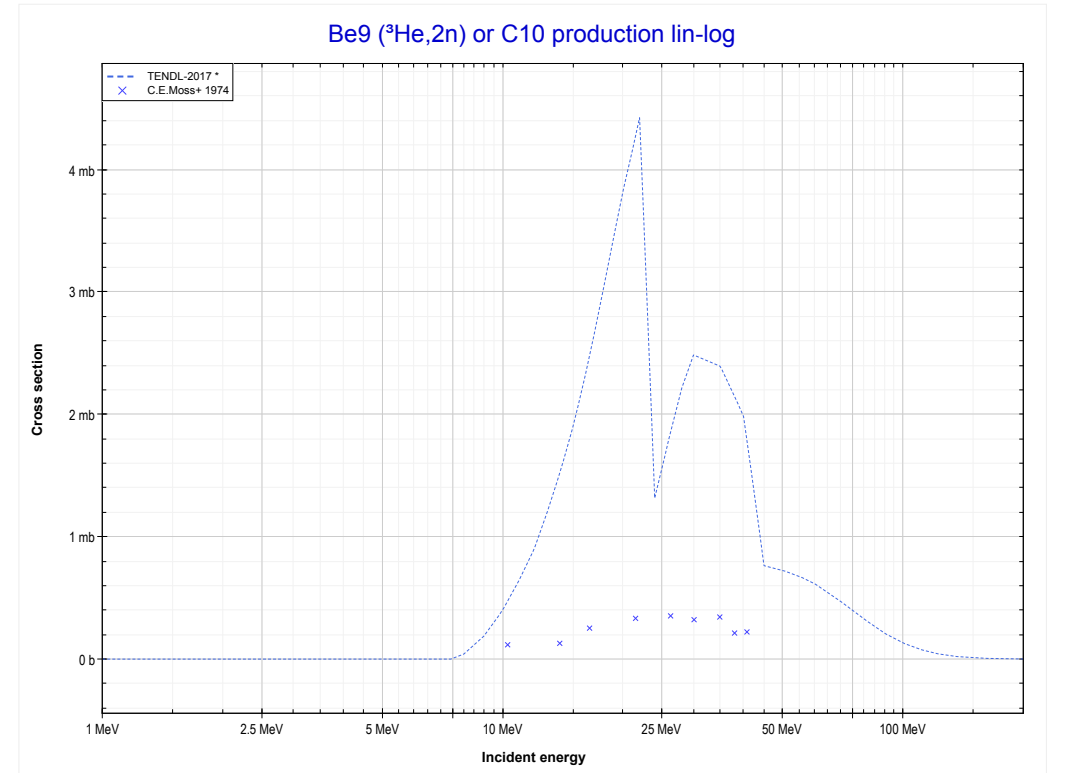
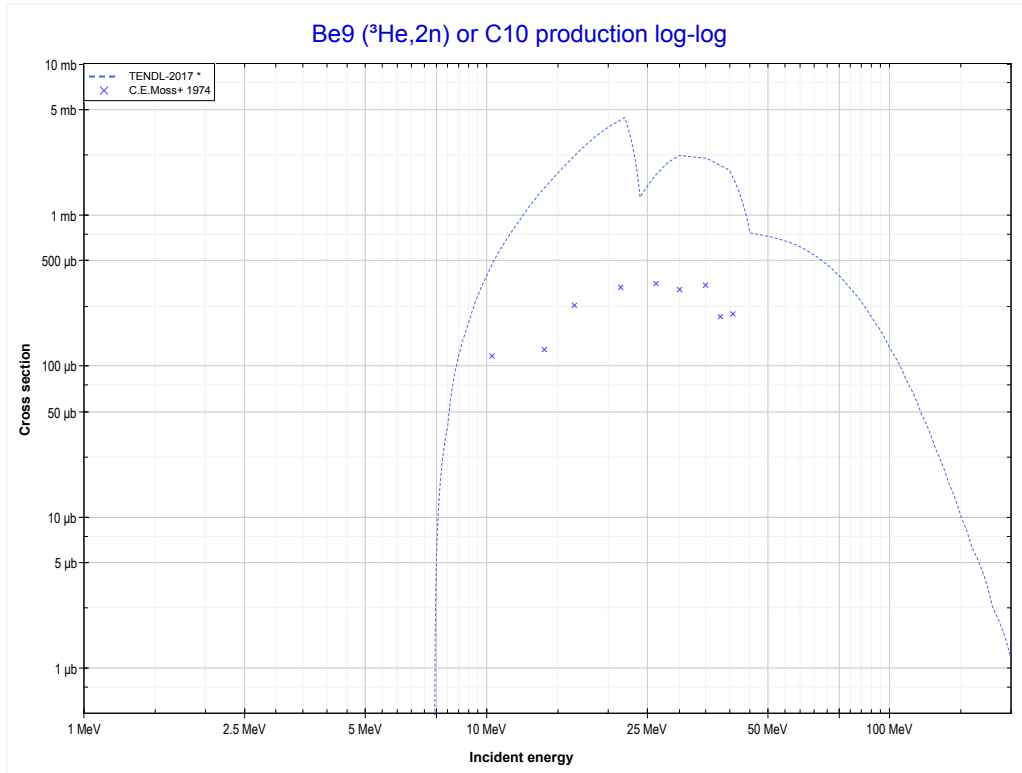
Reaction	Q-Value
Li7(He3,t)Be7	-880.49 keV
Li7(He3,n+d)Be7	-7137.72 keV
Li7(He3,2n+p)Be7	-9362.28 keV

<< 3-Li-6	4-Be-9	5-B-10 >>
<< 3-Li-7 MT105 (³ He,t)	MT4 (³He,n) or MT5 (C11 production)	MT16 (³ He,2n) >>



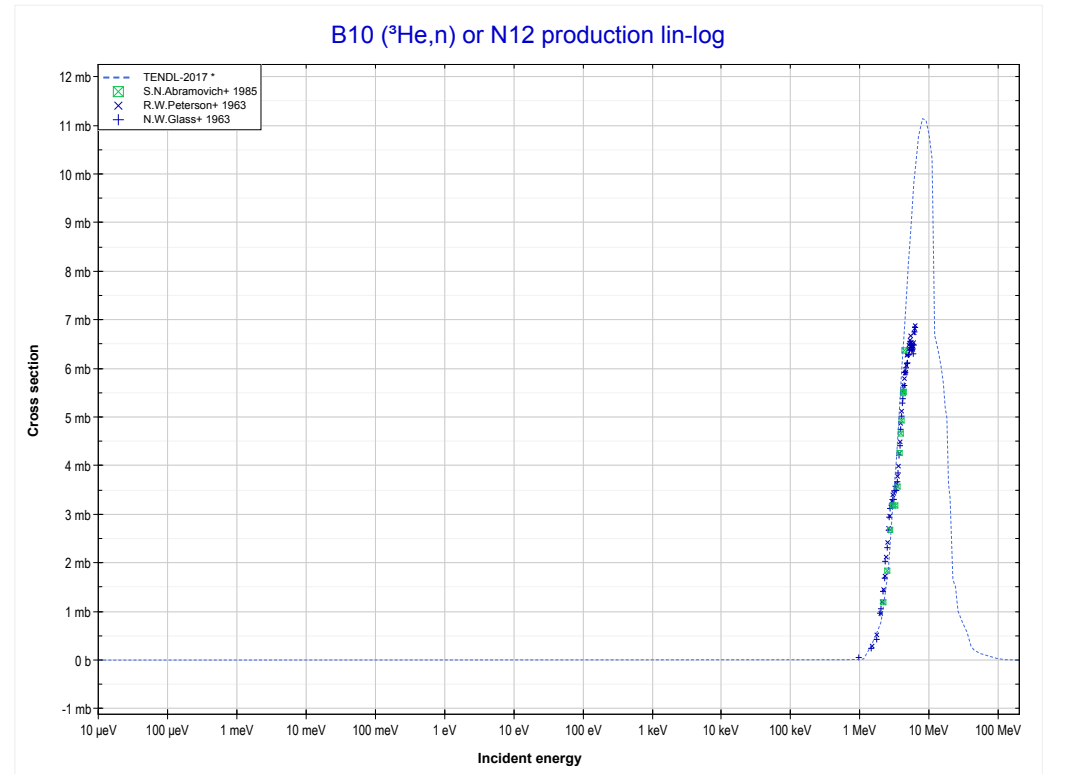
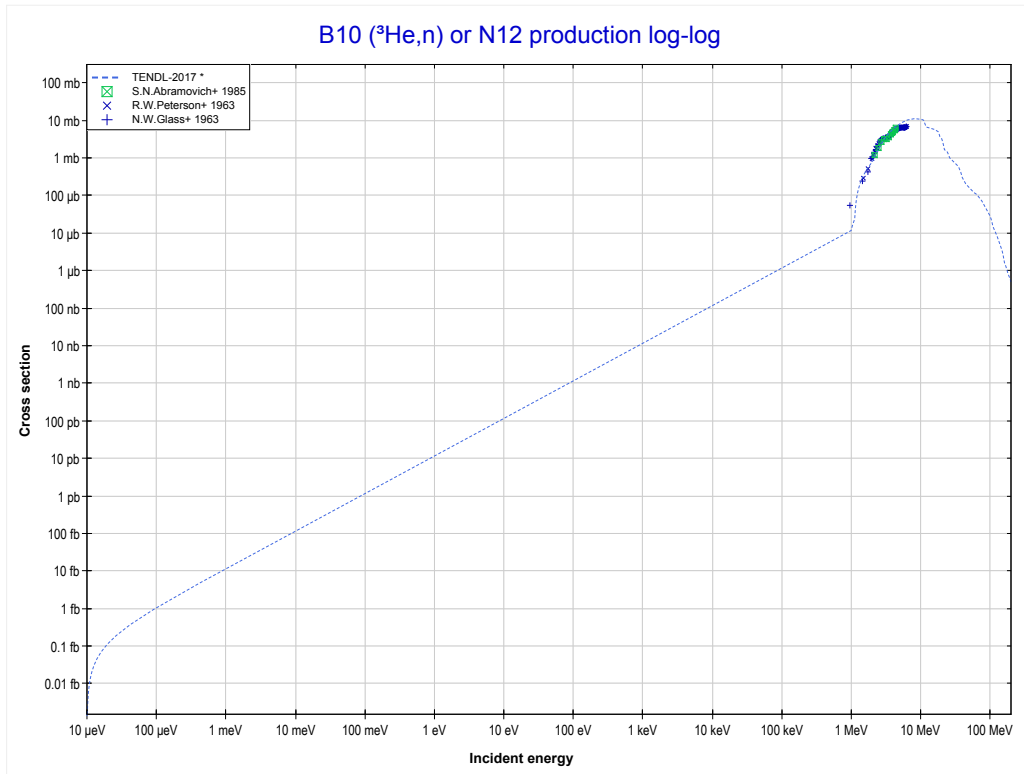
Reaction	Q-Value
Be9(He3,n)C11	7558.05 keV

	4-Be-9	12-Mg-24 >>
<< MT4 (³He,n)	MT16 (³He,2n) or MT5 (C10 production)	5-B-10 MT4 (³He,n) >>



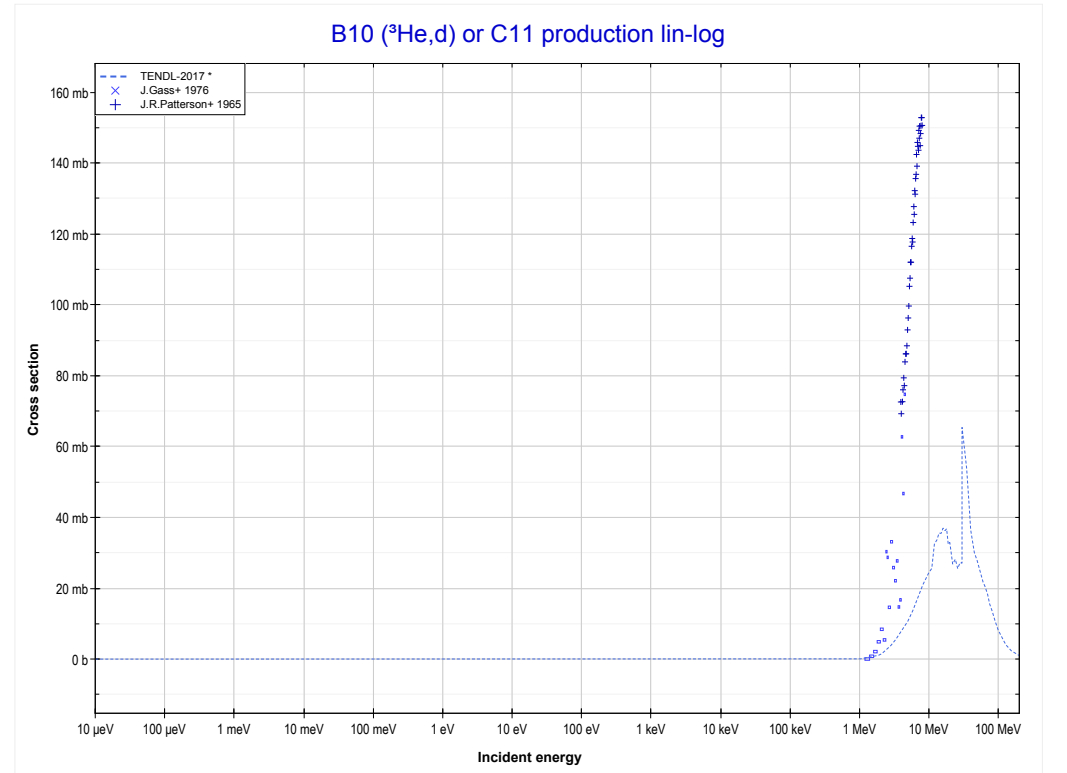
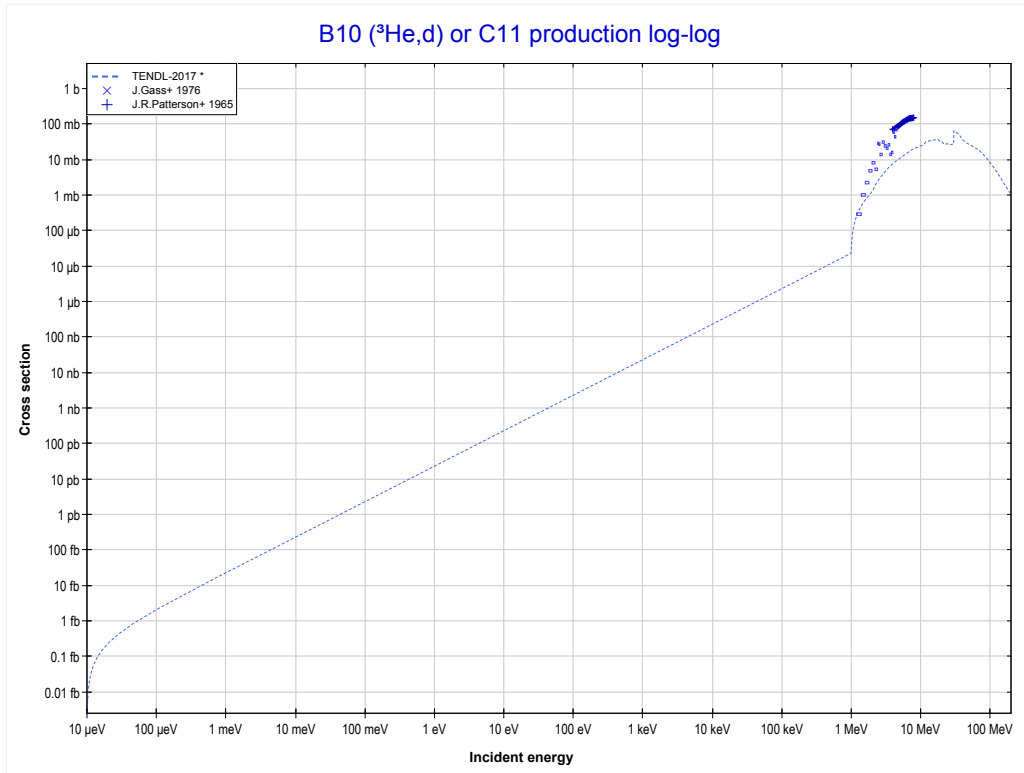
Reaction	Q-Value
Be9(He3,2n)C10	-5561.77 keV

<< 4-Be-9	5-B-10	6-C-12 >>
<< 4-Be-9 MT16 (³ He,2n)	MT4 (³He,n) or MT5 (N12 production)	MT104 (³ He,d) >>



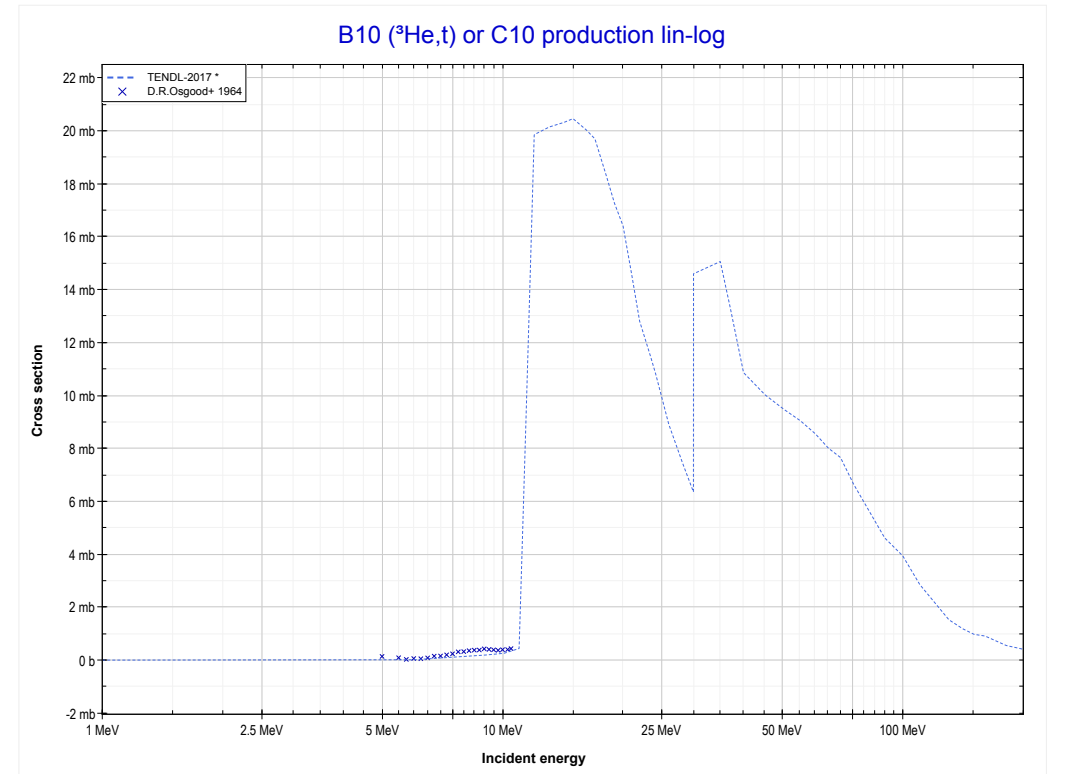
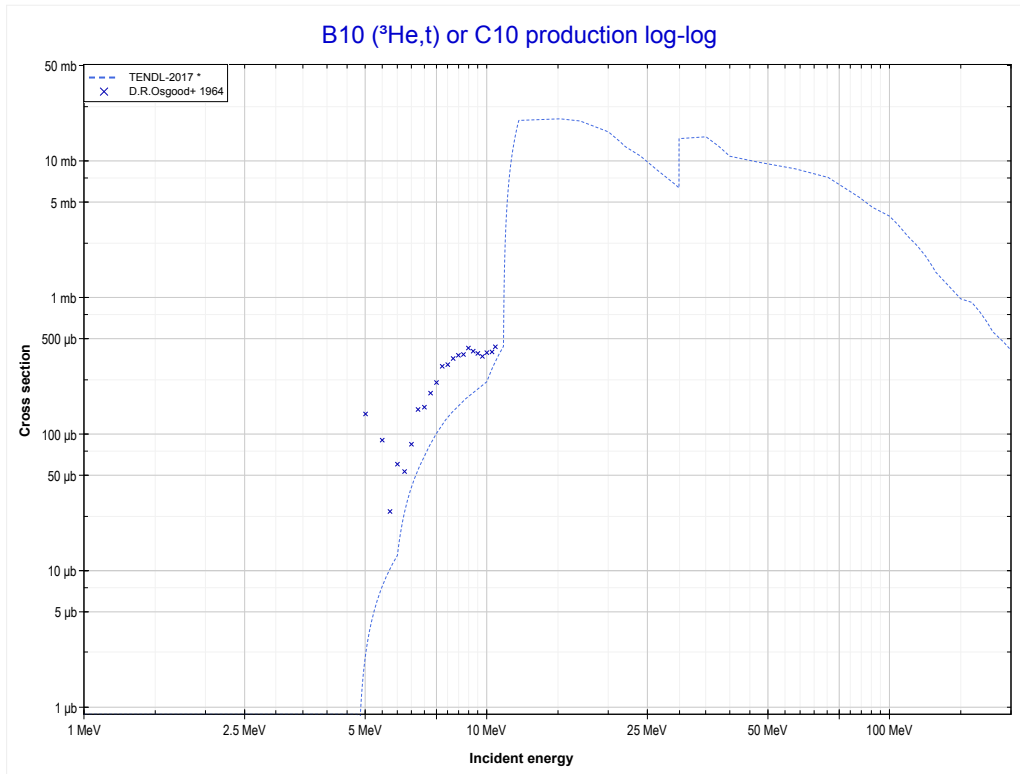
Reaction	Q-Value
B10(He3,n)N12	1572.50 keV

<< 3-Li-6	5-B-10	6-C-12 >>
<< MT4 (³ He,n)	MT104 (³He,d) or MT5 (C11 production)	MT105 (³ He,t) >>



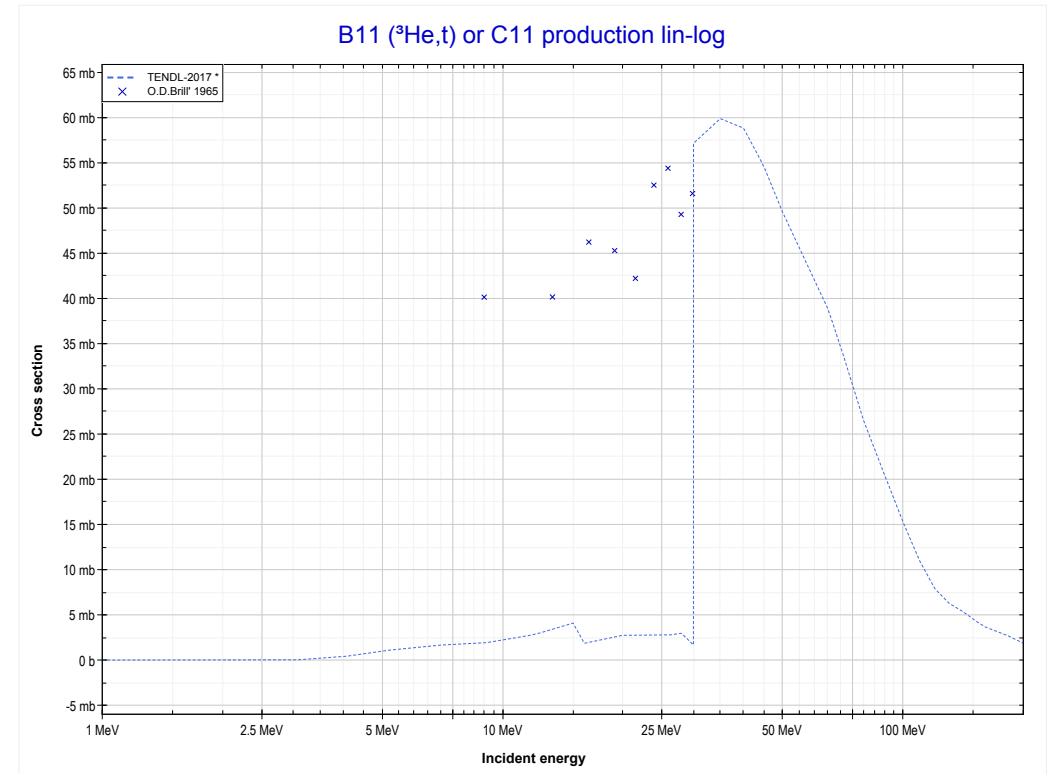
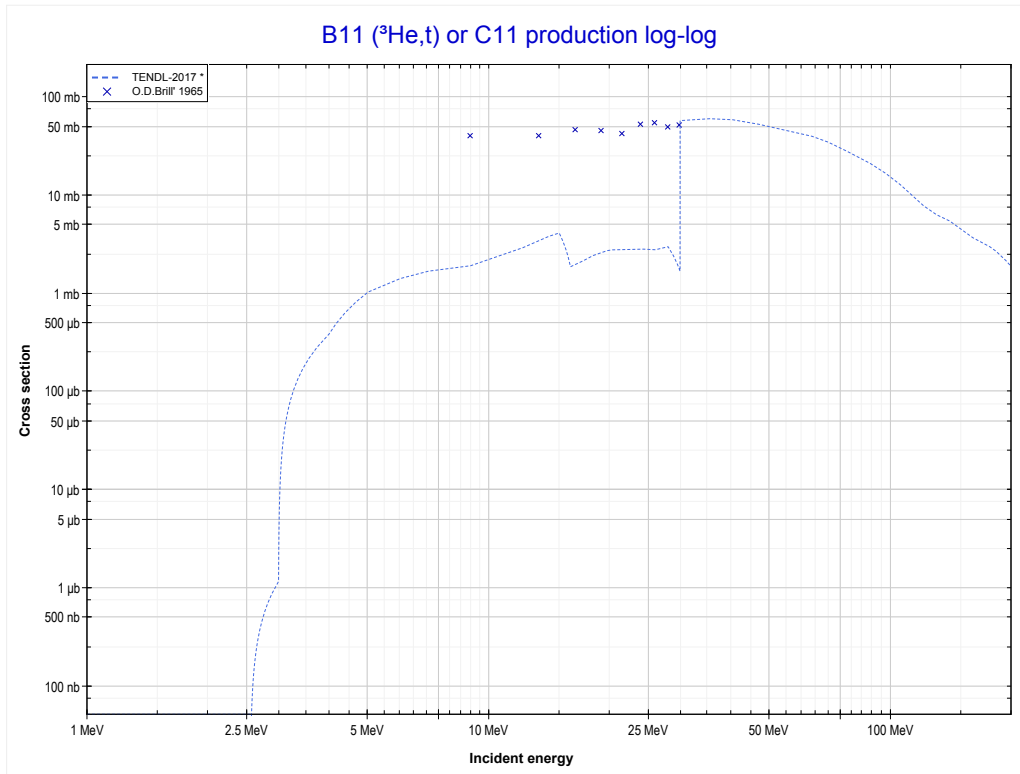
Reaction	Q-Value
B10(He3,d)C11	3195.89 keV
B10(He3,n+p)C11	971.33 keV

<< 3-Li-7	5-B-10	5-B-11 >>
<< MT104 (³ He,d)	MT105 (³He,t) or MT5 (C10 production)	5-B-11 MT105 (³ He,t) >>



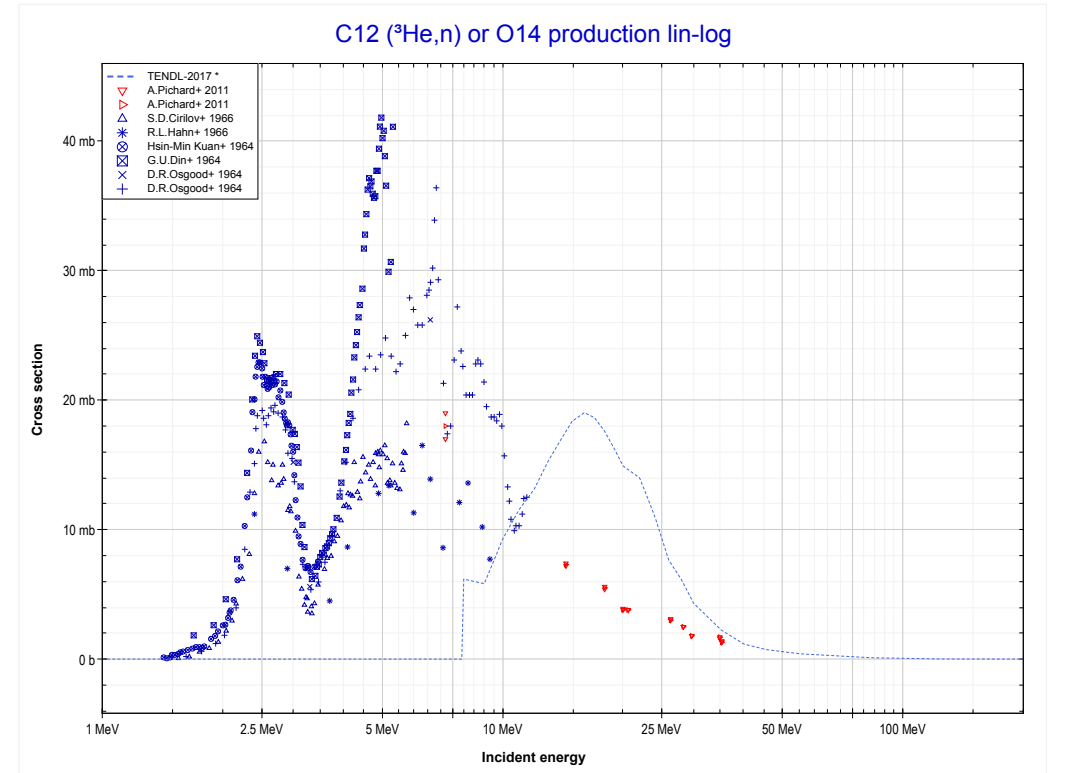
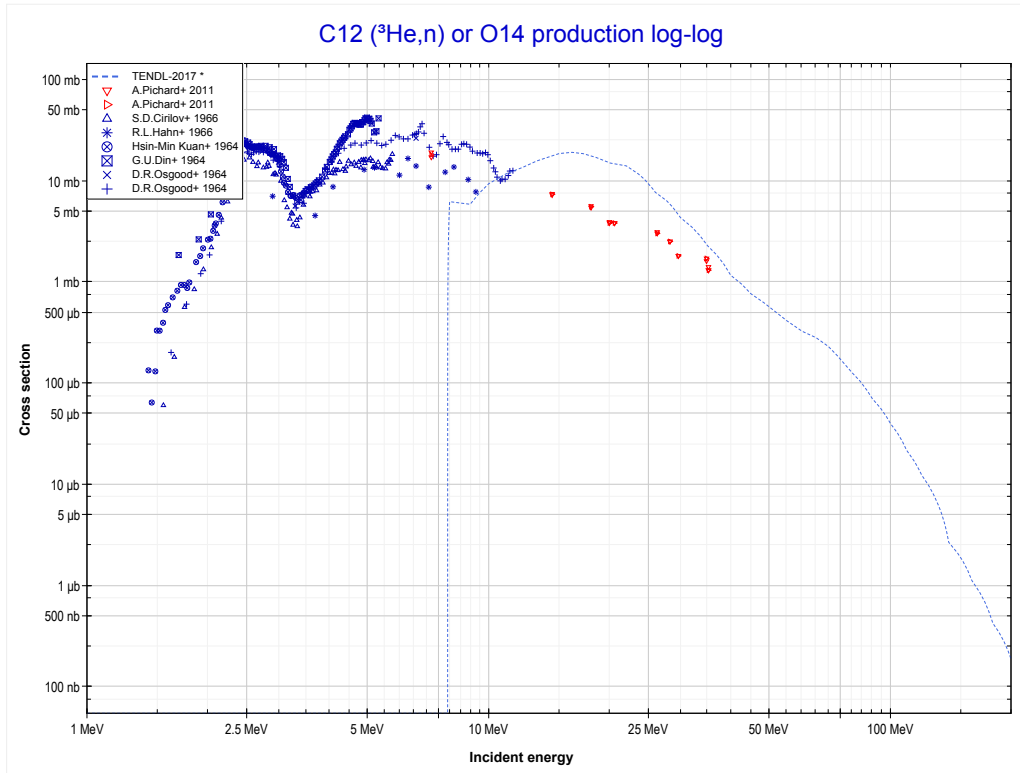
Reaction	Q-Value
B10(He3,t)C10	-3666.69 keV
B10(He3,n+d)C10	-9923.92 keV
B10(He3,2n+p)C10	-12148.49 keV

<< 5-B-10	5-B-11	
<< 5-B-10 MT105 (³ He,t)	MT105 (³He,t) or MT5 (C11 production)	6-C-12 MT4 (³ He,n) >>



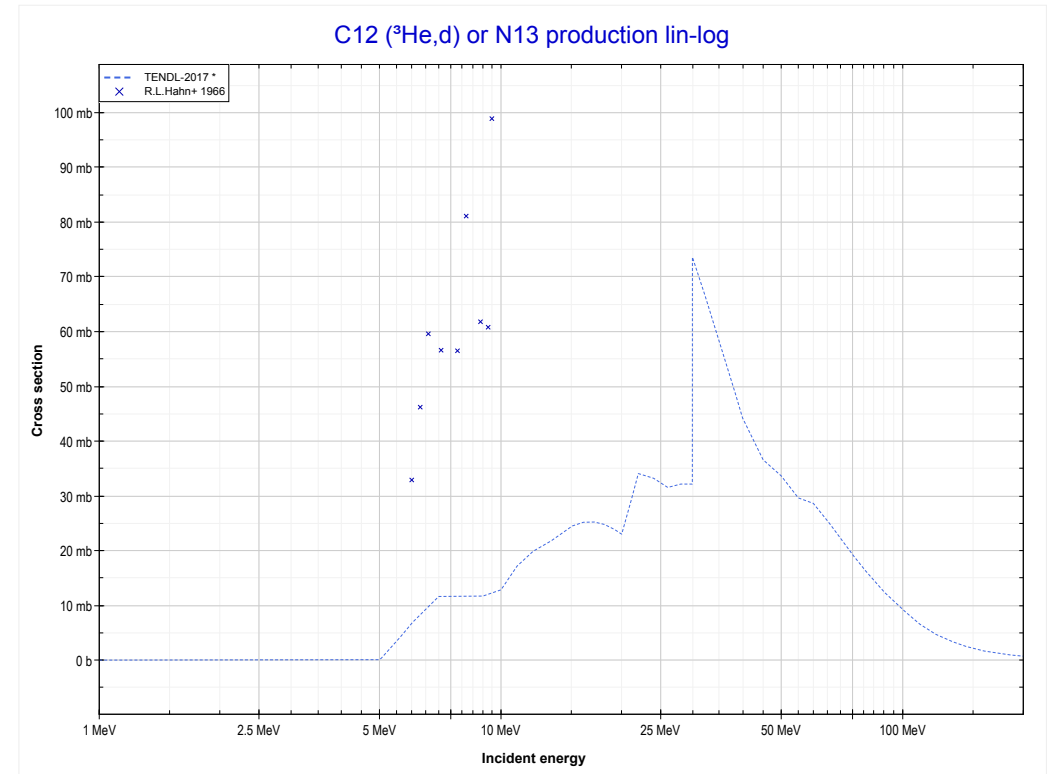
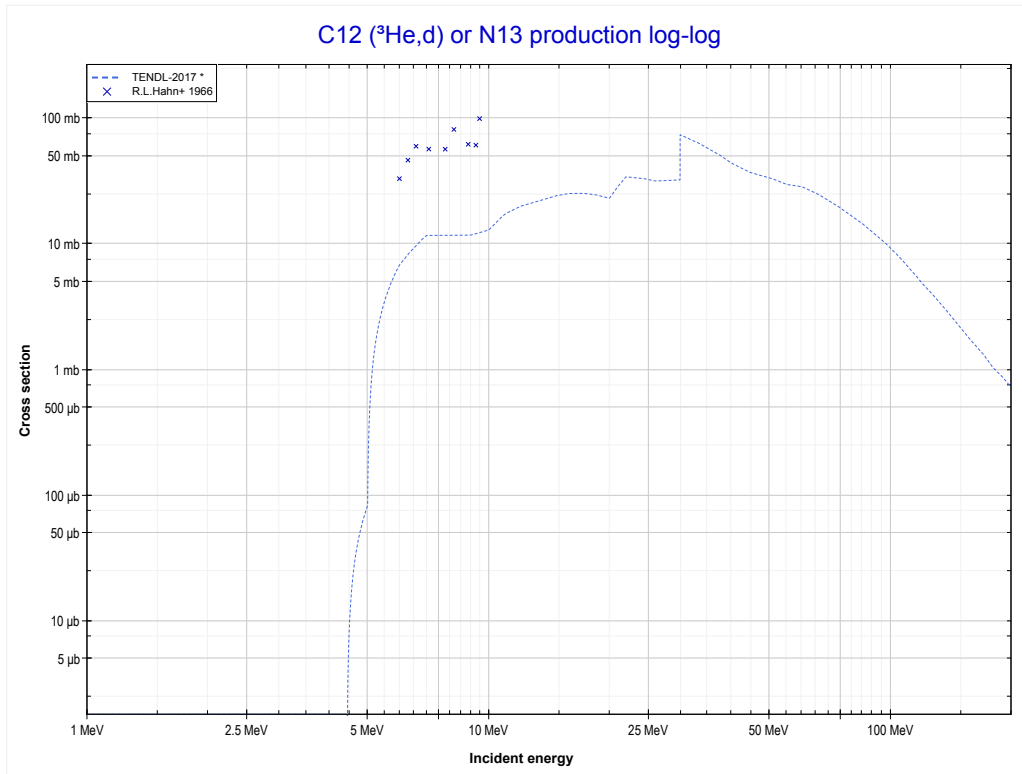
Reaction	Q-Value
B11(He3,t)C11	-2000.99 keV
B11(He3,n+d)C11	-8258.22 keV
B11(He3,2n+p)C11	-10482.79 keV

<< 5-B-10	6-C-12	12-Mg-24 >>
<< 5-B-11 MT105 (³ He,t)	MT4 (³He,n) or MT5 (O14 production)	MT104 (³ He,d) >>



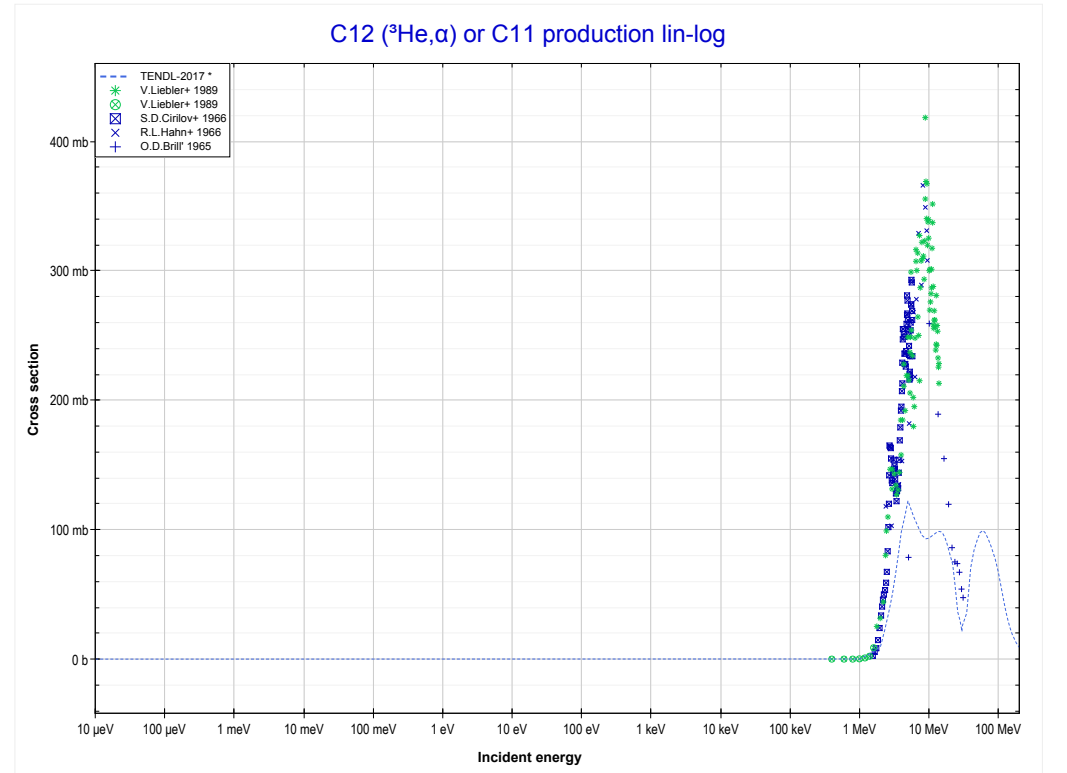
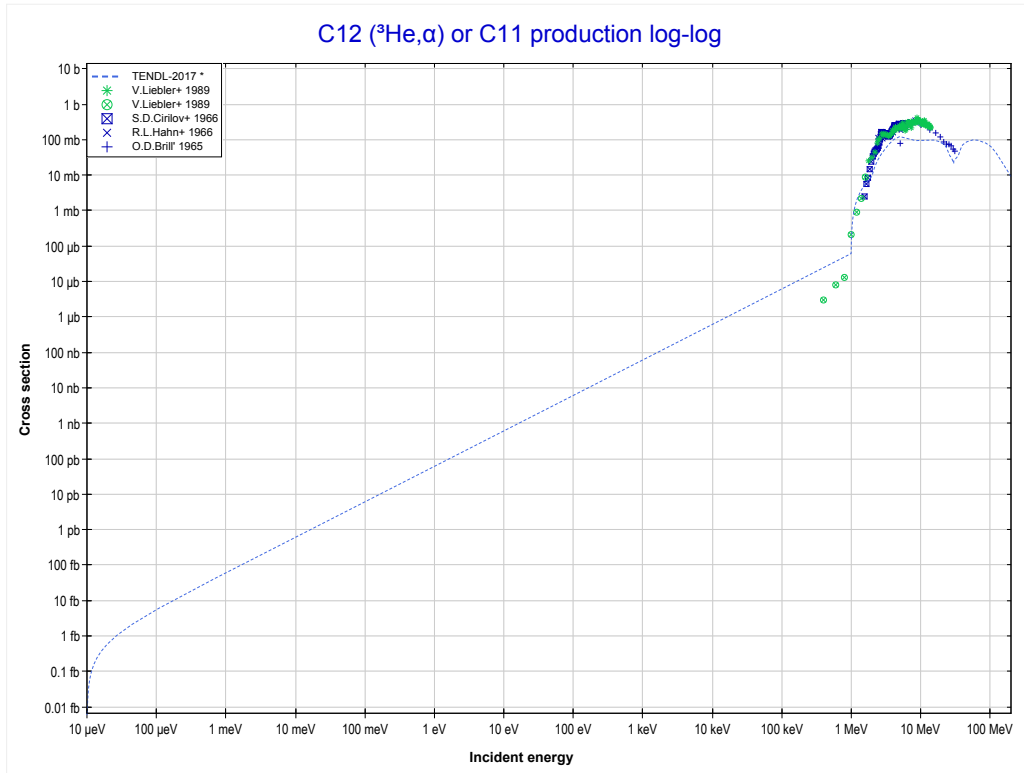
Reaction	Q-Value
C12(He3,n)O14	-1147.56 keV

<< 5-B-10	6-C-12	
<< MT4 (³ He,n)	MT104 (³He,d) or MT5 (N13 production)	MT107 (³ He,α) >>



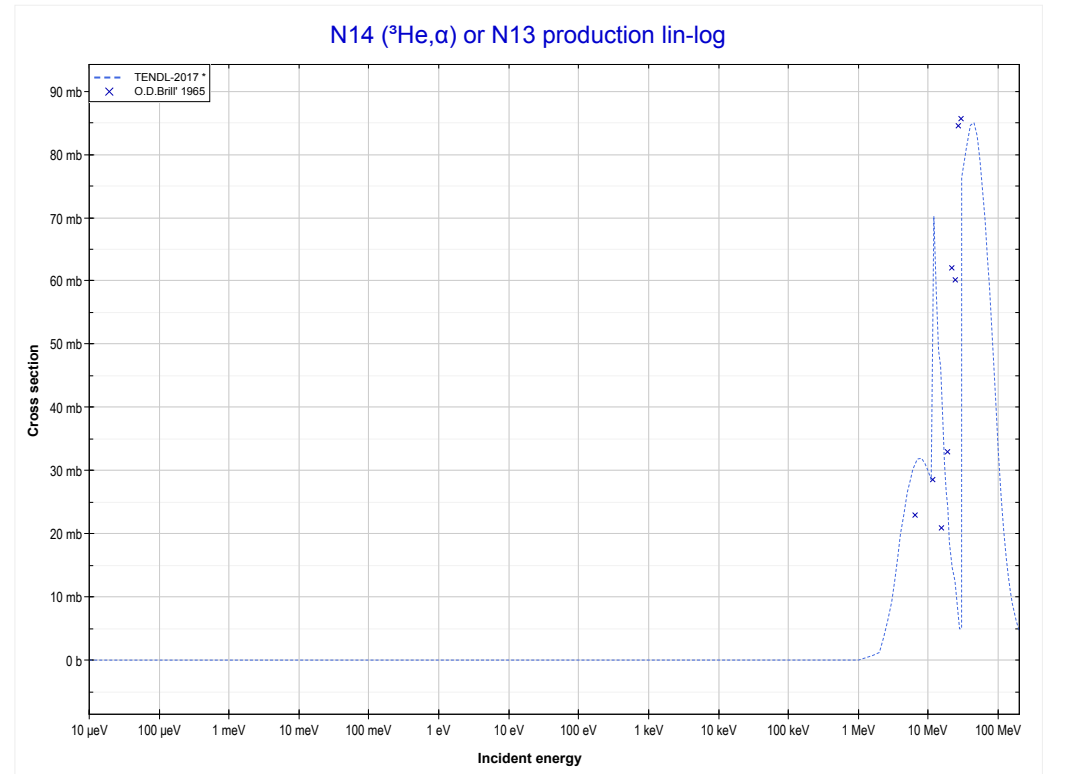
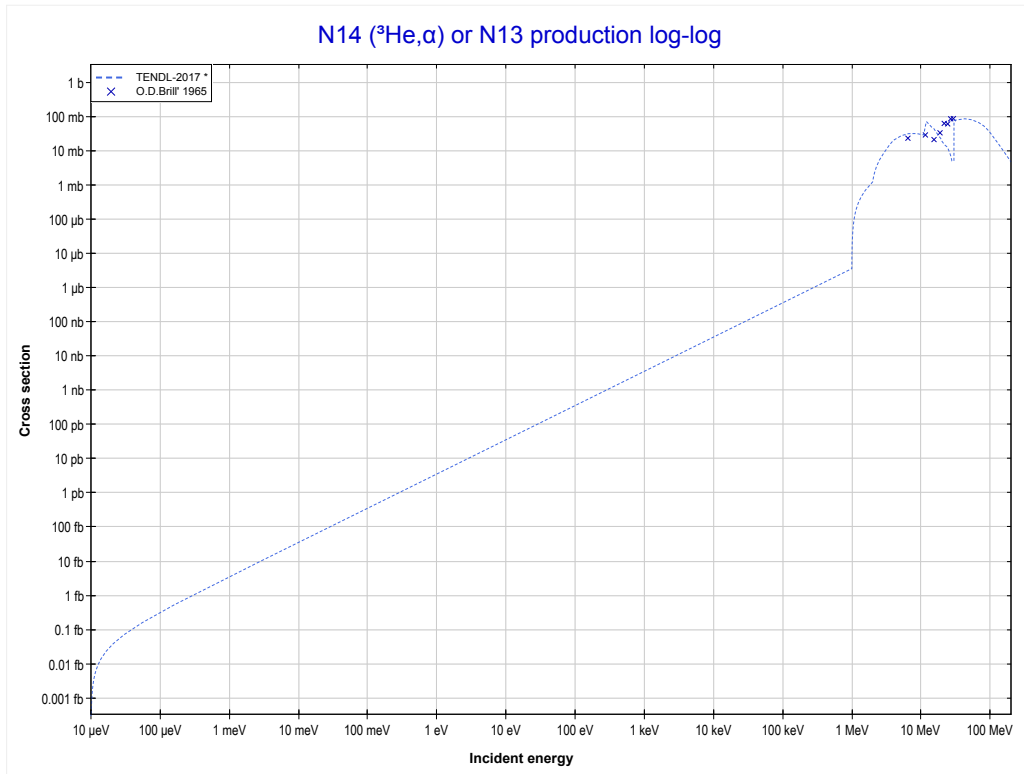
Reaction	Q-Value
C12(He3,d)N13	-3549.99 keV
C12(He3,n+p)N13	-5774.55 keV

	6-C-12	7-N-14 >>
<< MT104 (³ He,d)	MT107 (³He,α) or MT5 (C11 production)	7-N-14 MT107 (³ He,α) >>



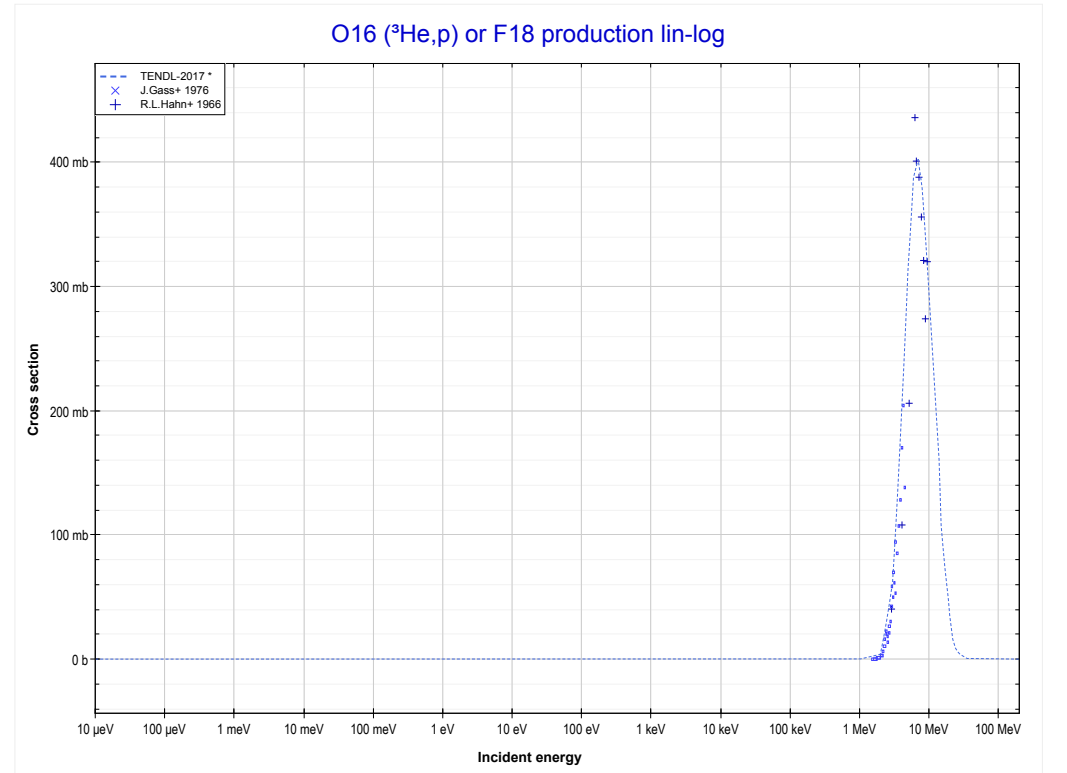
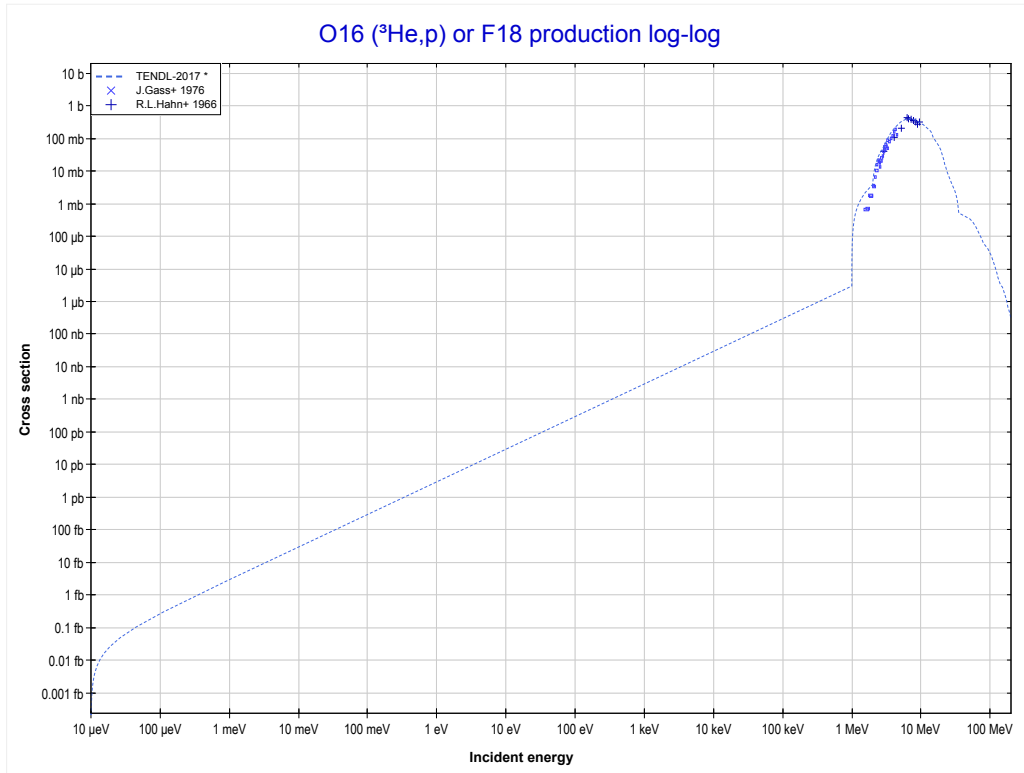
Reaction	Q-Value
C12(He3,α)C11	1856.00 keV
C12(He3,p+t)C11	-17957.86 keV
C12(He3,n+He3)C11	-18721.62 keV
C12(He3,2d)C11	-21990.53 keV
C12(He3,n+p+d)C11	-24215.09 keV
C12(He3,2n+2p)C11	-26439.66 keV

<< 6-C-12	7-N-14	8-O-16 >>
<< 6-C-12 MT107 (³ He,α)	MT107 (³He,α) or MT5 (N13 production)	8-O-16 MT103 (³ He,p) >>



Reaction	Q-Value
N14(He3,α)N13	10024.24 keV
N14(He3,p+t)N13	-9789.62 keV
N14(He3,n+He3)N13	-10553.38 keV
N14(He3,2d)N13	-13822.29 keV
N14(He3,n+p+d)N13	-16046.86 keV
N14(He3,2n+2p)N13	-18271.42 keV

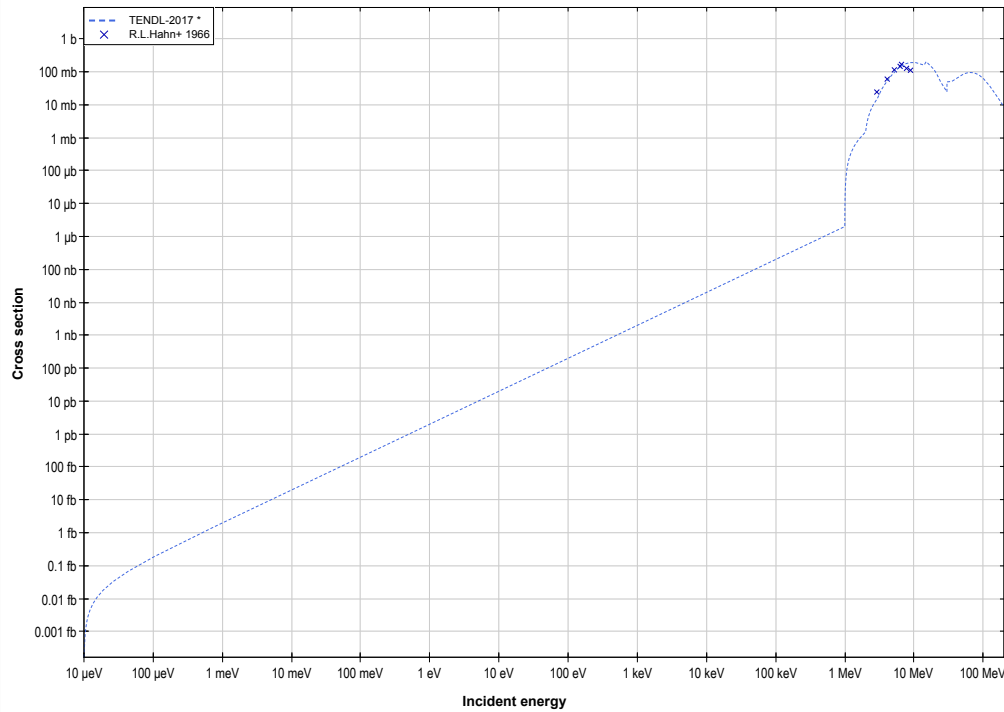
	8-O-16	12-Mg-24 >>
<< 7-N-14 MT107 (³ He,α)	MT103 (³He,p) or MT5 (F18 production)	MT107 (³ He,α) >>



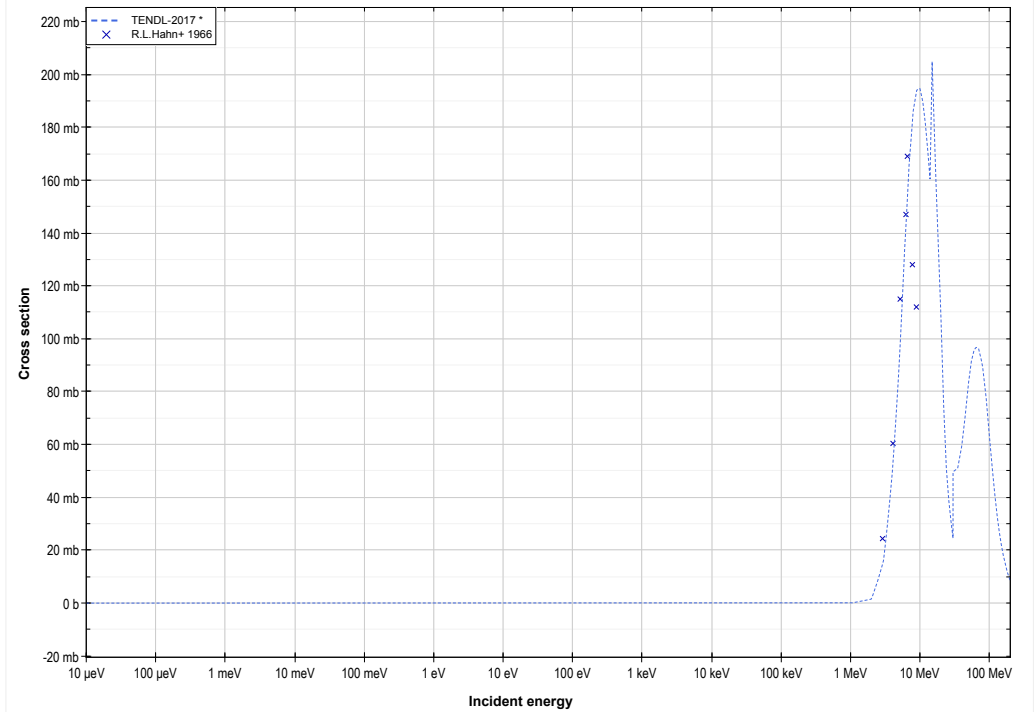
Reaction	Q-Value
O16(He3,p)F18	2032.14 keV

<< 7-N-14	8-O-16	9-F-19 >>
<< MT103 (³ He,p)	MT107 (³He,α) or MT5 (O15 production)	MT108 (³ He,2α) >>

O16 (³He,α) or O15 production log-log

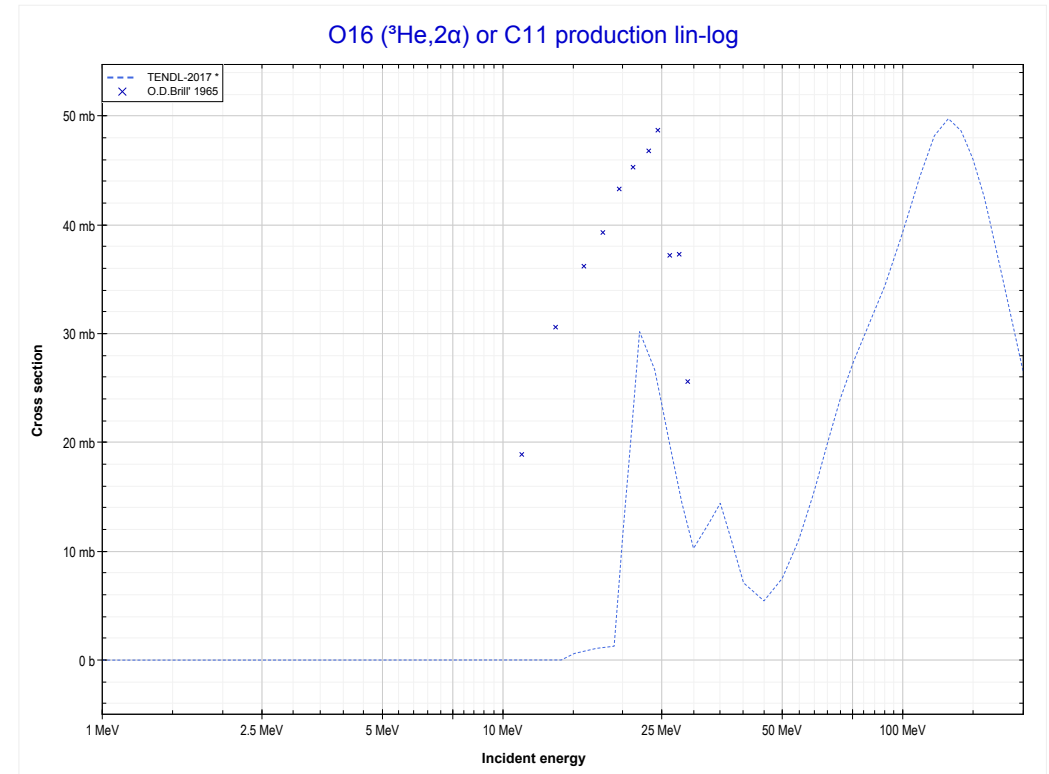
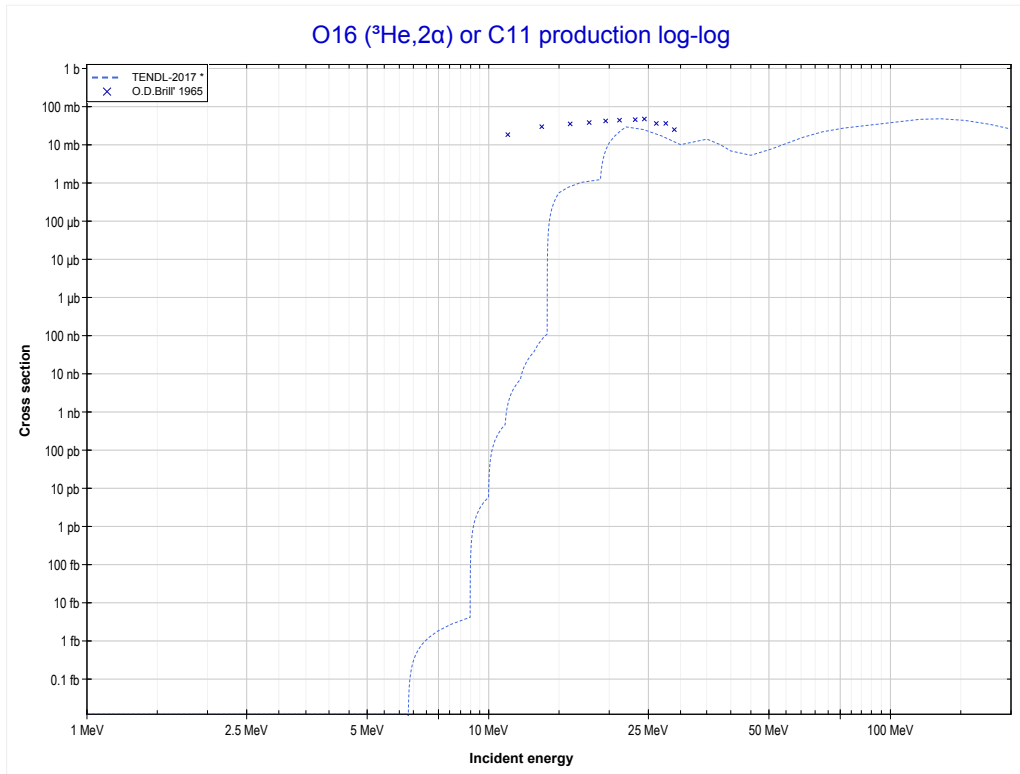


O16 (³He,α) or O15 production lin-log



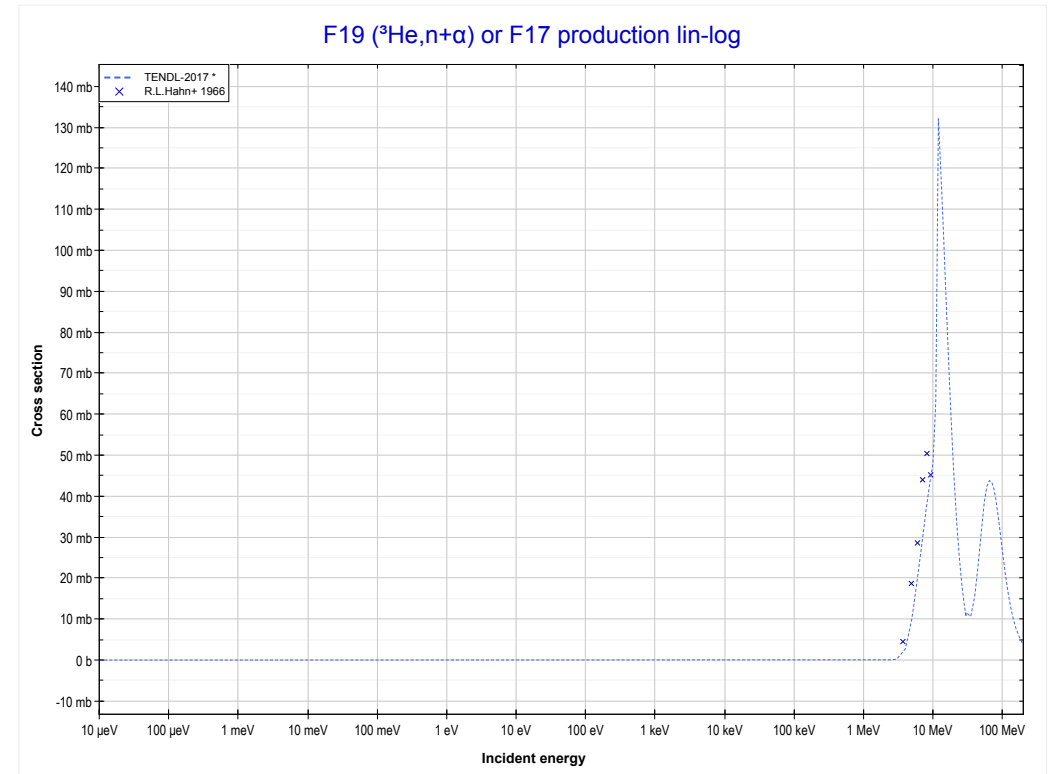
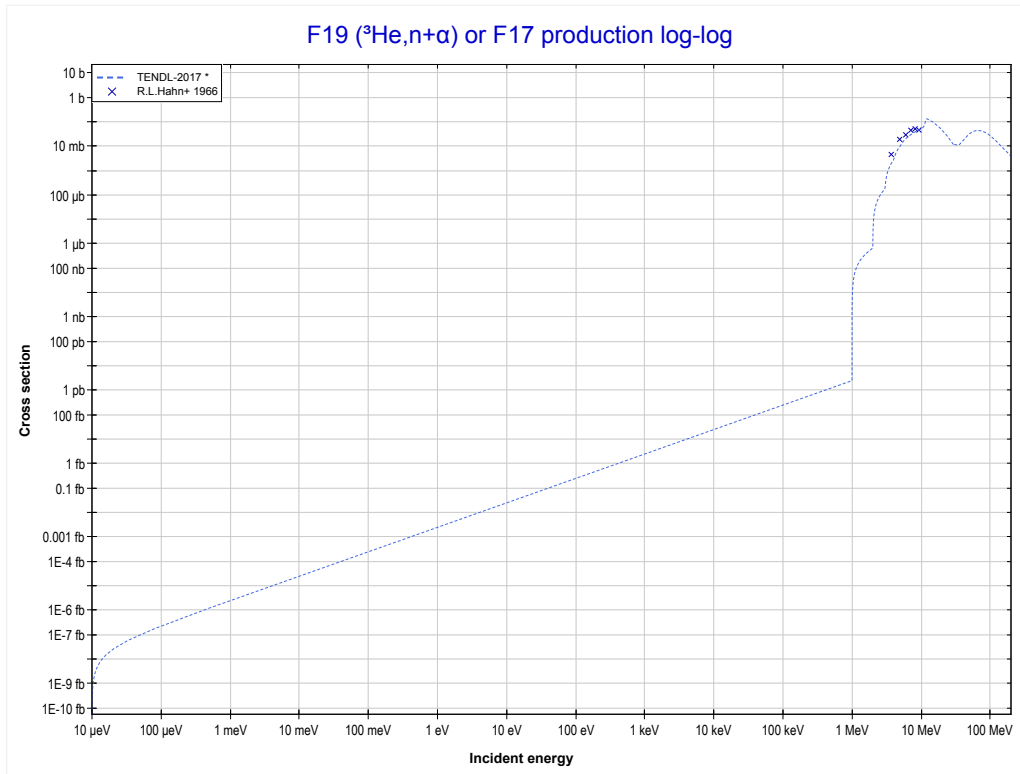
Reaction	Q-Value
O16(He3,α)O15	4913.70 keV
O16(He3,p+t)O15	-14900.16 keV
O16(He3,n+He3)O15	-15663.92 keV
O16(He3,2d)O15	-18932.83 keV
O16(He3,n+p+d)O15	-21157.40 keV
O16(He3,2n+2p)O15	-23381.96 keV

	8-O-16	13-AI-27 >>
<< MT107 ($^3\text{He},\alpha$)	MT108 ($^3\text{He},2\alpha$) or MT5 (C11 production)	9-F-19 MT22 ($^3\text{He},n+\alpha$) >>



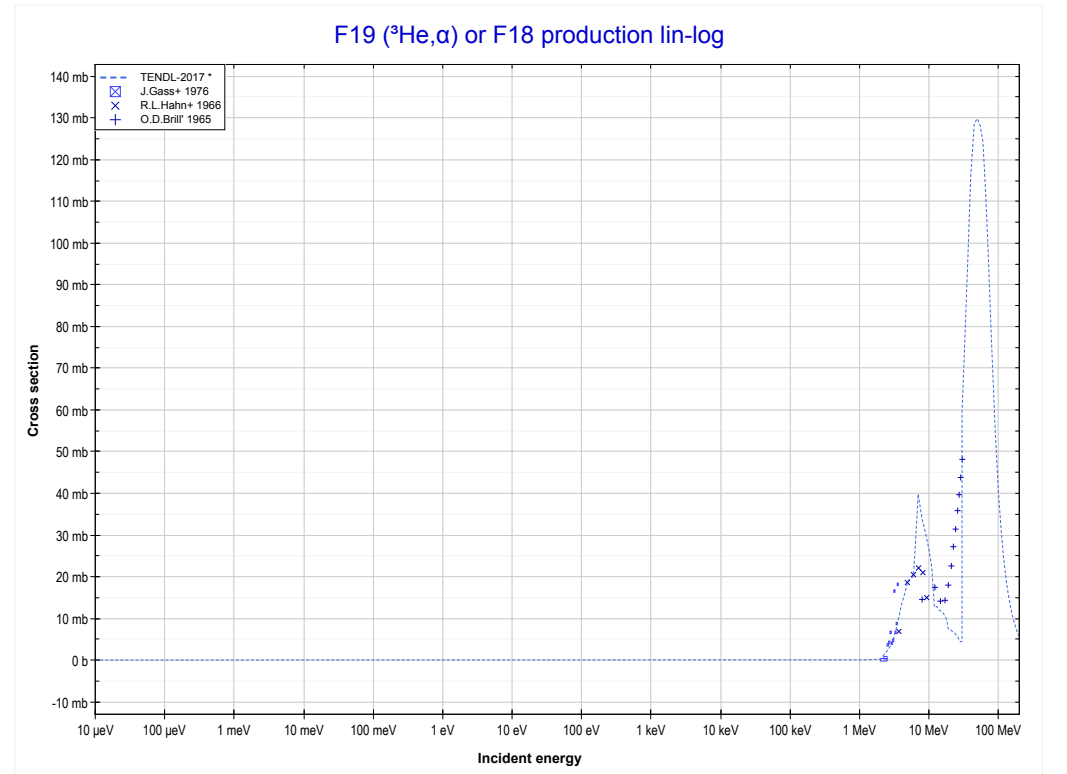
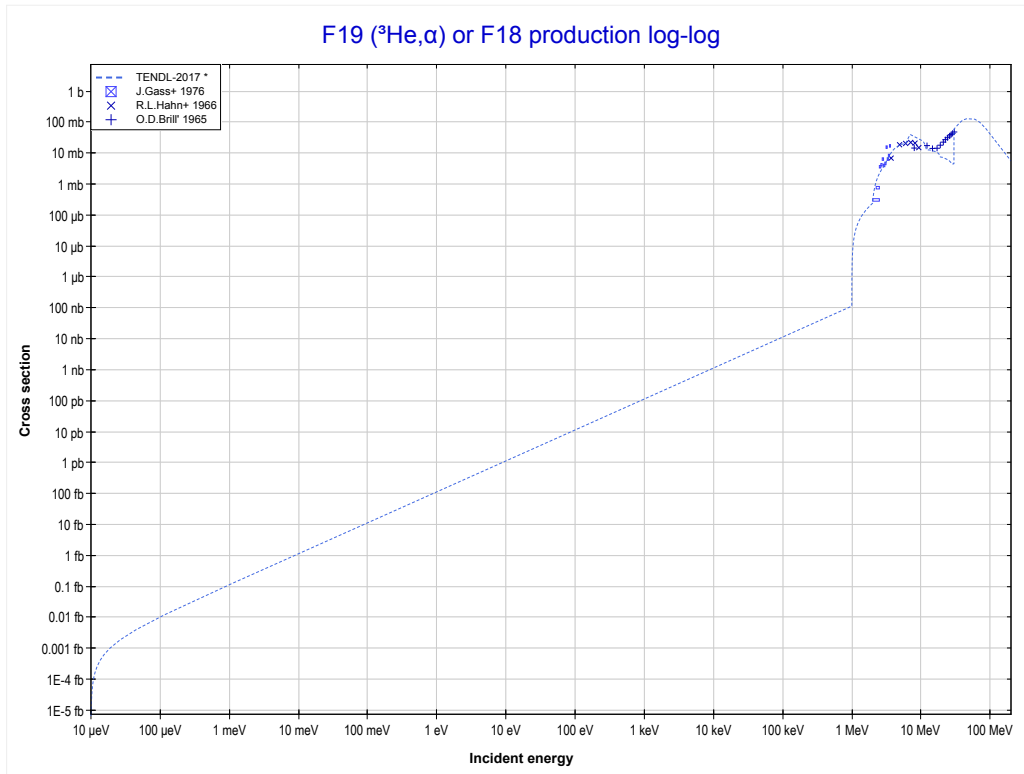
Reaction	Q-Value	Reaction	Q-Value
O16(He3,2α)C11	-5305.92 keV	O16(He3,n+p+t+He3)C11	-45697.39 keV
O16(He3,p+t+α)C11	-25119.78 keV	O16(He3,2n+2He3)C11	-46461.15 keV
O16(He3,n+He3+α)C11	-25883.53 keV	O16(He3,p+2d+t)C11	-48966.31 keV
O16(He3,2d+α)C11	-29152.44 keV	O16(He3,n+2d+He3)C11	-49730.06 keV
O16(He3,n+p+d+α)C11	-31377.01 keV	O16(He3,n+2p+d+t)C11	-51190.87 keV
O16(He3,2n+2p+α)C11	-33601.58 keV	O16(He3,2n+p+d+He3)C11	-51954.63 keV
O16(He3,d+t+He3)C11	-43472.83 keV	O16(He3,4d)C11	-52998.97 keV
O16(He3,2p+2t)C11	-44933.64 keV	O16(He3,2n+3p+t)C11	-53415.44 keV

	9-F-19	23-V-51 >>
<< 8-O-16 MT108 ($^3\text{He},2\alpha$)	MT22 ($^3\text{He},n+\alpha$) or MT5 (F17 production)	MT107 ($^3\text{He},\alpha$) >>



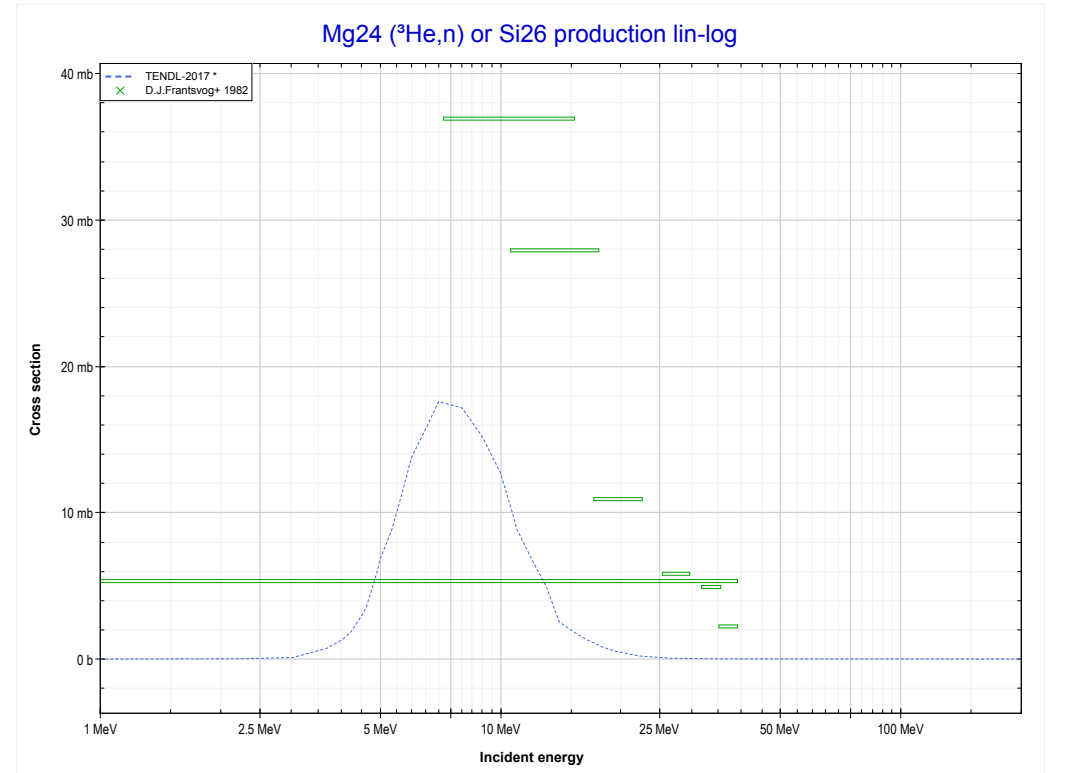
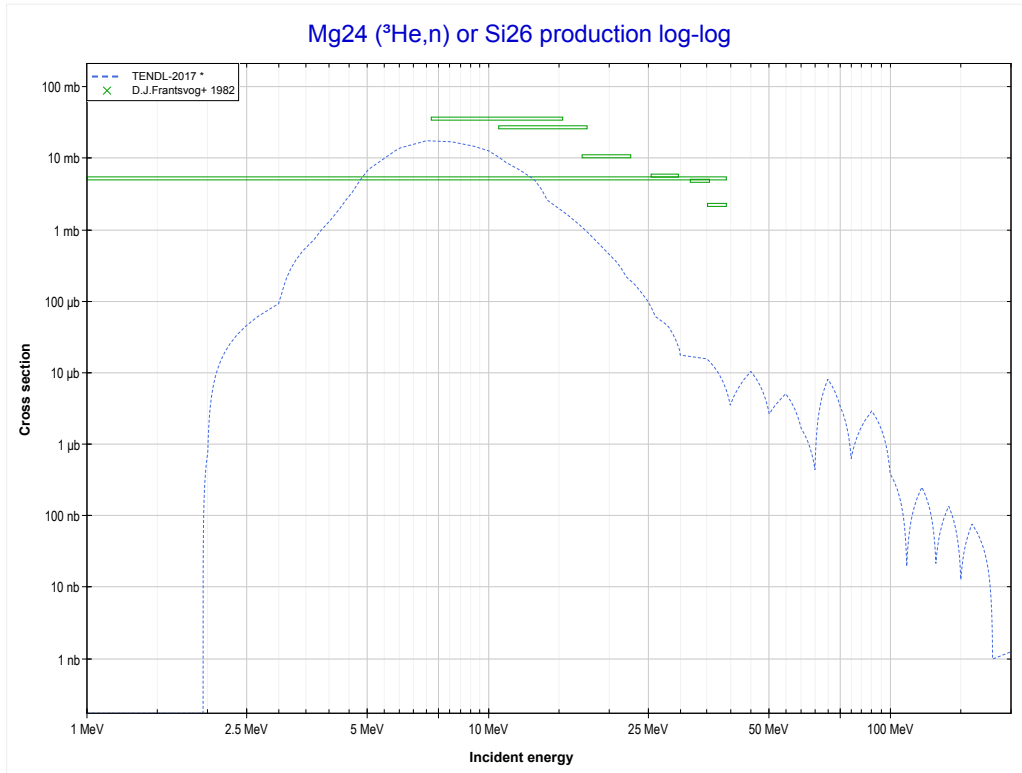
Reaction	Q-Value
F19($\text{He}3,n+\alpha$)F17	995.84 keV
F19($\text{He}3,d+t$)F17	-16593.46 keV
F19($\text{He}3,n+p+t$)F17	-18818.02 keV
F19($\text{He}3,2n+\text{He}3$)F17	-19581.78 keV
F19($\text{He}3,n+2d$)F17	-22850.69 keV
F19($\text{He}3,2n+p+d$)F17	-25075.26 keV
F19($\text{He}3,3n+2p$)F17	-27299.82 keV

<< 8-O-16	9-F-19	19-K-39 >>
<< MT22 (³ He,n+α)	MT107 (³He,α) or MT5 (F18 production)	12-Mg-24 MT4 (³ He,n) >>



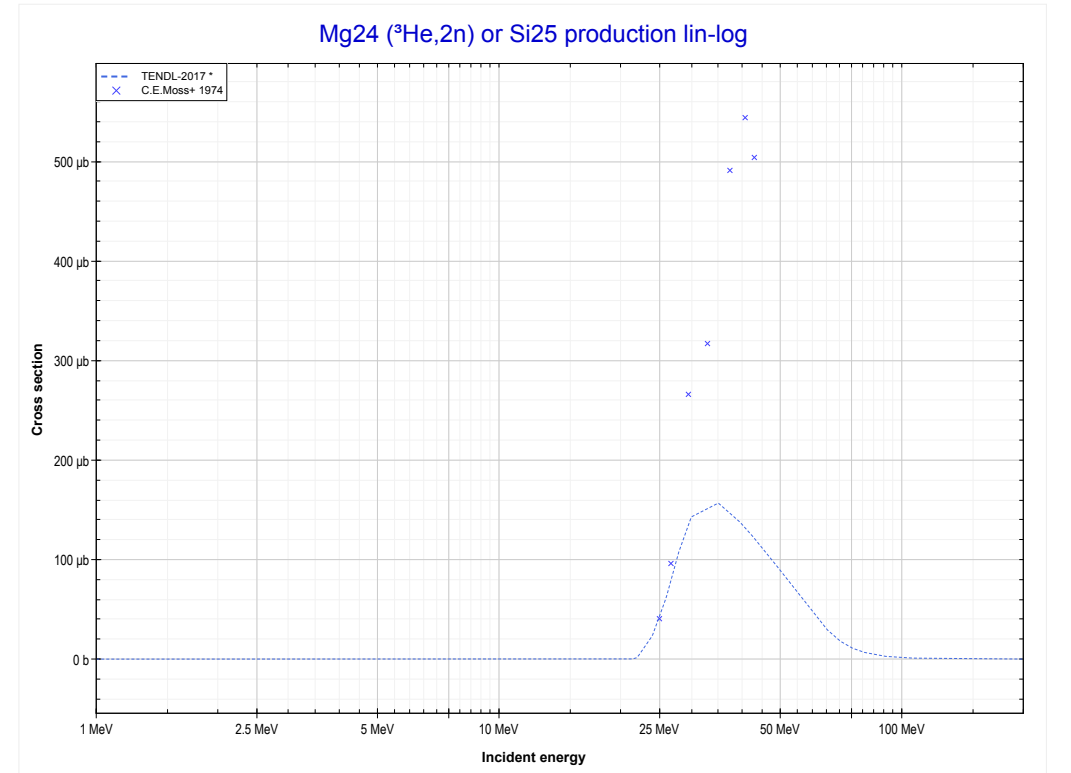
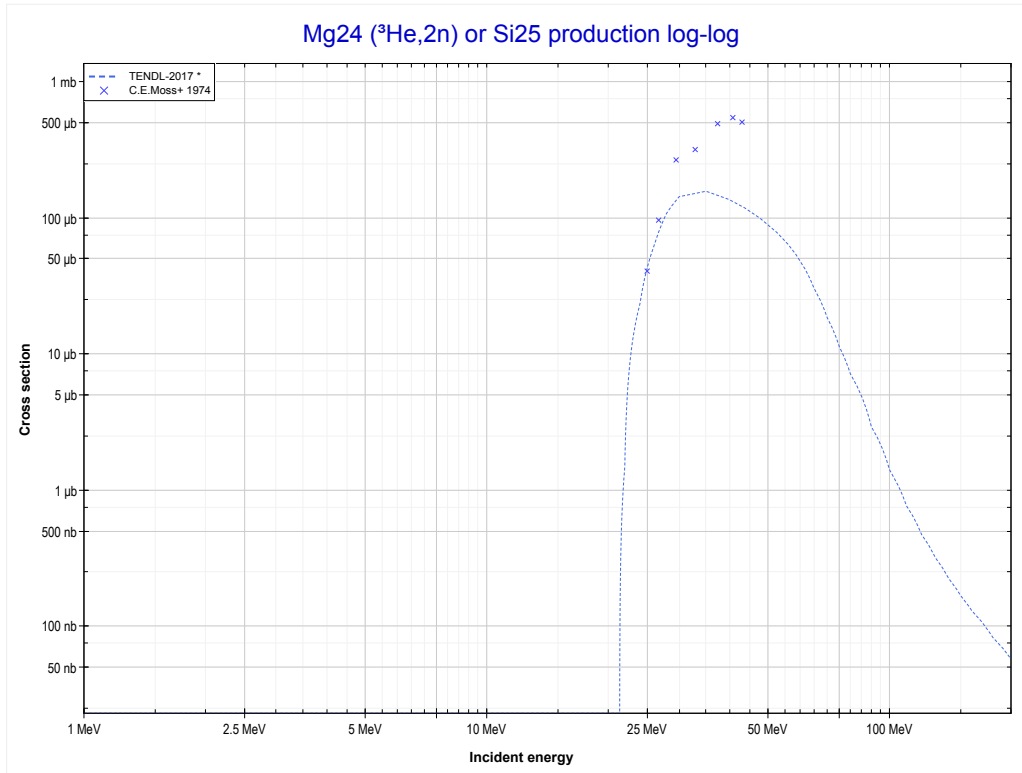
Reaction	Q-Value
F19(He3,α)F18	10145.76 keV
F19(He3,p+t)F18	-9668.11 keV
F19(He3,n+He3)F18	-10431.86 keV
F19(He3,2d)F18	-13700.77 keV
F19(He3,n+p+d)F18	-15925.34 keV
F19(He3,2n+2p)F18	-18149.90 keV

<< 6-C-12	12-Mg-24	13-Al-27 >>
<< 9-F-19 MT107 (³ He,α)	MT4 (³He,n) or MT5 (Si26 production)	MT16 (³ He,2n) >>



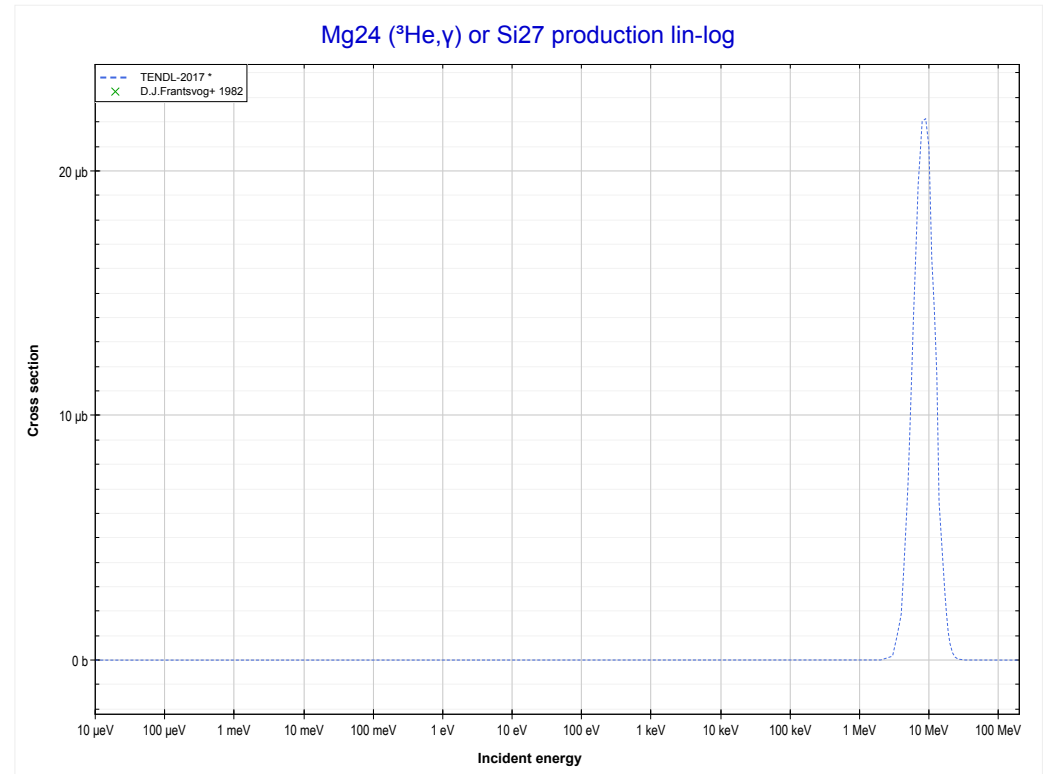
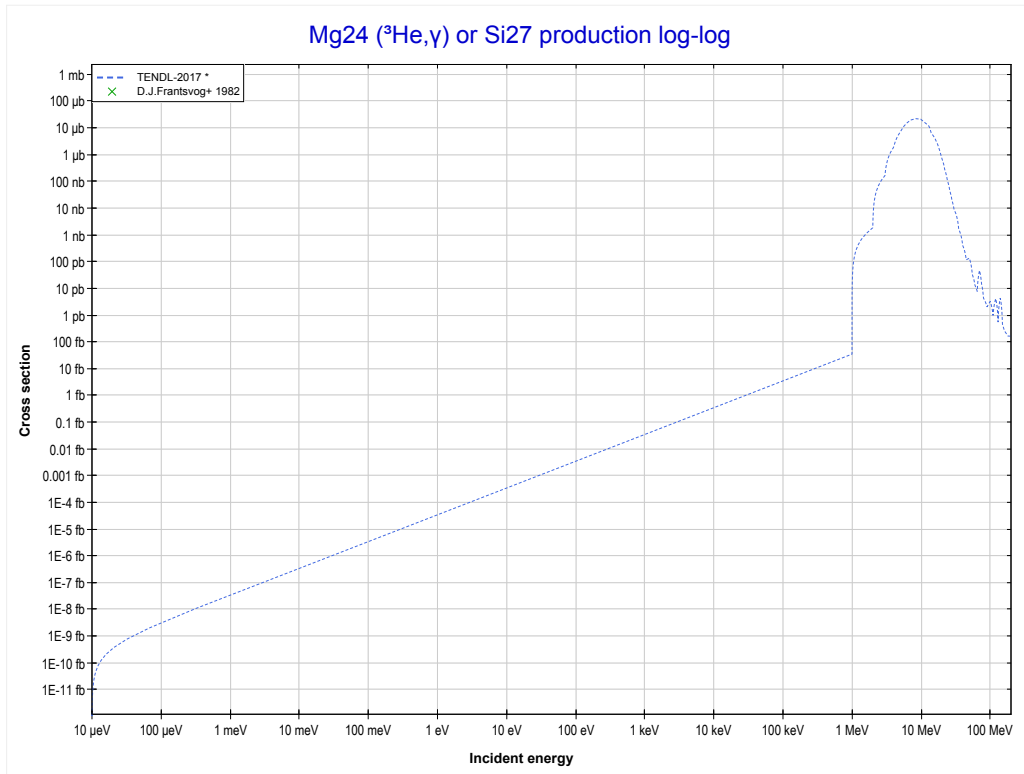
Reaction	Q-Value
Mg24(He3,n)Si26	67.31 keV

<< 4-Be-9	12-Mg-24	13-Al-27 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Si25 production)	MT102 (³ He,γ) >>



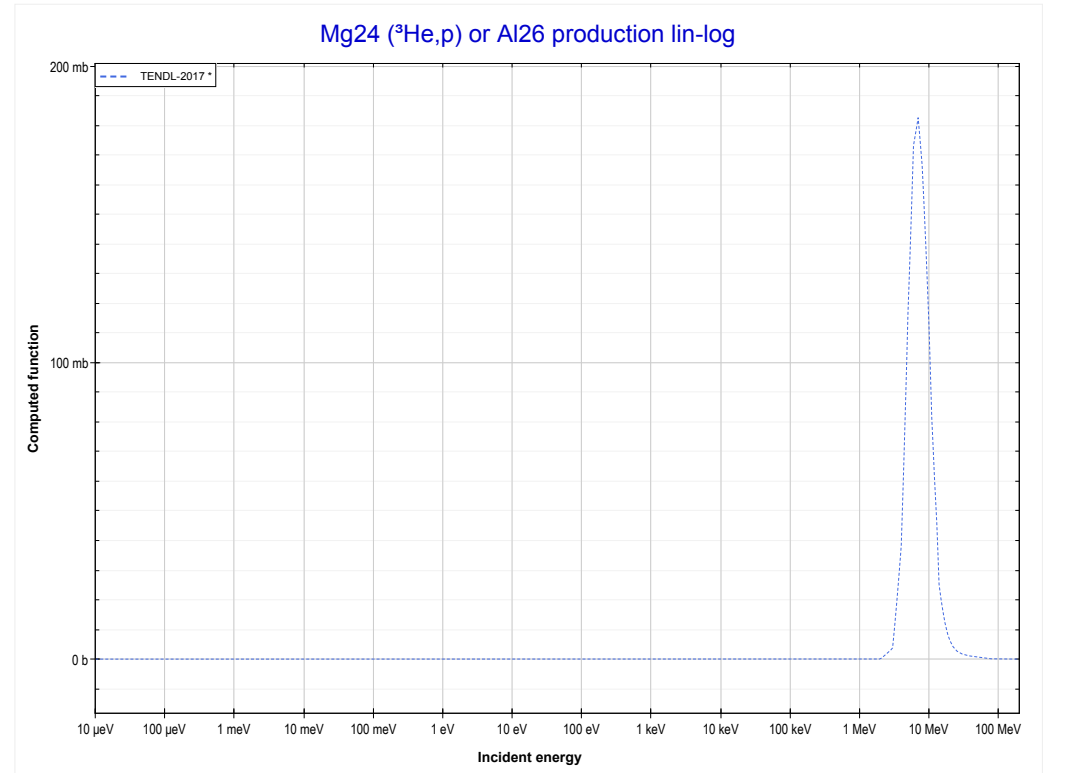
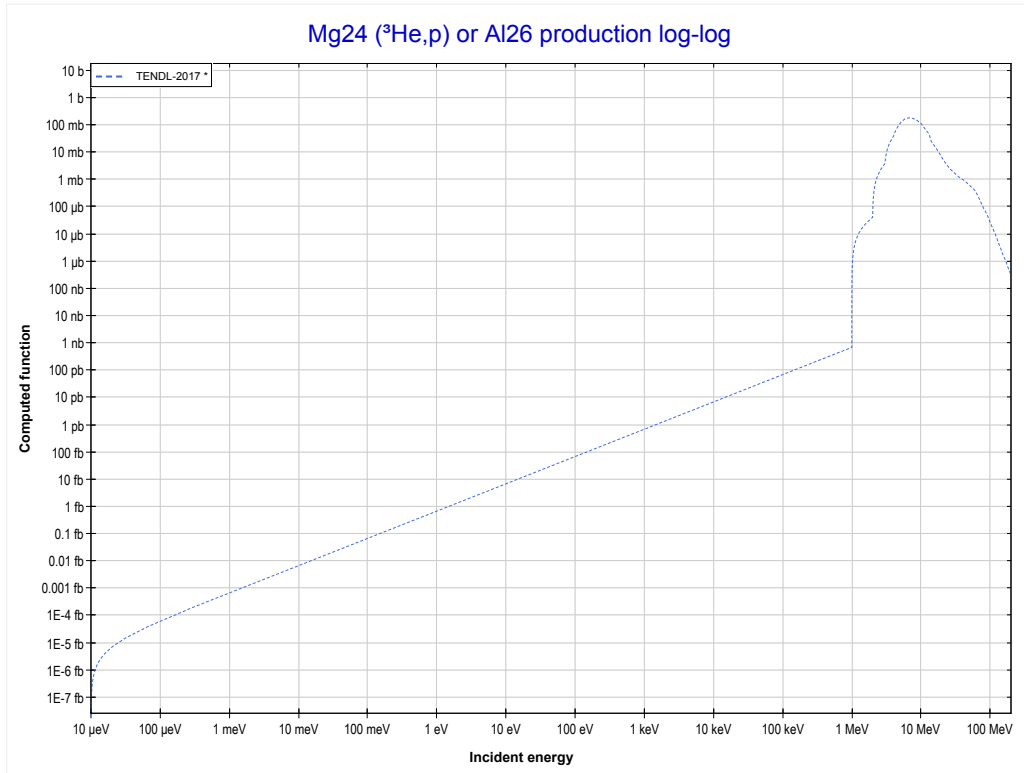
Reaction	Q-Value
Mg24(He3,2n)Si25	-18971.99 keV

	12-Mg-24	13-Al-27 >>
<< MT16 ($^3\text{He},2n$)	MT102 ($^3\text{He},\gamma$) or MT5 (Si27 production)	MT103 ($^3\text{He},p$) >>



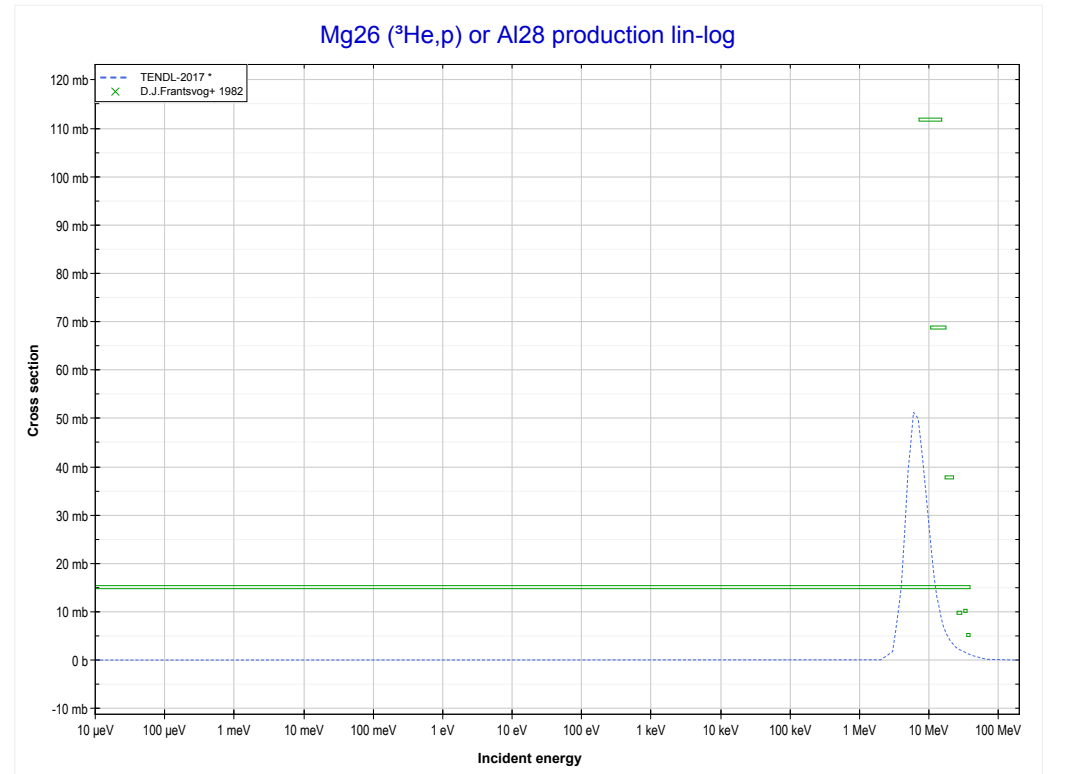
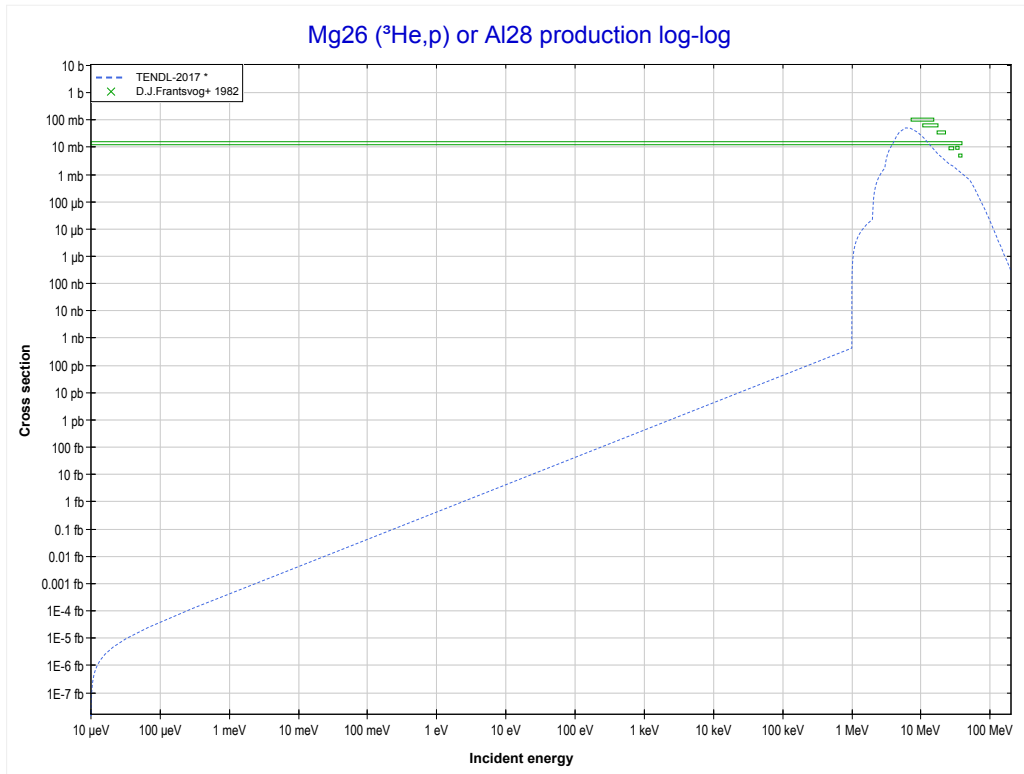
Reaction	Q-Value
Mg24(He3, γ)Si27	13382.04 keV

<< 8-O-16	12-Mg-24	12-Mg-26 >>
<< MT102 ($^3\text{He},\gamma$)	MT103 ($^3\text{He},p$) or MT5 (Al26 production)	12-Mg-26 MT103 ($^3\text{He},p$) >>



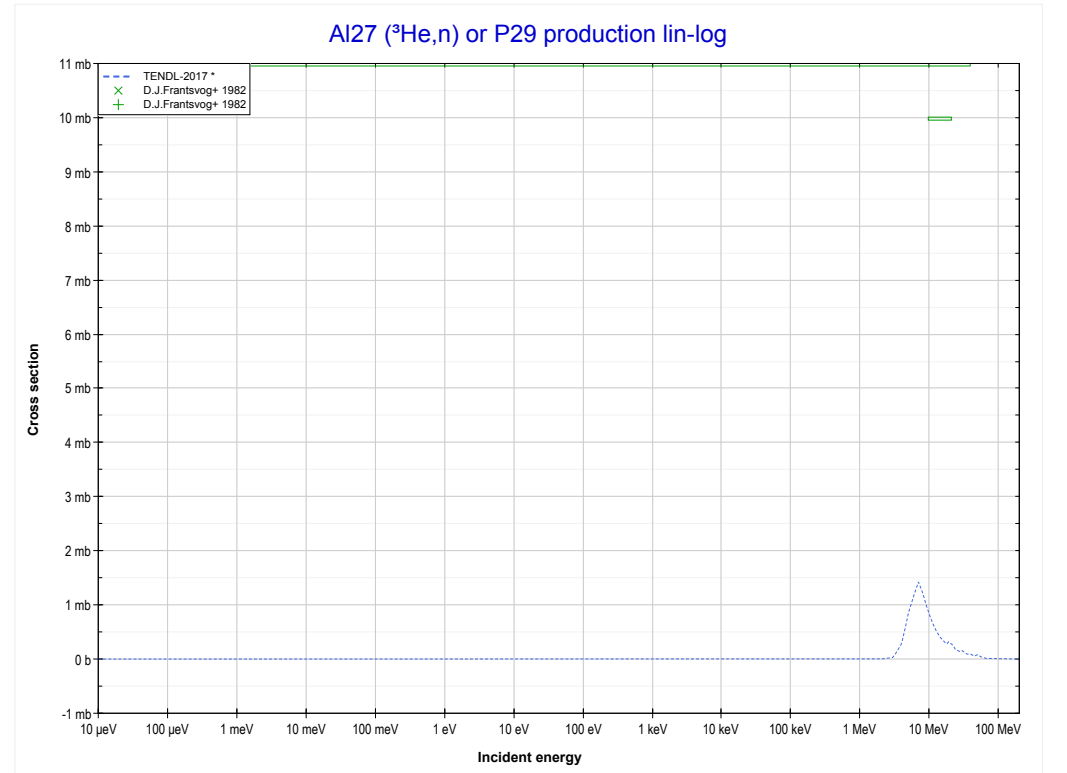
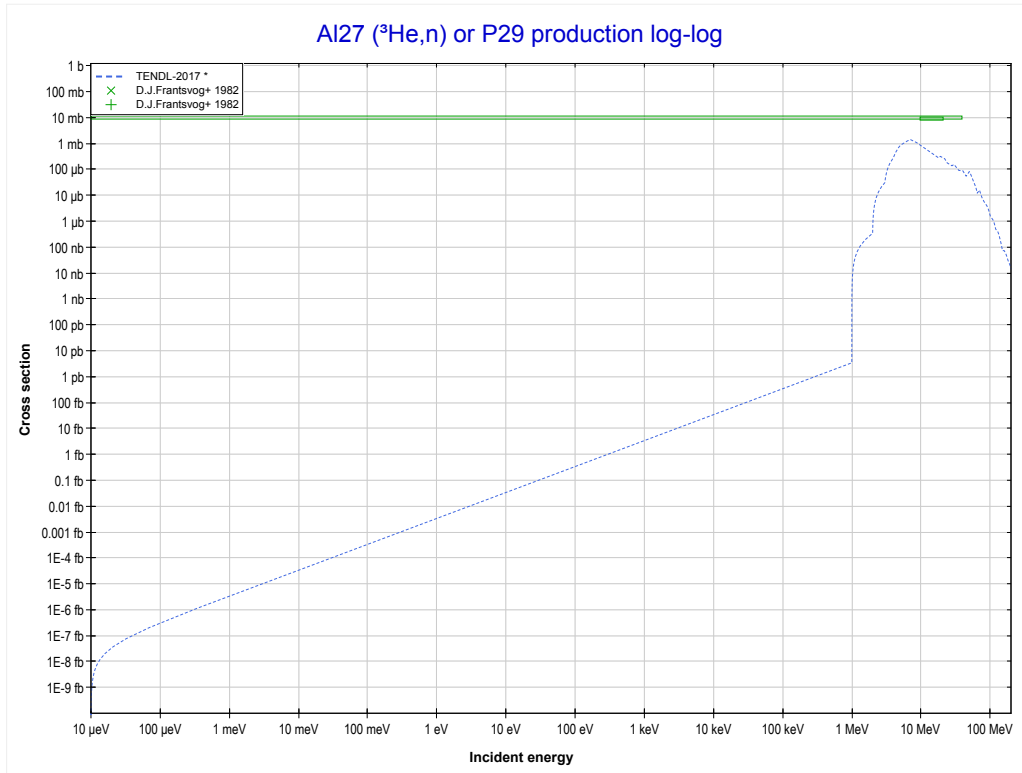
Reaction	Q-Value
Mg24(He3,p)Al26	5918.79 keV

<< 12-Mg-24	12-Mg-26	14-Si-28 >>
<< 12-Mg-24 MT103 (³ He,p)	MT103 (³He,p) or MT5 (Al28 production)	13-Al-27 MT4 (³ He,n) >>



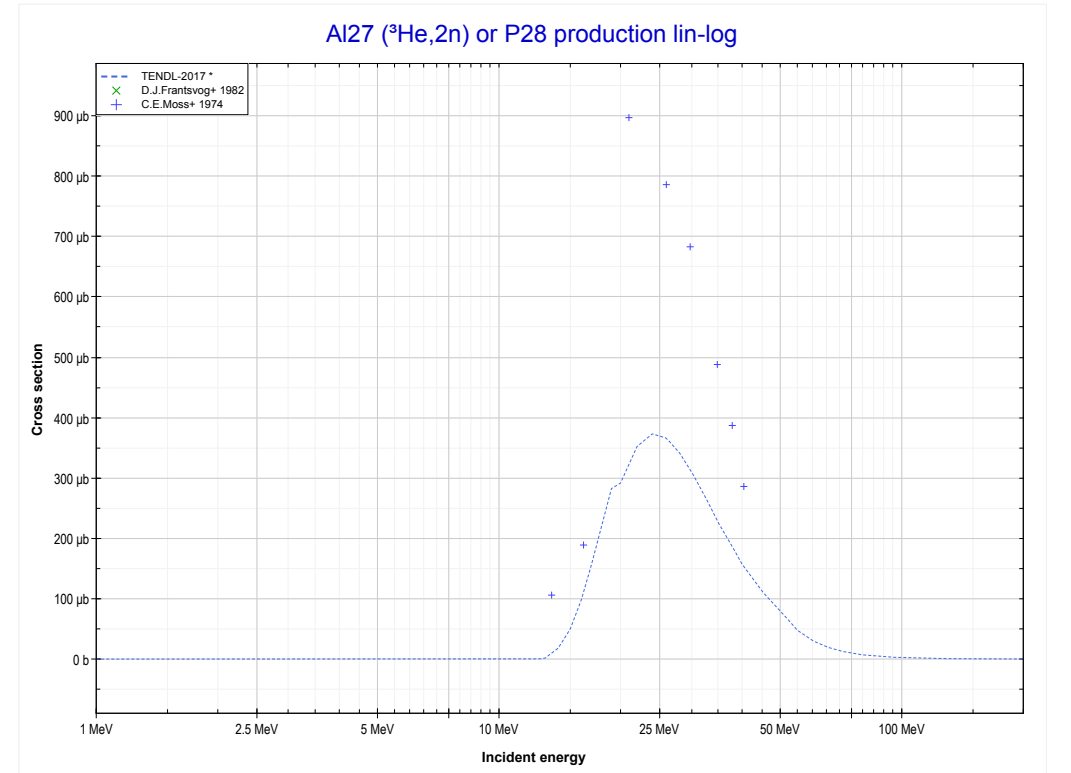
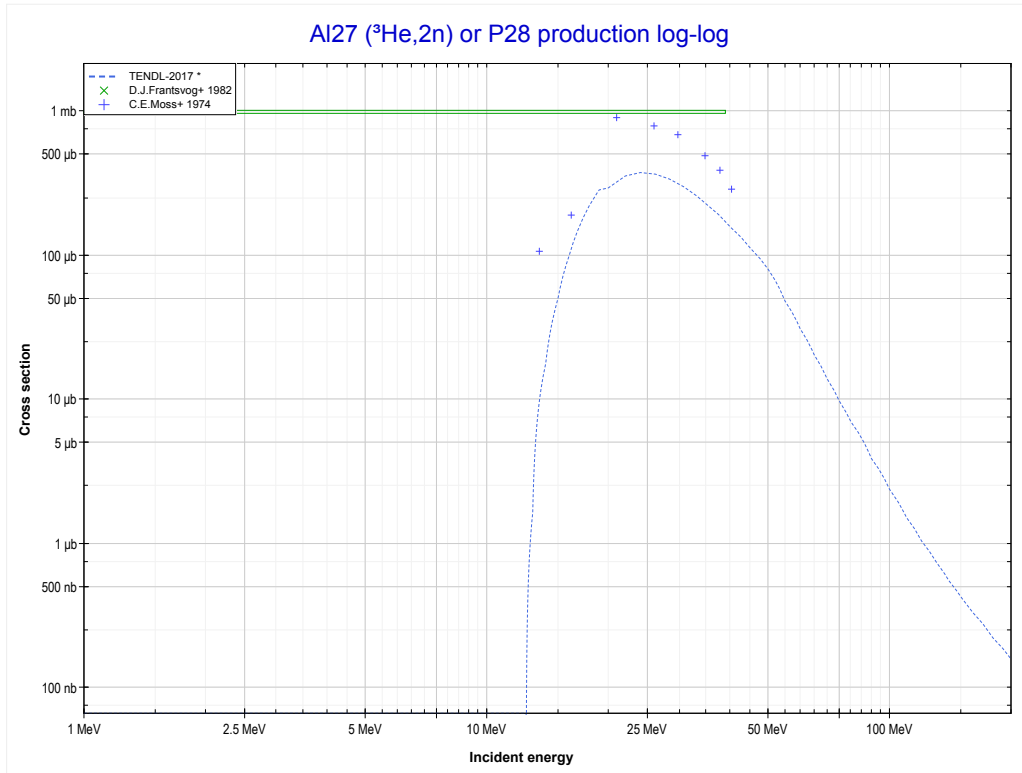
Reaction	Q-Value
Mg26(He3,p)Al28	8278.23 keV

<< 12-Mg-24	13-Al-27	14-Si-28 >>
<< 12-Mg-26 MT103 (³ He,p)	MT4 (³He,n) or MT5 (P29 production)	MT16 (³ He,2n) >>



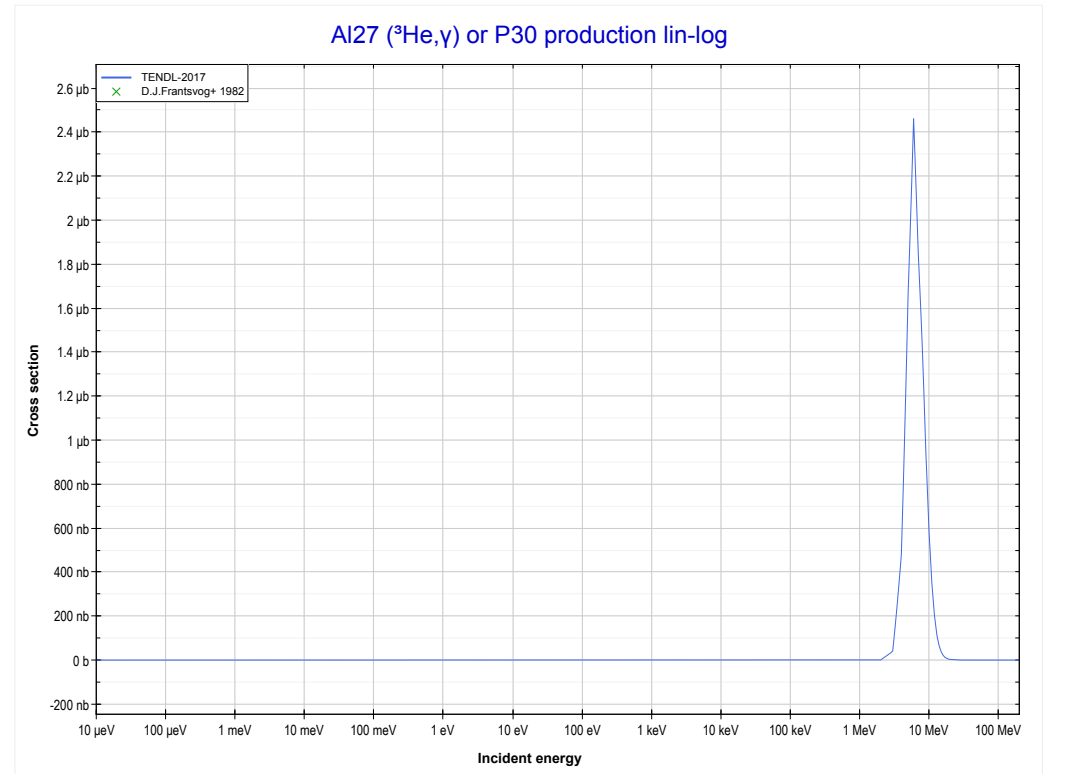
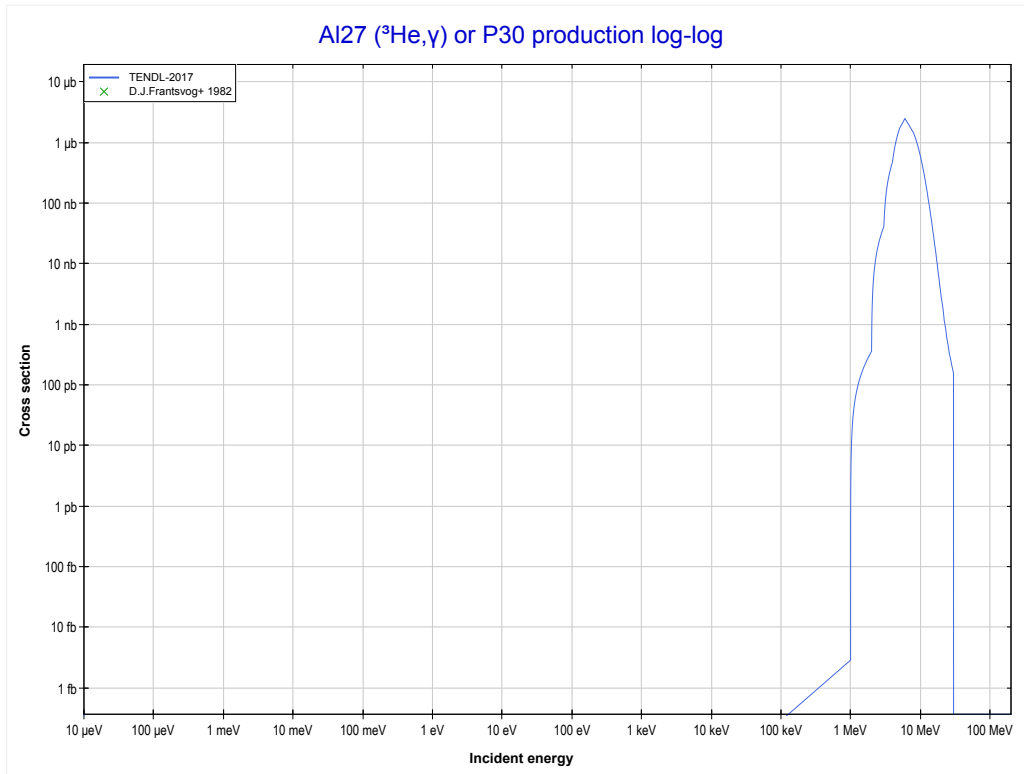
Reaction	Q-Value
Al27(He3,n)P29	6615.65 keV

<< 12-Mg-24	13-Al-27	24-Cr-50 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (P28 production)	MT102 (³ He,γ) >>



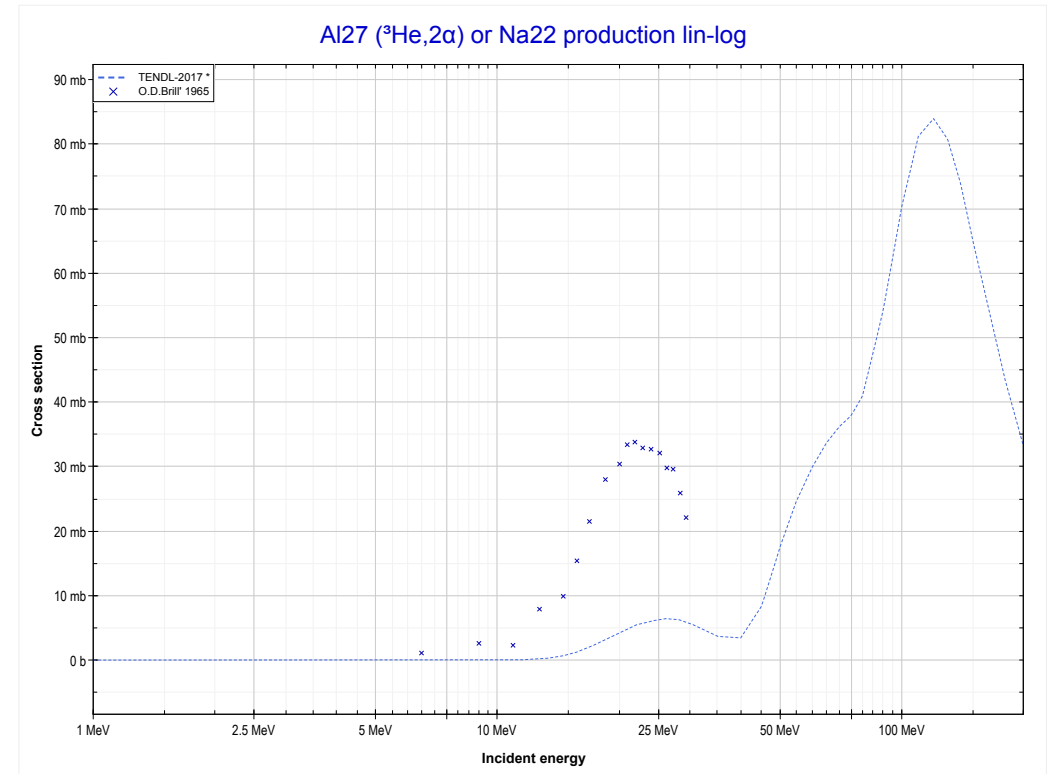
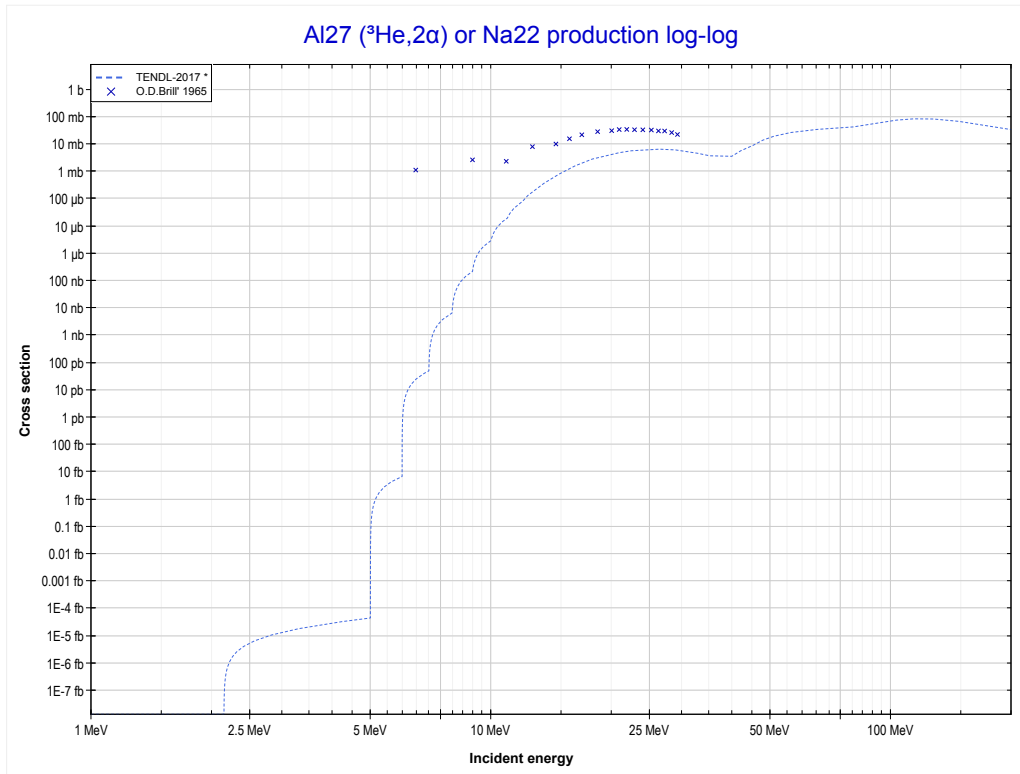
Reaction	Q-Value
Al27(He3,2n)P28	-11260.47 keV

<< 12-Mg-24	13-Al-27	14-Si-28 >>
<< MT16 ($^3\text{He},2n$)	MT102 ($^3\text{He},\gamma$) or MT5 (P30 production)	MT108 ($^3\text{He},2\alpha$) >>



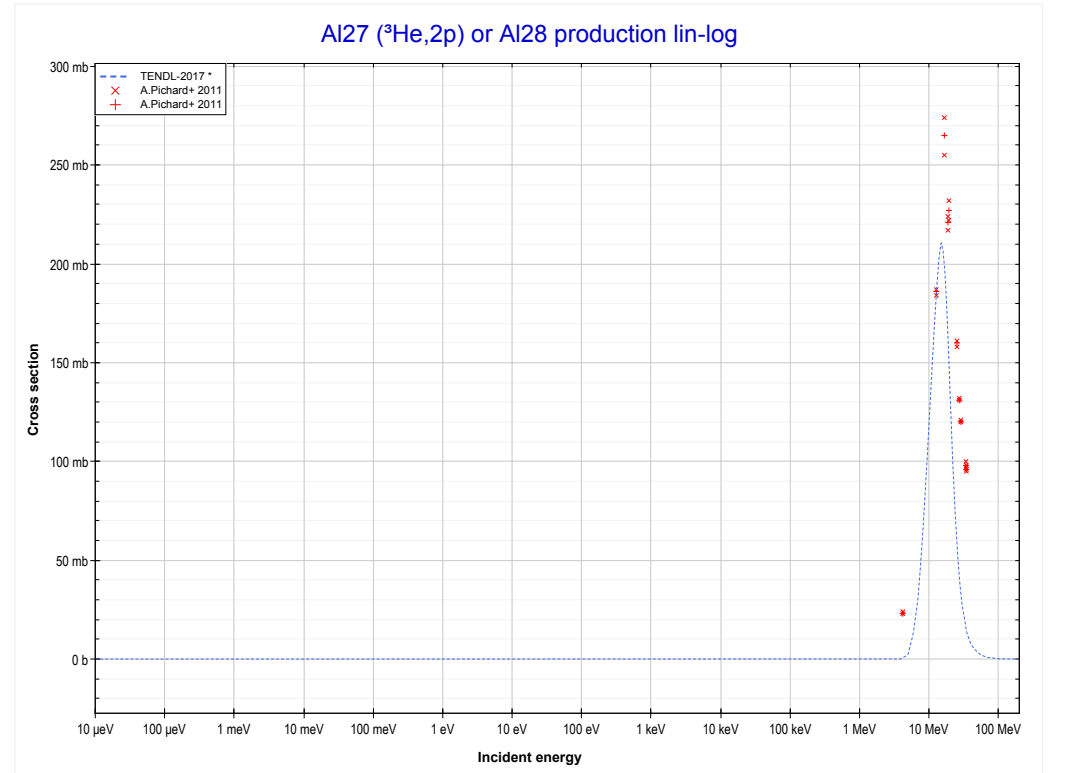
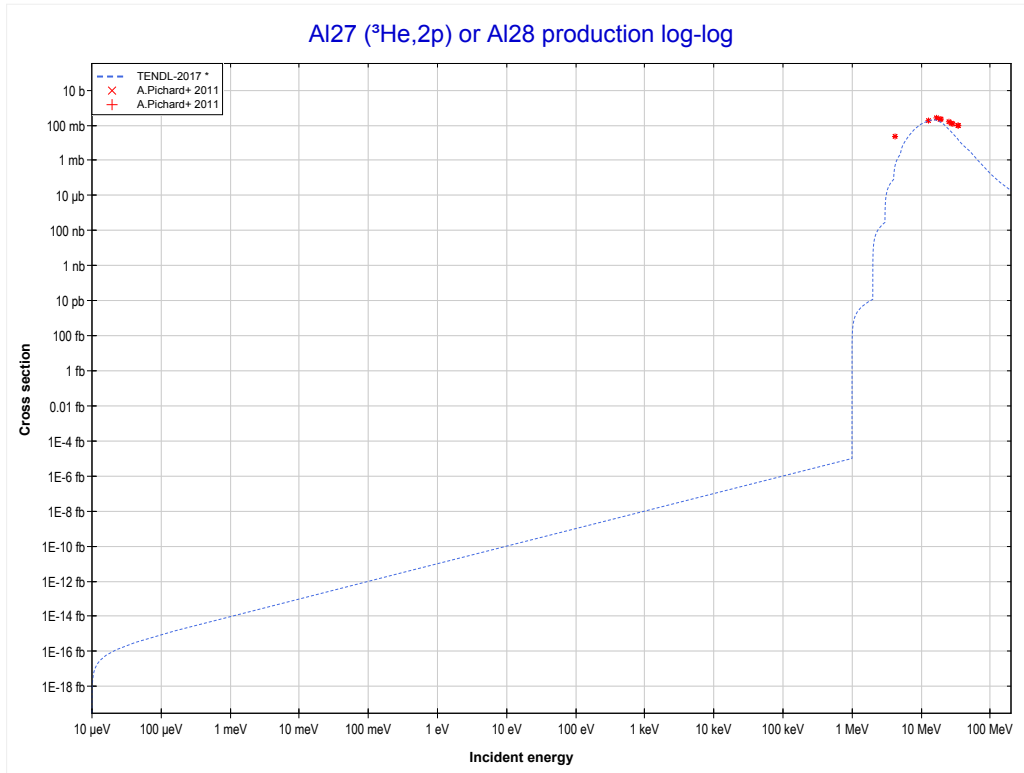
Reaction	Q-Value
Al27(He3,γ)P30	17935.07 keV

<< 8-O-16	13-Al-27	19-K-39 >>
<< MT102 (³ He,γ)	MT108 (³He,2α) or MT5 (Na22 production)	MT111 (³ He,2p) >>



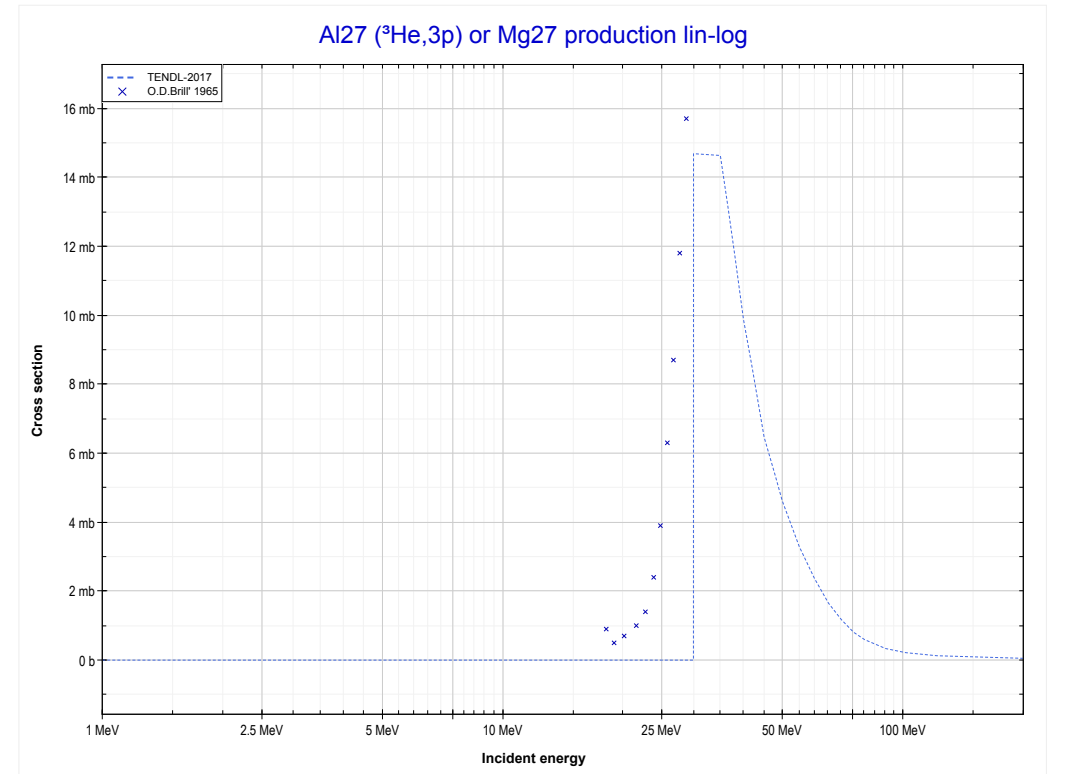
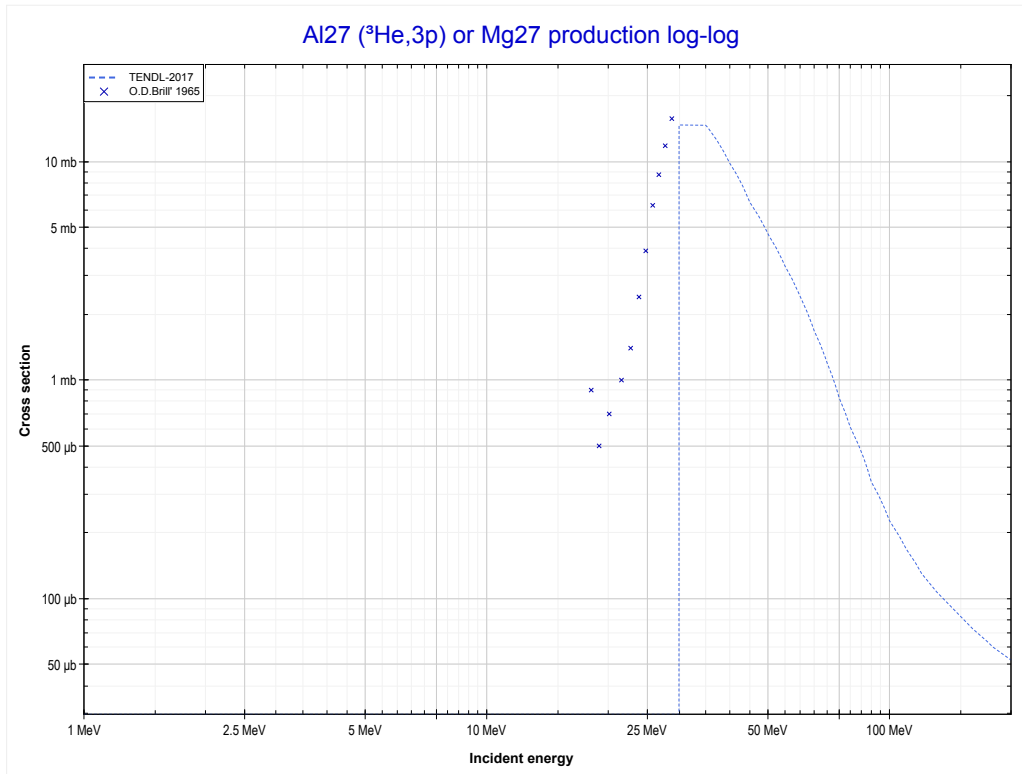
Reaction	Q-Value	Reaction	Q-Value
Al27(He3,2α)Na22	-1933.85 keV	Al27(He3,n+p+t+He3)Na22	-42325.32 keV
Al27(He3,p+t+α)Na22	-21747.71 keV	Al27(He3,2n+2He3)Na22	-43089.08 keV
Al27(He3,n+He3+α)Na22	-22511.46 keV	Al27(He3,p+2d+t)Na22	-45594.23 keV
Al27(He3,2d+α)Na22	-25780.37 keV	Al27(He3,n+2d+He3)Na22	-46357.99 keV
Al27(He3,n+p+d+α)Na22	-28004.94 keV	Al27(He3,n+2p+d+t)Na22	-47818.80 keV
Al27(He3,2n+2p+α)Na22	-30229.51 keV	Al27(He3,2n+p+d+He3)Na22	-48582.56 keV
Al27(He3,d+t+He3)Na22	-40100.76 keV	Al27(He3,4d)Na22	-49626.90 keV
Al27(He3,2p+2t)Na22	-41561.57 keV	Al27(He3,2n+3p+t)Na22	-50043.37 keV

<< 2-He-3	13-Al-27	21-Sc-45 >>
<< MT108 (³ He,2α)	MT111 (³He,2p) or MT5 (Al28 production)	MT197 (³ He,3p) >>



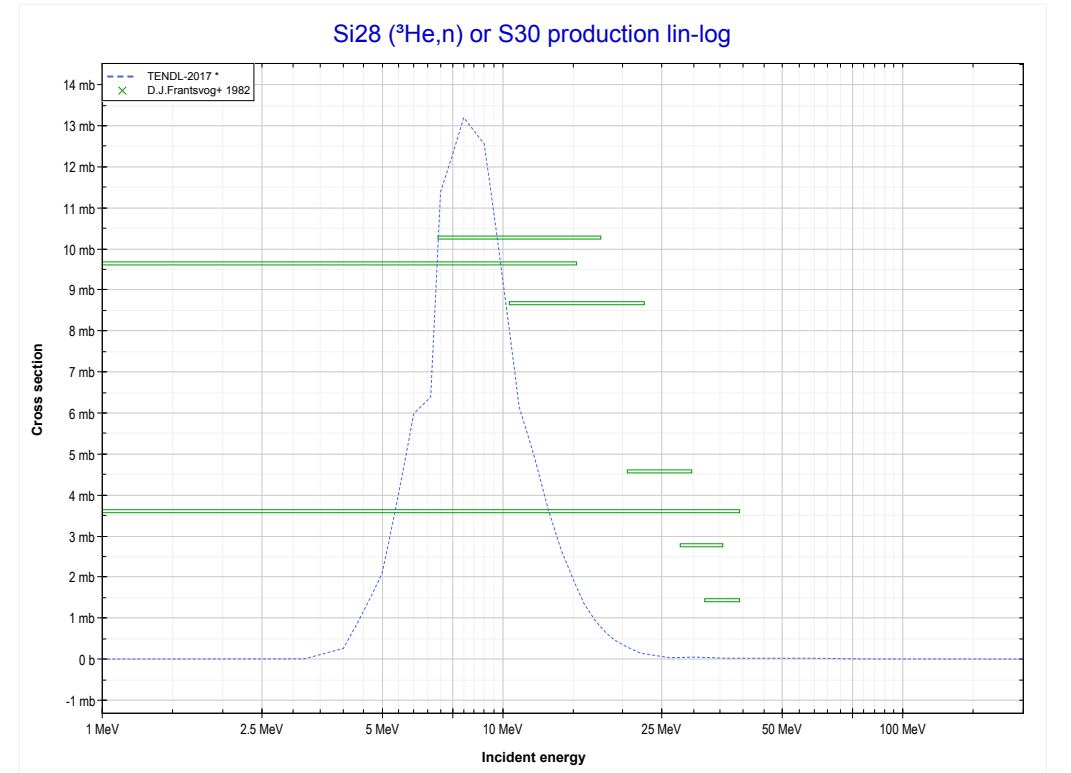
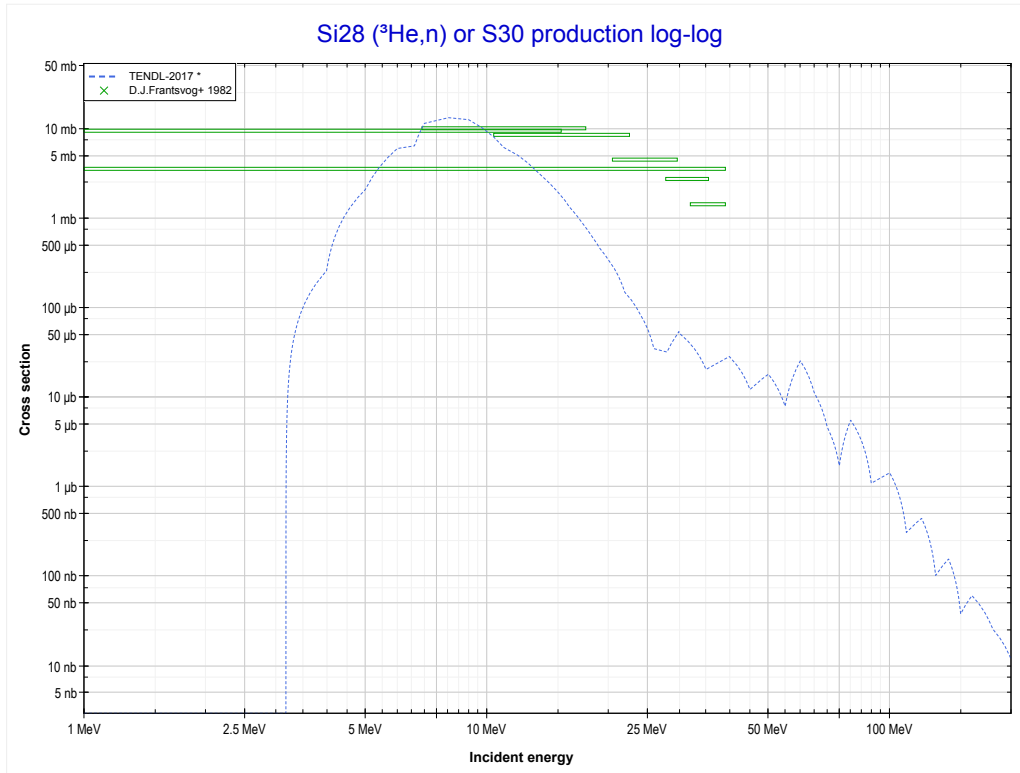
Reaction	Q-Value
Al27(He3,2p)Al28	7.05 keV

	13-Al-27	27-Co-59 >>
<< MT111 (³He,2p)	MT197 (³He,3p) or MT5 (Mg27 production)	14-Si-28 MT4 (³He,n) >>



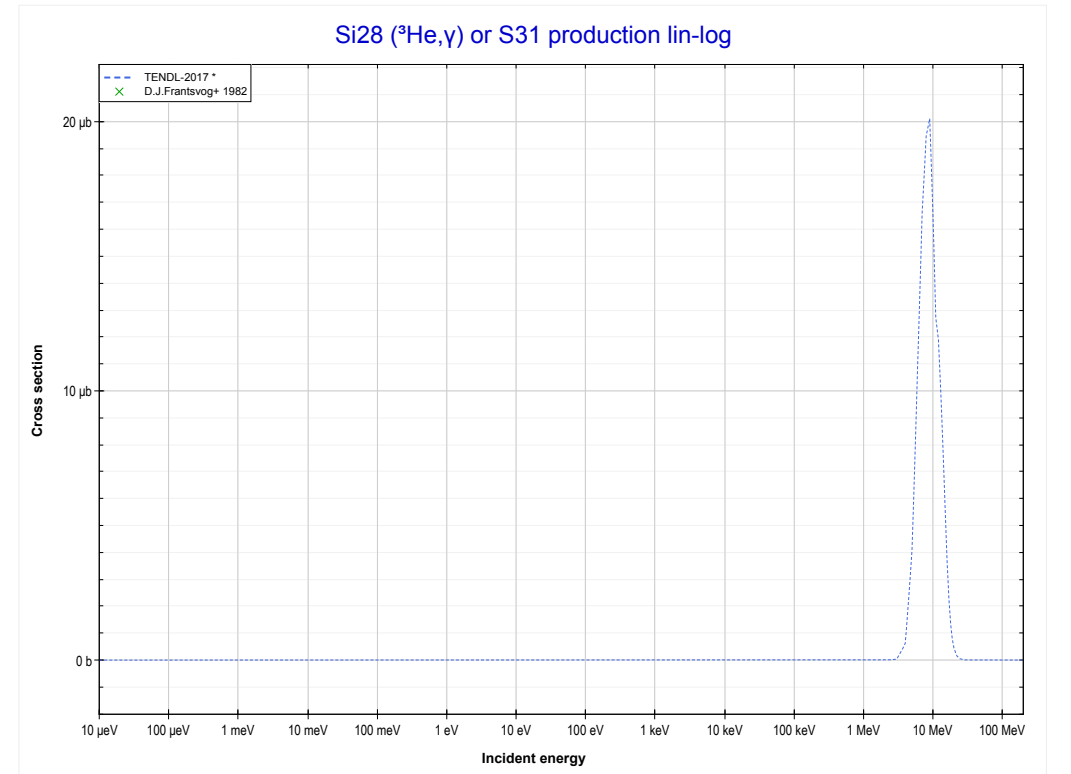
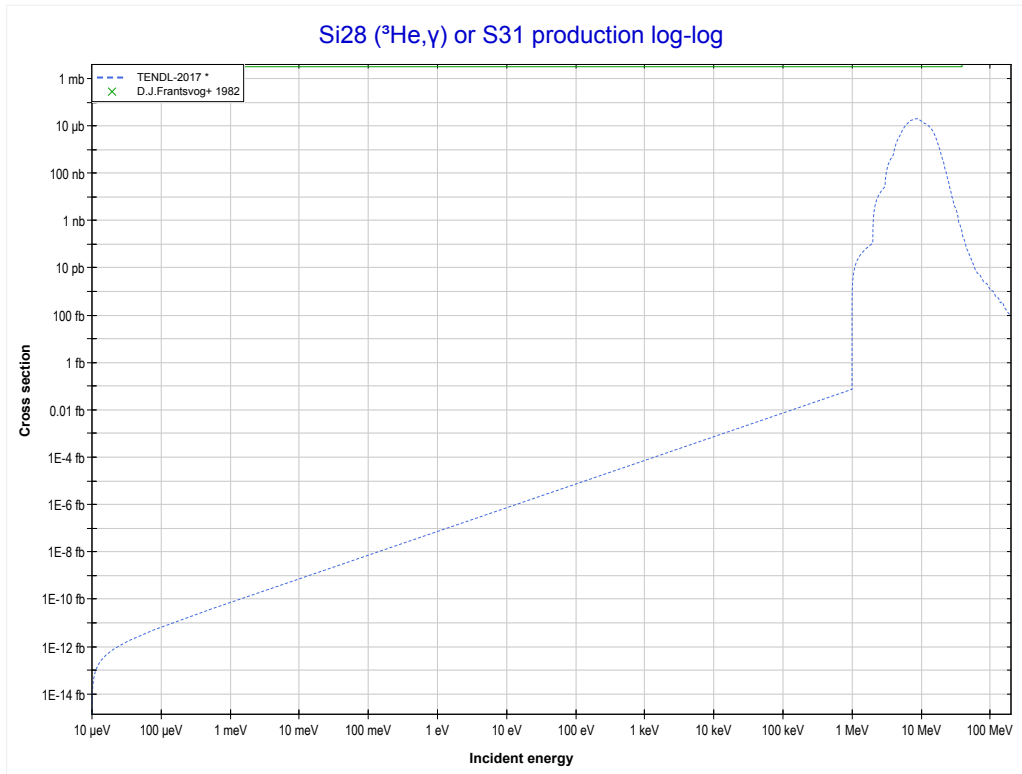
Reaction	Q-Value
Al27(He3,3p)Mg27	-9545.84 keV

<< 13-Al-27	14-Si-28	25-Mn-55 >>
<< 13-Al-27 MT197 (³ He,3p)	MT4 (³He,n) or MT5 (S30 production)	MT102 (³ He,γ) >>



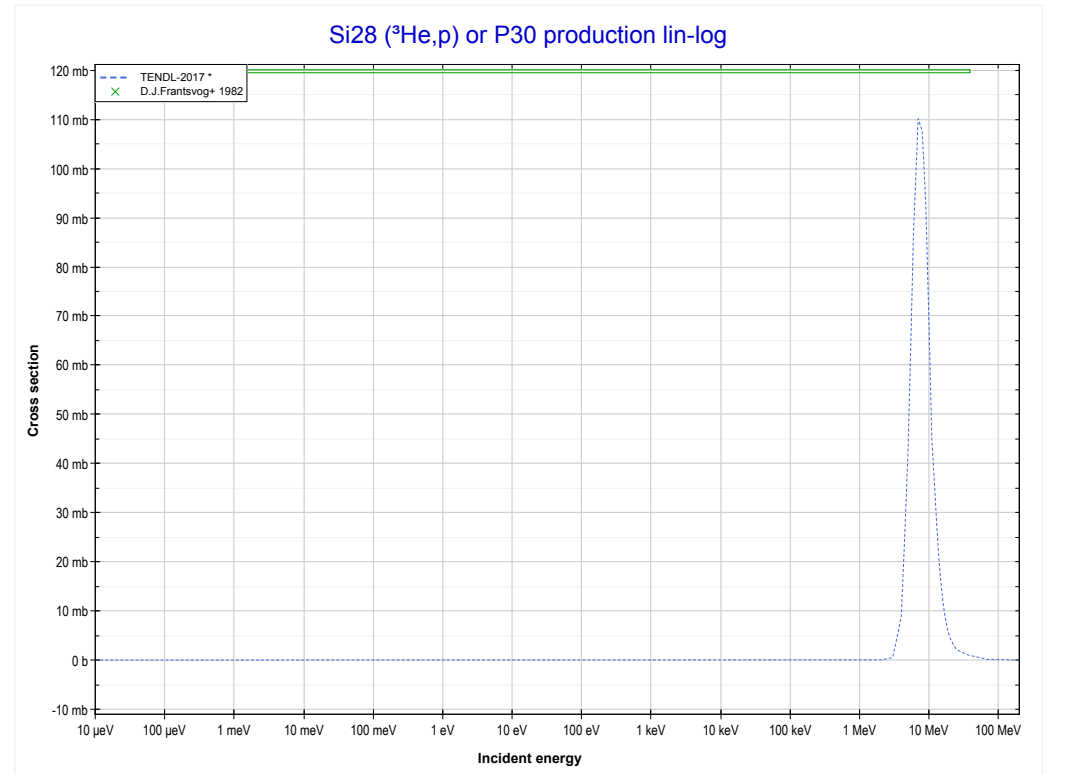
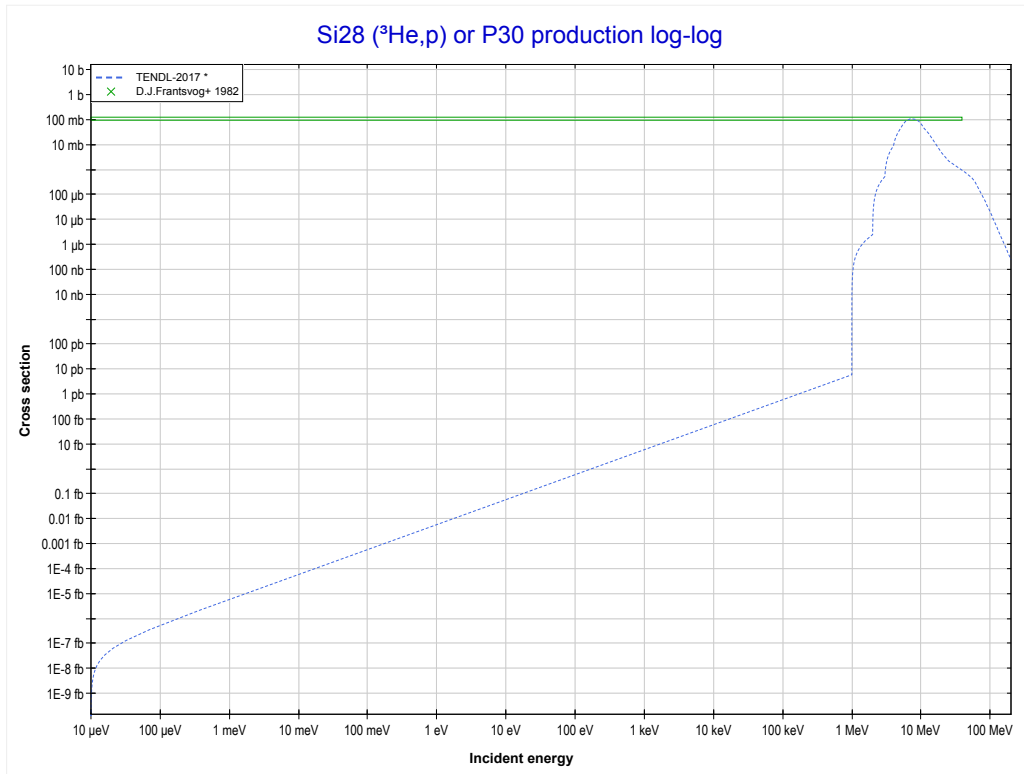
Reaction	Q-Value
Si28(He3,n)S30	-573.90 keV

<< 13-Al-27	14-Si-28	19-K-41 >>
<< MT4 (³ He,n)	MT102 (³He,γ) or MT5 (S31 production)	MT103 (³ He,p) >>



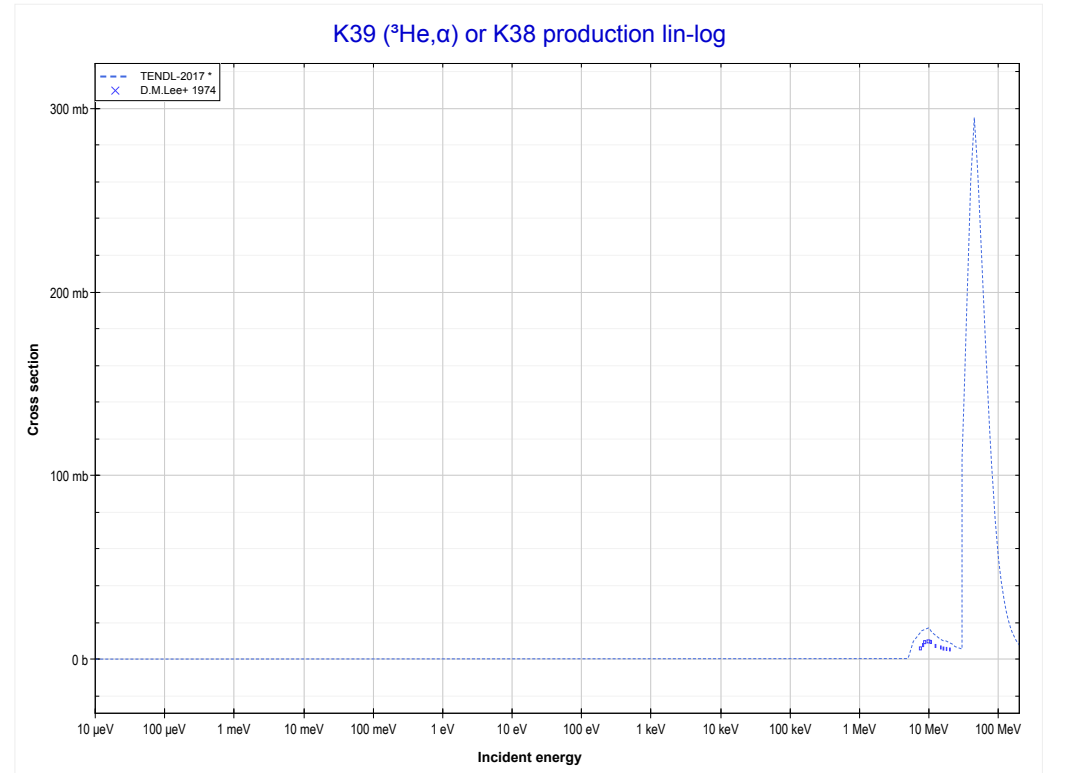
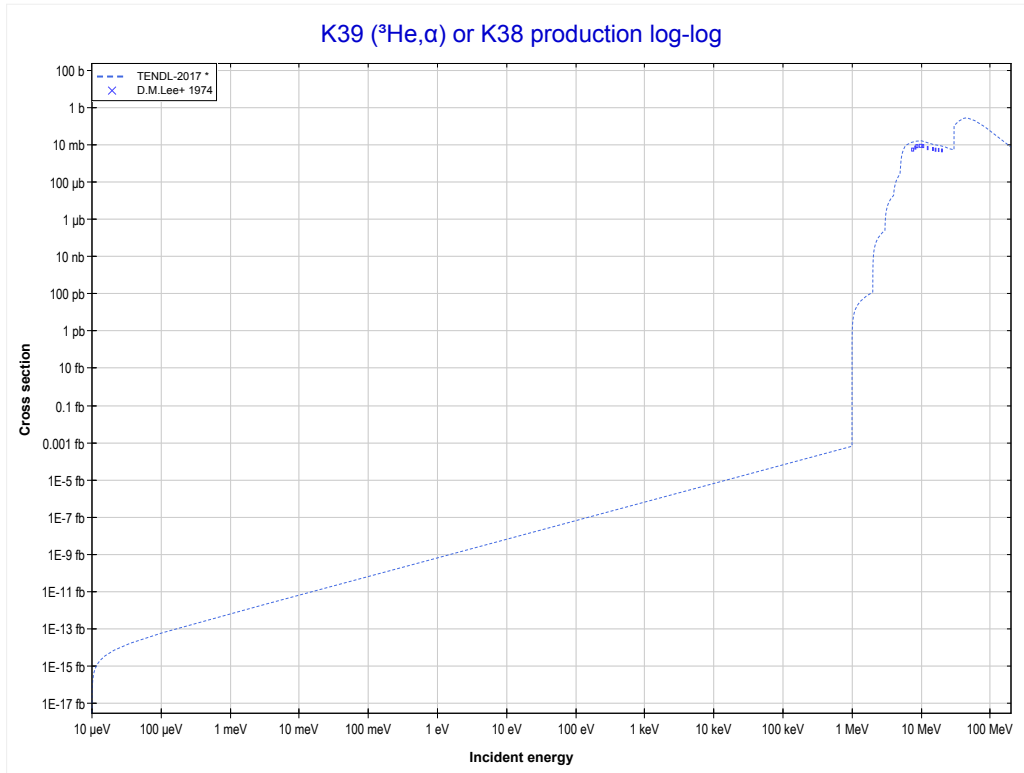
Reaction	Q-Value
Si28(He3,γ)S31	12480.94 keV

<< 12-Mg-26	14-Si-28	29-Cu-63 >>
<< MT102 (³ He,γ)	MT103 (³He,p) or MT5 (P30 production)	19-K-39 MT107 (³ He,α) >>



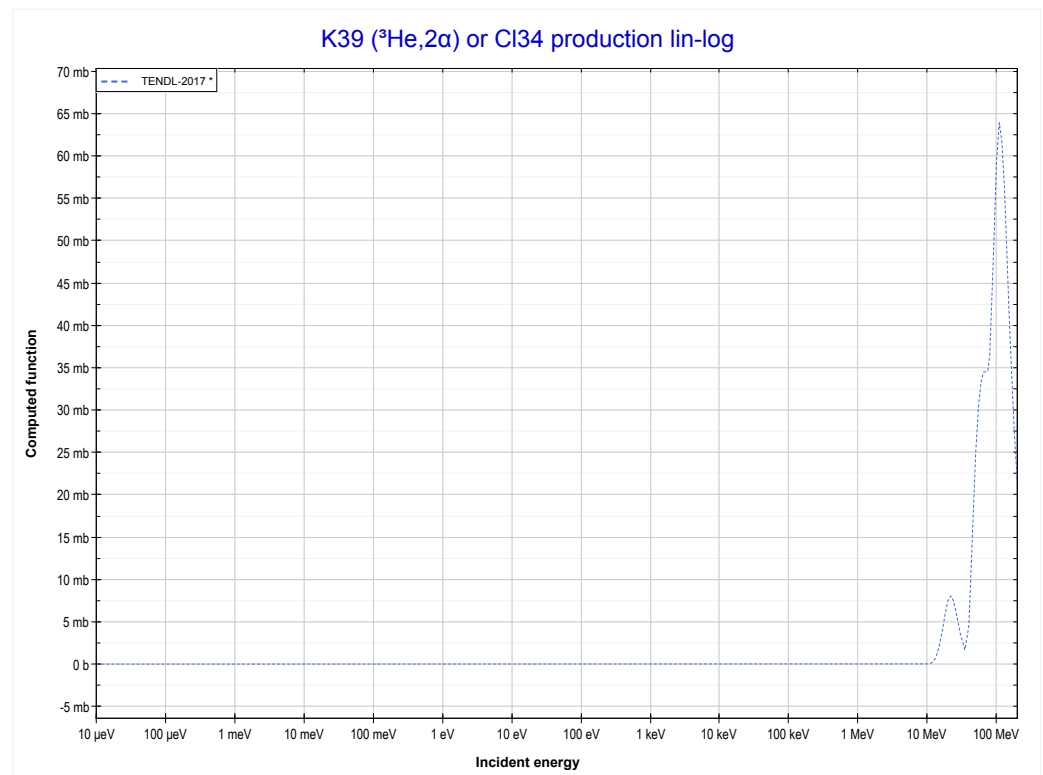
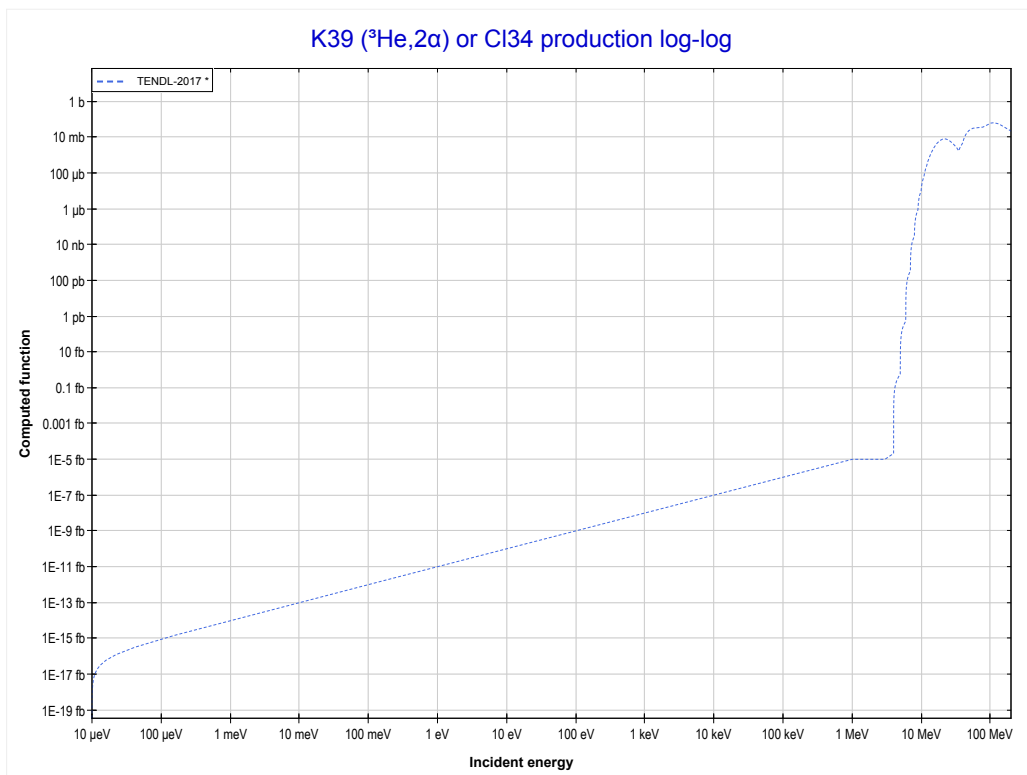
Reaction	Q-Value
Si28(He3,p)P30	6350.05 keV

<< 9-F-19	19-K-39	30-Zn-64 >>
<< 14-Si-28 MT103 (³ He,p)	MT107 (³He,α) or MT5 (K38 production)	MT108 (³ He,2α) >>



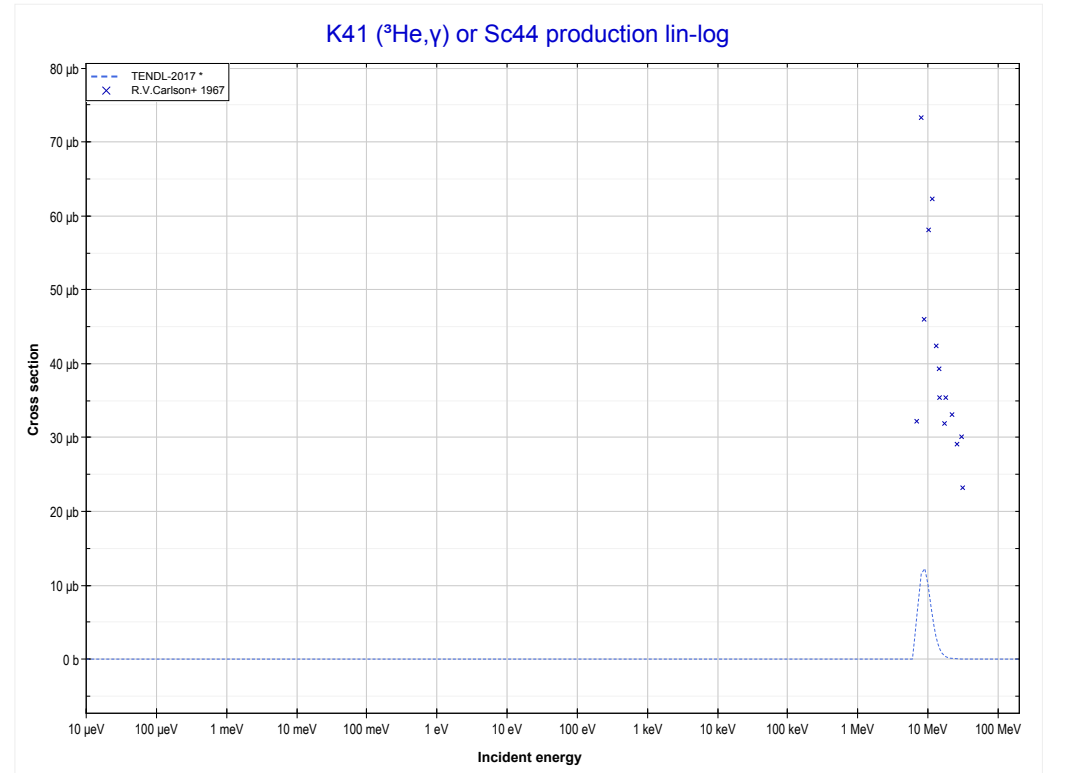
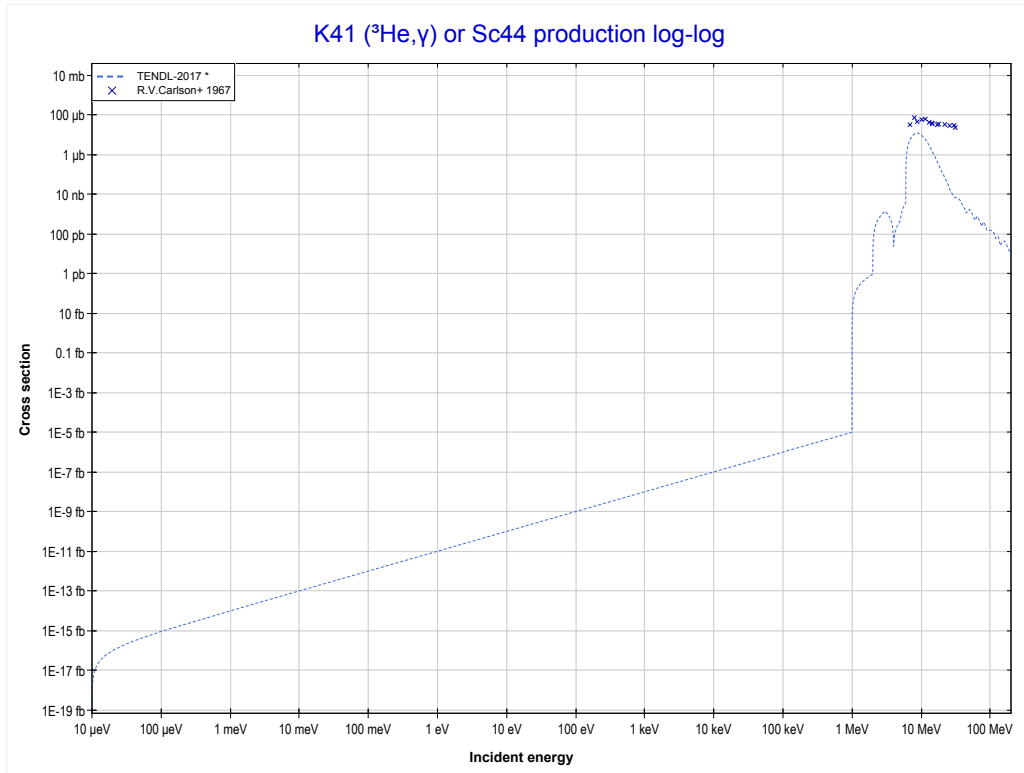
Reaction	Q-Value
K39(He3,α)K38	7499.86 keV
K39(He3,p+t)K38	-12314.00 keV
K39(He3,n+He3)K38	-13077.76 keV
K39(He3,2d)K38	-16346.67 keV
K39(He3,n+p+d)K38	-18571.23 keV
K39(He3,2n+2p)K38	-20795.80 keV

<< 13-AI-27	19-K-39	29-Cu-63 >>
<< MT107 ($^3\text{He},\alpha$)	MT108 ($^3\text{He},2\alpha$) or MT5 (Cl34 production)	19-K-41 MT102 ($^3\text{He},\gamma$) >>



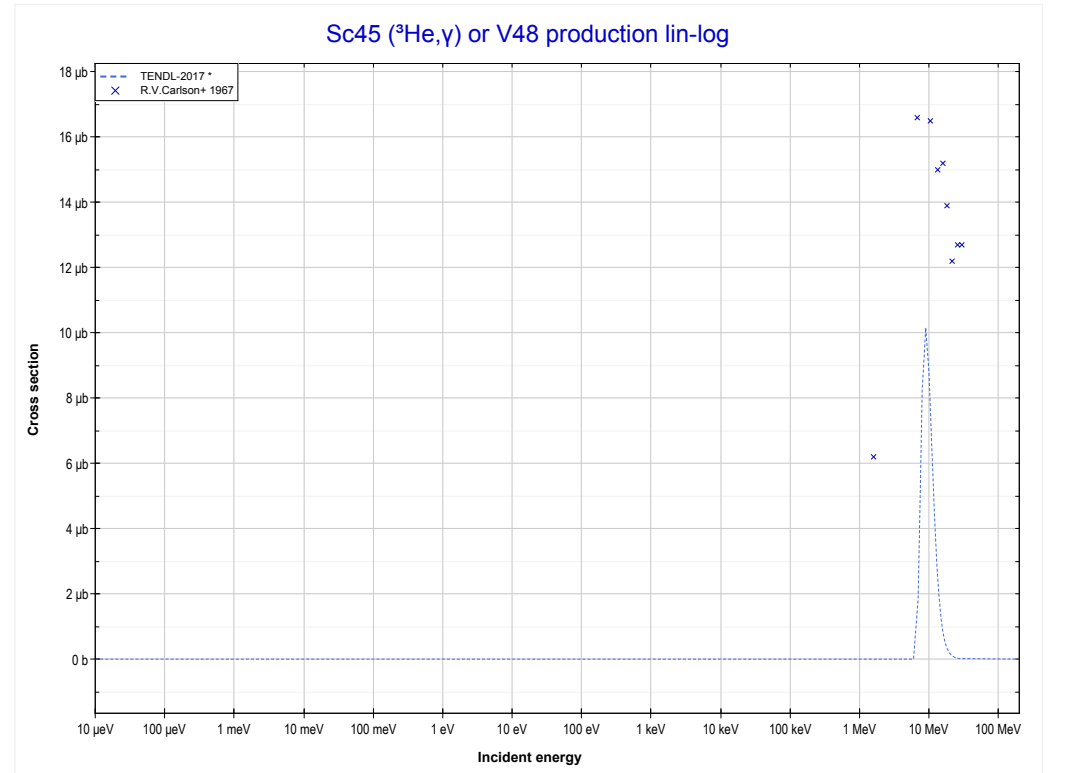
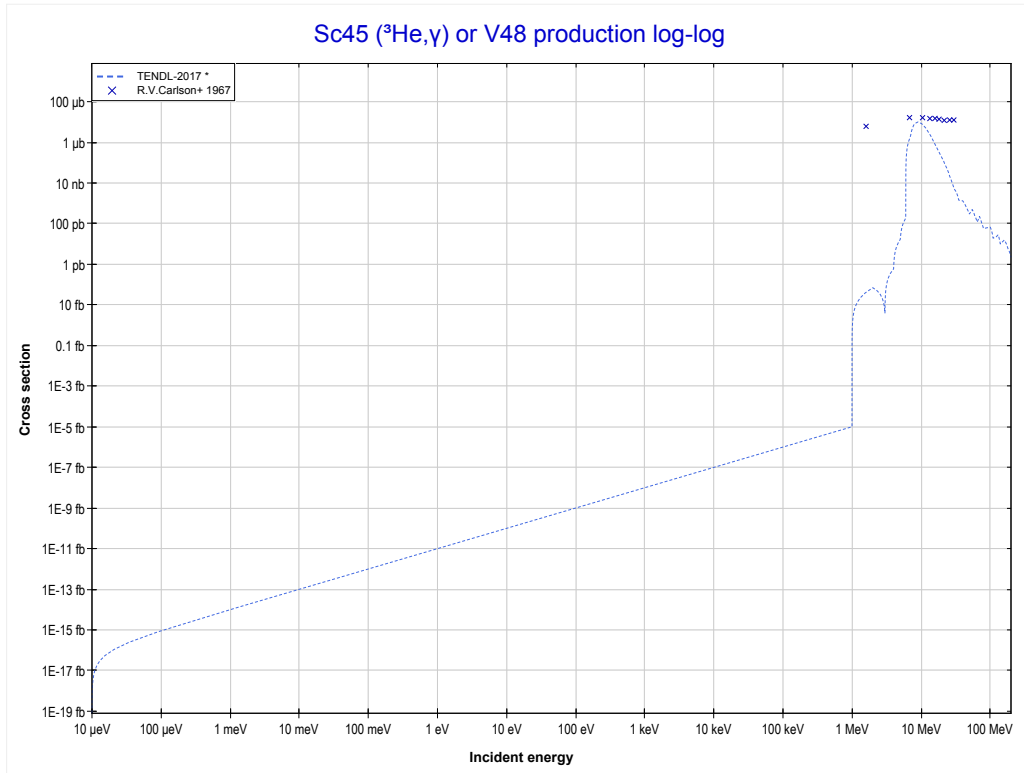
Reaction	Q-Value	Reaction	Q-Value
K39(He3,2α)Cl34	714.28 keV	K39(He3,n+p+t+He3)Cl34	-39677.19 keV
K39(He3,p+t+α)Cl34	-19099.58 keV	K39(He3,2n+2He3)Cl34	-40440.95 keV
K39(He3,n+He3+α)Cl34	-19863.33 keV	K39(He3,p+2d+t)Cl34	-42946.10 keV
K39(He3,2d+α)Cl34	-23132.24 keV	K39(He3,n+2d+He3)Cl34	-43709.86 keV
K39(He3,n+p+d+α)Cl34	-25356.81 keV	K39(He3,n+2p+d+t)Cl34	-45170.67 keV
K39(He3,2n+2p+α)Cl34	-27581.38 keV	K39(He3,2n+p+d+He3)Cl34	-45934.43 keV
K39(He3,d+t+He3)Cl34	-37452.63 keV	K39(He3,4d)Cl34	-46978.77 keV
K39(He3,2p+2t)Cl34	-38913.44 keV	K39(He3,2n+3p+t)Cl34	-47395.24 keV

<< 14-Si-28	19-K-41	21-Sc-45 >>
<< 19-K-39 MT108 (³ He,2α)	MT102 (³He,γ) or MT5 (Sc44 production)	21-Sc-45 MT102 (³ He,γ) >>



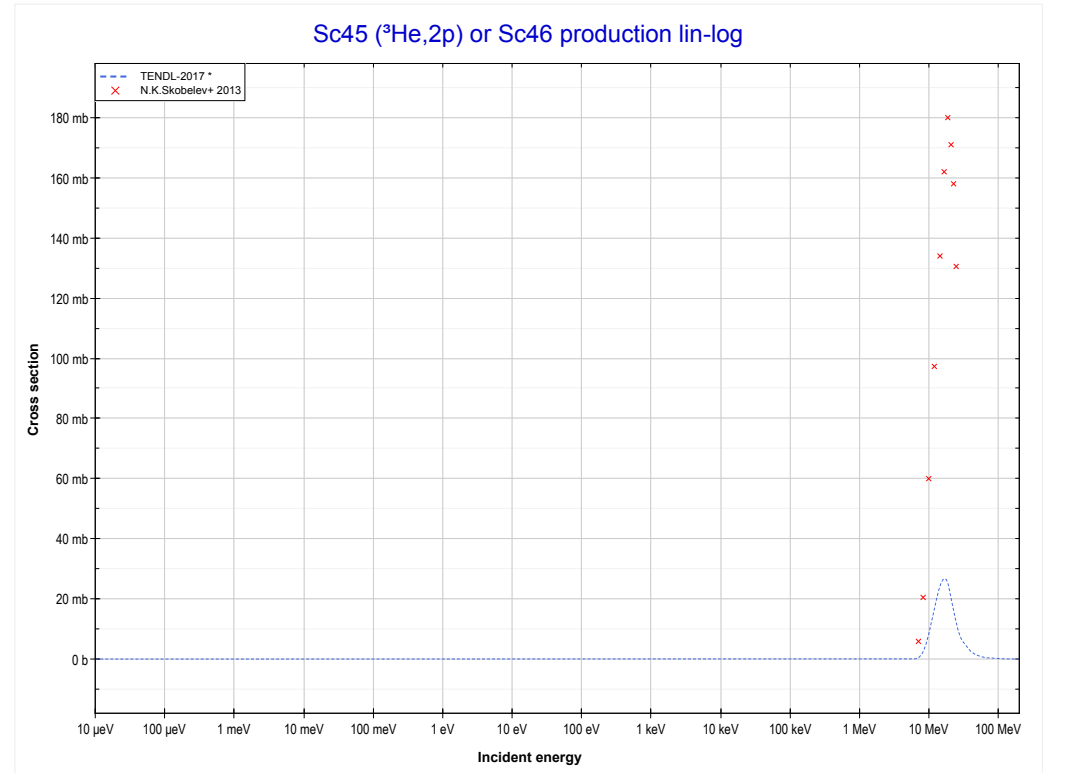
Reaction	Q-Value
K41(He3,γ)Sc44	17187.67 keV

<< 19-K-41	21-Sc-45	31-Ga-71 >>
<< 19-K-41 MT102 (³ He, γ)	MT102 (³He,γ) or MT5 (V48 production)	MT111 (³ He,2p) >>



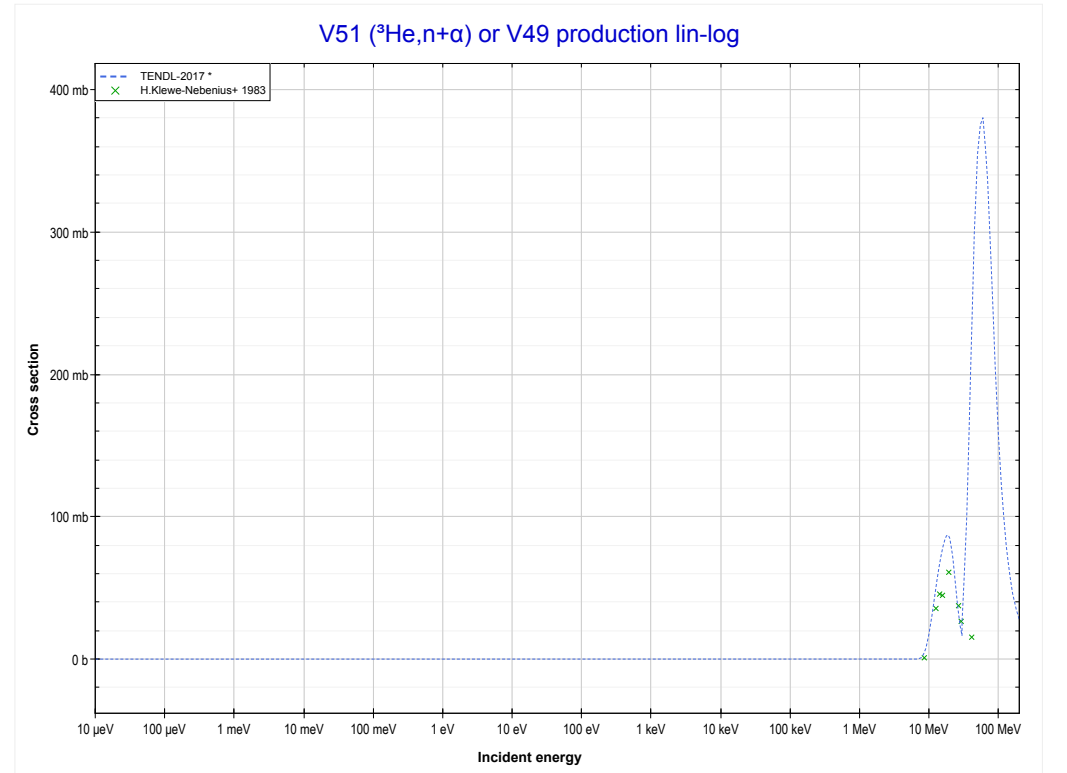
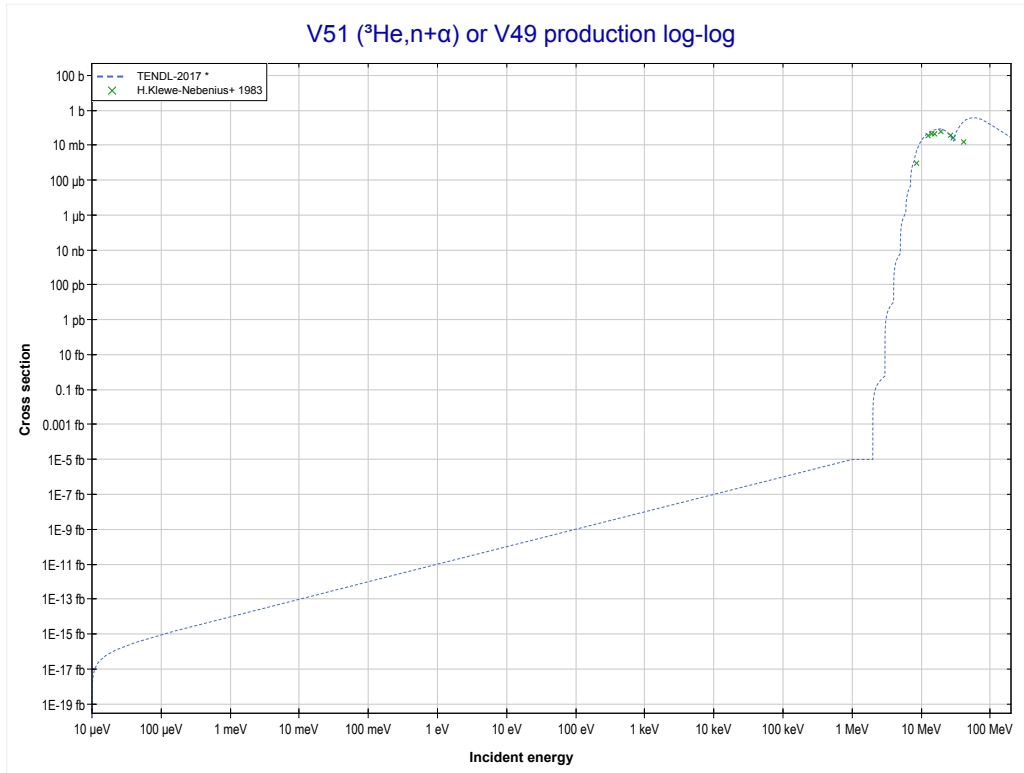
Reaction	Q-Value
Sc45(He3, γ)V48	18336.82 keV

<< 13-Al-27	21-Sc-45	25-Mn-55 >>
<< MT102 (³ He,γ)	MT111 (³He,2p) or MT5 (Sc46 production)	23-V-51 MT22 (³ He,n+α) >>



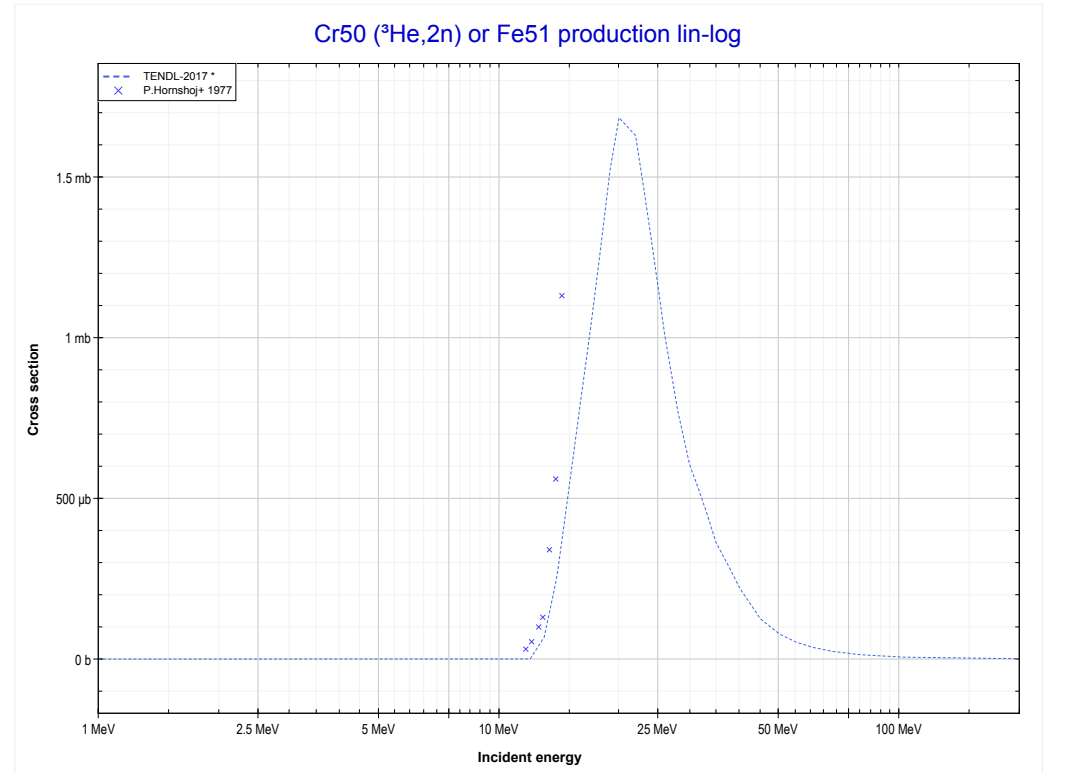
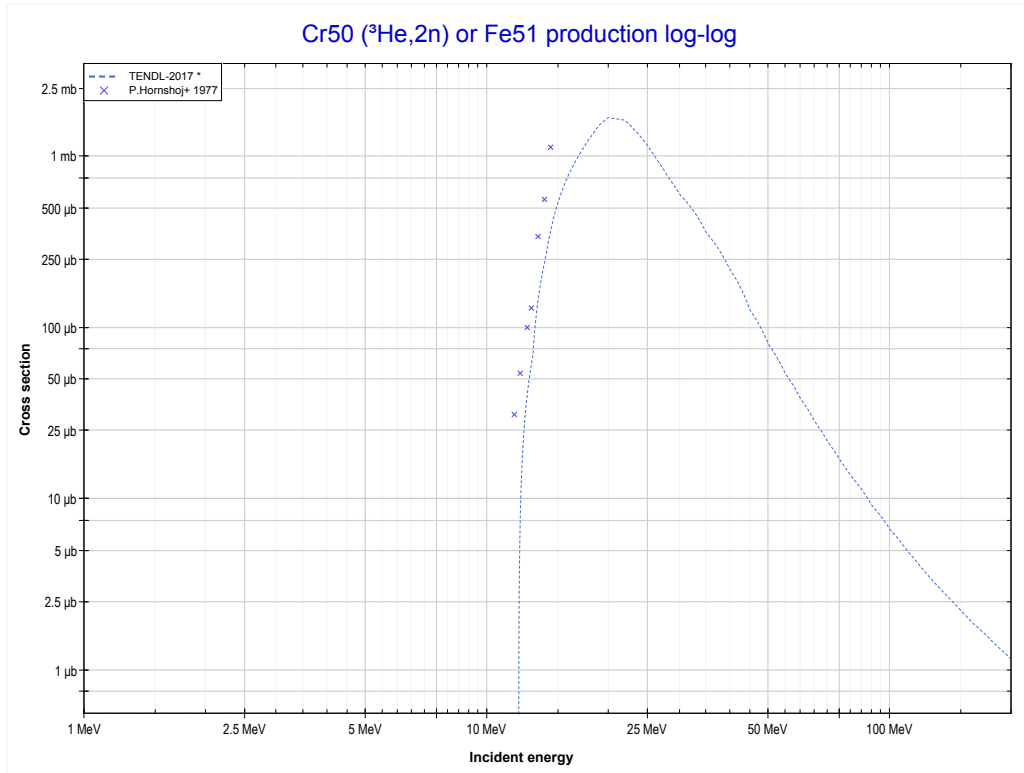
Reaction	Q-Value
Sc45(He3,2p)Sc46	1042.57 keV

<< 9-F-19	23-V-51	27-Co-59 >>
<< 21-Sc-45 MT111 (³ He,2p)	MT22 (³He,n+α) or MT5 (V49 production)	24-Cr-50 MT16 (³ He,2n) >>



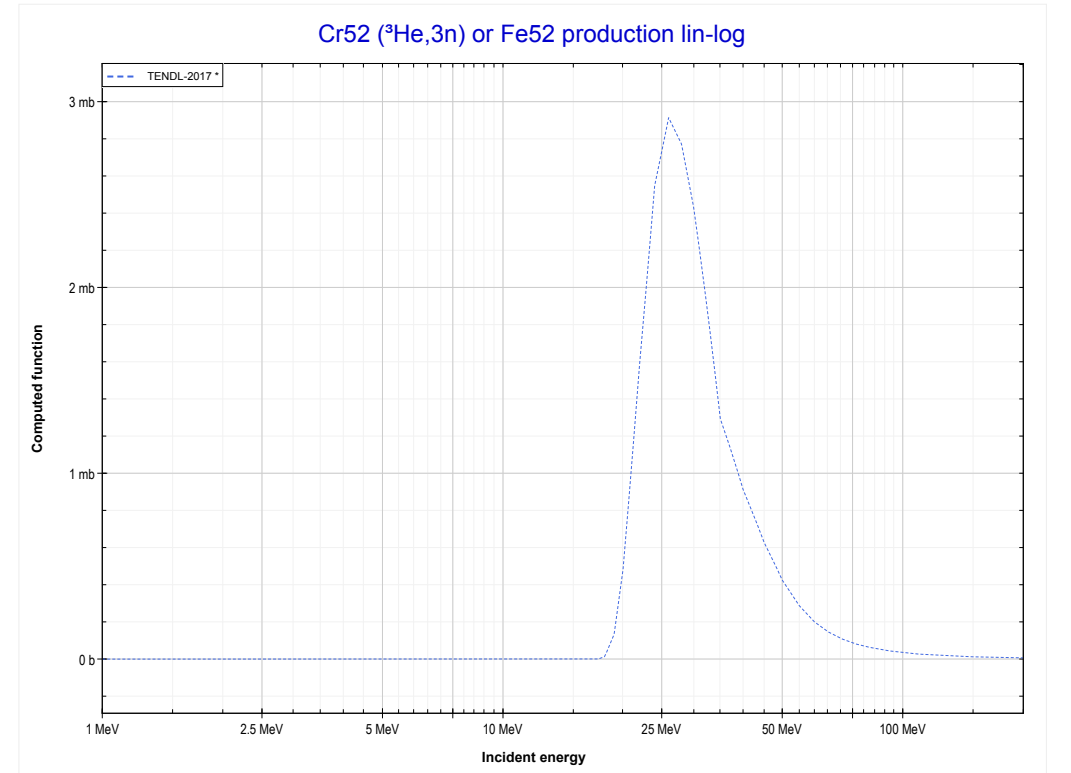
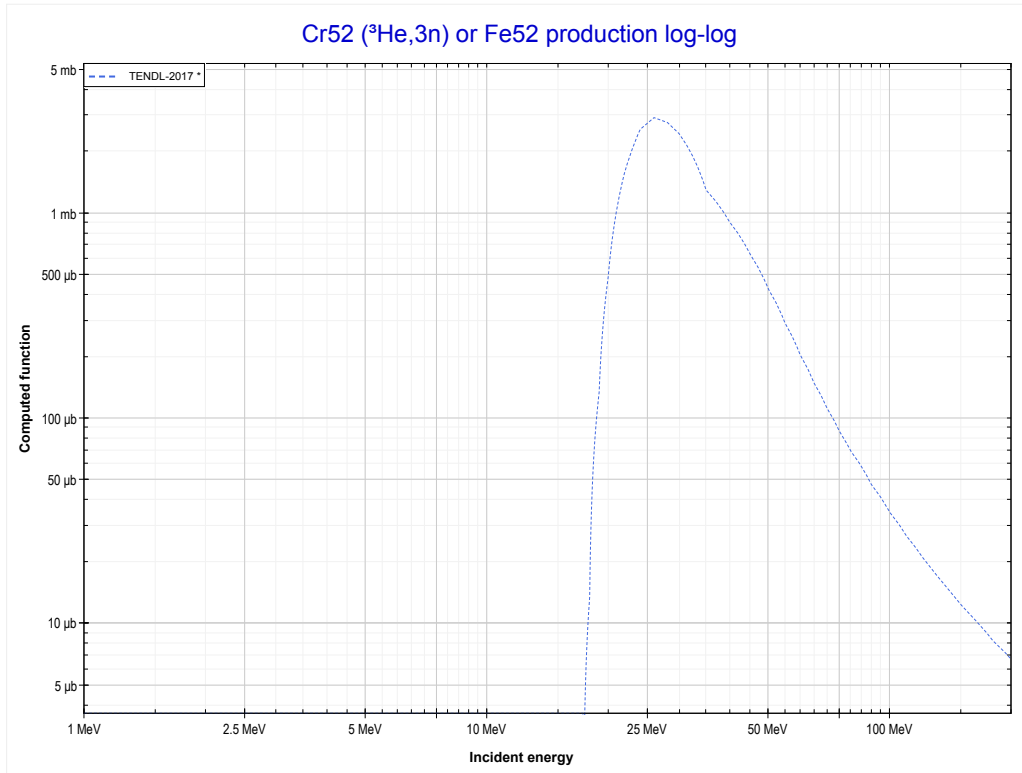
Reaction	Q-Value
V51(He3,n+α)V49	192.28 keV
V51(He3,d+t)V49	-17397.01 keV
V51(He3,n+p+t)V49	-19621.58 keV
V51(He3,2n+He3)V49	-20385.33 keV
V51(He3,n+2d)V49	-23654.24 keV
V51(He3,2n+p+d)V49	-25878.81 keV
V51(He3,3n+2p)V49	-28103.38 keV

<< 13-Al-27	24-Cr-50	25-Mn-55 >>
<< 23-V-51 MT22 (³ He,n+α)	MT16 (³He,2n) or MT5 (Fe51 production)	24-Cr-52 MT17 (³ He,3n) >>



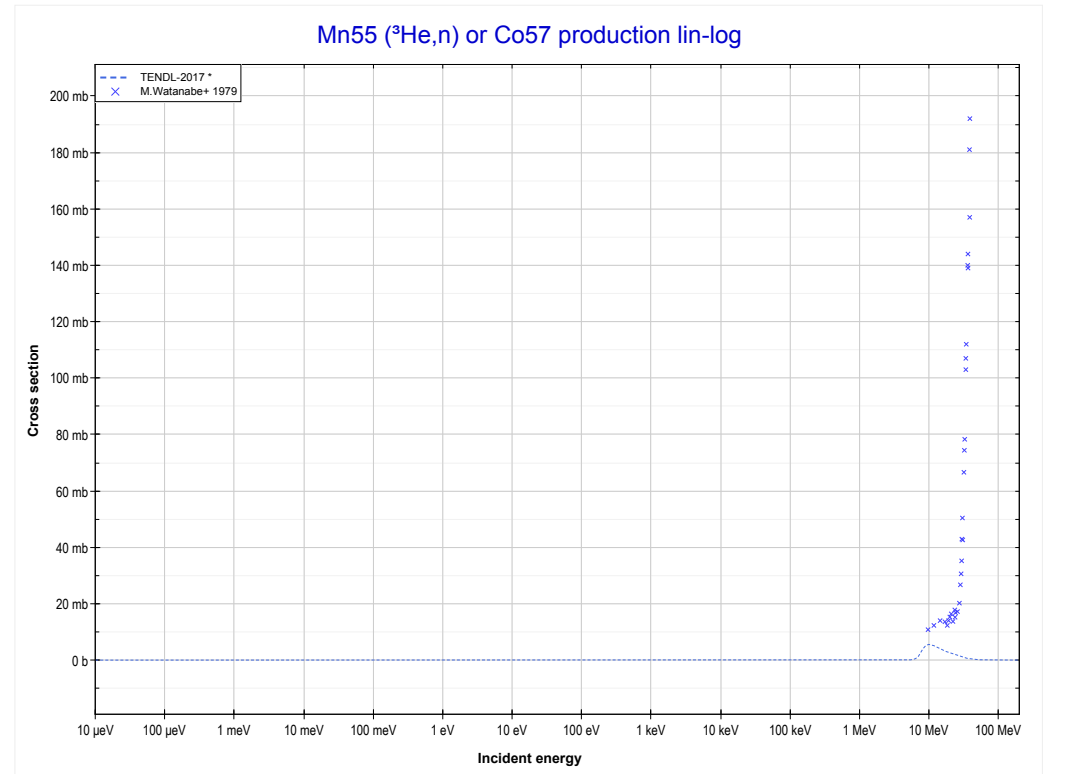
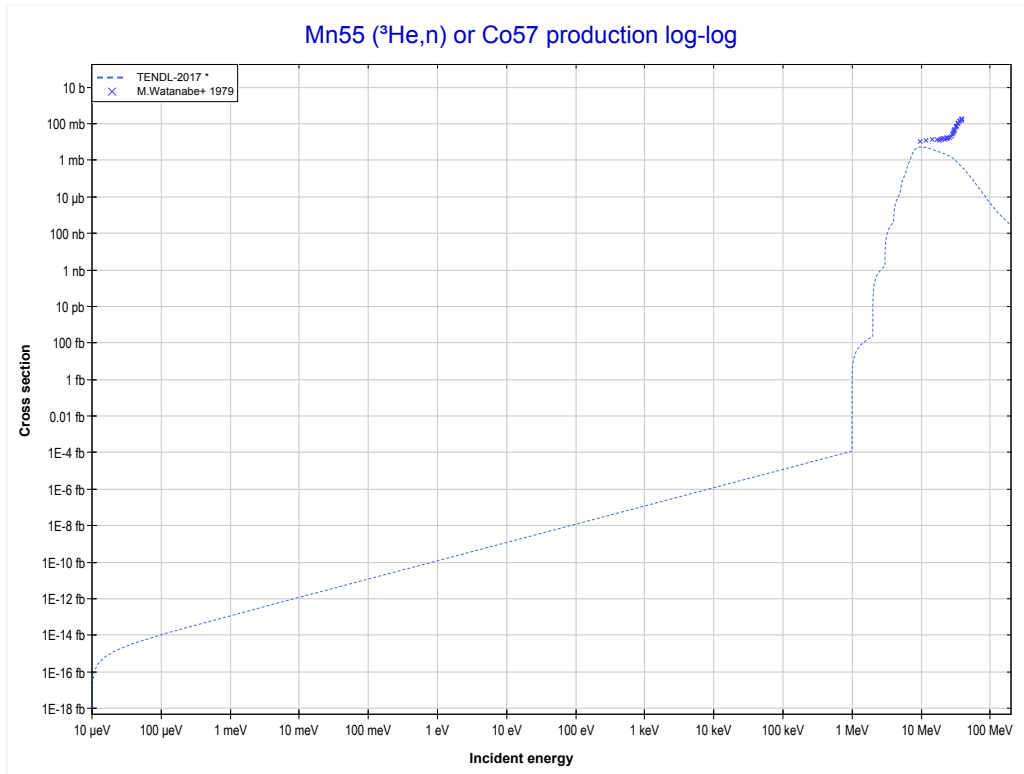
Reaction	Q-Value
Cr50(He3,2n)Fe51	-11271.12 keV

	24-Cr-52	25-Mn-55 >>
<< 24-Cr-50 MT16 (³He,2n)	MT17 (³He,3n) or MT5 (Fe52 production)	25-Mn-55 MT4 (³He,n) >>



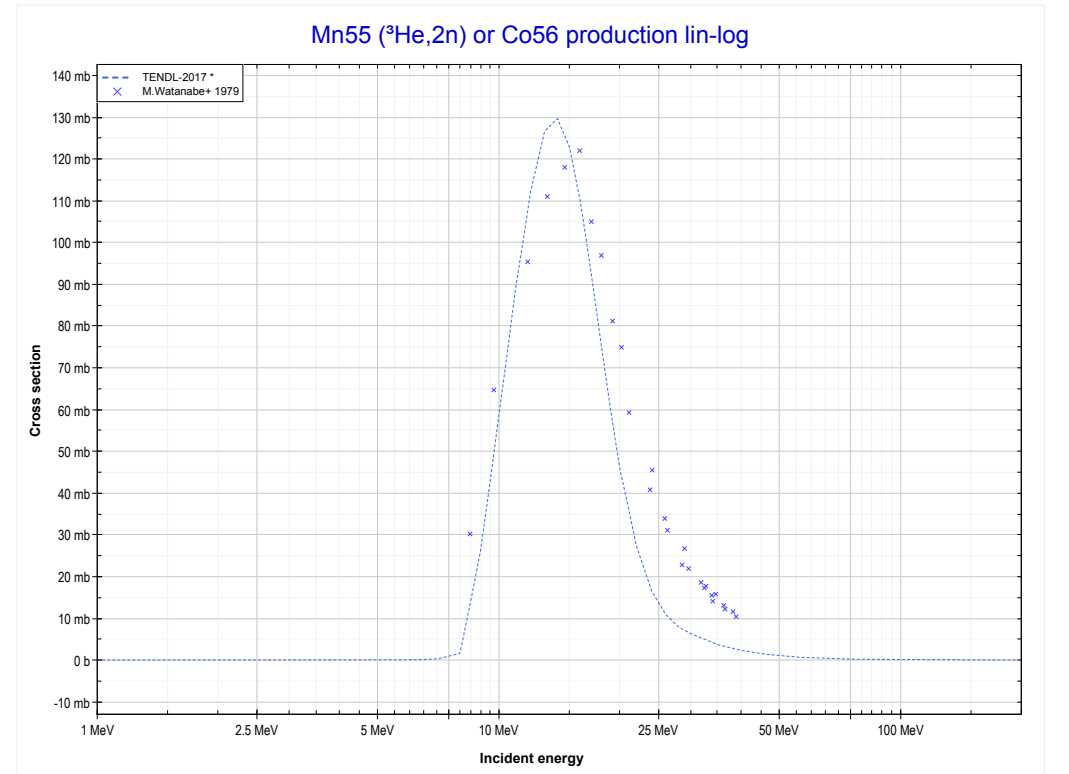
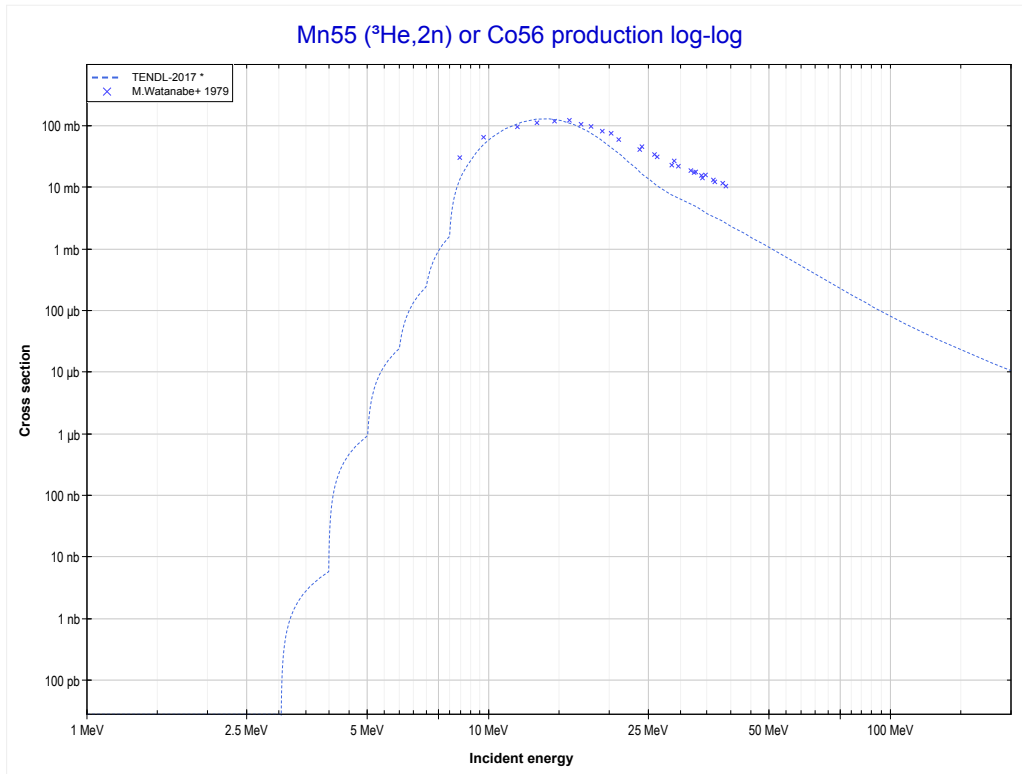
Reaction	Q-Value
Cr52(He3,3n)Fe52	-16368.84 keV

<< 14-Si-28	25-Mn-55	27-Co-59 >>
<< 24-Cr-52 MT17 (³ He,3n)	MT4 (³He,n) or MT5 (Co57 production)	MT16 (³ He,2n) >>



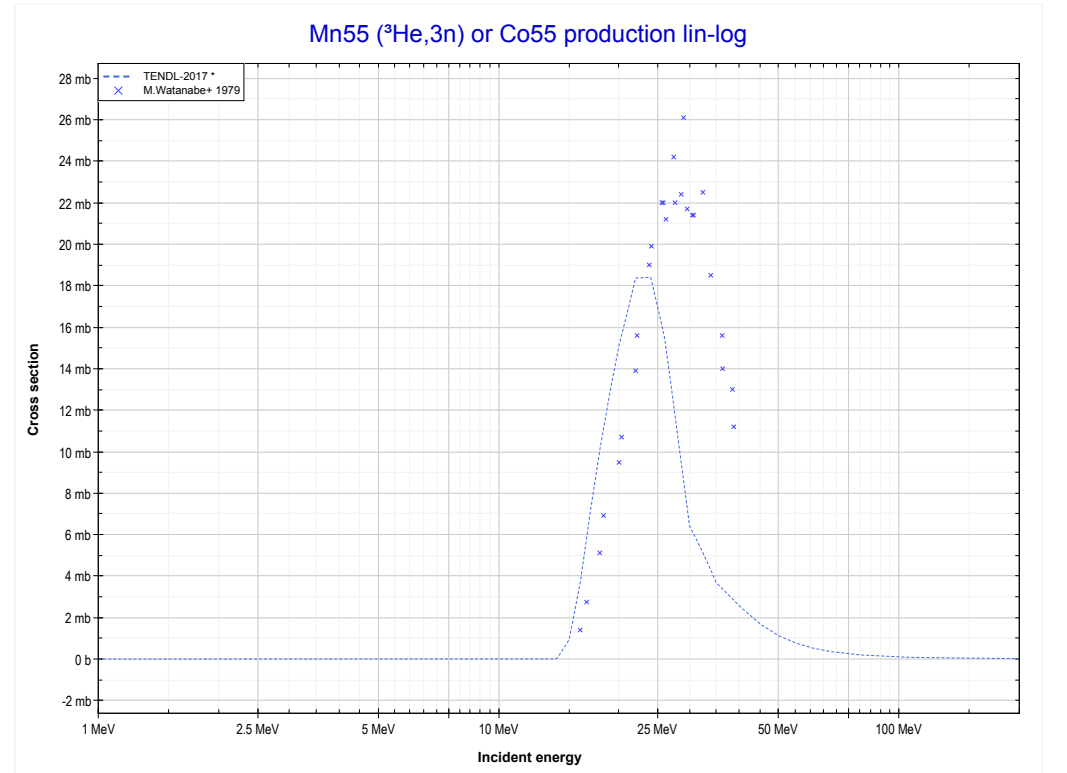
Reaction	Q-Value
Mn55(He3,n)Co57	8493.10 keV

<< 24-Cr-50	25-Mn-55	26-Fe-54 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Co56 production)	MT17 (³ He,3n) >>



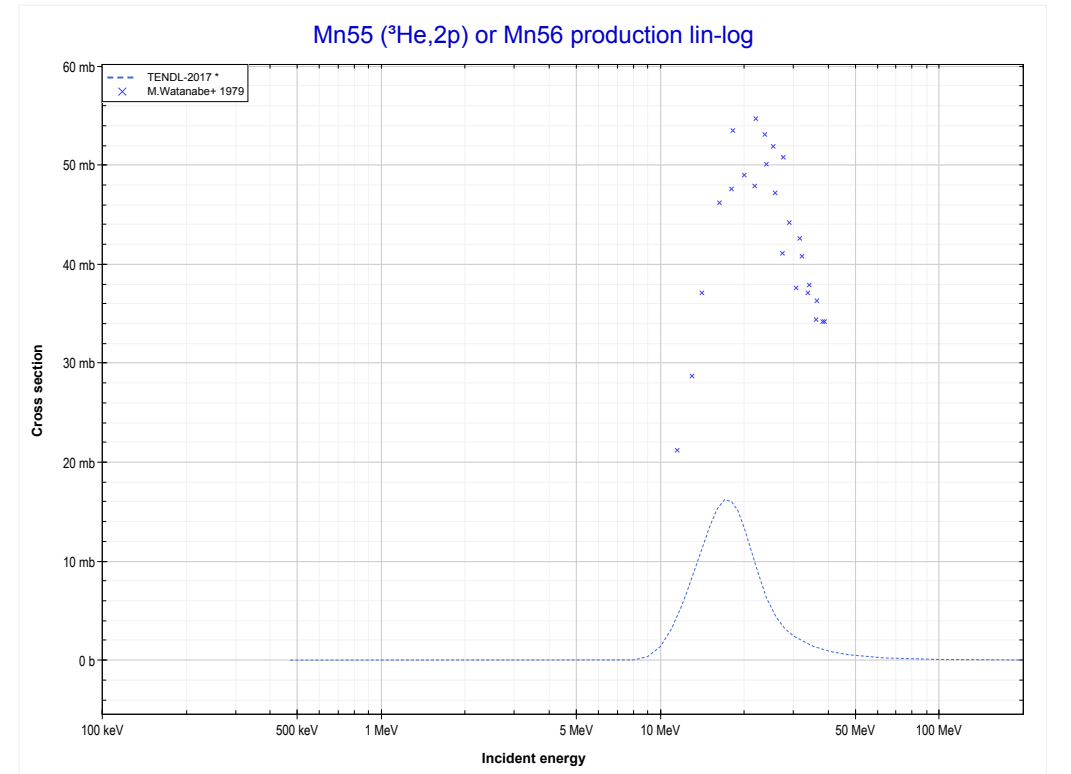
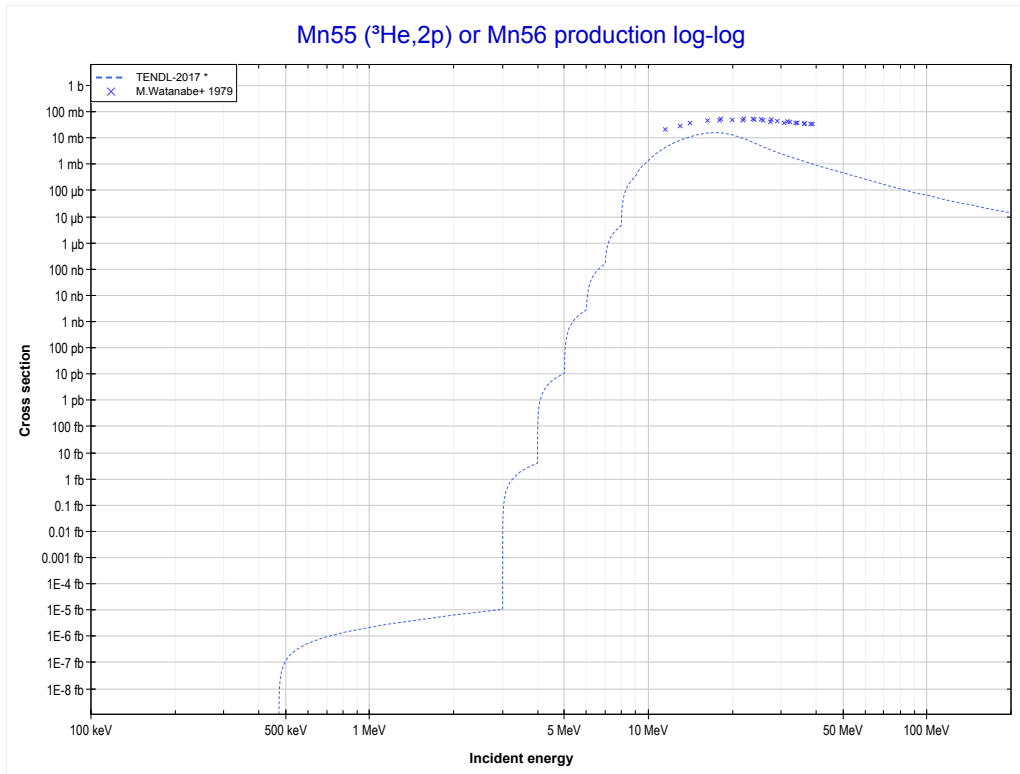
Reaction	Q-Value
Mn55(He3,2n)Co56	-2883.32 keV

<< 24-Cr-52	25-Mn-55	29-Cu-65 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (Co55 production)	MT111 ($^3\text{He},2p$) >>



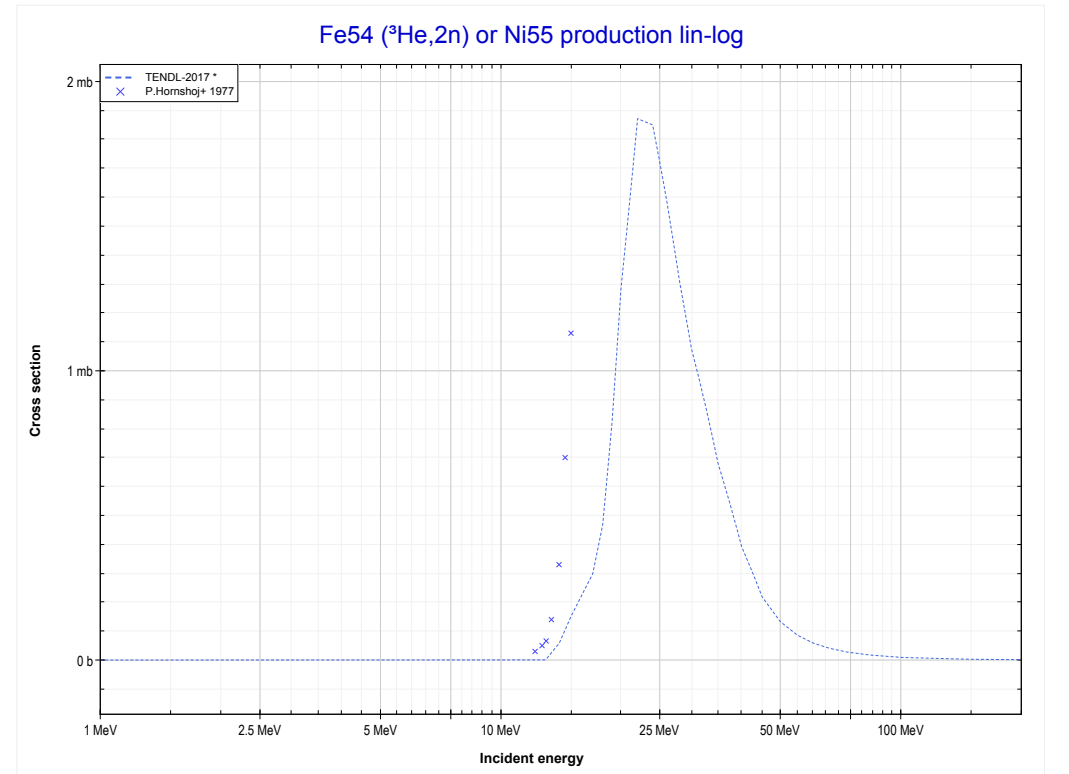
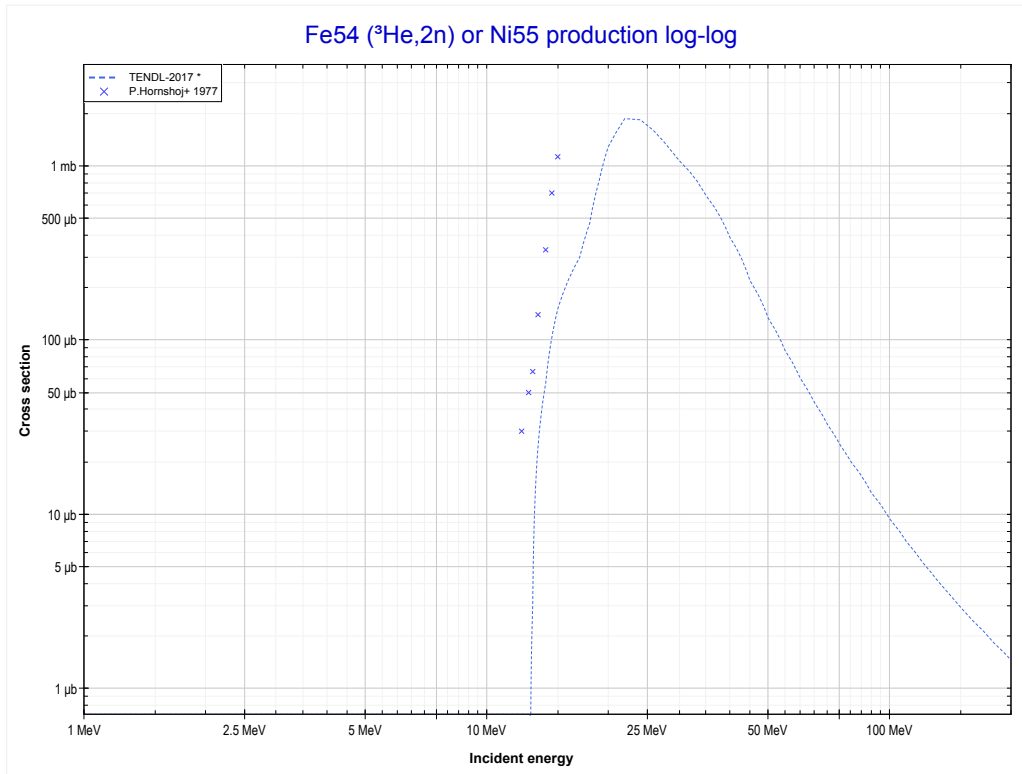
Reaction	Q-Value
Mn55(He3,3n)Co55	-12965.14 keV

<< 21-Sc-45	25-Mn-55	27-Co-59 >>
<< MT17 (³ He,3n)	MT111 (³He,2p) or MT5 (Mn56 production)	26-Fe-54 MT16 (³ He,2n) >>



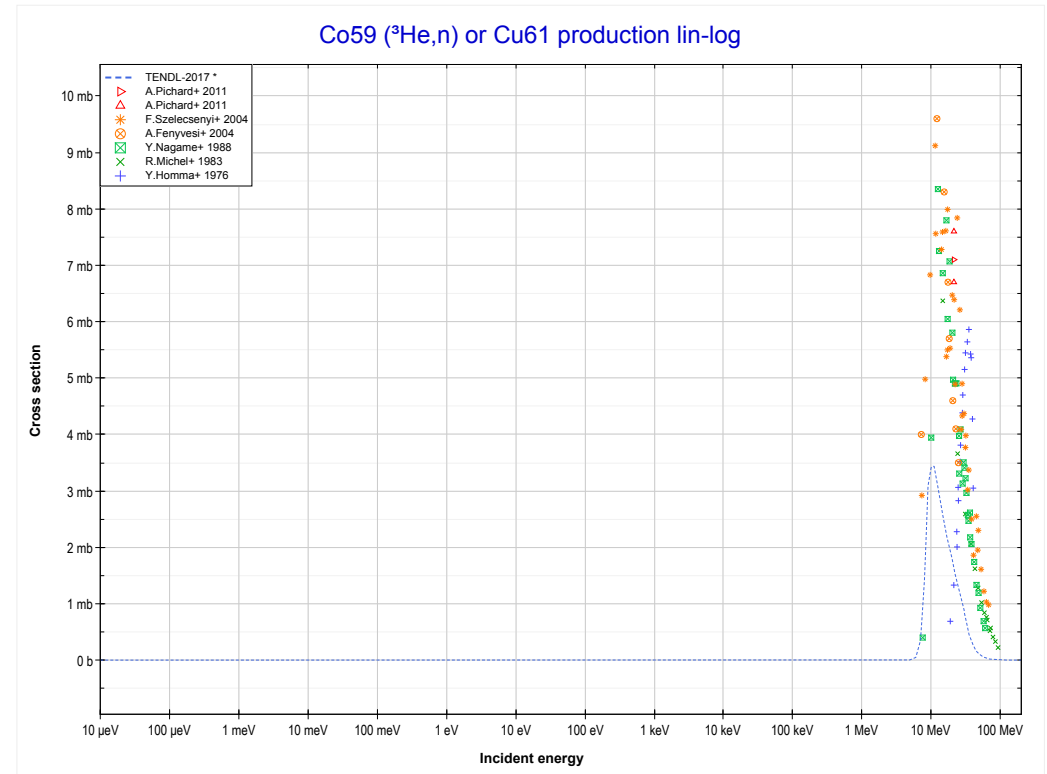
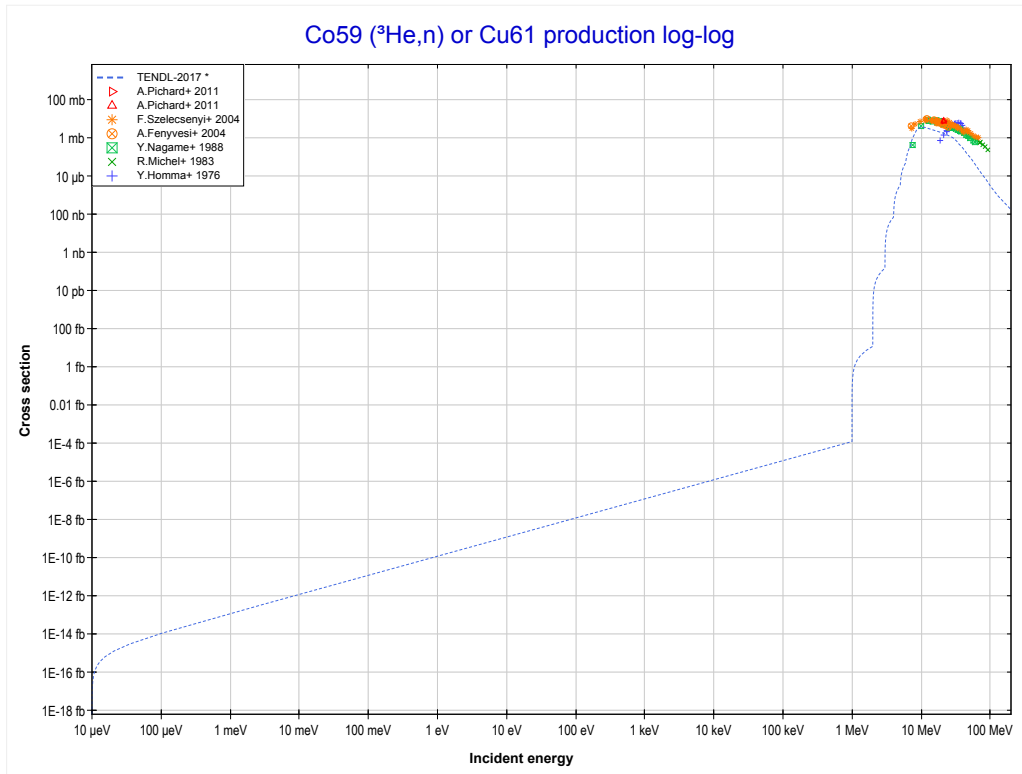
Reaction	Q-Value
Mn55(He3,2p)Mn56	-447.63 keV

<< 25-Mn-55	26-Fe-54	27-Co-59 >>
<< 25-Mn-55 MT111 (³ He,2p)	MT16 (³He,2n) or MT5 (Ni55 production)	27-Co-59 MT4 (³ He,n) >>



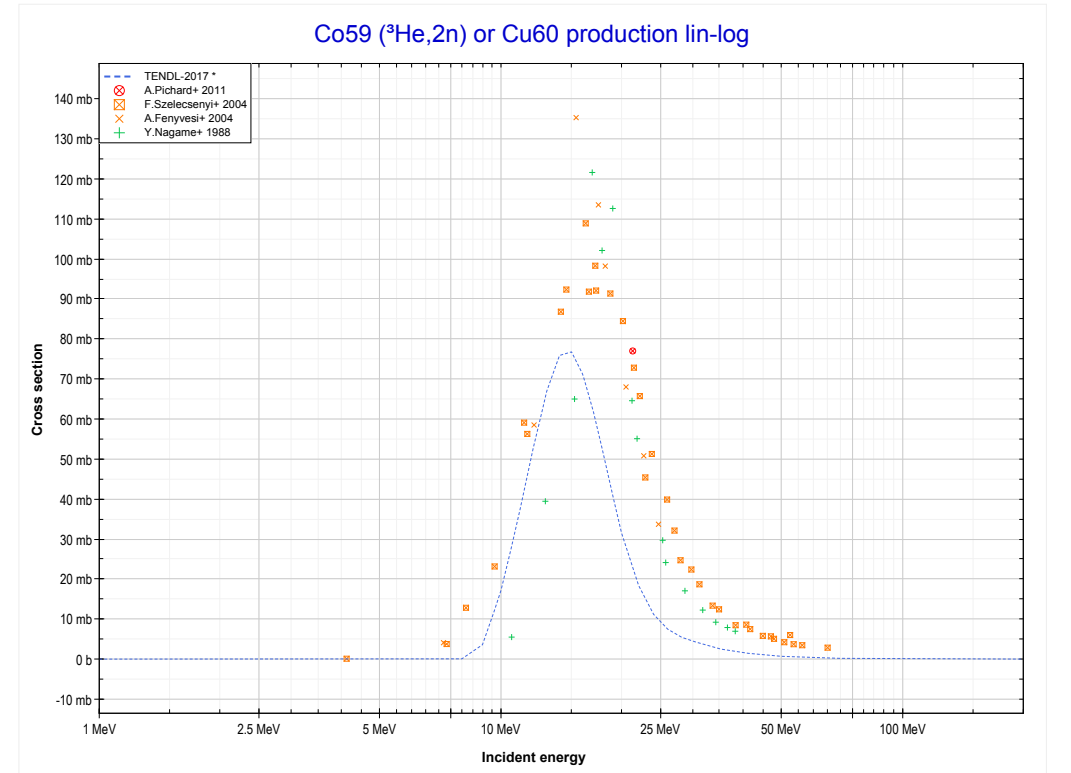
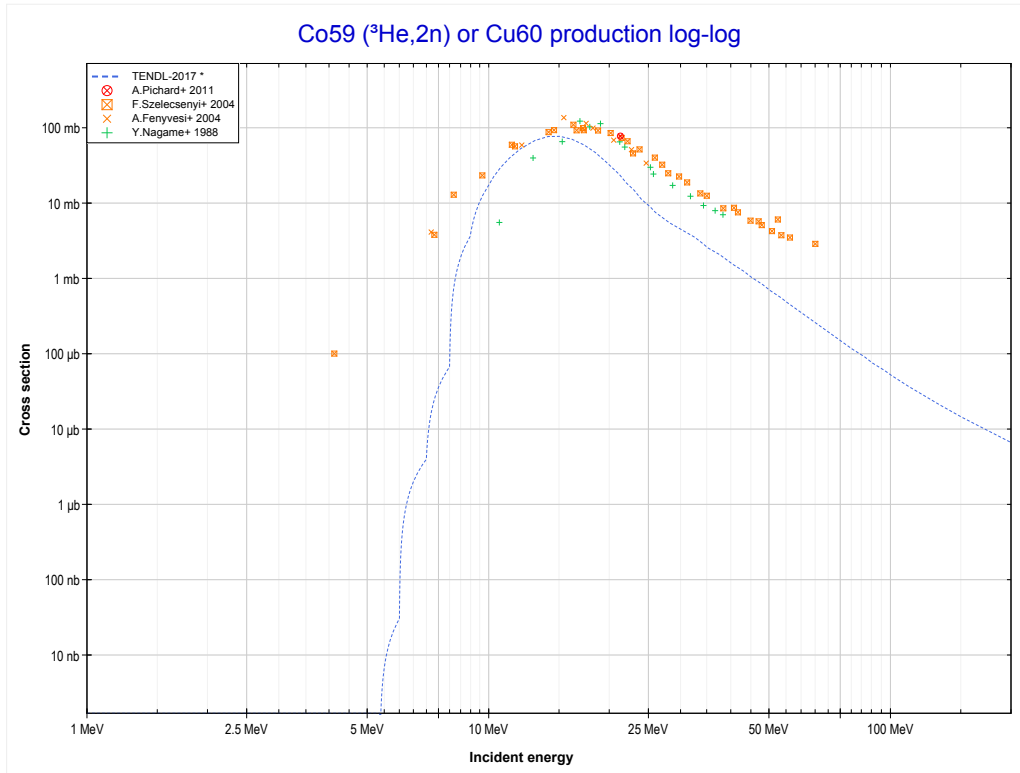
Reaction	Q-Value
Fe54(He3,2n)Ni55	-12130.12 keV

<< 25-Mn-55	27-Co-59	29-Cu-63 >>
<< 26-Fe-54 MT16 (³ He,2n)	MT4 (³He,n) or MT5 (Cu61 production)	MT16 (³ He,2n) >>



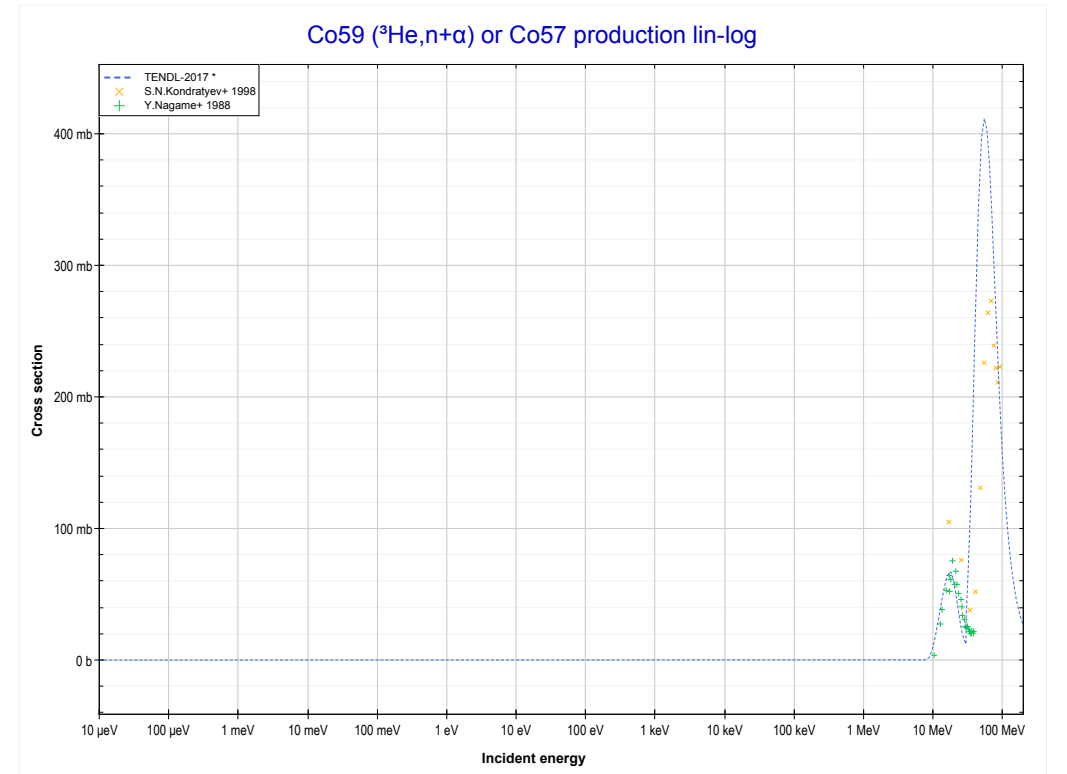
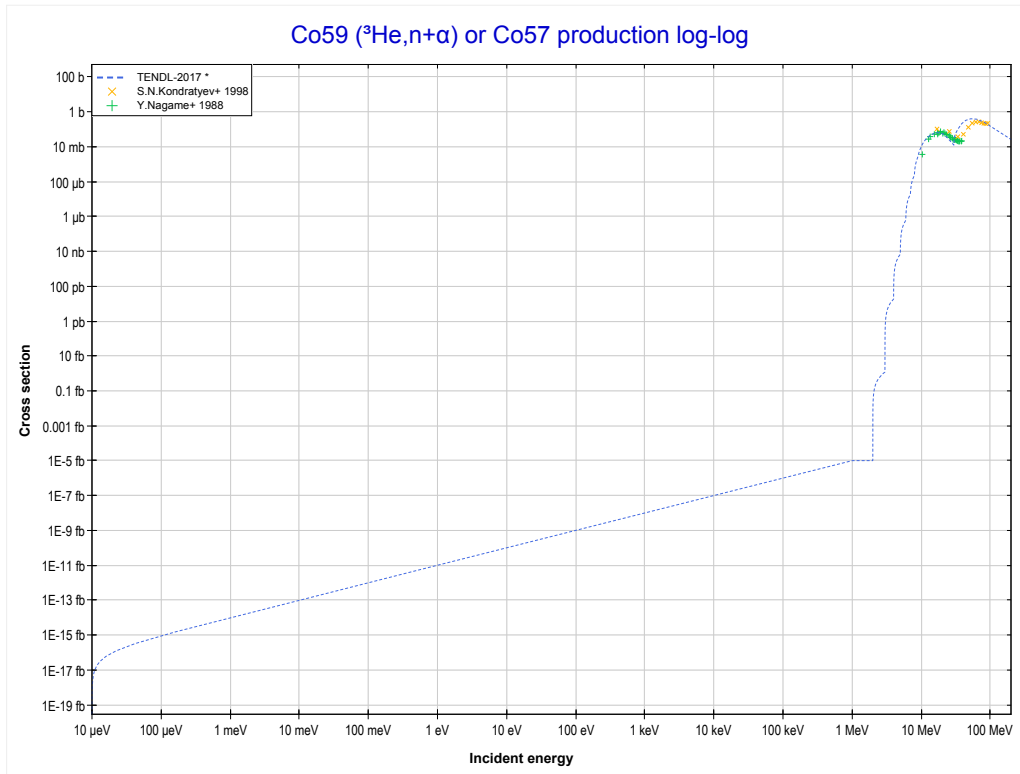
Reaction	Q-Value
Co59(He3,n)Cu61	6614.60 keV

<< 26-Fe-54	27-Co-59	29-Cu-63 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Cu60 production)	MT22 (³ He,n+α) >>



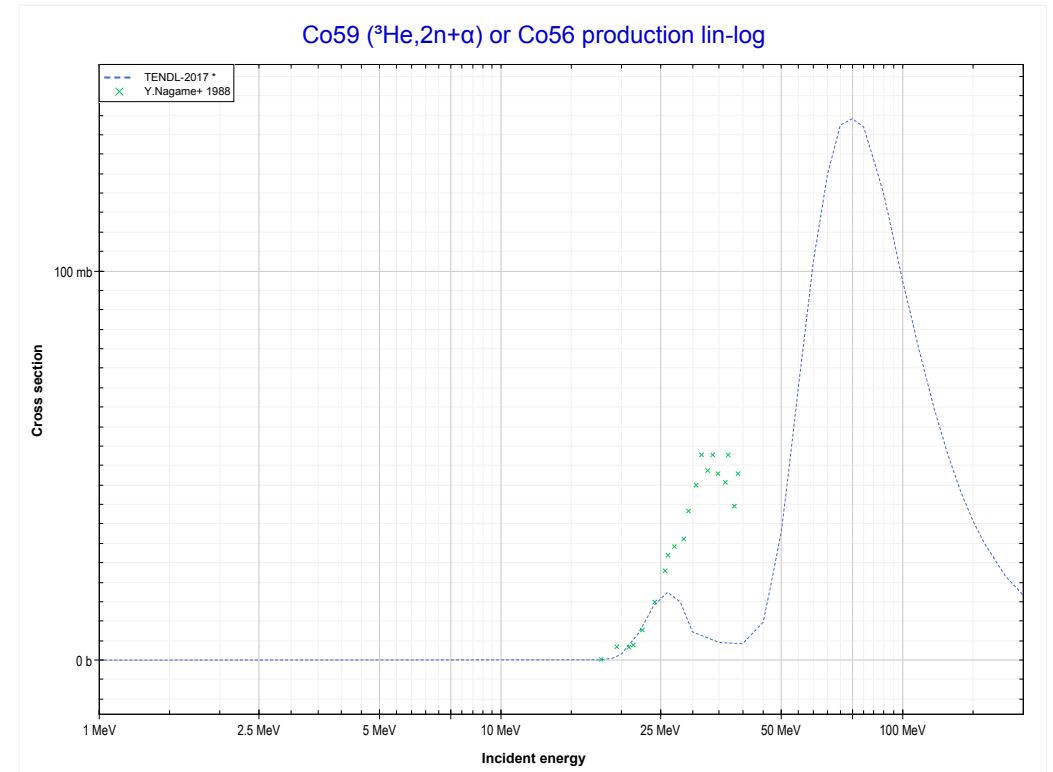
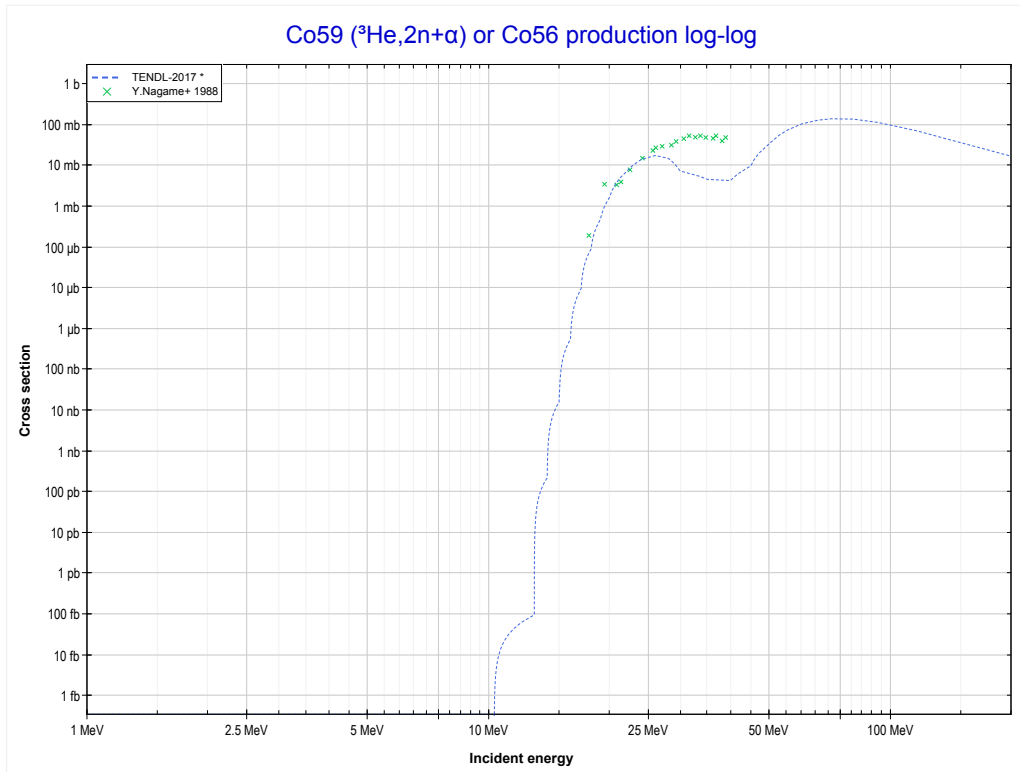
Reaction	Q-Value
Co59(He3,2n)Cu60	-5095.92 keV

<< 23-V-51	27-Co-59	29-Cu-63 >>
<< MT16 (³ He,2n)	MT22 (³He,n+α) or MT5 (Co57 production)	MT24 (³ He,2n+α) >>



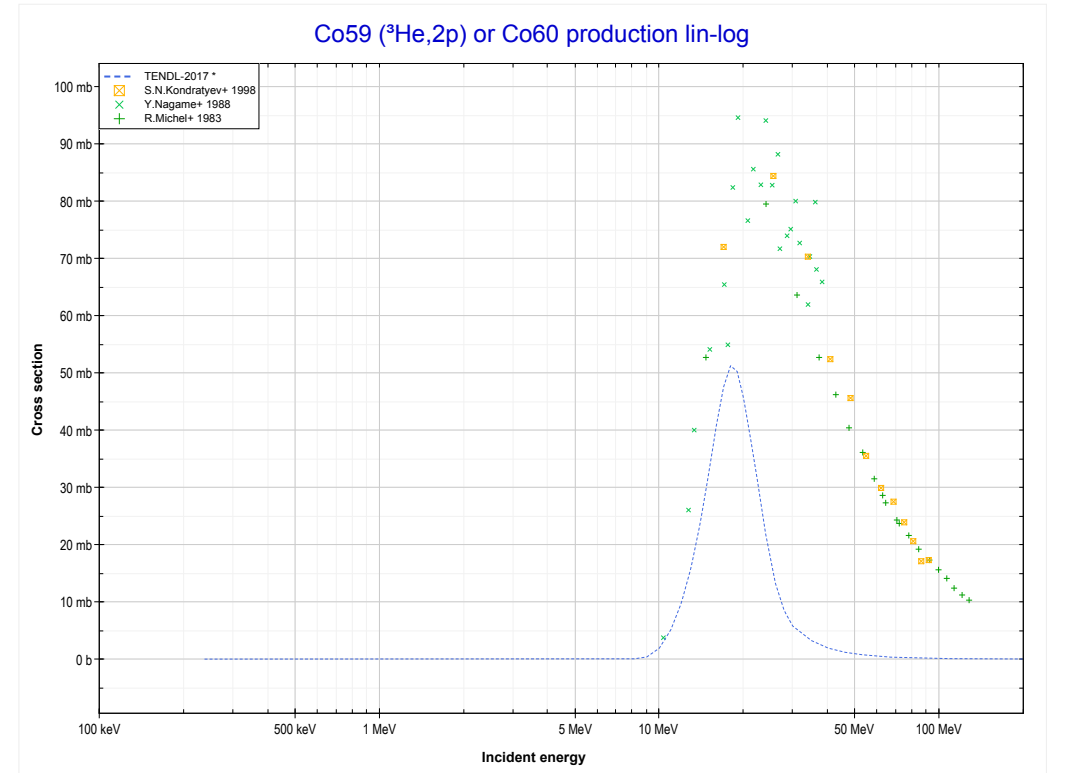
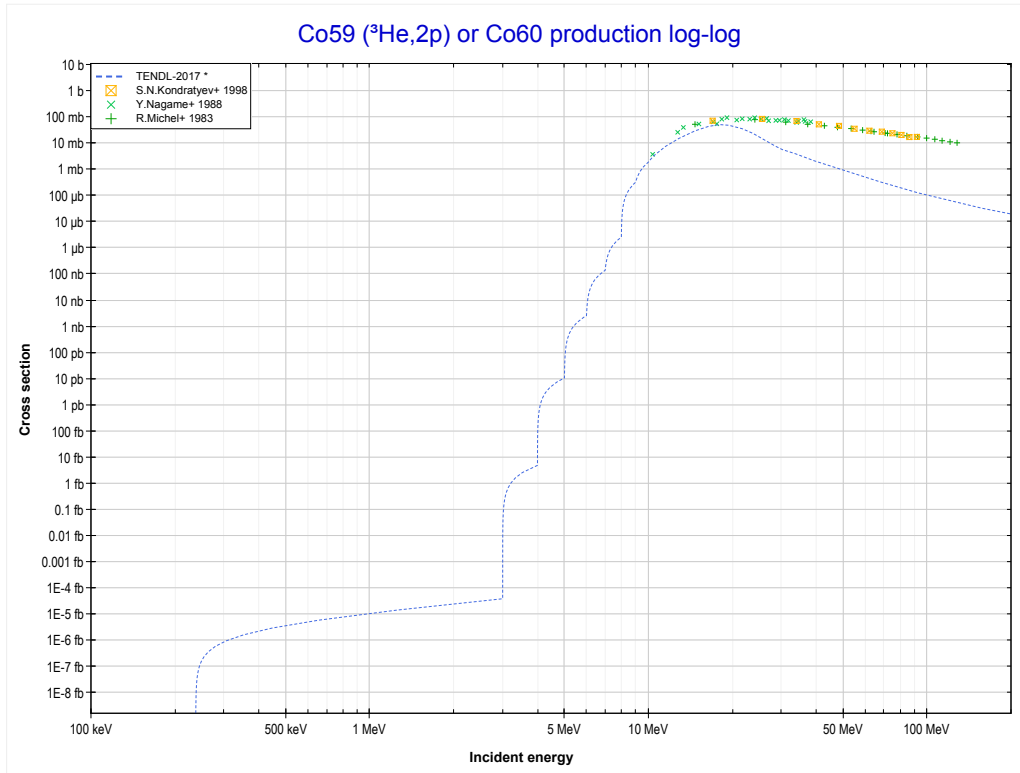
Reaction	Q-Value
Co59(He3,n+α)Co57	1550.78 keV
Co59(He3,d+t)Co57	-16038.51 keV
Co59(He3,n+p+t)Co57	-18263.08 keV
Co59(He3,2n+He3)Co57	-19026.83 keV
Co59(He3,n+2d)Co57	-22295.75 keV
Co59(He3,2n+p+d)Co57	-24520.31 keV
Co59(He3,3n+2p)Co57	-26744.88 keV

	27-Co-59	73-Ta-181 >>
<< MT22 ($^3\text{He},n+\alpha$)	MT24 ($^3\text{He},2n+\alpha$) or MT5 (Co56 production)	MT111 ($^3\text{He},2p$) >>



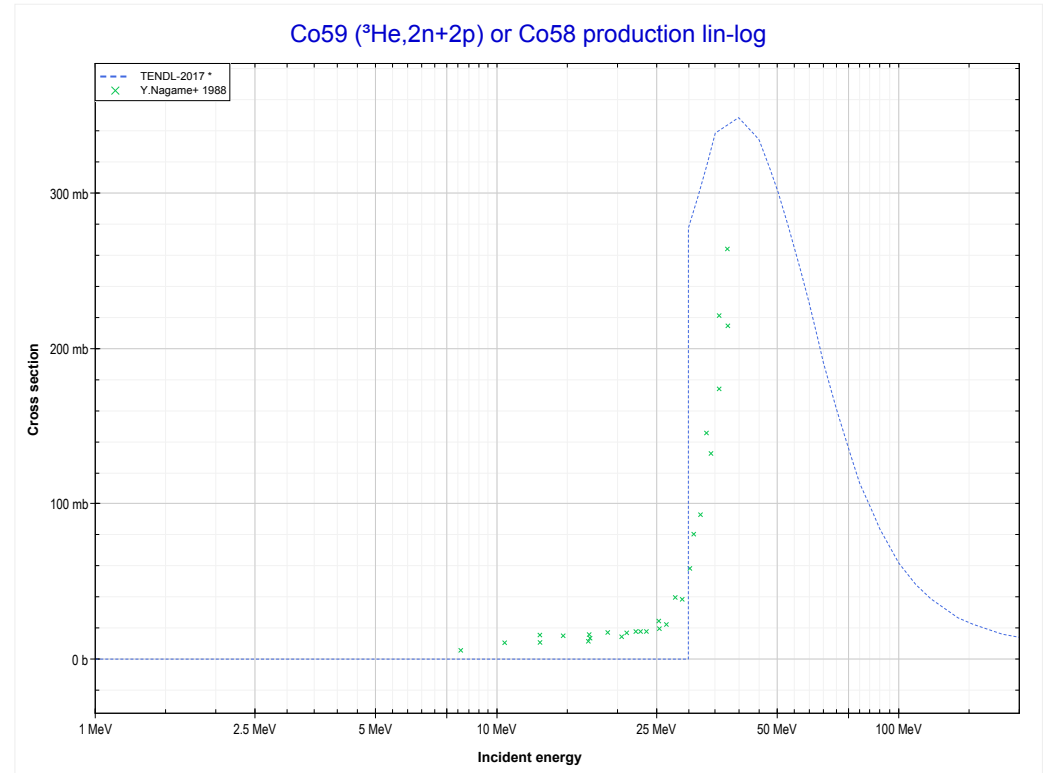
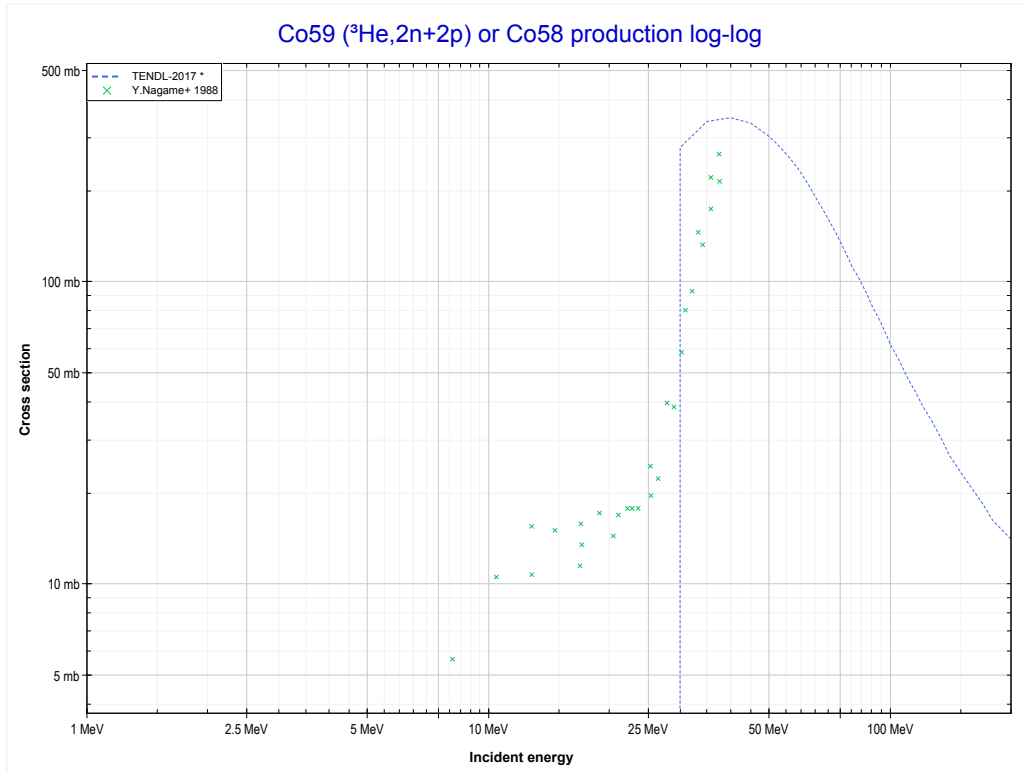
Reaction	Q-Value
Co59($\text{He}3,2n+\alpha$)Co56	-9825.63 keV
Co59($\text{He}3,2t$)Co56	-21157.70 keV
Co59($\text{He}3,n+d+t$)Co56	-27414.93 keV
Co59($\text{He}3,2n+p+t$)Co56	-29639.50 keV
Co59($\text{He}3,3n+\text{He}3$)Co56	-30403.25 keV
Co59($\text{He}3,2n+2d$)Co56	-33672.16 keV
Co59($\text{He}3,3n+p+d$)Co56	-35896.73 keV
Co59($\text{He}3,4n+2p$)Co56	-38121.29 keV

<< 25-Mn-55	27-Co-59	29-Cu-63 >>
<< MT24 ($^3\text{He},2n+\alpha$)	MT111 ($^3\text{He},2p$) or MT5 (Co60 production)	MT190 ($^3\text{He},2n+2p$) >>



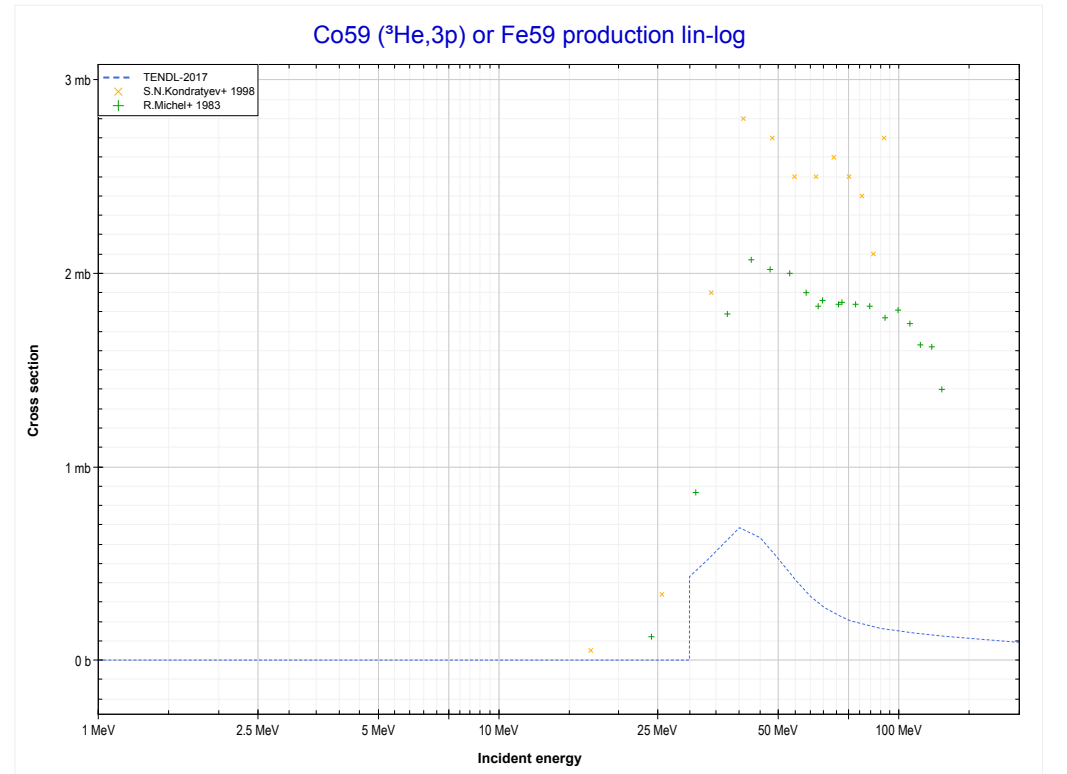
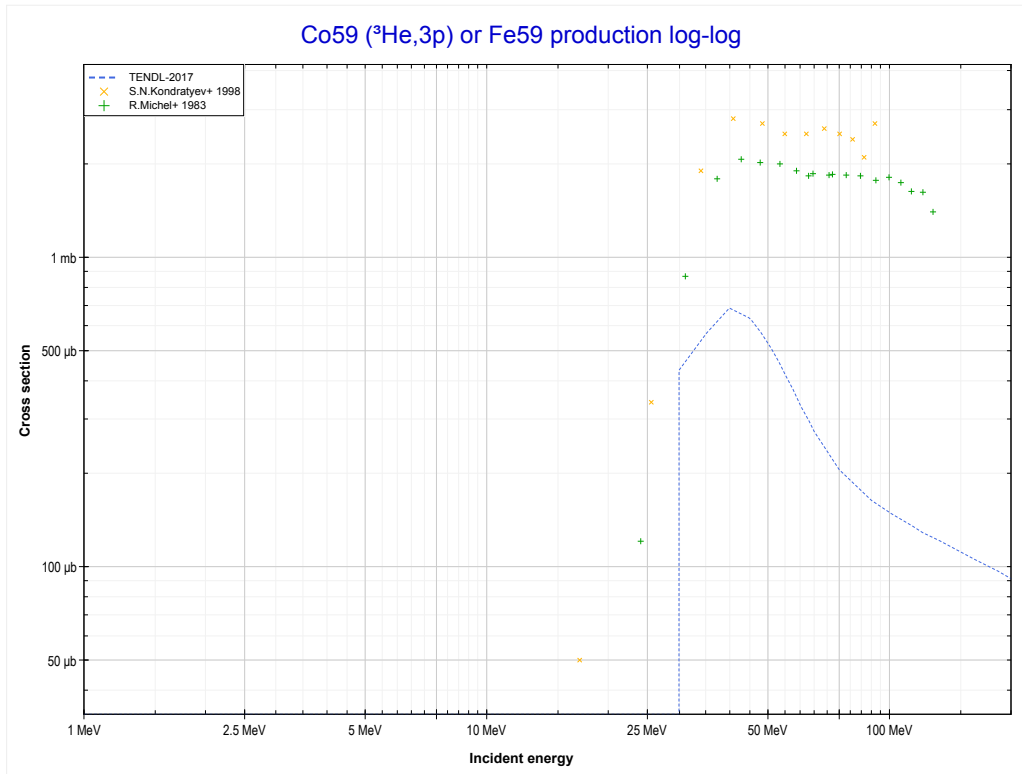
Reaction	Q-Value
Co59($\text{He}3,2p$)Co60	-226.13 keV

	27-Co-59	
<< MT111 (³ He,2p)	MT190 (³He,2n+2p) or MT5 (Co58 production)	MT197 (³ He,3p) >>



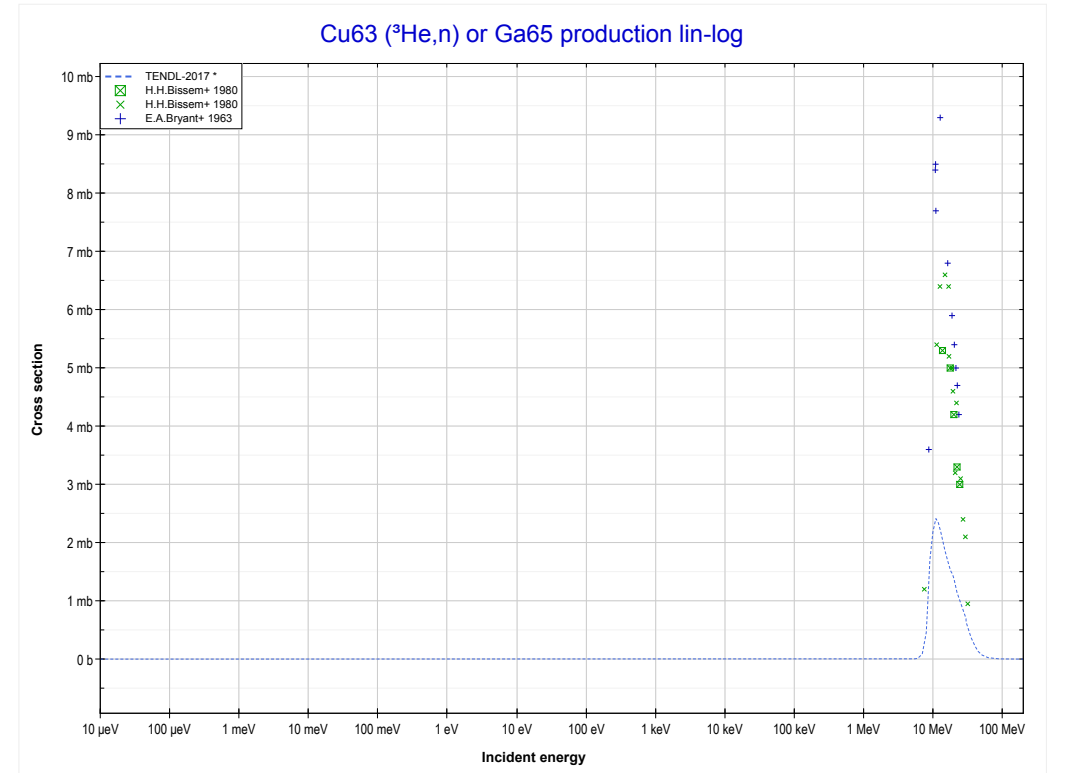
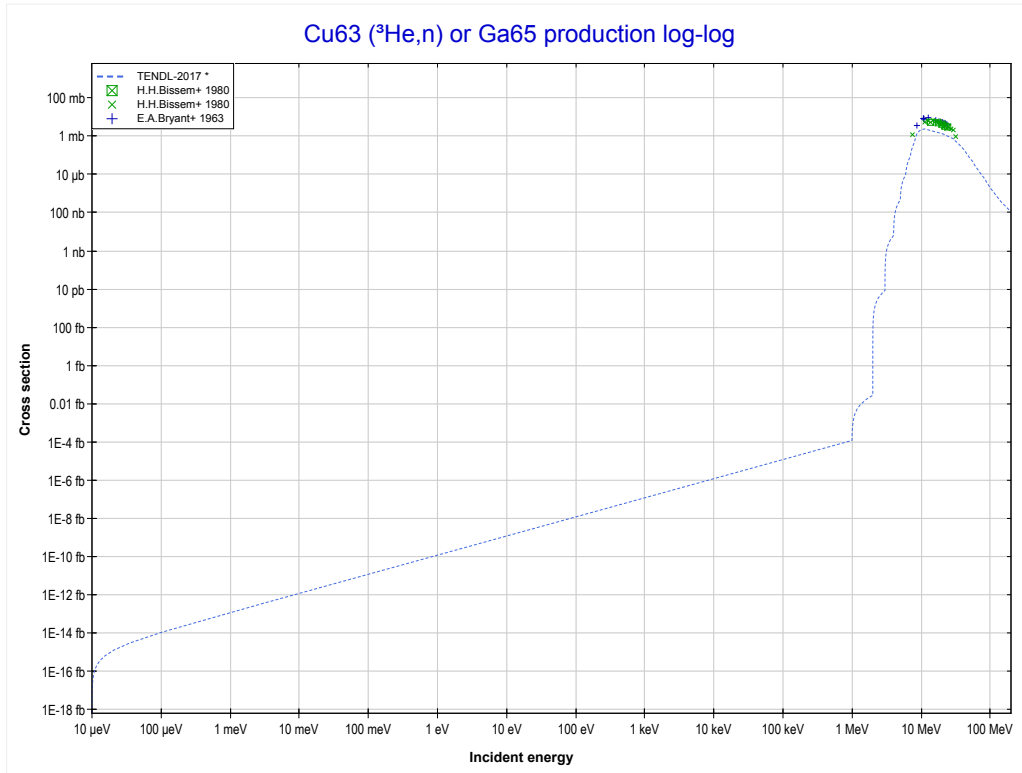
Reaction	Q-Value
Co59(He3,α)Co58	10123.80 keV
Co59(He3,p+t)Co58	-9690.06 keV
Co59(He3,n+He3)Co58	-10453.82 keV
Co59(He3,2d)Co58	-13722.73 keV
Co59(He3,n+p+d)Co58	-15947.29 keV
Co59(He3,2n+2p)Co58	-18171.86 keV

<< 13-Al-27	27-Co-59	29-Cu-65 >>
<< MT190 (³ He,2n+2p)	MT197 (³He,3p) or MT5 (Fe59 production)	29-Cu-63 MT4 (³ He,n) >>



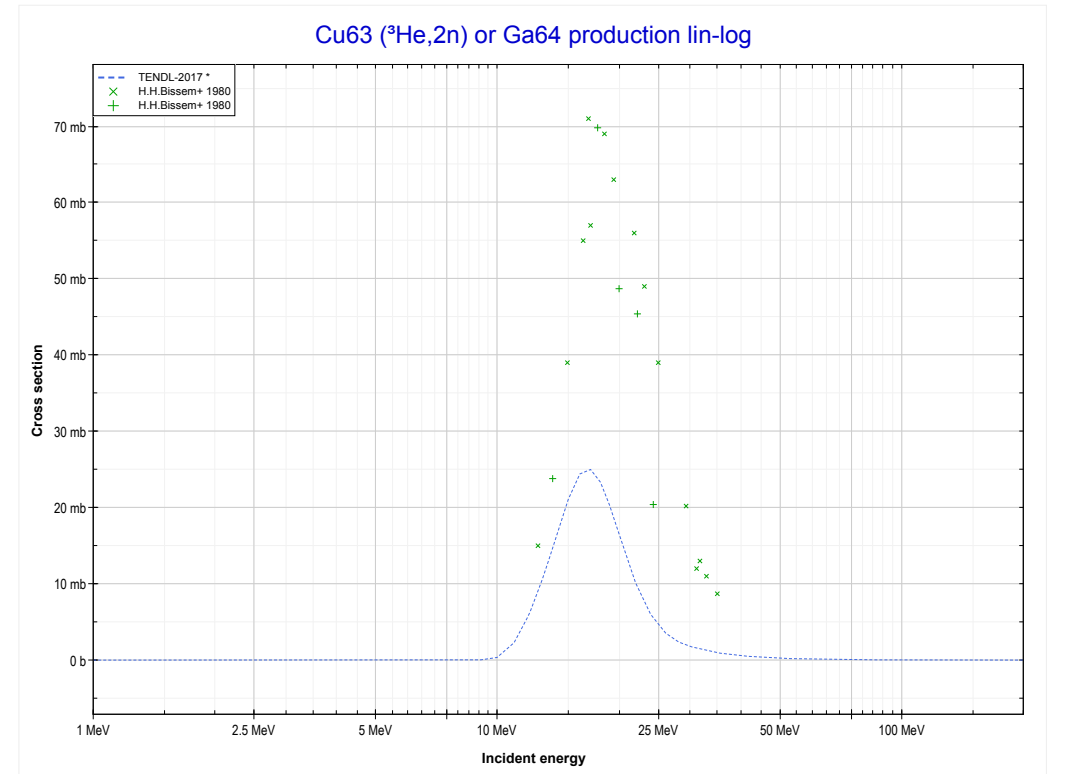
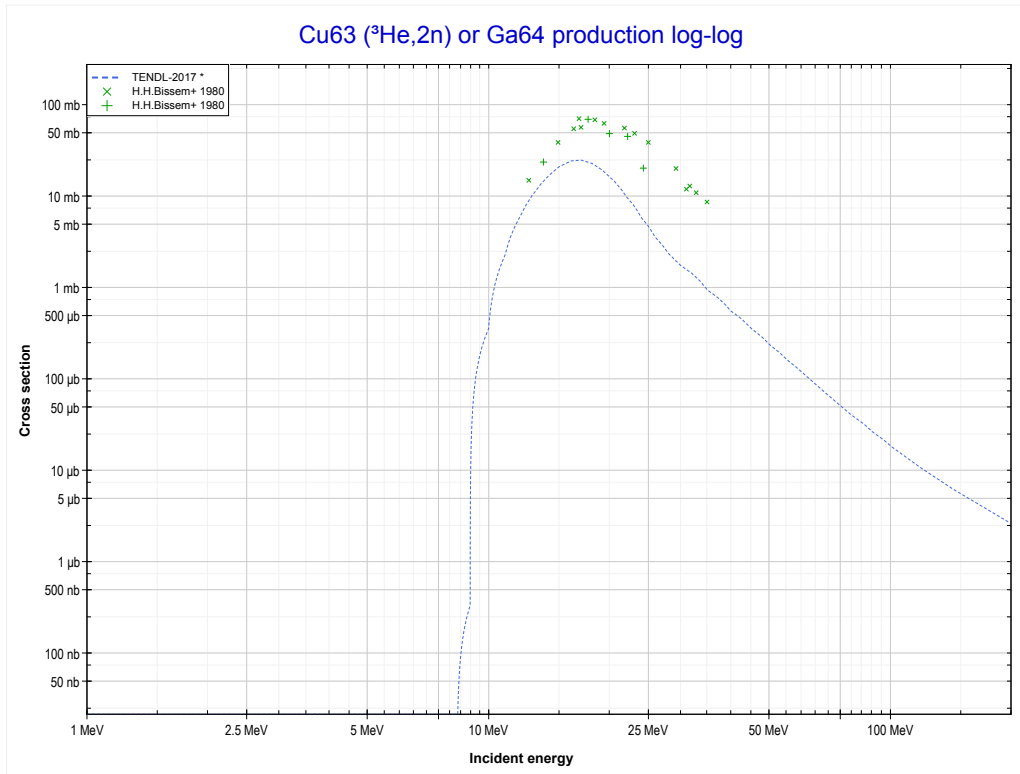
Reaction	Q-Value
Co59(He3,3p)Fe59	-8500.60 keV

<< 27-Co-59	29-Cu-63	29-Cu-65 >>
<< 27-Co-59 MT197 (³ He,3p)	MT4 (³He,n) or MT5 (Ga65 production)	MT16 (³ He,2n) >>



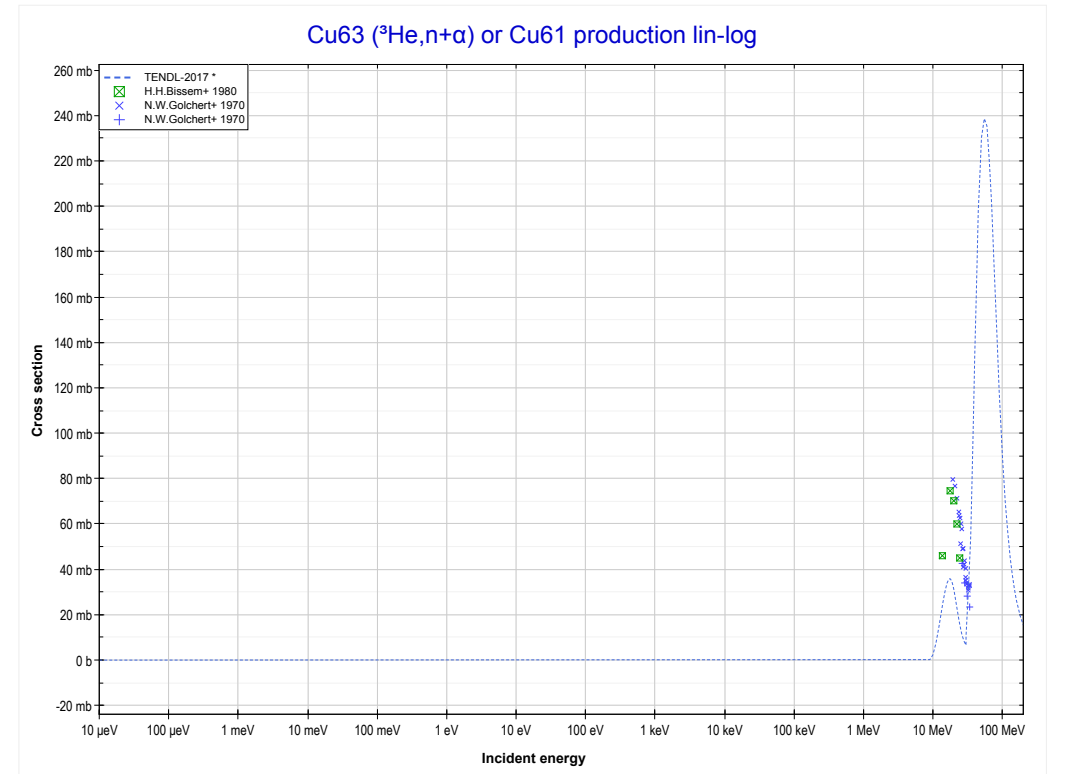
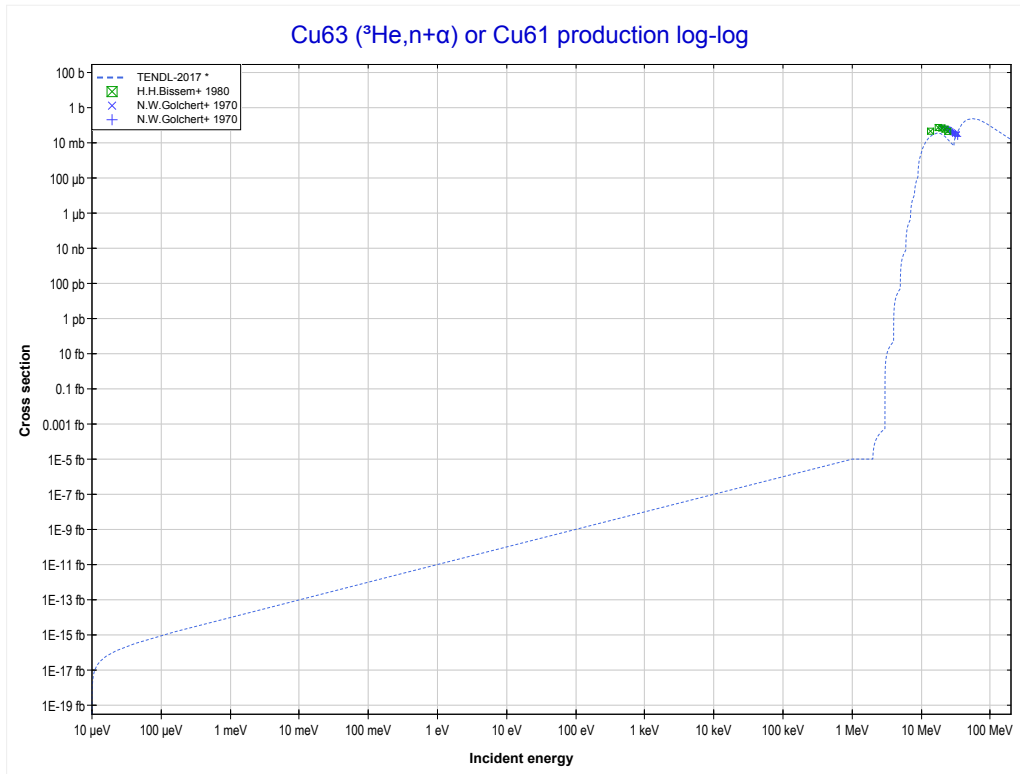
Reaction	Q-Value
Cu63(He3,n)Ga65	3937.90 keV

<< 27-Co-59	29-Cu-63	29-Cu-65 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Ga64 production)	MT22 (³ He,n+α) >>



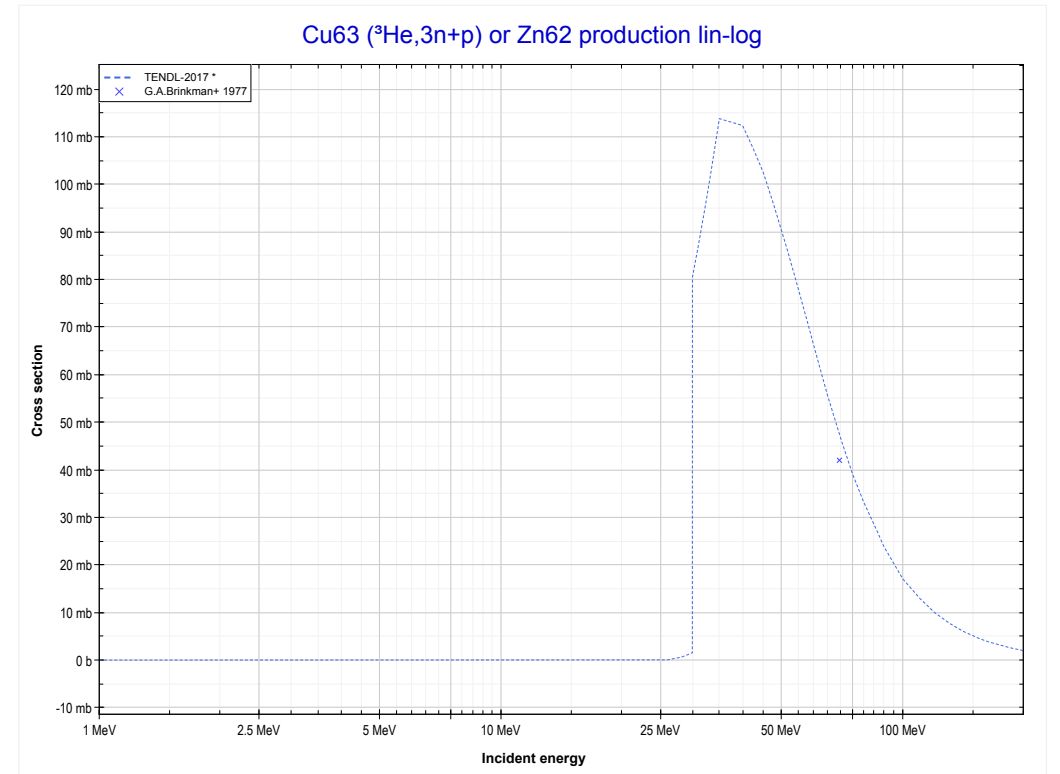
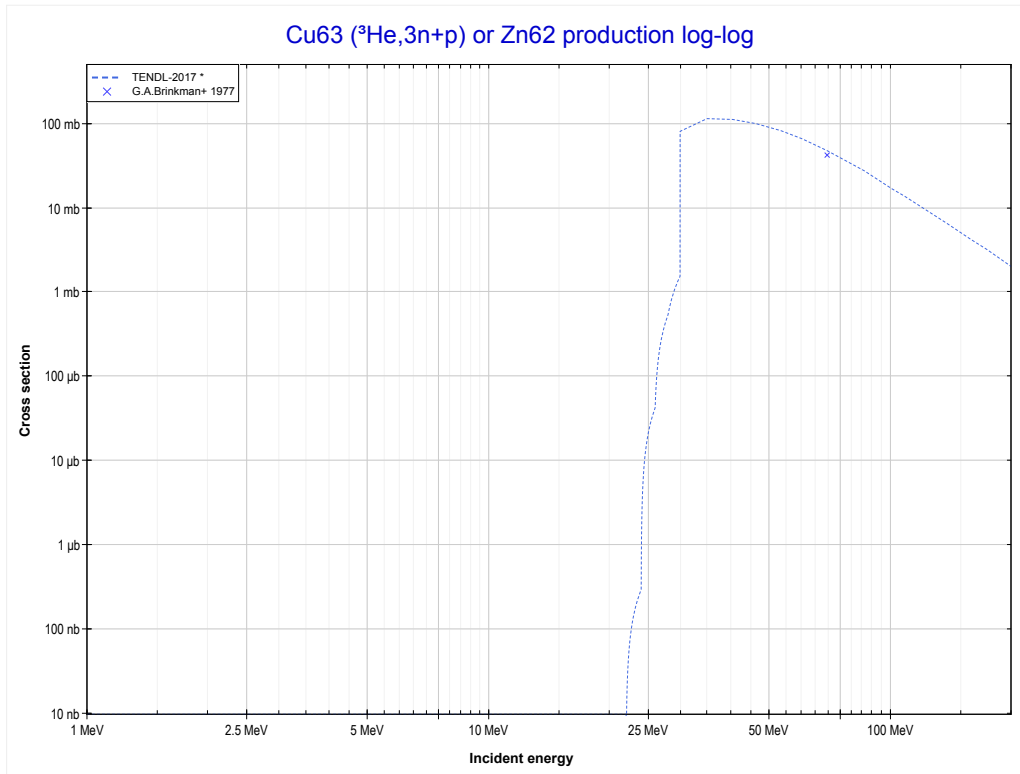
Reaction	Q-Value
Cu63(He3,2n)Ga64	-7957.92 keV

<< 27-Co-59	29-Cu-63	30-Zn-64 >>
<< MT16 (³ He,2n)	MT22 (³He,n+α) or MT5 (Cu61 production)	MT42 (³ He,3n+p) >>



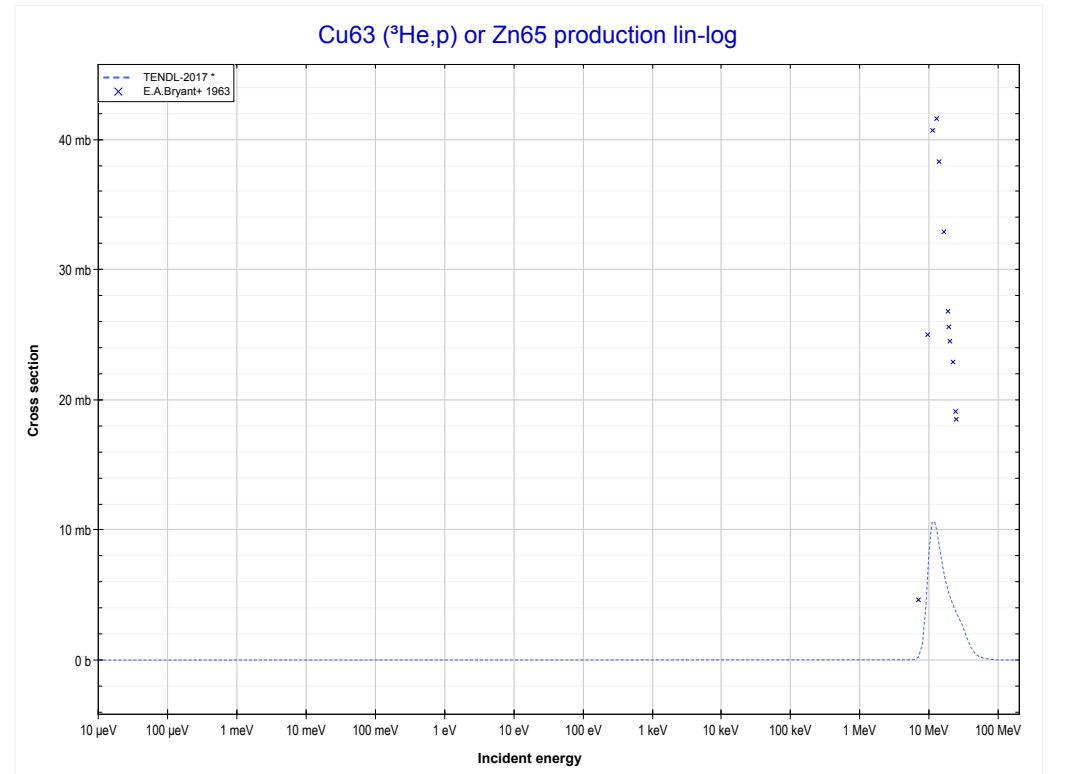
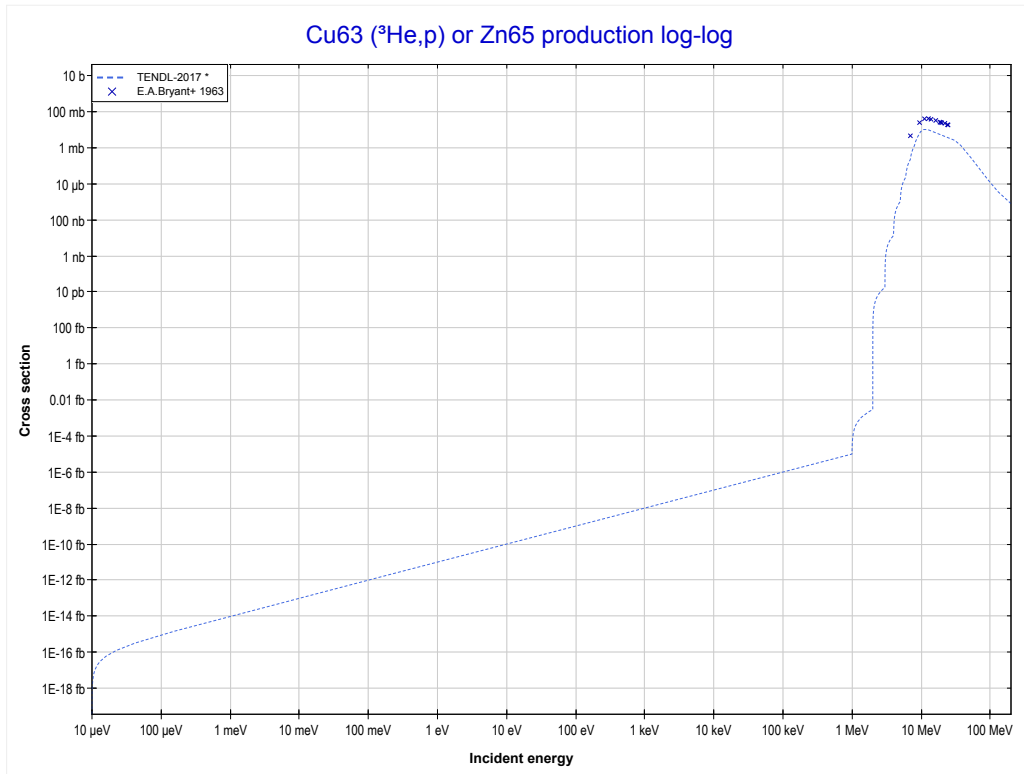
Reaction	Q-Value
Cu63(He3,n+α)Cu61	839.48 keV
Cu63(He3,d+t)Cu61	-16749.81 keV
Cu63(He3,n+p+t)Cu61	-18974.38 keV
Cu63(He3,2n+He3)Cu61	-19738.13 keV
Cu63(He3,n+2d)Cu61	-23007.04 keV
Cu63(He3,2n+p+d)Cu61	-25231.61 keV
Cu63(He3,3n+2p)Cu61	-27456.18 keV

	29-Cu-63	34-Se-76 >>
<< MT22 ($^3\text{He},n+\alpha$)	MT42 ($^3\text{He},3n+p$) or MT5 (Zn62 production)	MT103 ($^3\text{He},p$) >>



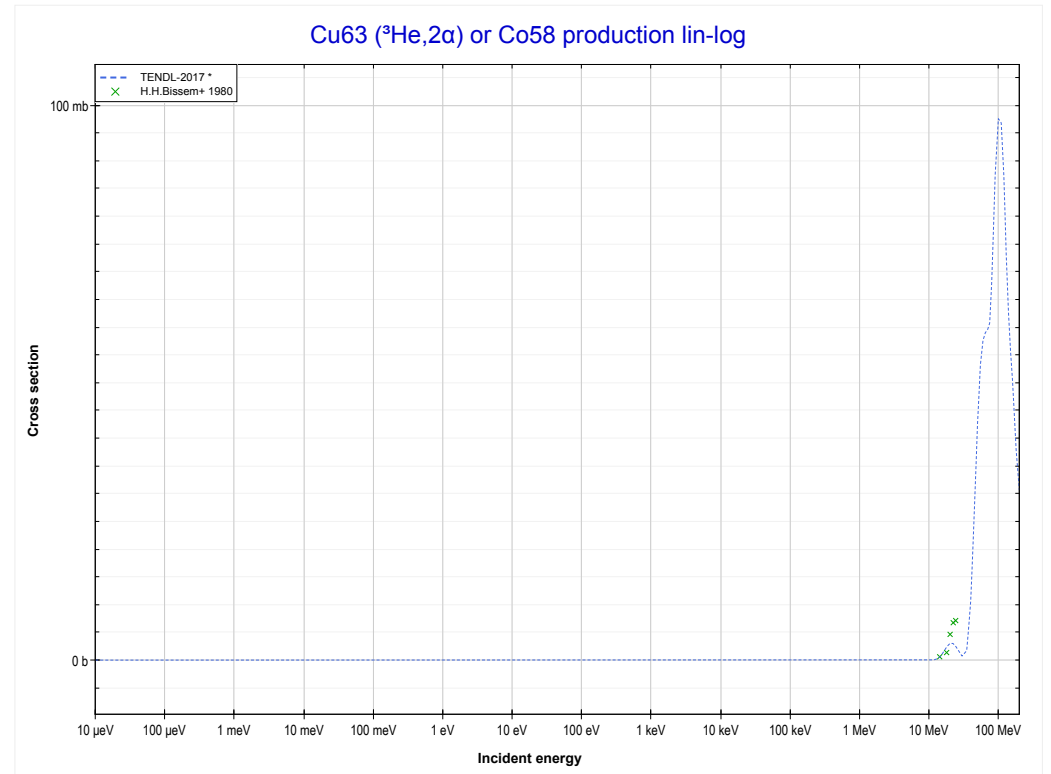
Reaction	Q-Value
Cu63(He3,n+t)Zn62	-12501.71 keV
Cu63(He3,2n+d)Zn62	-18758.94 keV
Cu63(He3,3n+p)Zn62	-20983.51 keV

<< 14-Si-28	29-Cu-63	30-Zn-64 >>
<< MT42 (³ He,3n+p)	MT103 (³He,p) or MT5 (Zn65 production)	MT108 (³ He,2α) >>



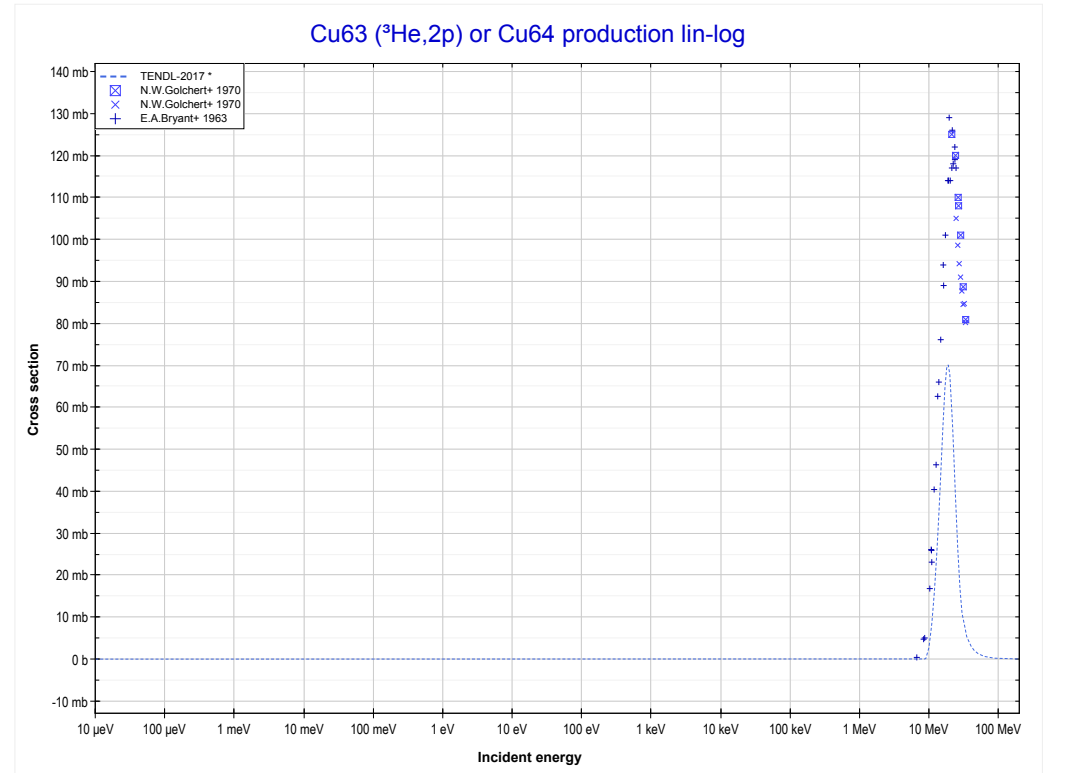
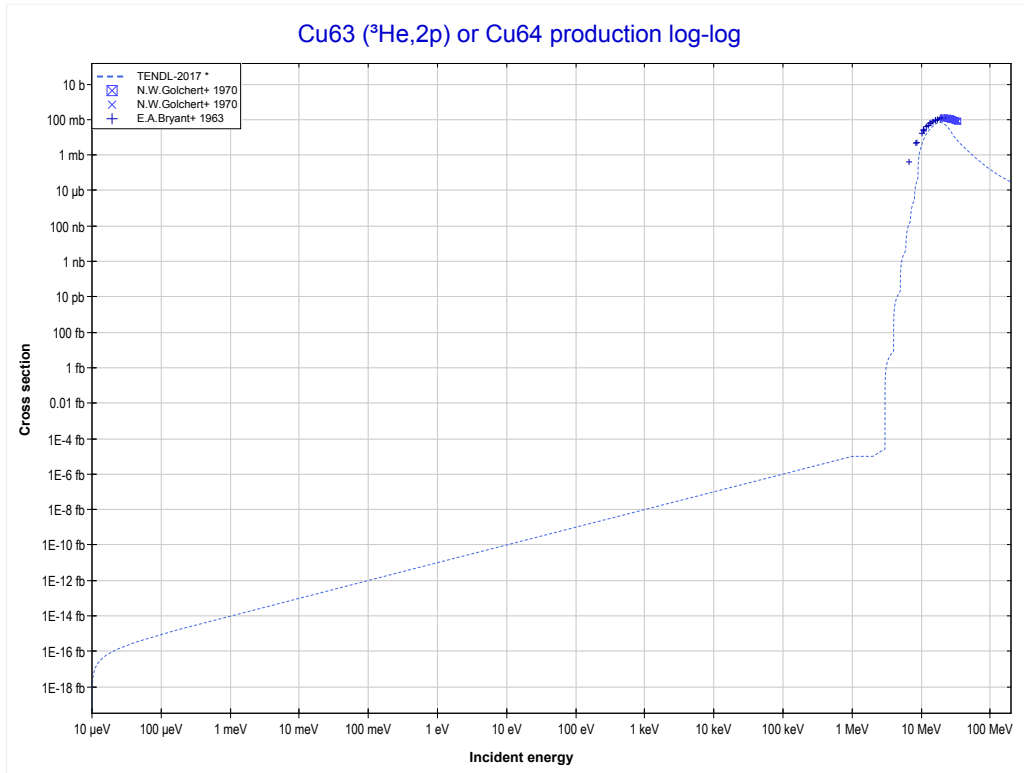
Reaction	Q-Value
Cu63(He3,p)Zn65	7974.74 keV

<< 19-K-39	29-Cu-63	29-Cu-65 >>
<< MT103 (³ He,p)	MT108 (³He,2α) or MT5 (Co58 production)	MT111 (³ He,2p) >>



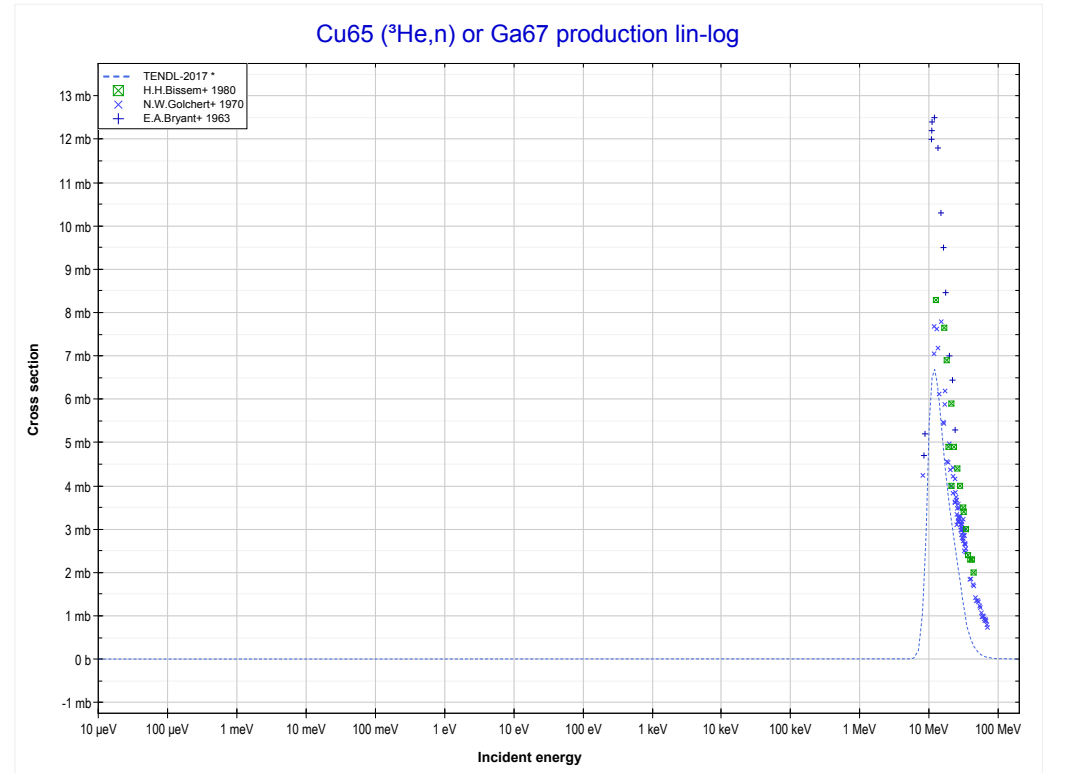
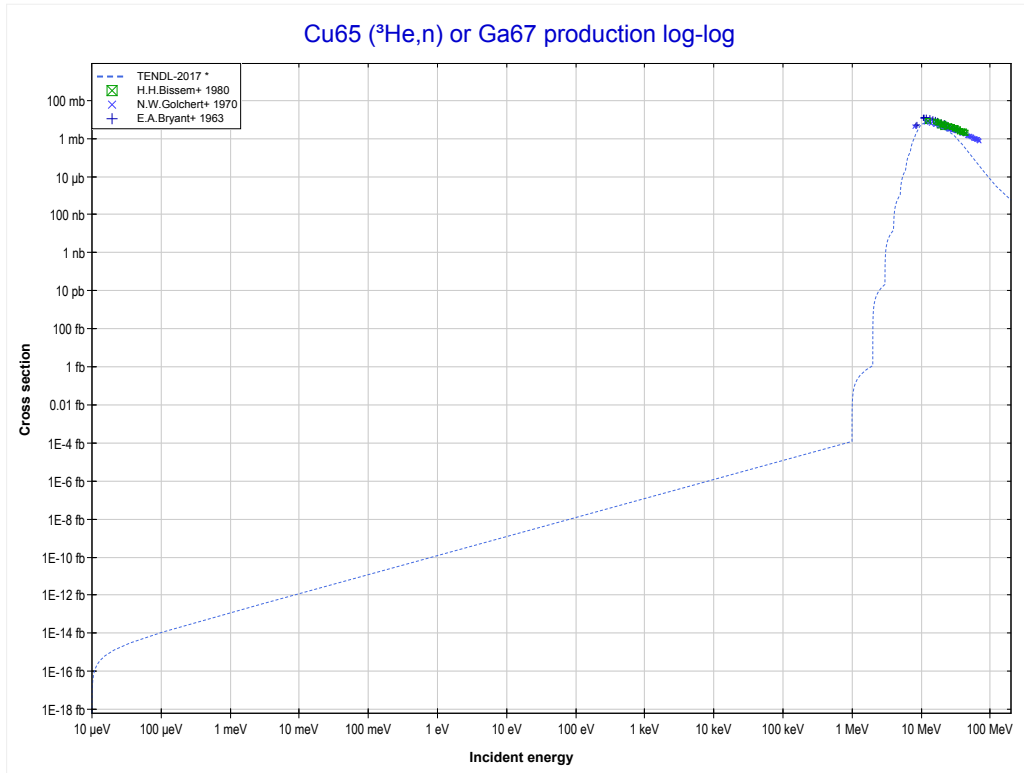
Reaction	Q-Value	Reaction	Q-Value
Cu63(He3,2α)Co58	4348.68 keV	Cu63(He3,n+p+t+He3)Co58	-36042.79 keV
Cu63(He3,p+t+α)Co58	-15465.18 keV	Cu63(He3,2n+2He3)Co58	-36806.55 keV
Cu63(He3,n+He3+α)Co58	-16228.93 keV	Cu63(He3,p+2d+t)Co58	-39311.70 keV
Cu63(He3,2d+α)Co58	-19497.84 keV	Cu63(He3,n+2d+He3)Co58	-40075.46 keV
Cu63(He3,n+p+d+α)Co58	-21722.41 keV	Cu63(He3,n+2p+d+t)Co58	-41536.27 keV
Cu63(He3,2n+2p+α)Co58	-23946.98 keV	Cu63(He3,2n+p+d+He3)Co58	-42300.03 keV
Cu63(He3,d+t+He3)Co58	-33818.23 keV	Cu63(He3,4d)Co58	-43344.37 keV
Cu63(He3,2p+2t)Co58	-35279.04 keV	Cu63(He3,2n+3p+t)Co58	-43760.84 keV

<< 27-Co-59	29-Cu-63	30-Zn-64 >>
<< MT108 ($^3\text{He},2\alpha$)	MT111 ($^3\text{He},2p$) or MT5 (Cu64 production)	29-Cu-65 MT4 ($^3\text{He},n$) >>



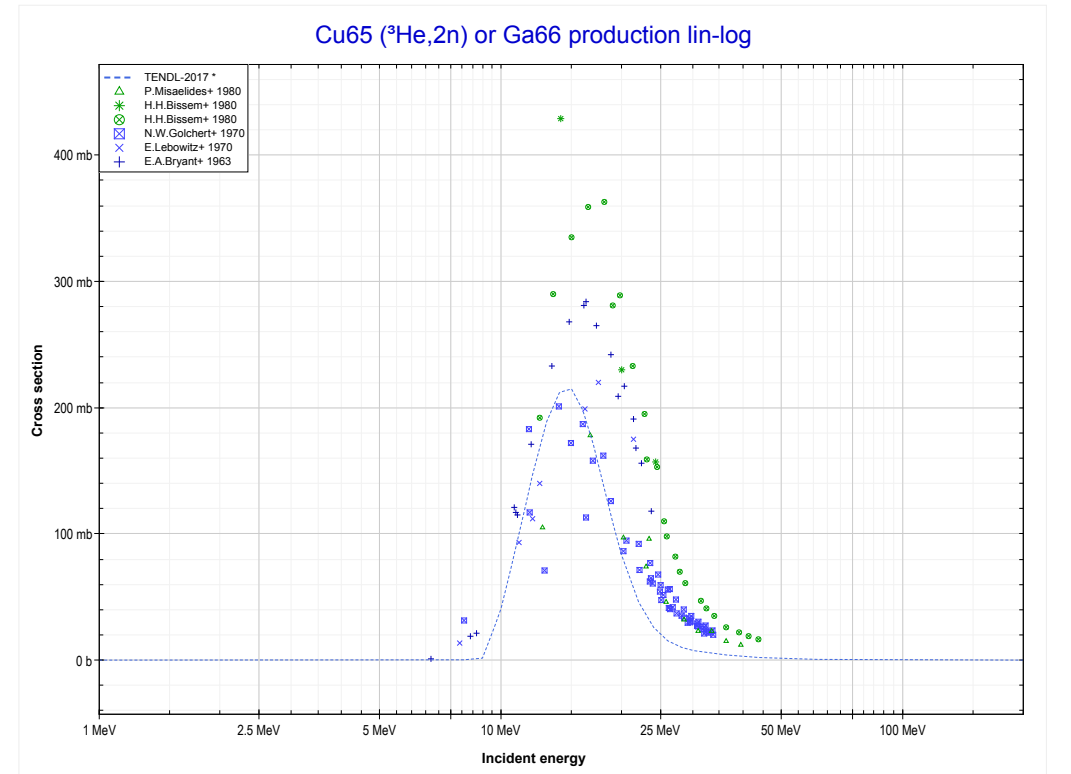
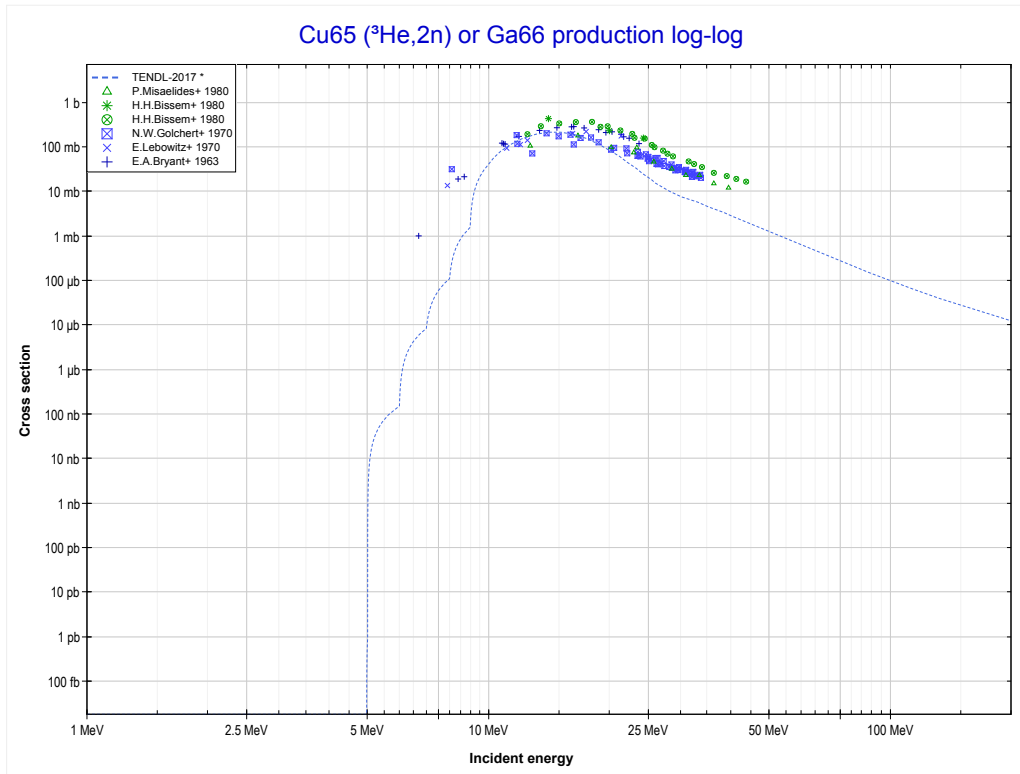
Reaction	Q-Value
Cu63($\text{He}3,2p$)Cu64	198.07 keV

<< 29-Cu-63	29-Cu-65	30-Zn-64 >>
<< 29-Cu-63 MT111 (³ He,2p)	MT4 (³He,n) or MT5 (Ga67 production)	MT16 (³ He,2n) >>



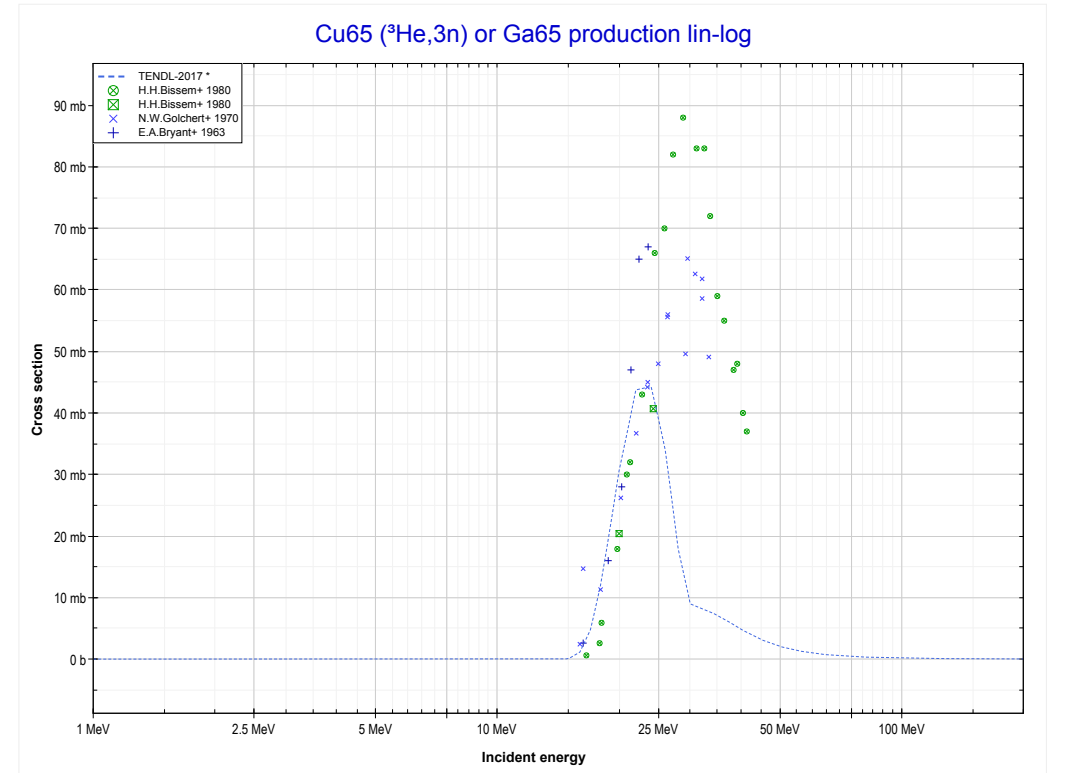
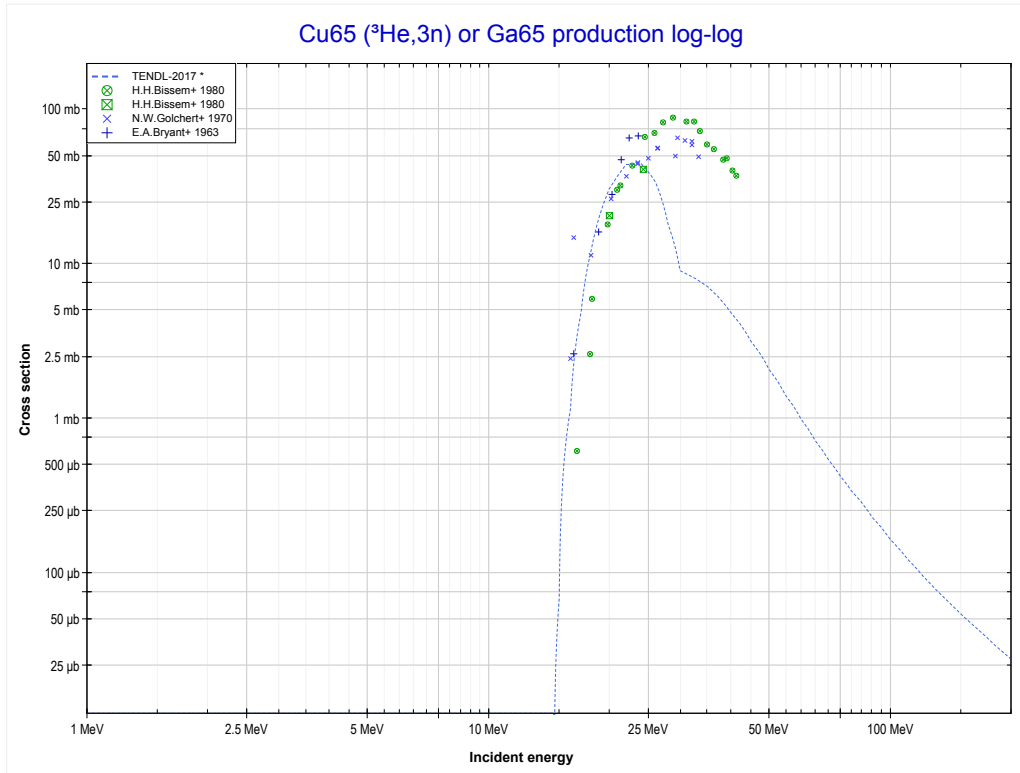
Reaction	Q-Value
Cu65(He3,n)Ga67	6475.30 keV

<< 29-Cu-63	29-Cu-65	30-Zn-66 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Ga66 production)	MT17 (³ He,3n) >>



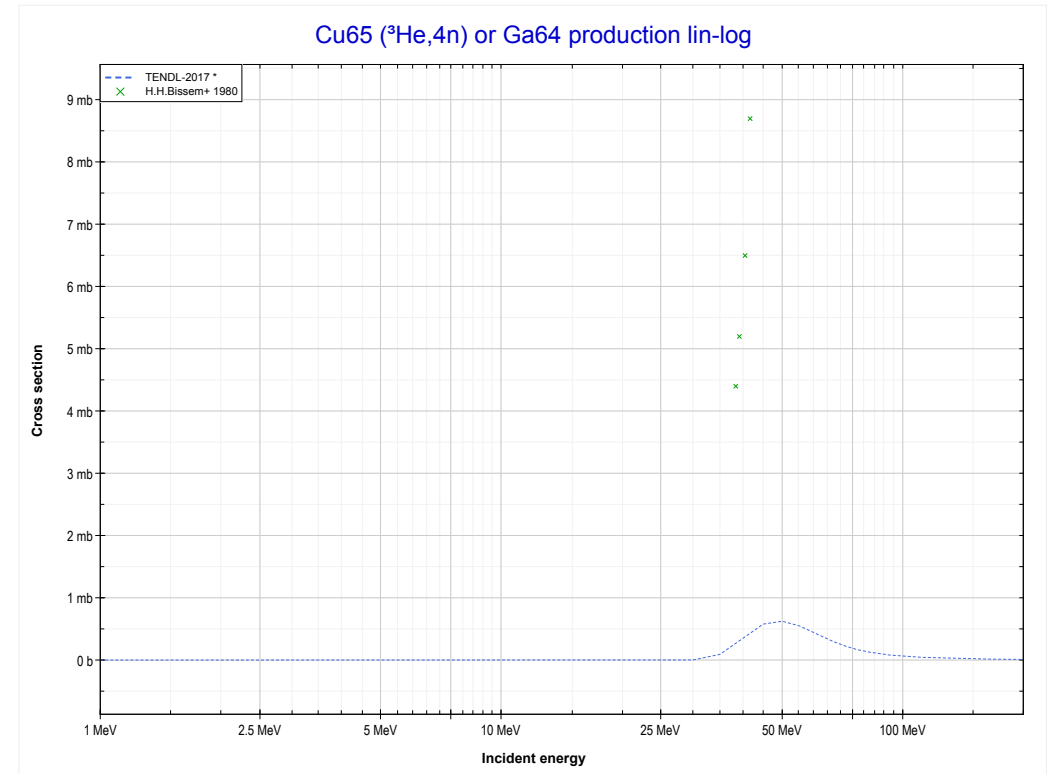
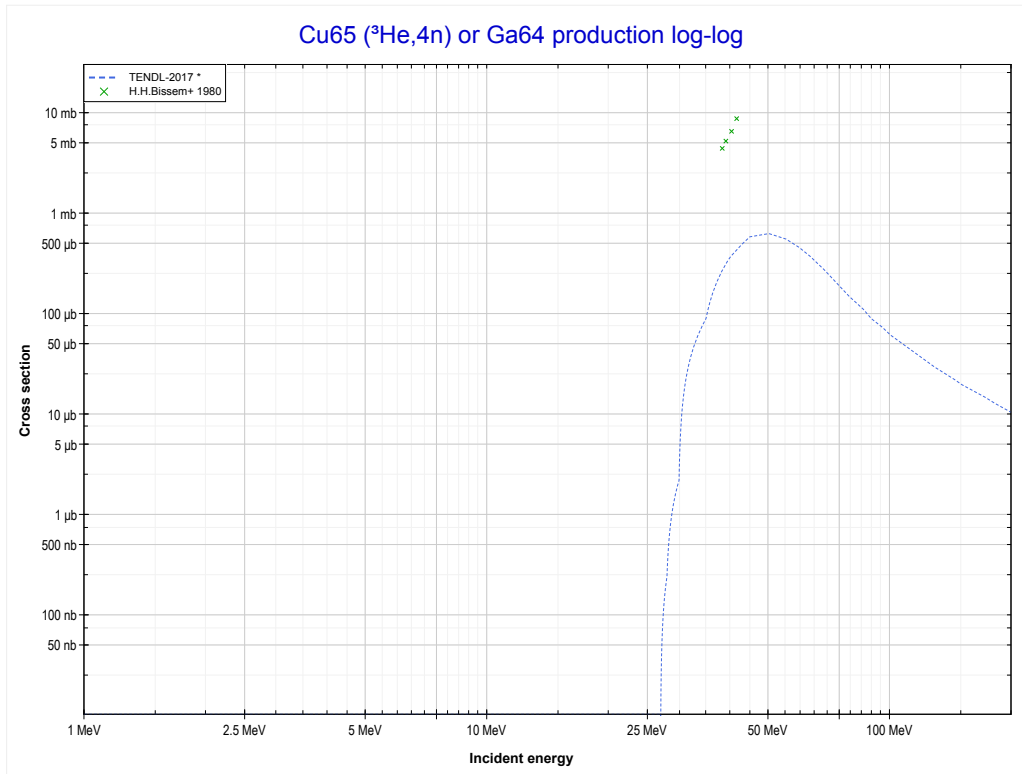
Reaction	Q-Value
Cu65(He3,2n)Ga66	-4750.92 keV

<< 25-Mn-55	29-Cu-65	30-Zn-68 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (Ga65 production)	MT37 ($^3\text{He},4n$) >>



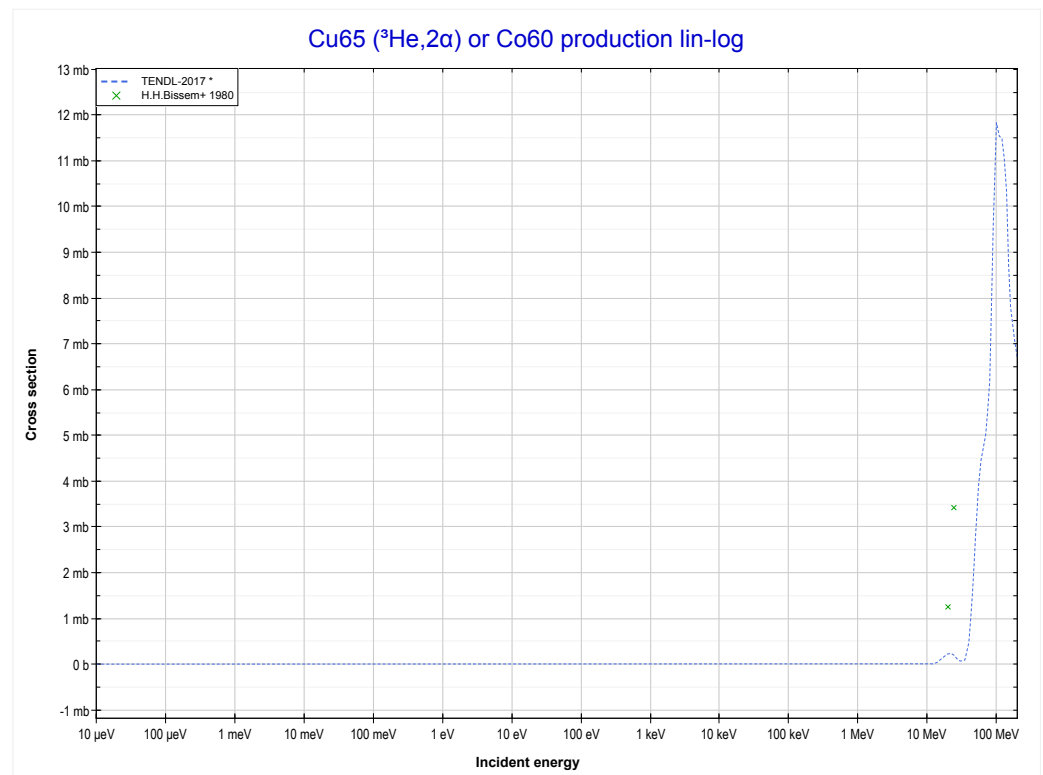
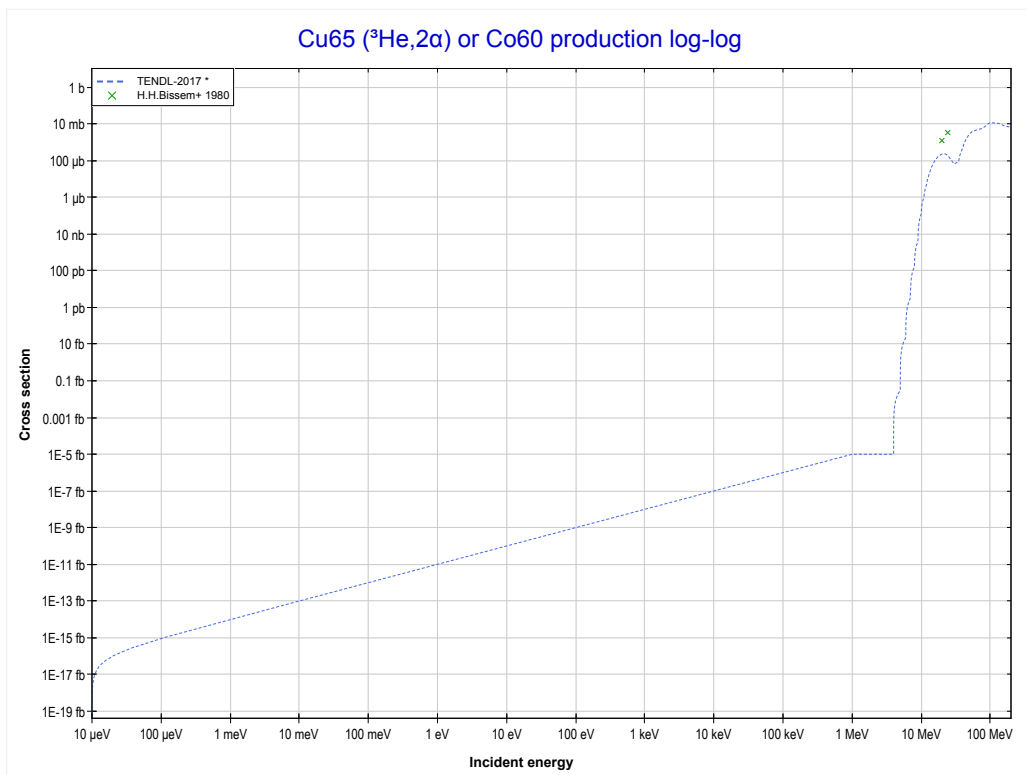
Reaction	Q-Value
Cu65(He3,3n)Ga65	-13888.94 keV

	29-Cu-65	33-As-75 >>
<< MT17 (³He,3n)	MT37 (³He,4n) or MT5 (Ga64 production)	MT108 (³He,2α) >>



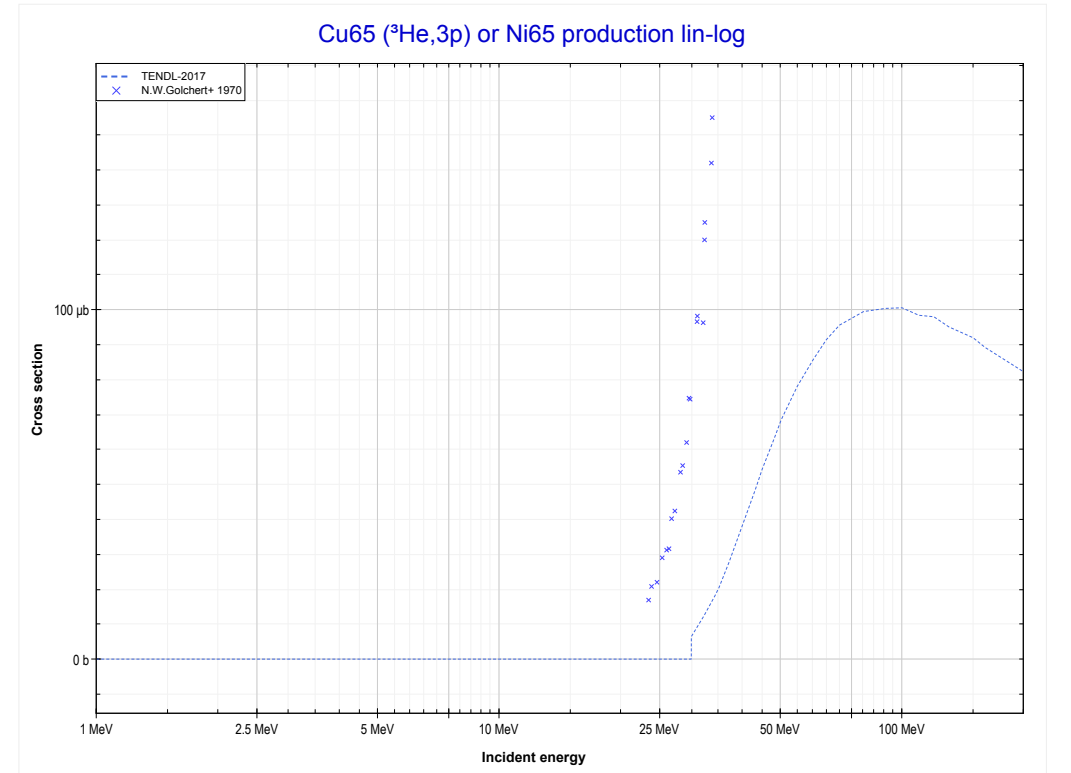
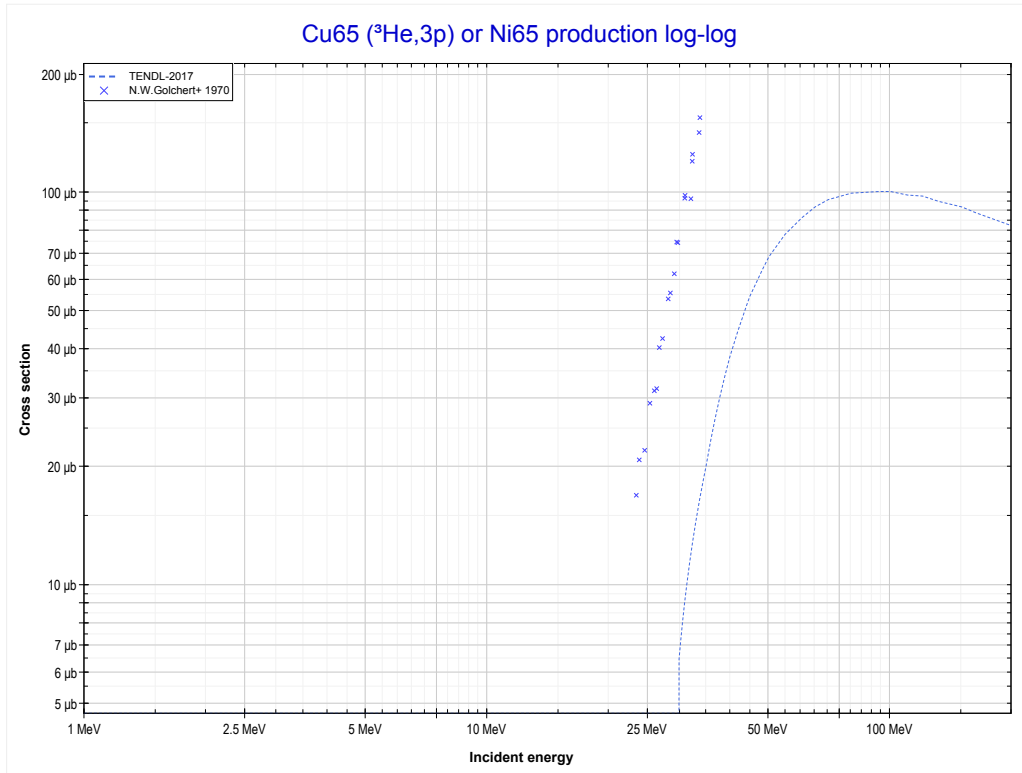
Reaction	Q-Value
Cu65(He3,4n)Ga64	-25784.75 keV

<< 29-Cu-63	29-Cu-65	
<< MT37 (³ He,4n)	MT108 (³He,2α) or MT5 (Co60 production)	MT197 (³ He,3p) >>



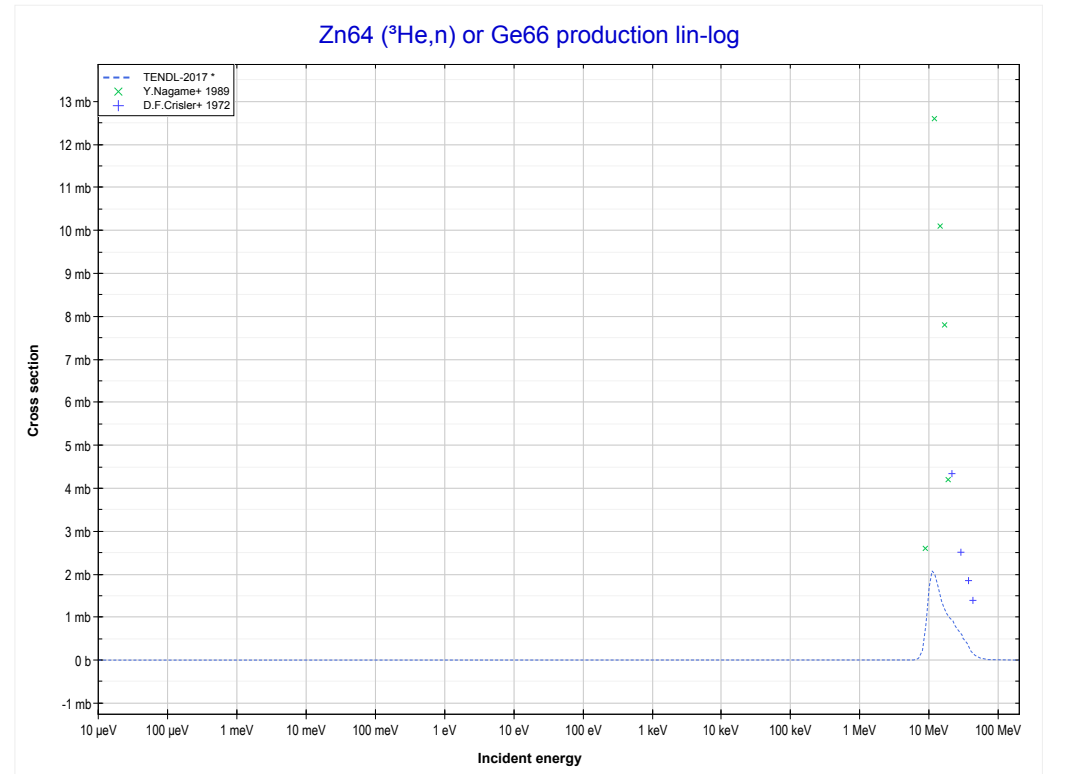
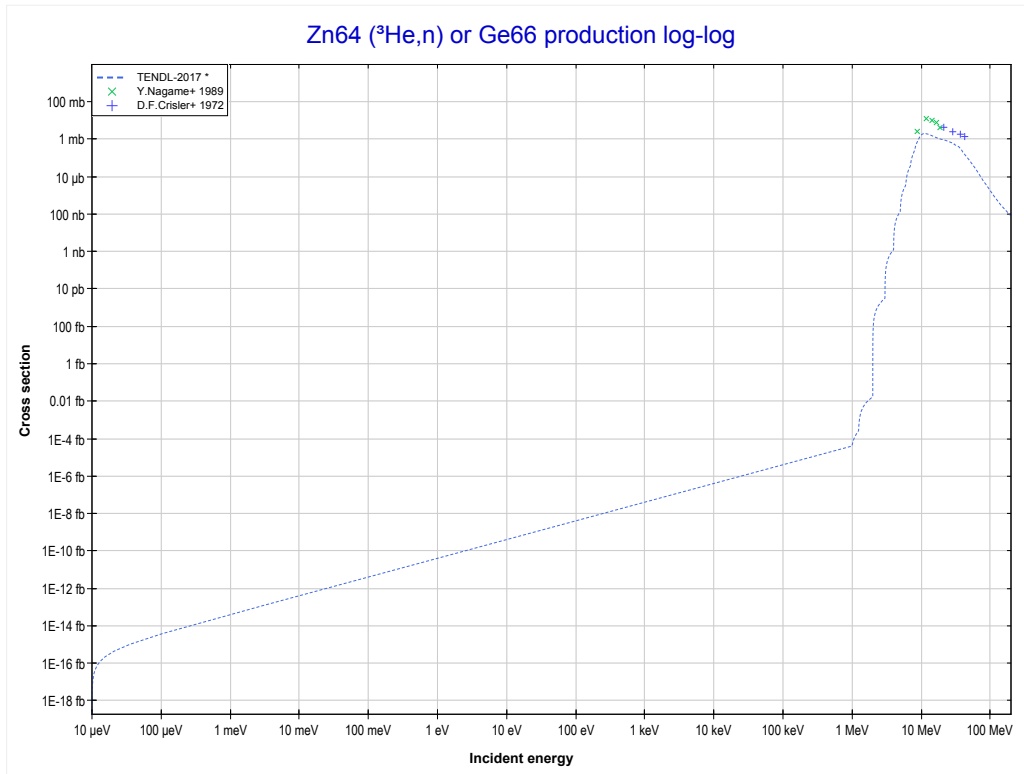
Reaction	Q-Value	Reaction	Q-Value
Cu65(He3,2α)Co60	4467.58 keV	Cu65(He3,n+p+t+He3)Co60	-35923.89 keV
Cu65(He3,p+t+α)Co60	-15346.28 keV	Cu65(He3,2n+2He3)Co60	-36687.65 keV
Cu65(He3,n+He3+α)Co60	-16110.03 keV	Cu65(He3,p+2d+t)Co60	-39192.80 keV
Cu65(He3,2d+α)Co60	-19378.94 keV	Cu65(He3,n+2d+He3)Co60	-39956.56 keV
Cu65(He3,n+p+d+α)Co60	-21603.51 keV	Cu65(He3,n+2p+d+t)Co60	-41417.37 keV
Cu65(He3,2n+2p+α)Co60	-23828.08 keV	Cu65(He3,2n+p+d+He3)Co60	-42181.13 keV
Cu65(He3,d+t+He3)Co60	-33699.33 keV	Cu65(He3,4d)Co60	-43225.47 keV
Cu65(He3,2p+2t)Co60	-35160.14 keV	Cu65(He3,2n+3p+t)Co60	-43641.94 keV

<< 27-Co-59	29-Cu-65	30-Zn-64 >>
<< MT108 (³ He,2α)	MT197 (³He,3p) or MT5 (Ni65 production)	30-Zn-64 MT4 (³ He,n) >>



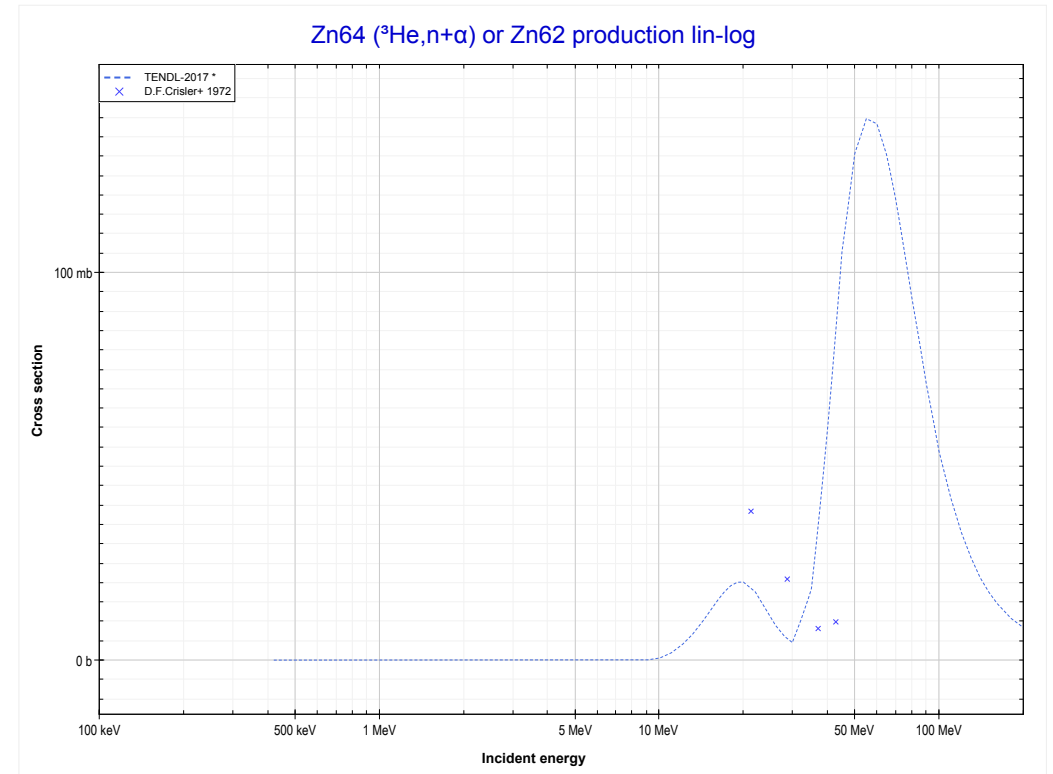
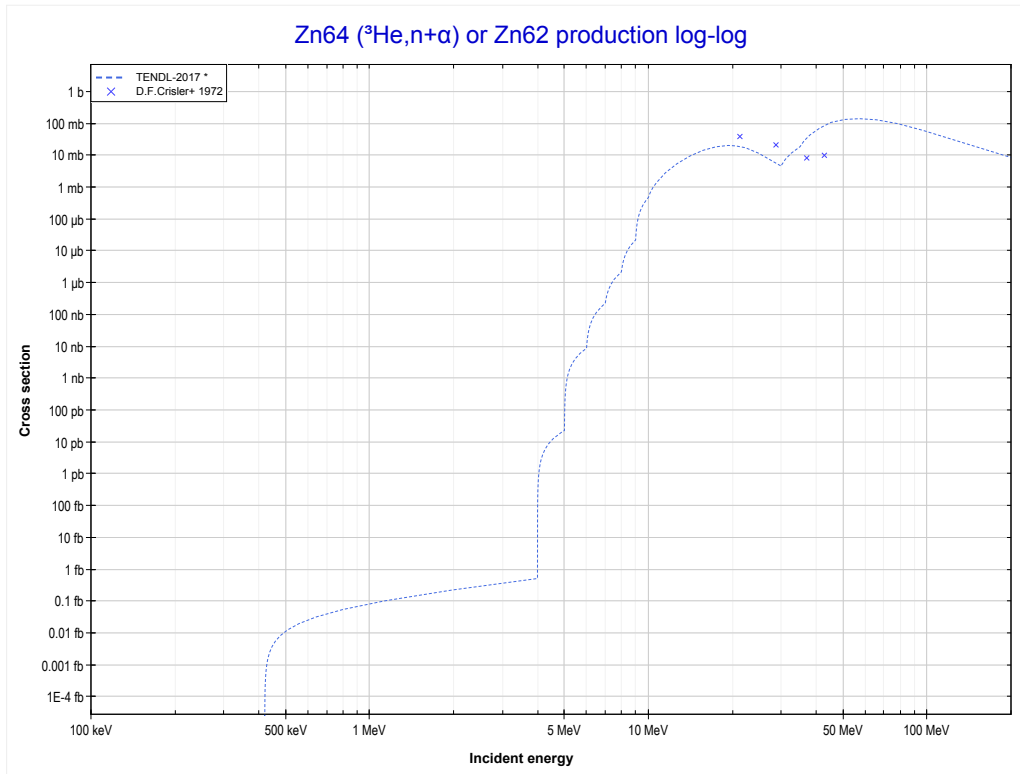
Reaction	Q-Value
Cu65(He3,3p)Ni65	-9074.00 keV

<< 29-Cu-65	30-Zn-64	31-Ga-69 >>
<< 29-Cu-65 MT197 ($^3\text{He},3p$)	MT4 ($^3\text{He},n$) or MT5 (Ge66 production)	MT22 ($^3\text{He},n+\alpha$) >>



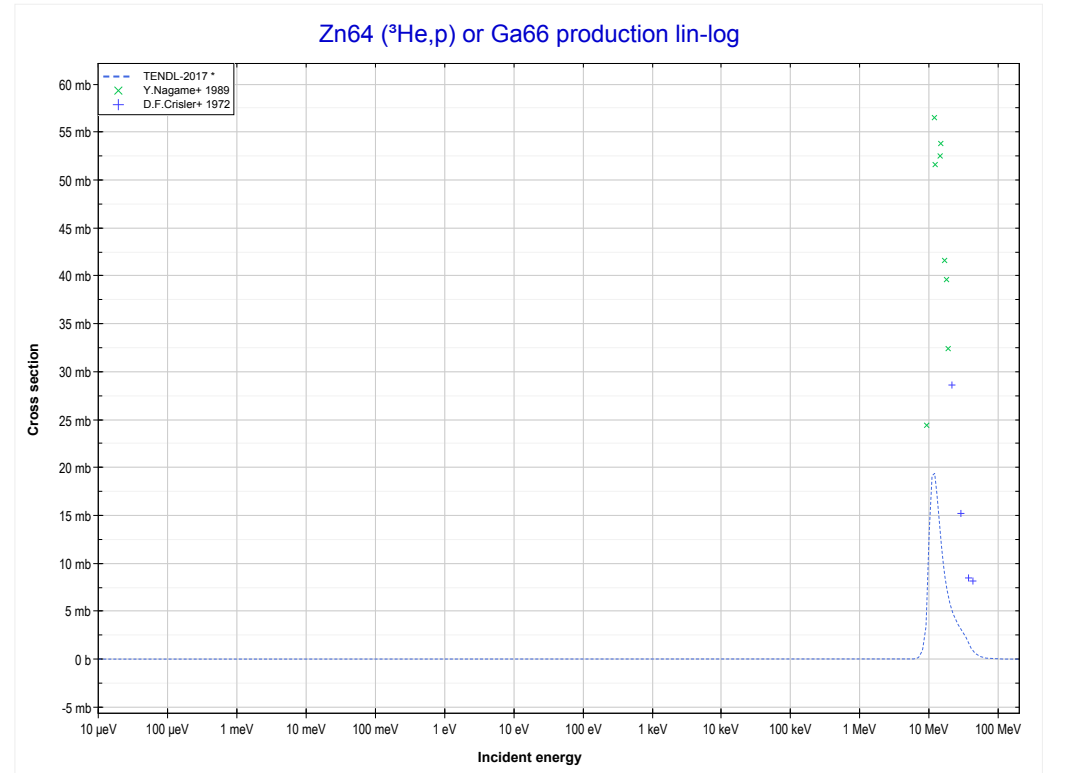
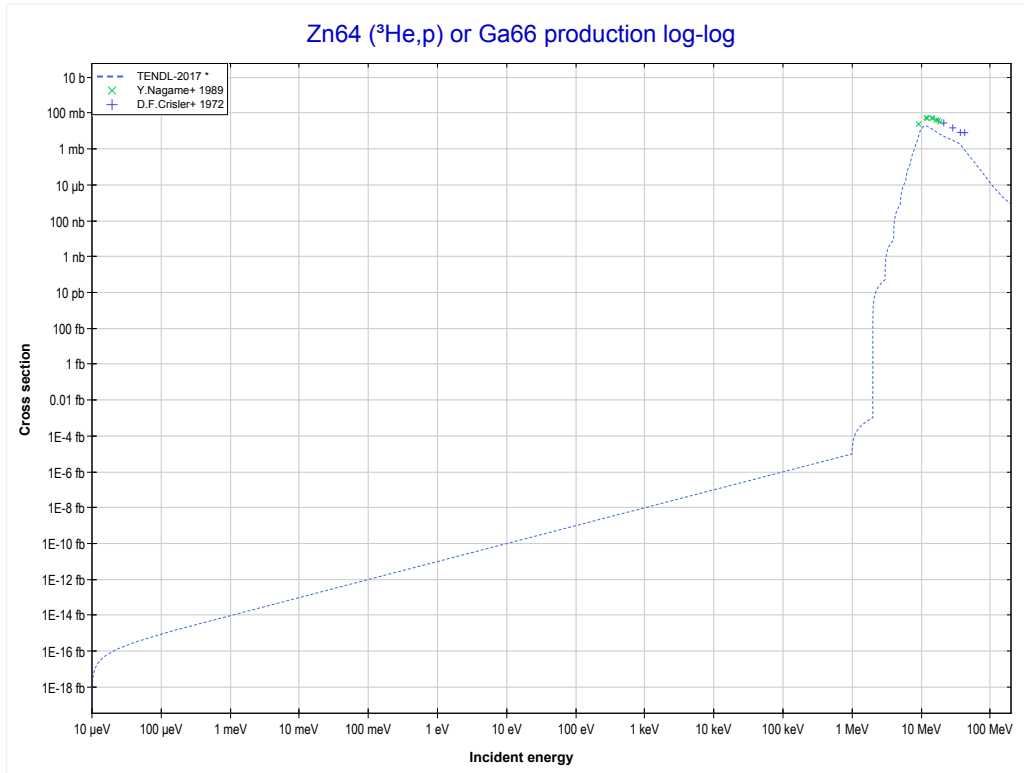
Reaction	Q-Value
Zn64(He3,n)Ge66	2463.10 keV

<< 29-Cu-63	30-Zn-64	31-Ga-69 >>
<< MT4 (³ He,n)	MT22 (³He,n+α) or MT5 (Zn62 production)	MT103 (³ He,p) >>



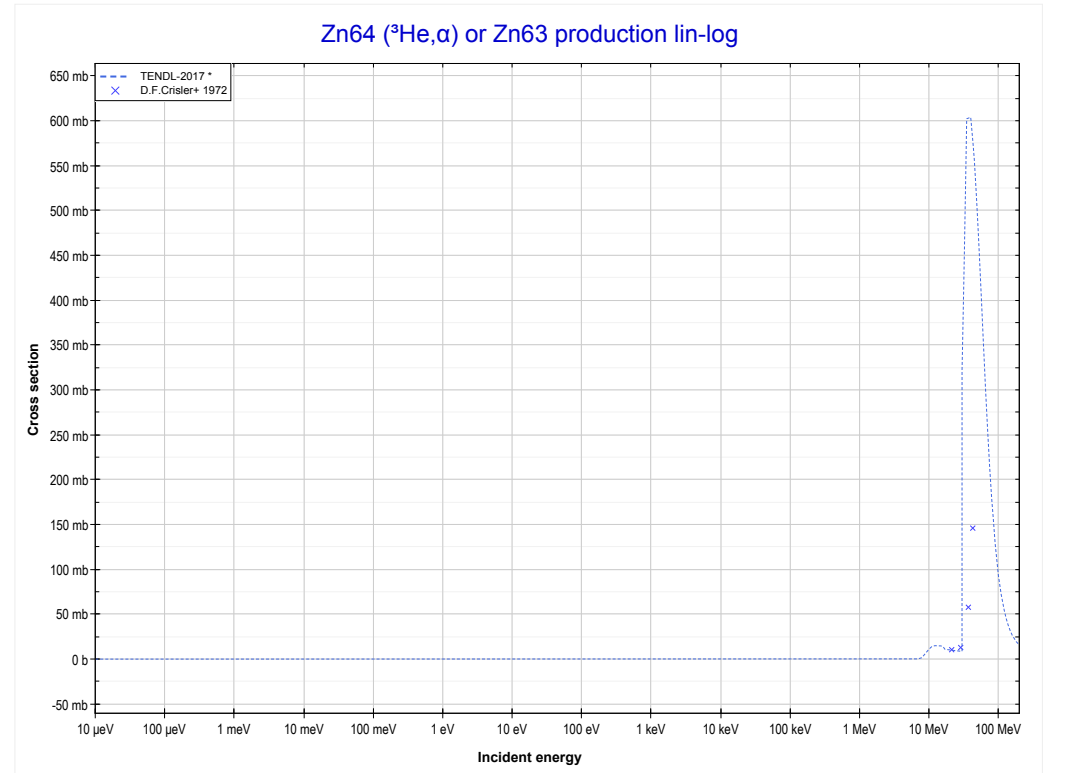
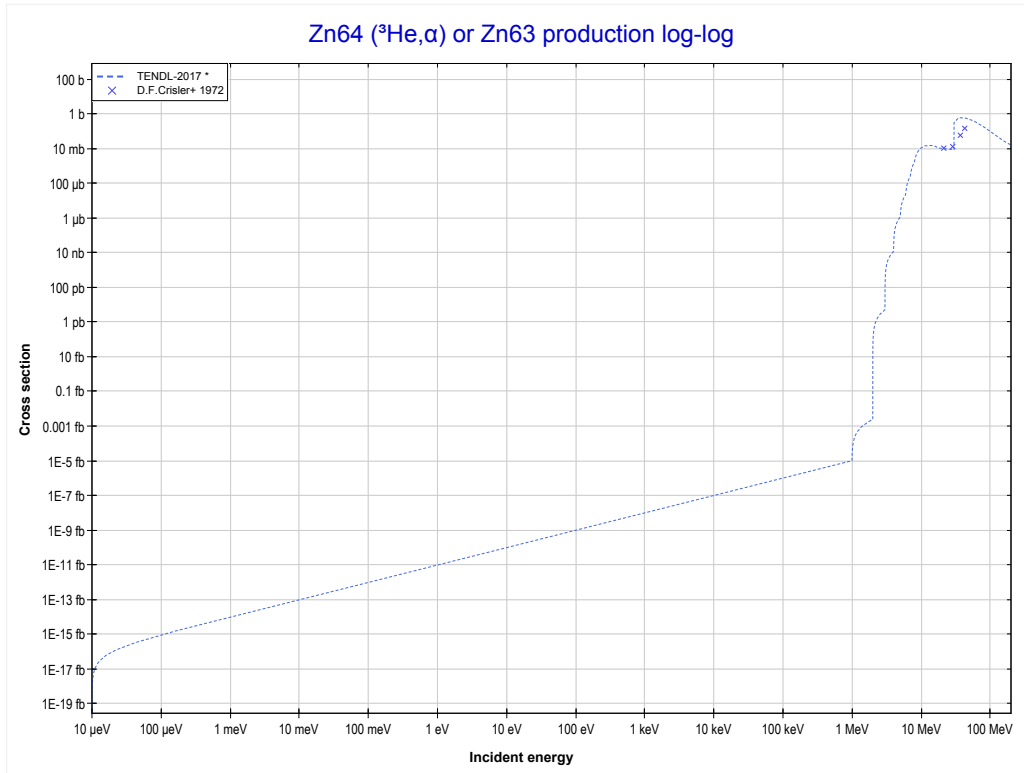
Reaction	Q-Value
Zn64(He3,n+α)Zn62	-401.32 keV
Zn64(He3,d+t)Zn62	-17990.61 keV
Zn64(He3,n+p+t)Zn62	-20215.18 keV
Zn64(He3,2n+He3)Zn62	-20978.93 keV
Zn64(He3,n+2d)Zn62	-24247.84 keV
Zn64(He3,2n+p+d)Zn62	-26472.41 keV
Zn64(He3,3n+2p)Zn62	-28696.98 keV

<< 29-Cu-63	30-Zn-64	38-Sr-88 >>
<< MT22 ($^3\text{He},n+\alpha$)	MT103 ($^3\text{He},p$) or MT5 (Ga66 production)	MT107 ($^3\text{He},\alpha$) >>



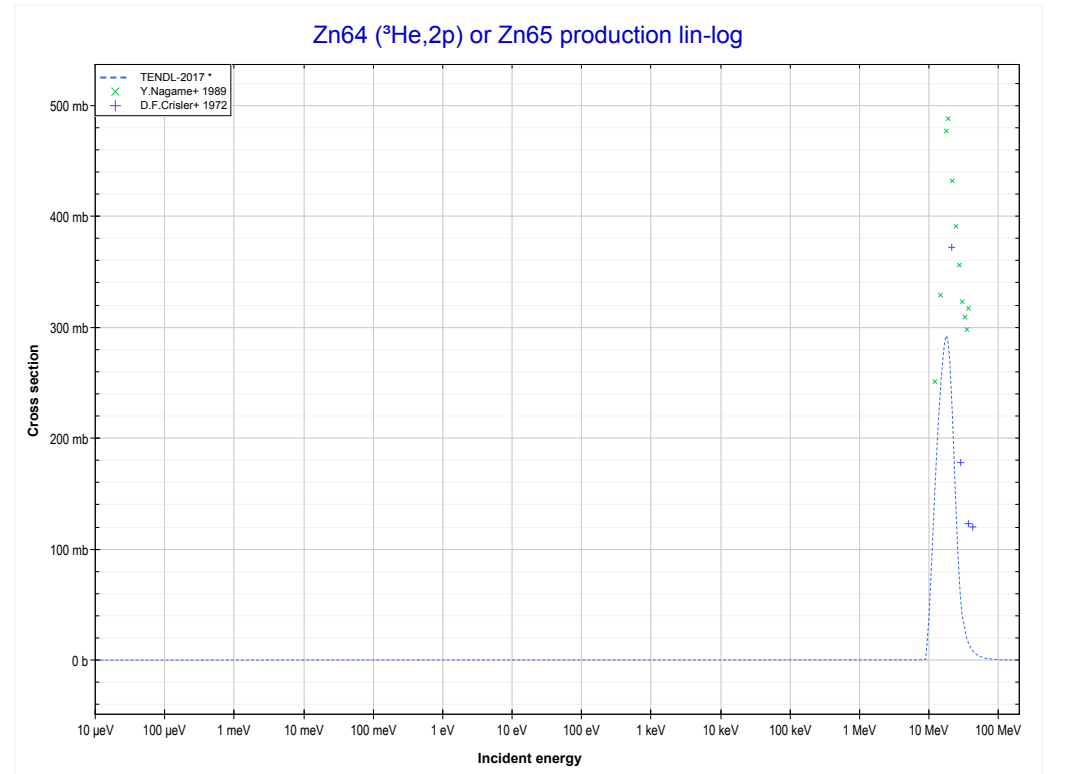
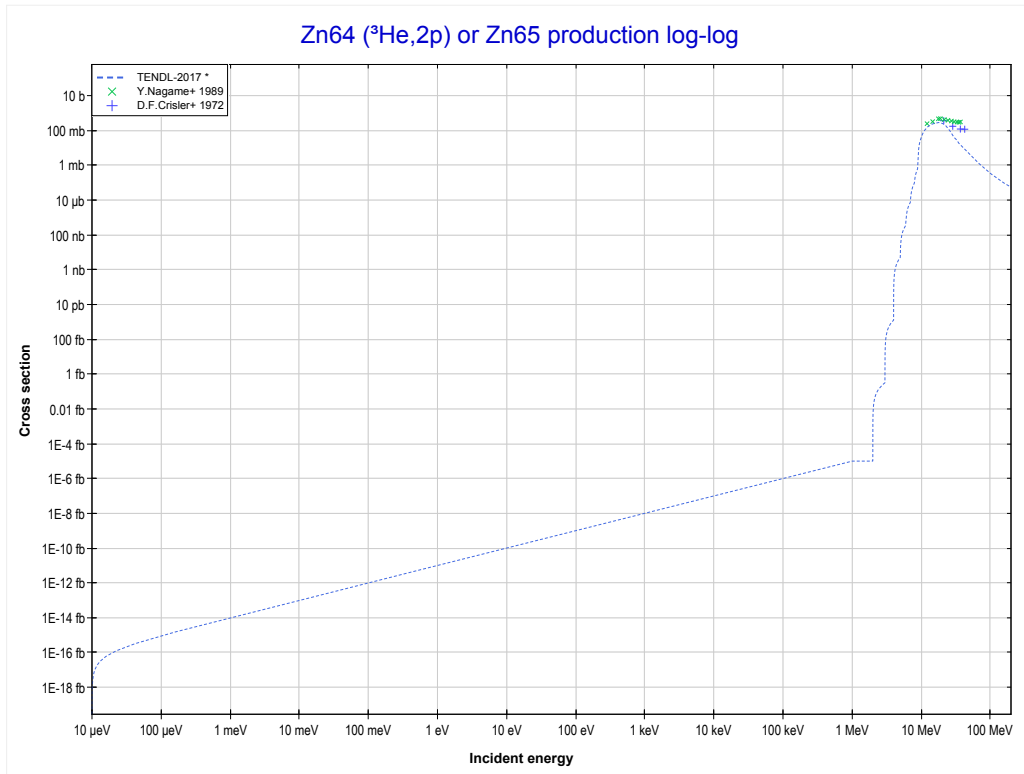
Reaction	Q-Value
Zn64(He3,p)Ga66	5362.45 keV

<< 19-K-39	30-Zn-64	31-Ga-69 >>
<< MT103 (³ He,p)	MT107 (³He,α) or MT5 (Zn63 production)	MT111 (³ He,2p) >>



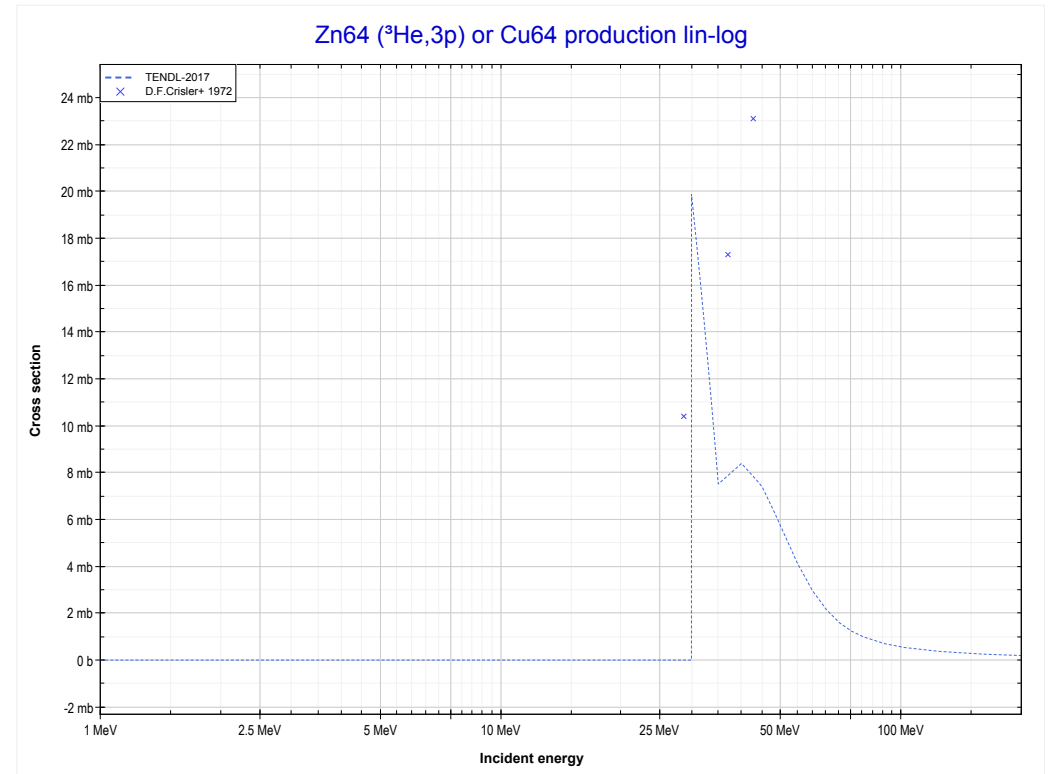
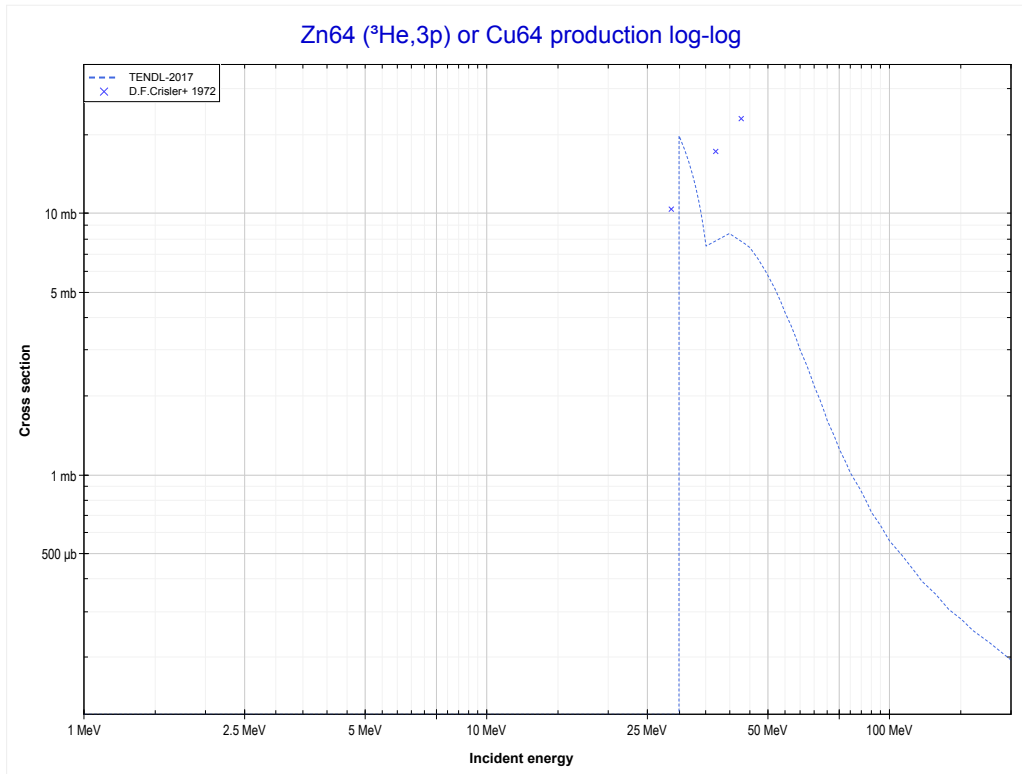
Reaction	Q-Value
Zn64(He3,α)Zn63	8715.60 keV
Zn64(He3,p+t)Zn63	-11098.26 keV
Zn64(He3,n+He3)Zn63	-11862.02 keV
Zn64(He3,2d)Zn63	-15130.93 keV
Zn64(He3,n+p+d)Zn63	-17355.49 keV
Zn64(He3,2n+2p)Zn63	-19580.06 keV

<< 29-Cu-63	30-Zn-64	30-Zn-68 >>
<< MT107 ($^3\text{He},\alpha$)	MT111 ($^3\text{He},2p$) or MT5 (Zn65 production)	MT197 ($^3\text{He},3p$) >>



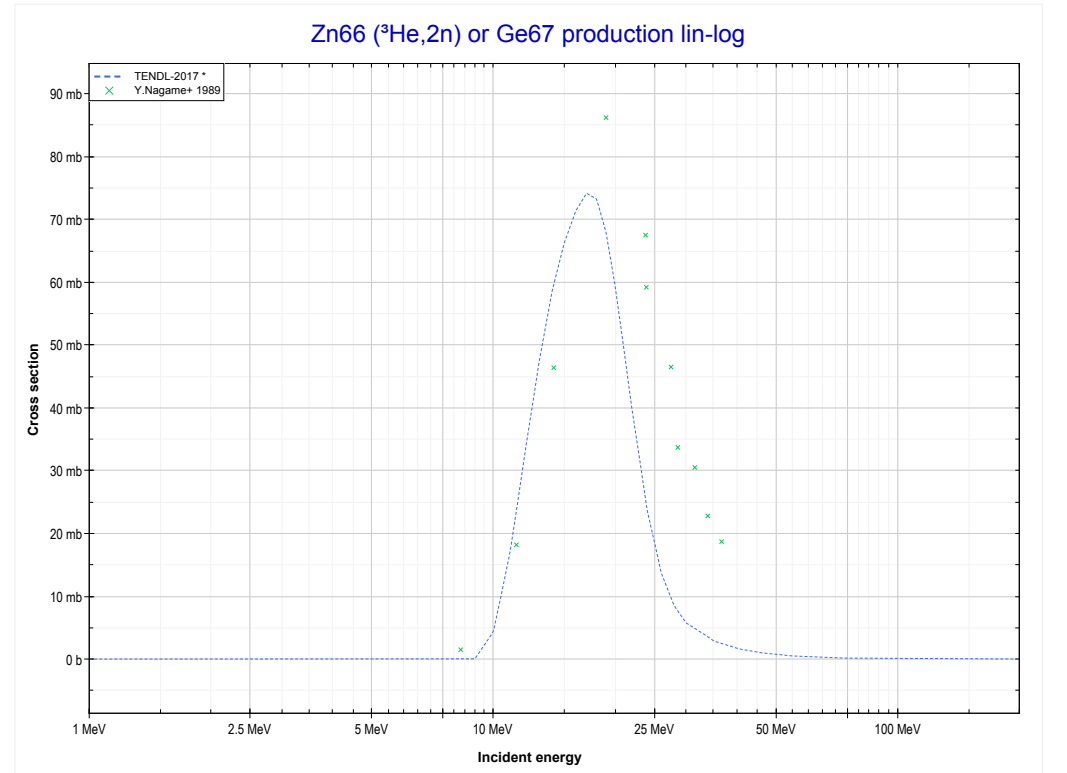
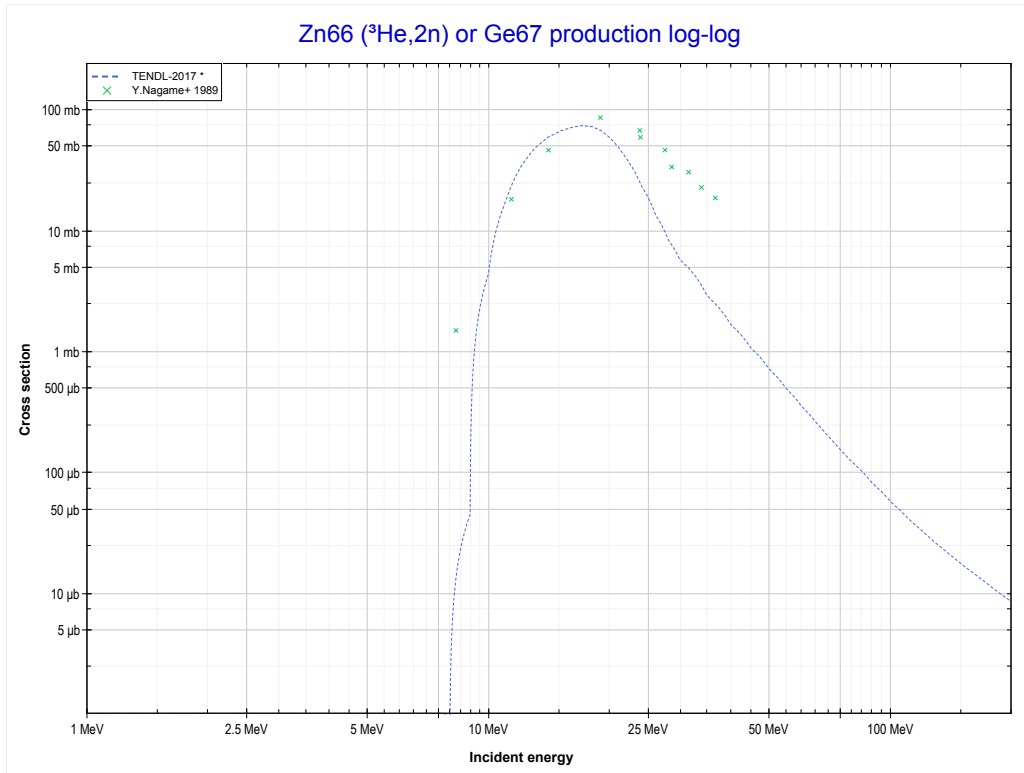
Reaction	Q-Value
Zn64(He3,2p)Zn65	261.27 keV

<< 29-Cu-65	30-Zn-64	
<< MT111 (³ He,2p)	MT197 (³He,3p) or MT5 (Cu64 production)	30-Zn-66 MT16 (³ He,2n) >>



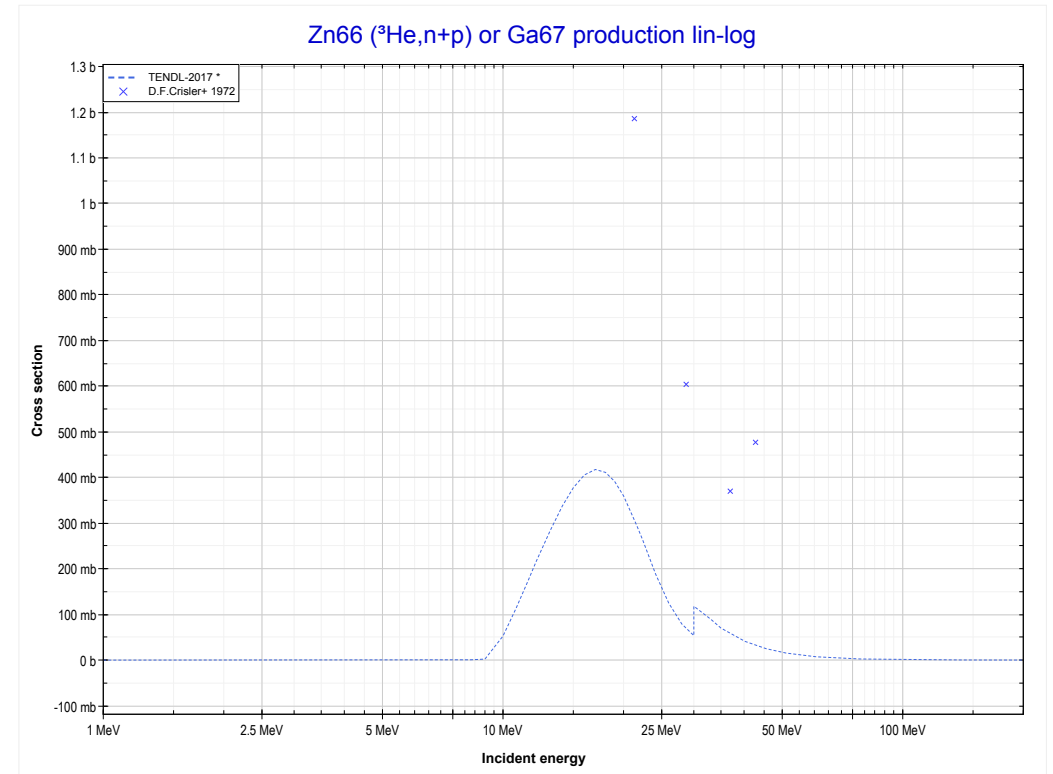
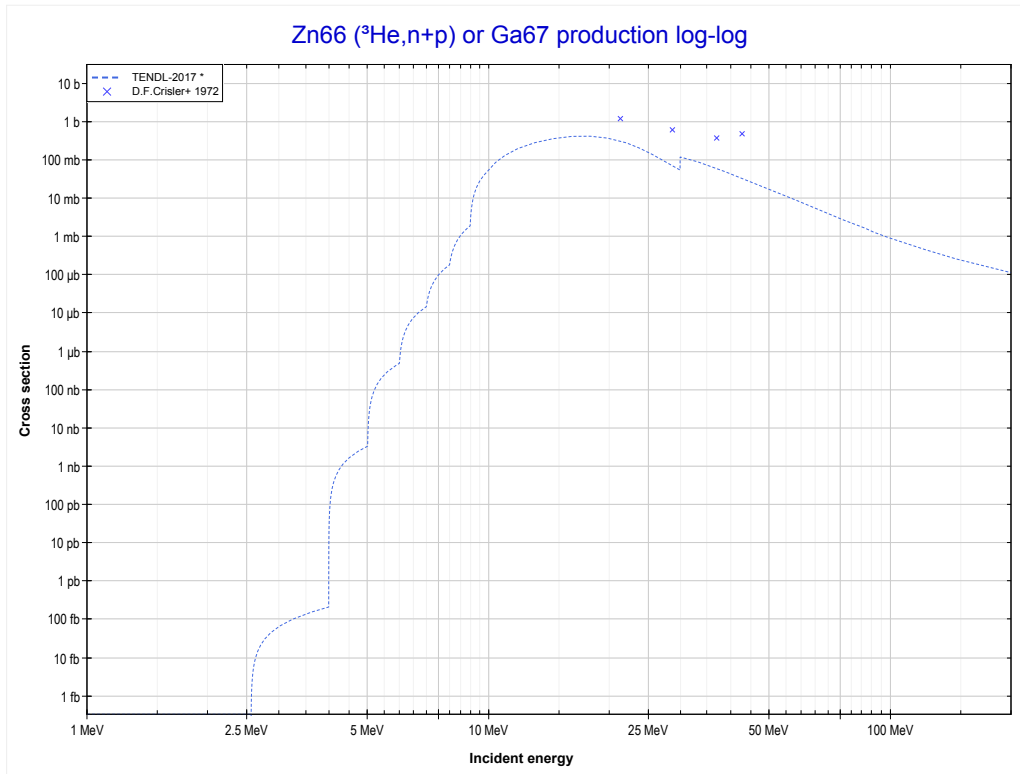
Reaction	Q-Value
Zn64(He3,3p)Cu64	-7515.40 keV

<< 29-Cu-65	30-Zn-66	30-Zn-68 >>
<< 30-Zn-64 MT197 (³ He,3p)	MT16 (³He,2n) or MT5 (Ge67 production)	MT28 (³ He,n+p) >>



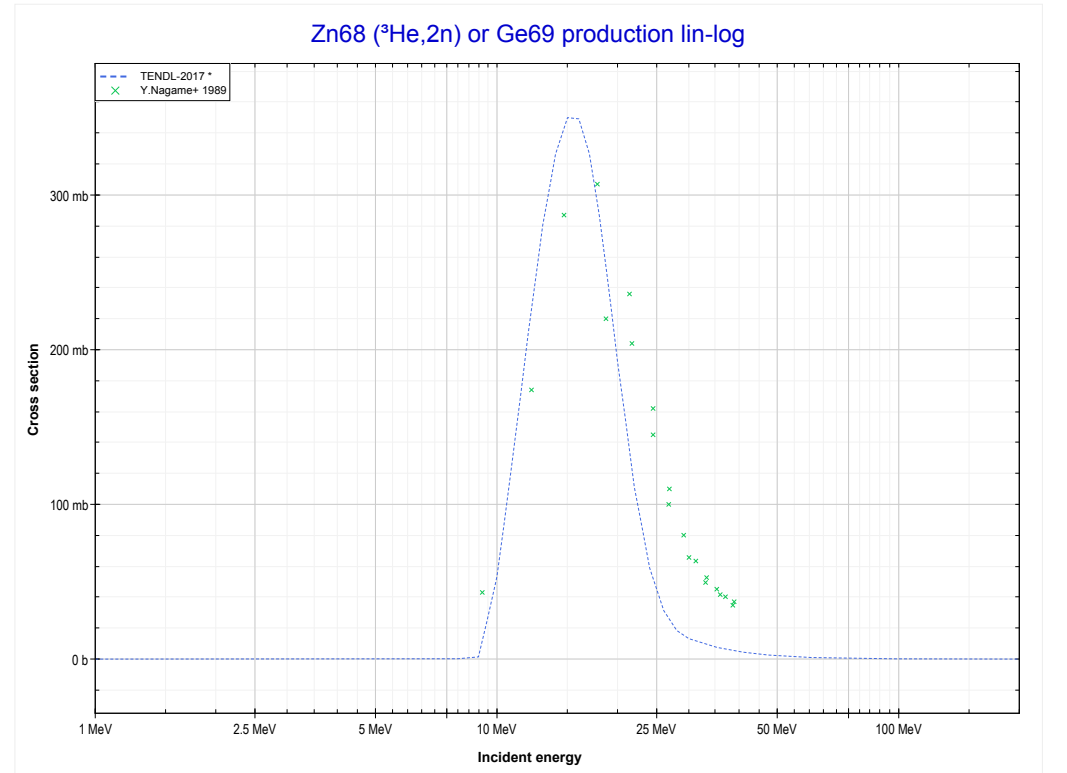
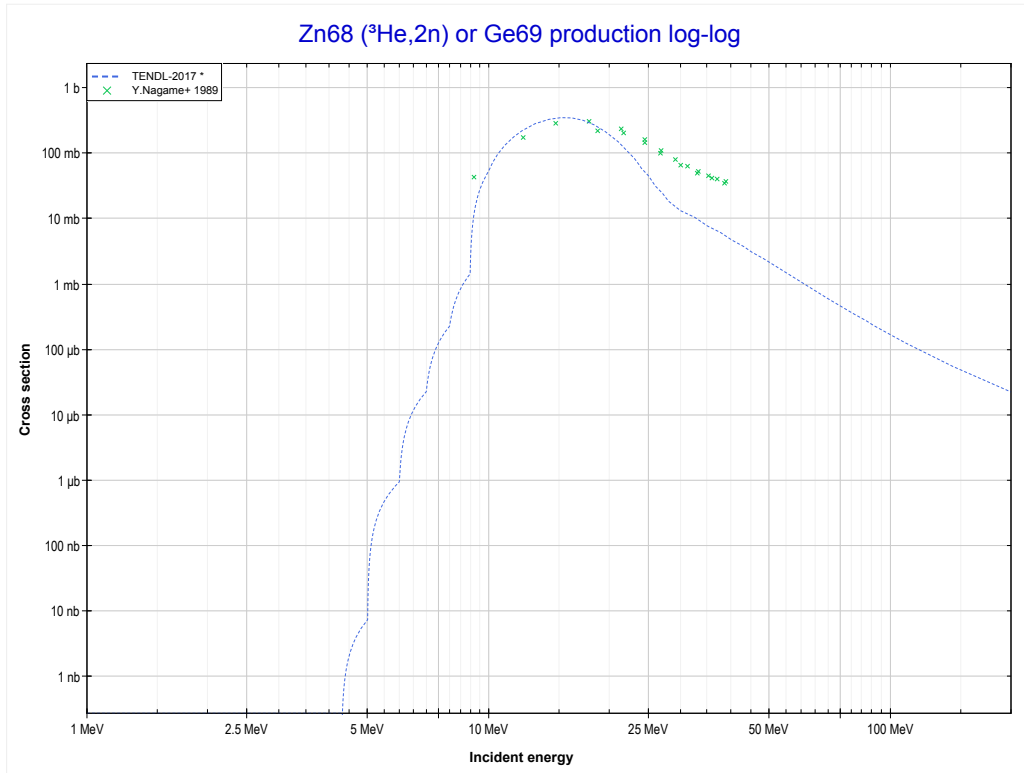
Reaction	Q-Value
Zn66(He3,2n)Ge67	-7452.52 keV

	30-Zn-66	34-Se-76 >>
<< MT16 (³He,2n)	MT28 (³He,n+p) or MT5 (Ga67 production)	30-Zn-68 MT16 (³He,2n) >>



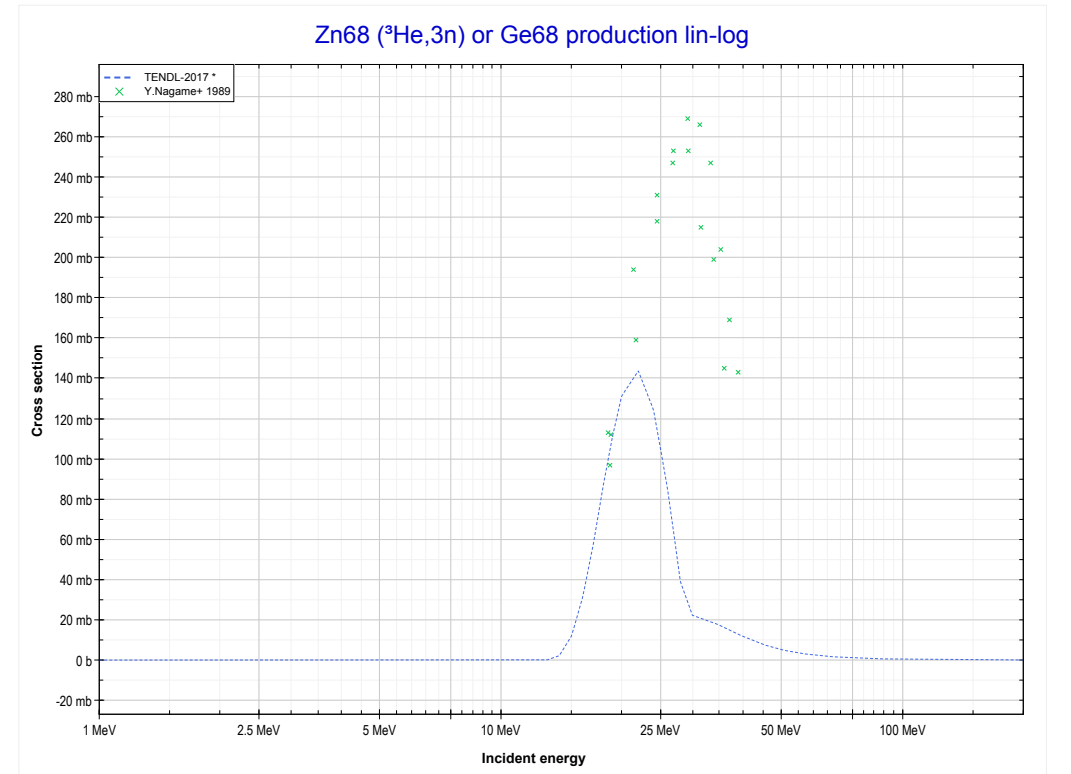
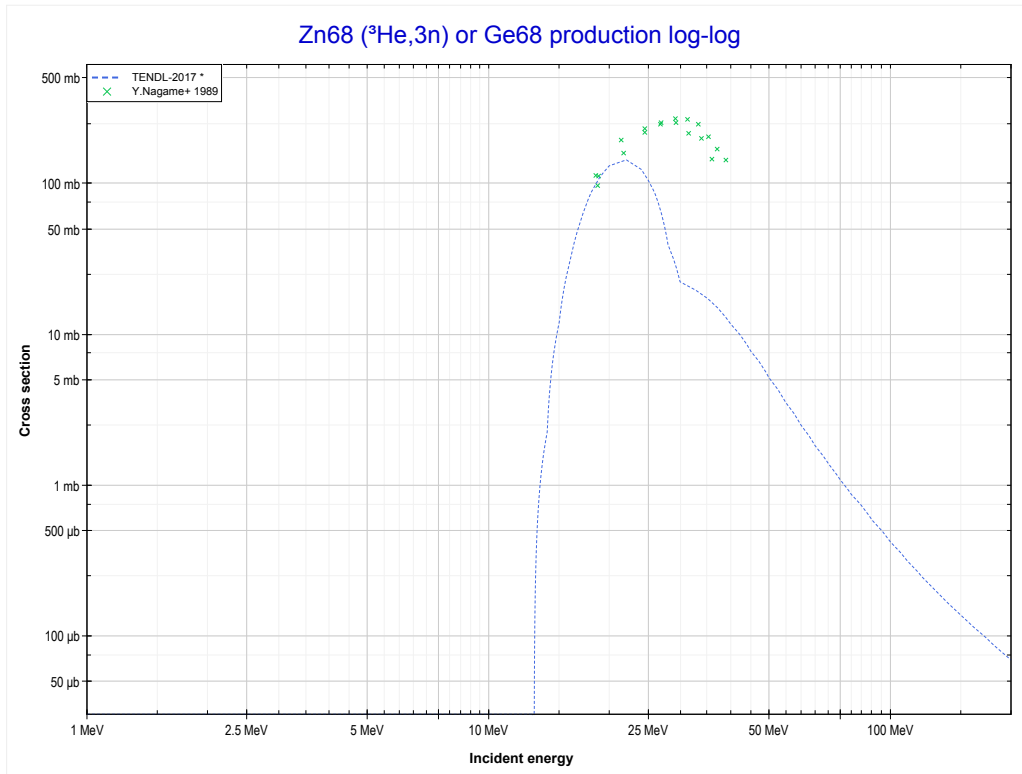
Reaction	Q-Value
Zn66(He3,d)Ga67	-224.71 keV
Zn66(He3,n+p)Ga67	-2449.27 keV

<< 30-Zn-66	30-Zn-68	31-Ga-69 >>
<< 30-Zn-66 MT28 (³ He,n+p)	MT16 (³He,2n) or MT5 (Ge69 production)	MT17 (³ He,3n) >>



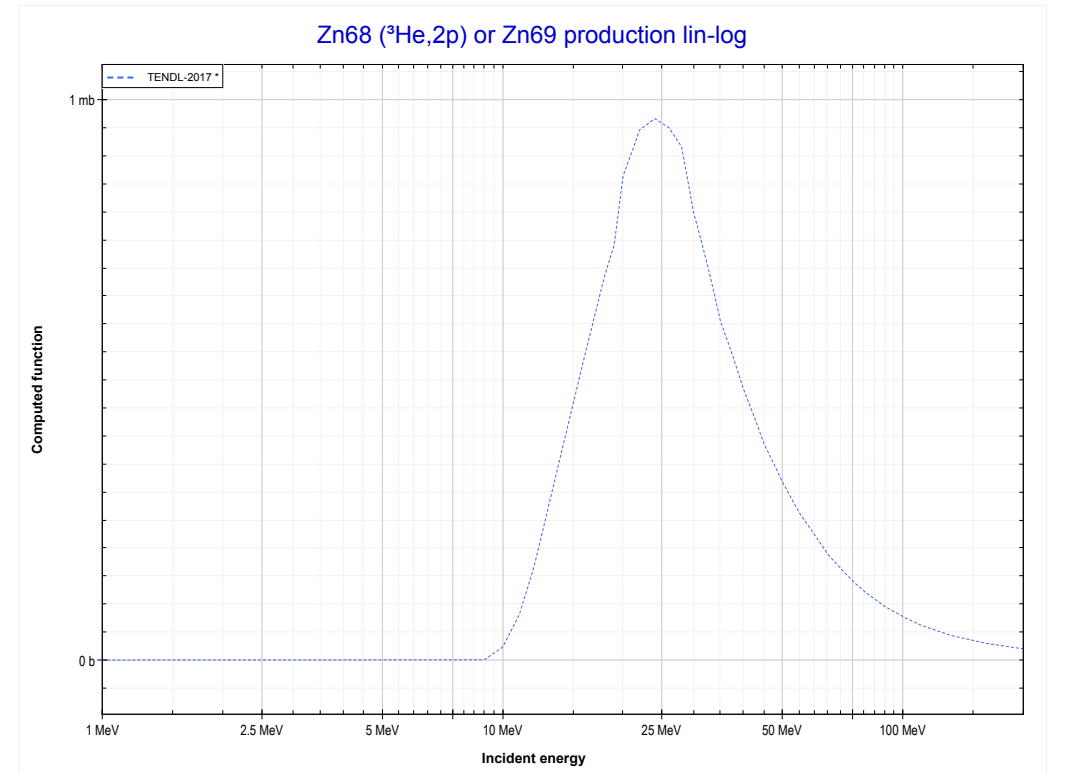
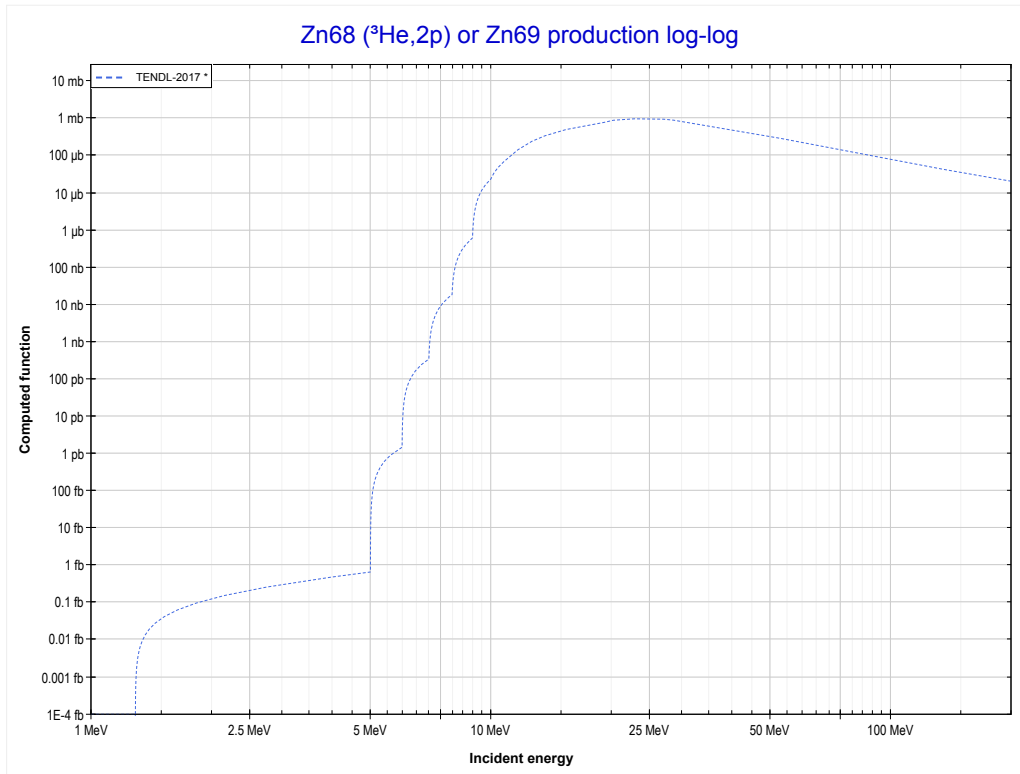
Reaction	Q-Value
Zn68(He3,2n)Ge69	-4117.52 keV

<< 29-Cu-65	30-Zn-68	33-As-75 >>
<< MT16 (³ He,2n)	MT17 (³He,3n) or MT5 (Ge68 production)	MT111 (³ He,2p) >>



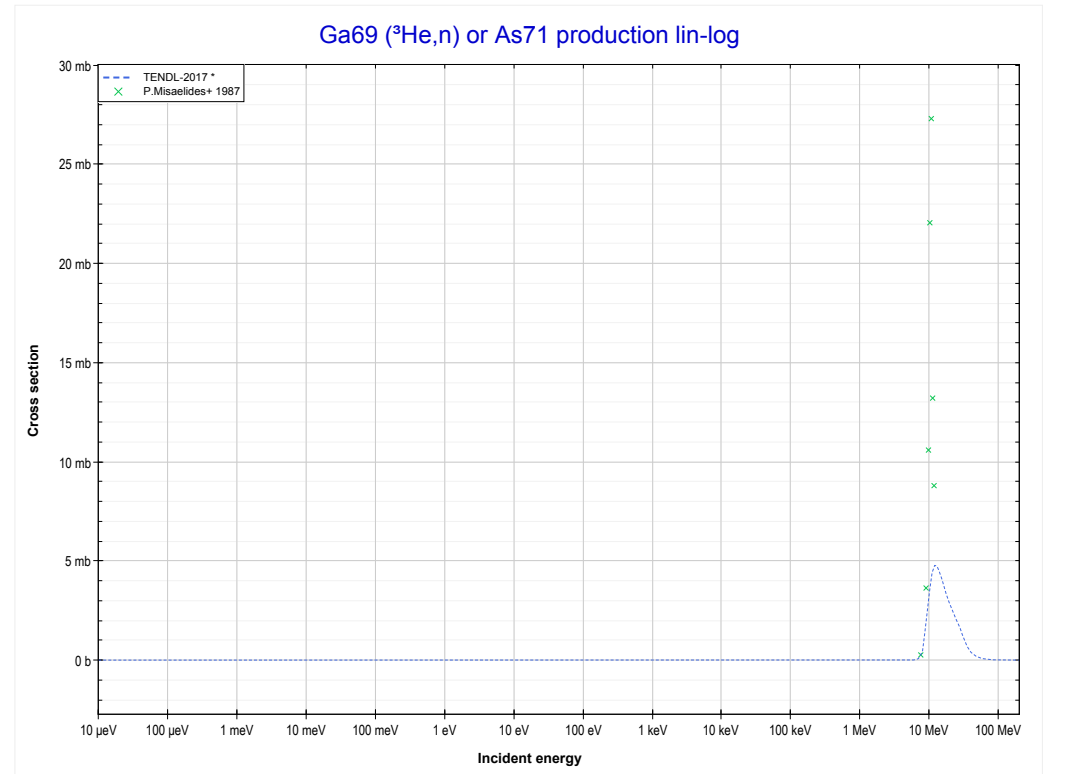
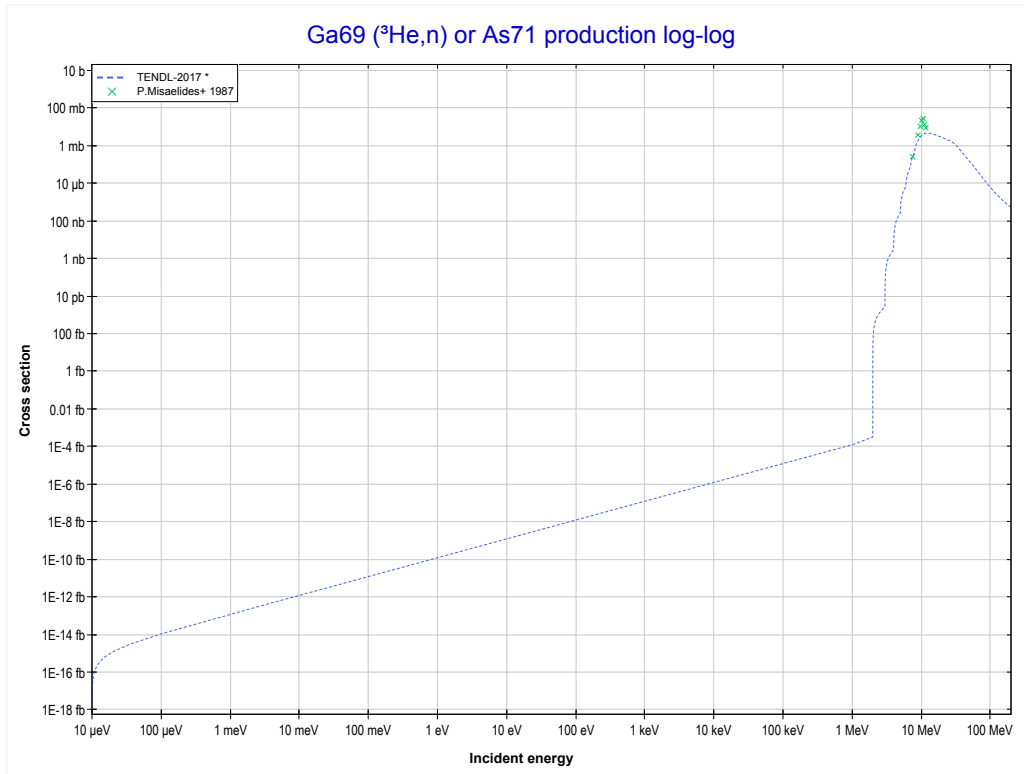
Reaction	Q-Value
Zn68(He3,3n)Ge68	-12310.74 keV

<< 30-Zn-64	30-Zn-68	31-Ga-71 >>
<< MT17 (³ He,3n)	MT111 (³He,2p) or MT5 (Zn69 production)	31-Ga-69 MT4 (³ He,n) >>



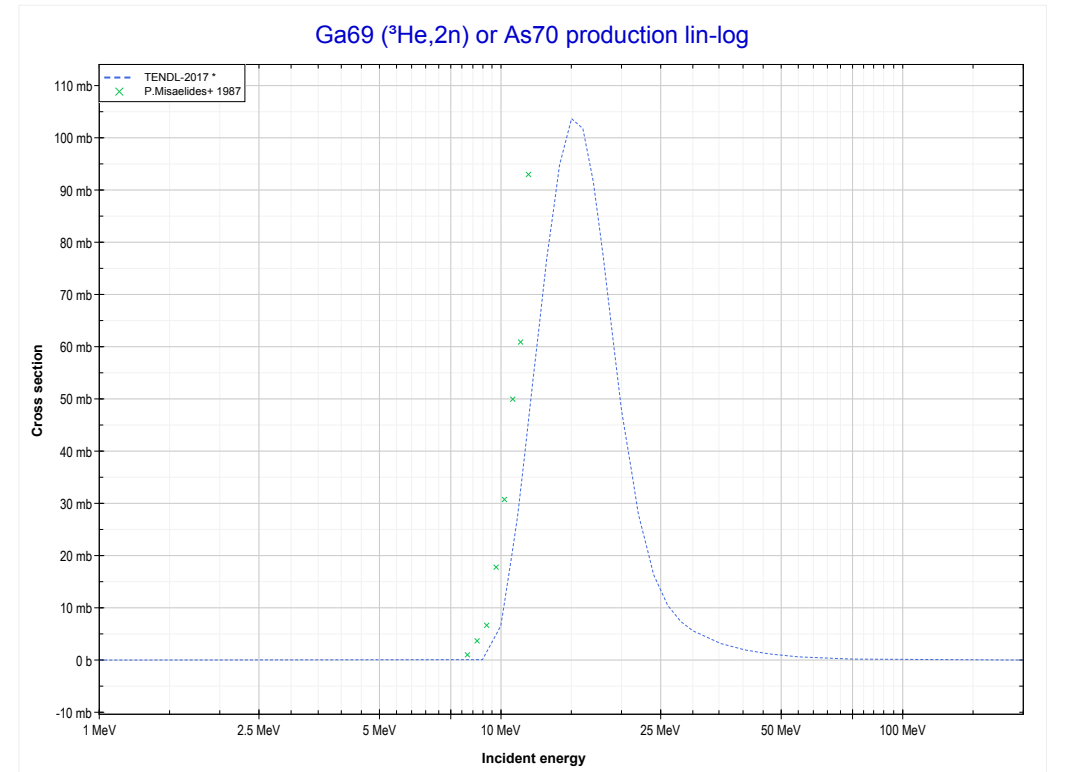
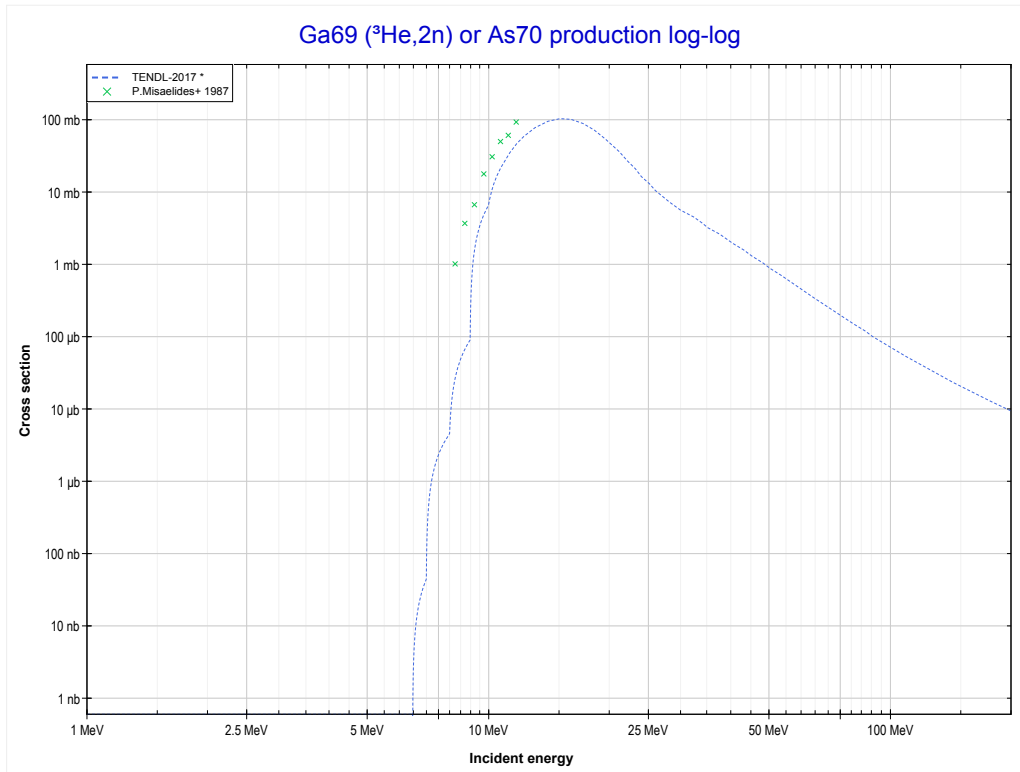
Reaction	Q-Value
Zn68(He3,2p)Zn69	-1235.93 keV

<< 30-Zn-64	31-Ga-69	33-As-75 >>
<< 30-Zn-68 MT111 (³ He,2p)	MT4 (³He,n) or MT5 (As71 production)	MT16 (³ He,2n) >>



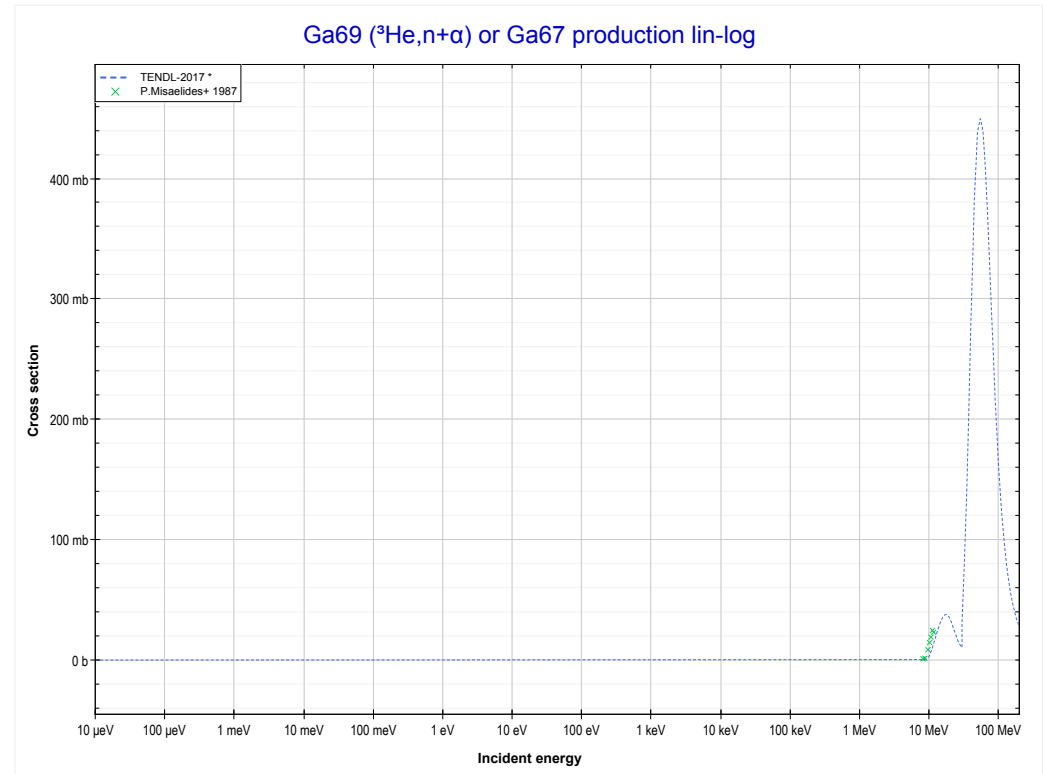
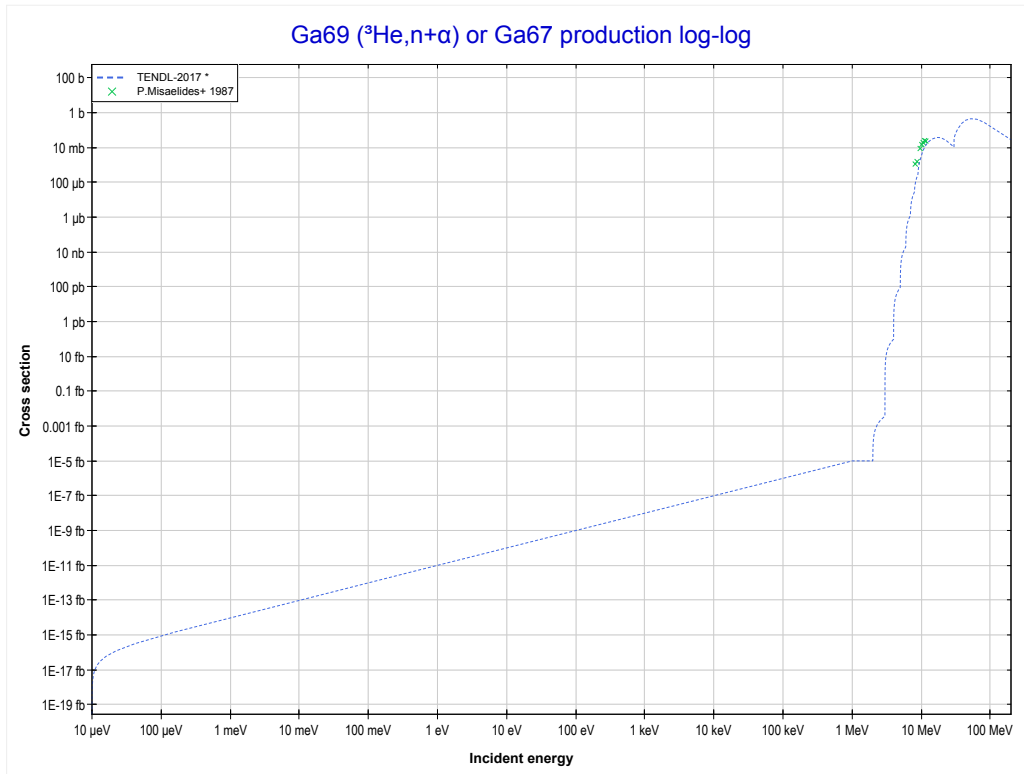
Reaction	Q-Value
Ga69(He3,n)As71	5425.10 keV

<< 30-Zn-68	31-Ga-69	31-Ga-71 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (As70 production)	MT22 (³ He,n+α) >>



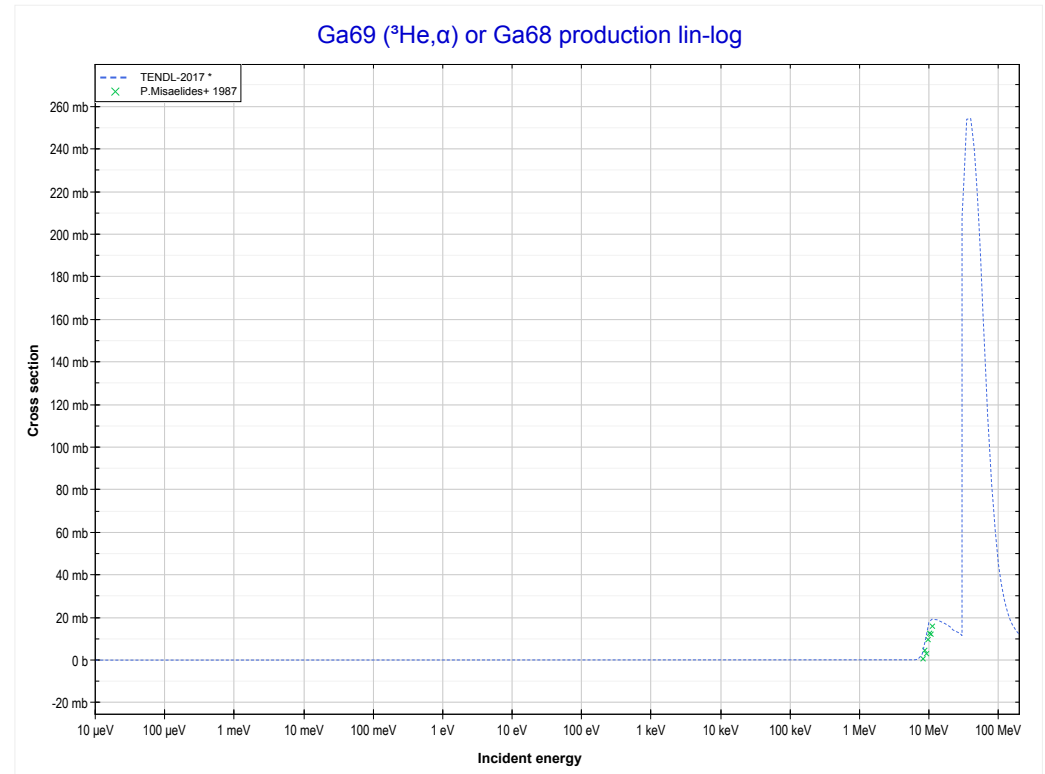
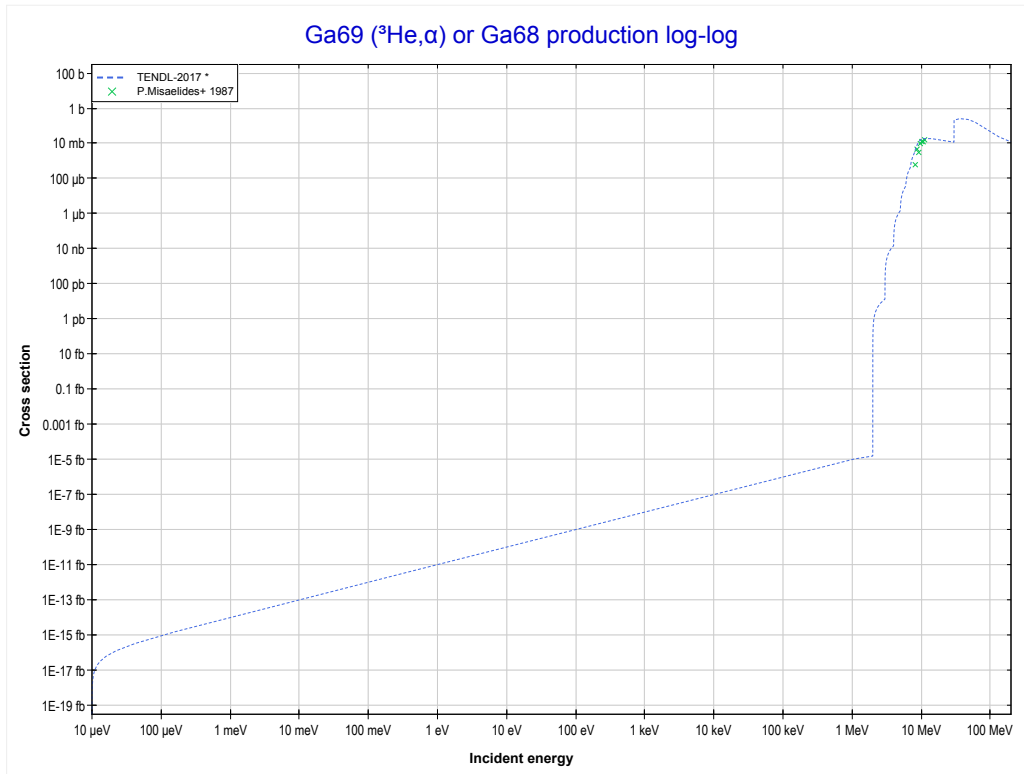
Reaction	Q-Value
Ga69(He3,2n)As70	-6199.22 keV

<< 30-Zn-64	31-Ga-69	34-Se-77 >>
<< MT16 (³ He,2n)	MT22 (³He,n+α) or MT5 (Ga67 production)	MT107 (³ He,α) >>



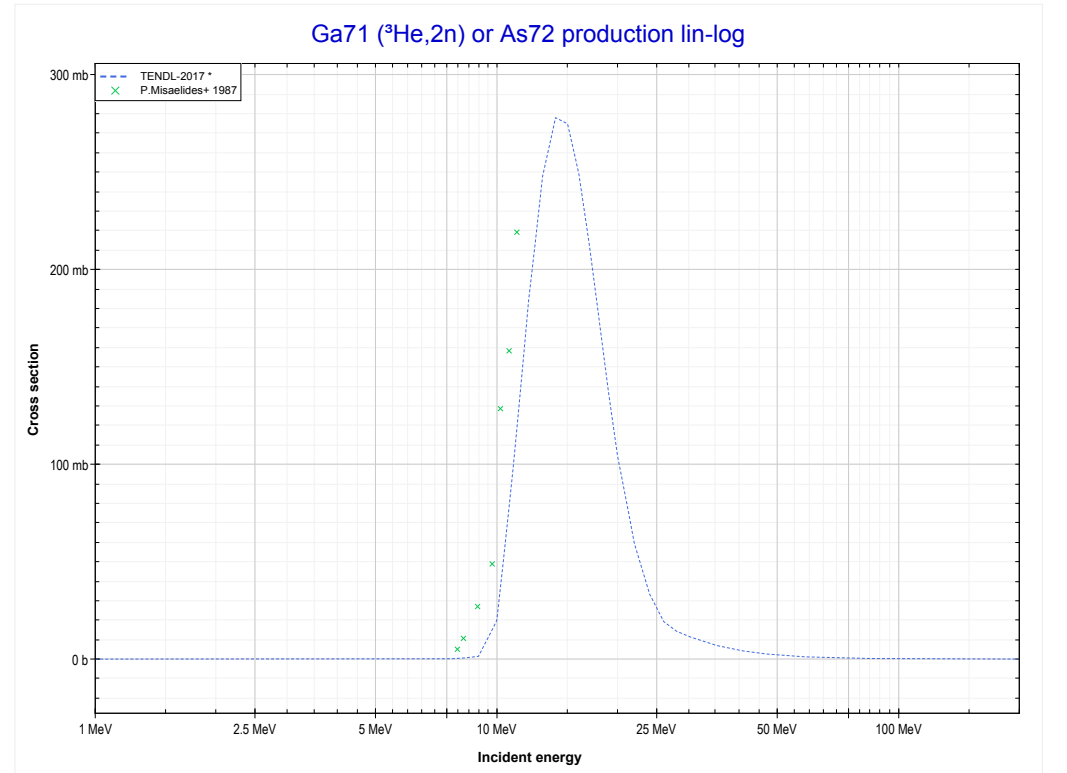
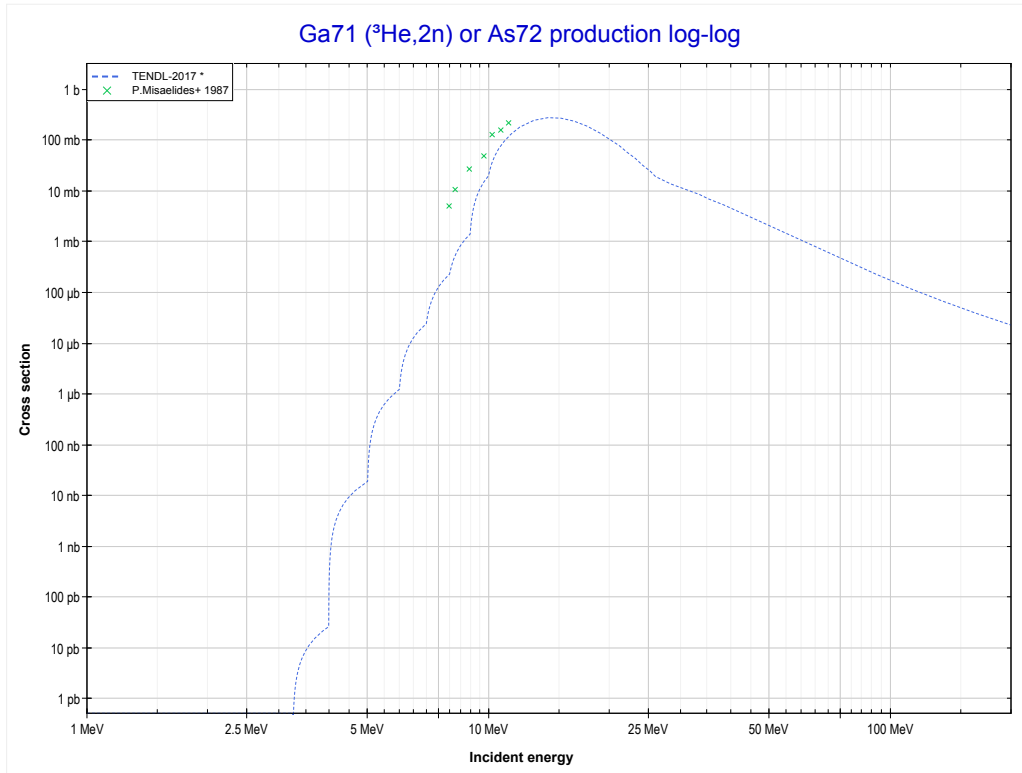
Reaction	Q-Value
Ga69(He3,n+α)Ga67	1986.08 keV
Ga69(He3,d+t)Ga67	-15603.21 keV
Ga69(He3,n+p+t)Ga67	-17827.78 keV
Ga69(He3,2n+He3)Ga67	-18591.53 keV
Ga69(He3,n+2d)Ga67	-21860.44 keV
Ga69(He3,2n+p+d)Ga67	-24085.01 keV
Ga69(He3,3n+2p)Ga67	-26309.58 keV

<< 30-Zn-64	31-Ga-69	34-Se-76 >>
<< MT22 (³ He,n+α)	MT107 (³He,α) or MT5 (Ga68 production)	31-Ga-71 MT16 (³ He,2n) >>



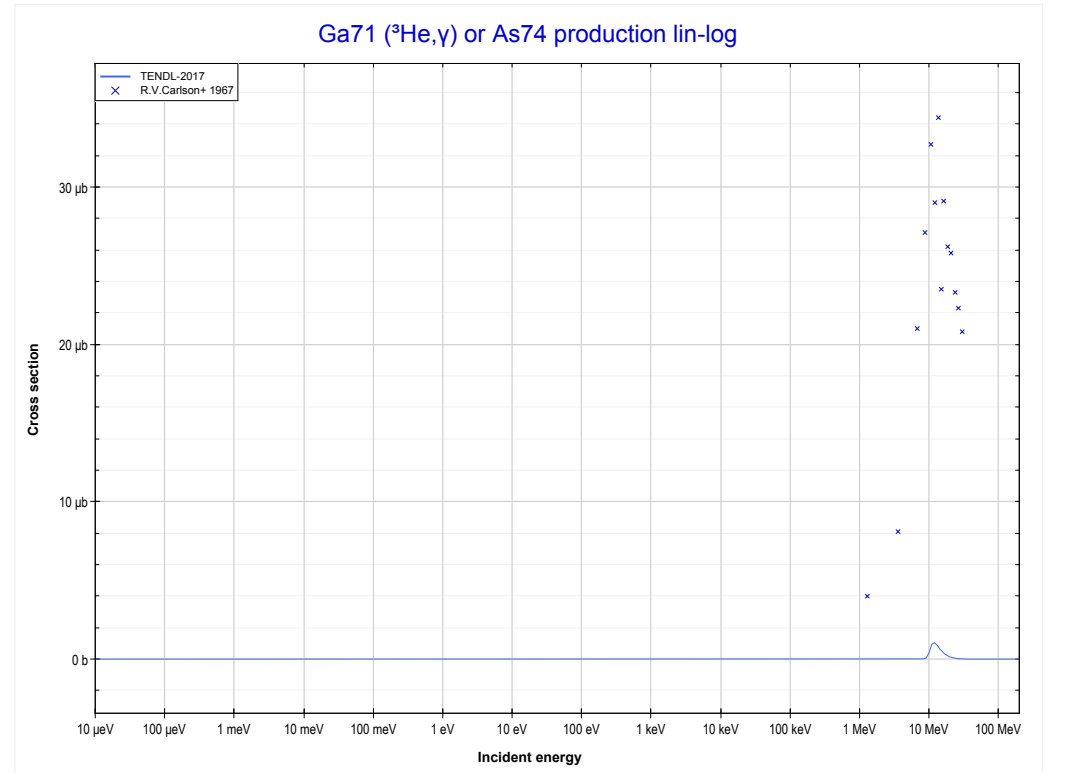
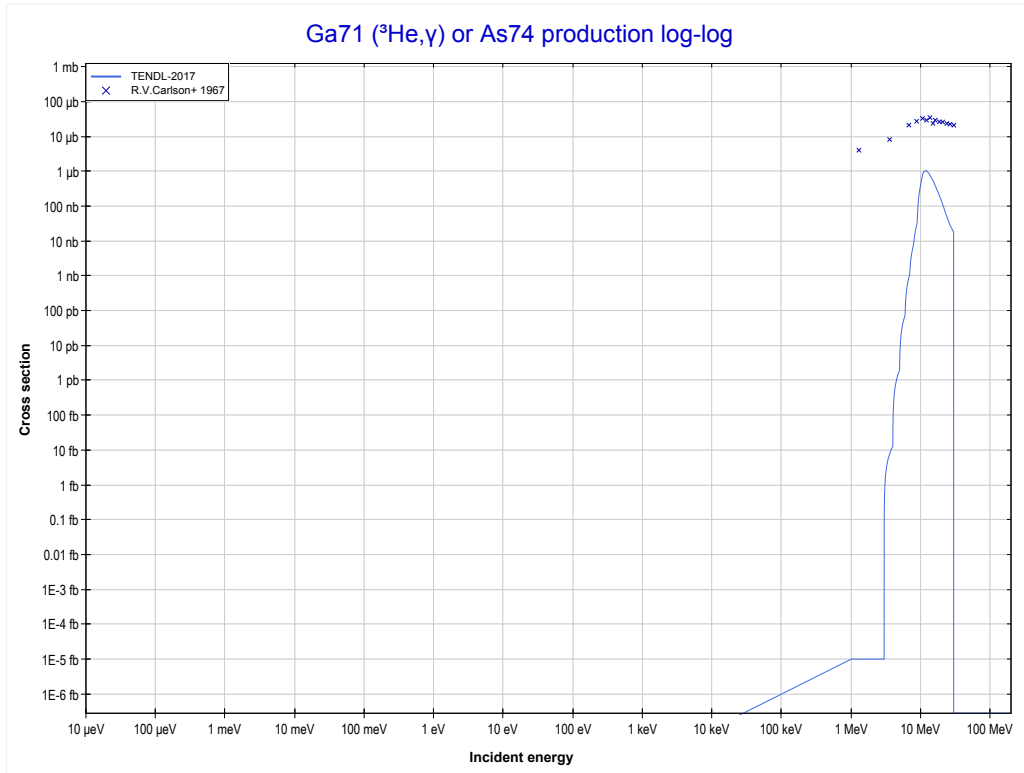
Reaction	Q-Value
Ga69(He3,α)Ga68	10264.20 keV
Ga69(He3,p+t)Ga68	-9549.66 keV
Ga69(He3,n+He3)Ga68	-10313.42 keV
Ga69(He3,2d)Ga68	-13582.33 keV
Ga69(He3,n+p+d)Ga68	-15806.89 keV
Ga69(He3,2n+2p)Ga68	-18031.46 keV

<< 31-Ga-69	31-Ga-71	33-As-75 >>
<< 31-Ga-69 MT107 ($^3\text{He},\alpha$)	MT16 ($^3\text{He},2n$) or MT5 (As72 production)	MT102 ($^3\text{He},\gamma$) >>



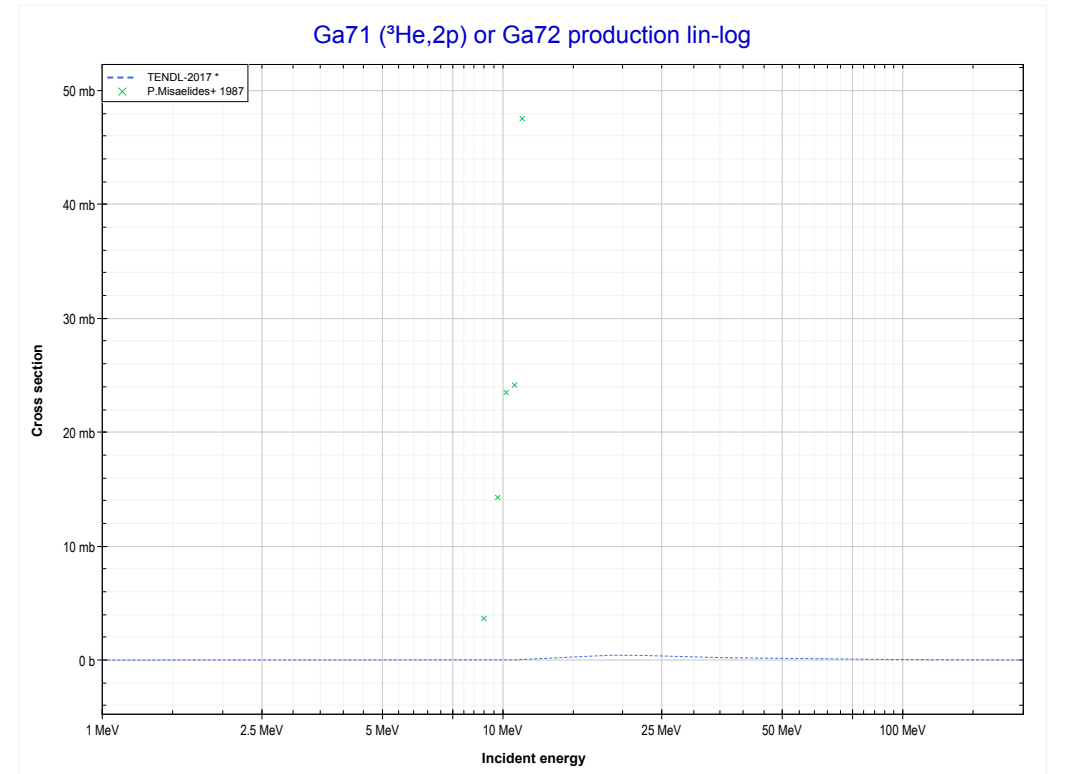
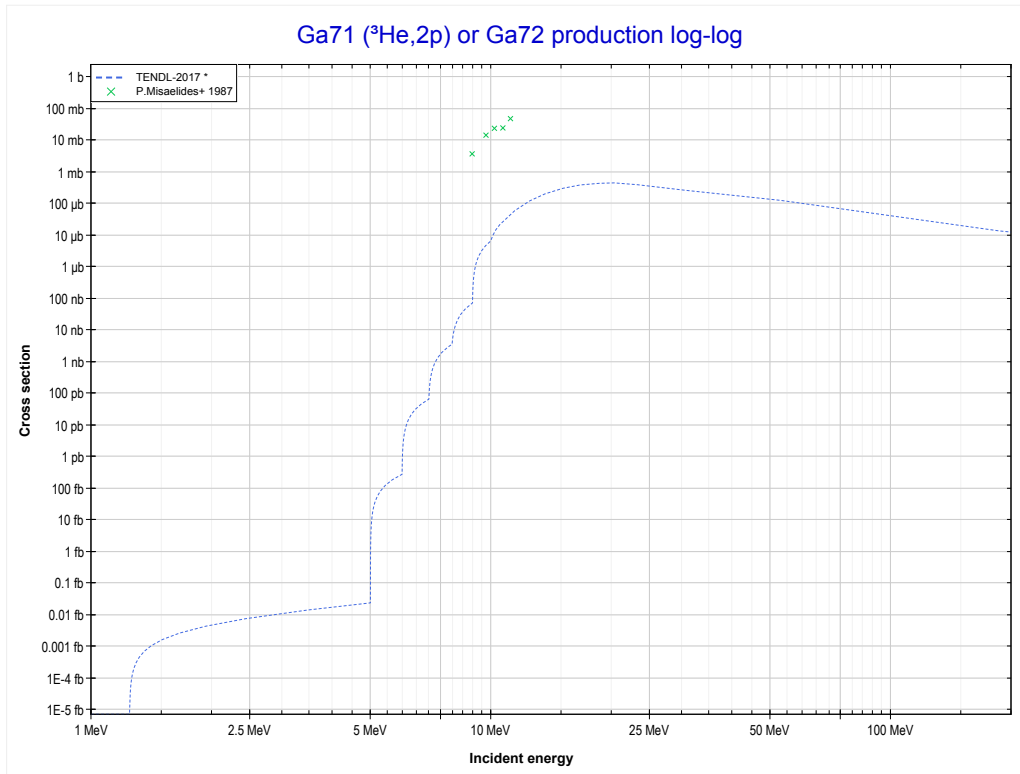
Reaction	Q-Value
Ga71($\text{He}3,2n$)As72	-3120.52 keV

<< 21-Sc-45	31-Ga-71	41-Nb-93 >>
<< MT16 (³ He,2n)	MT102 (³He,γ) or MT5 (As74 production)	MT111 (³ He,2p) >>



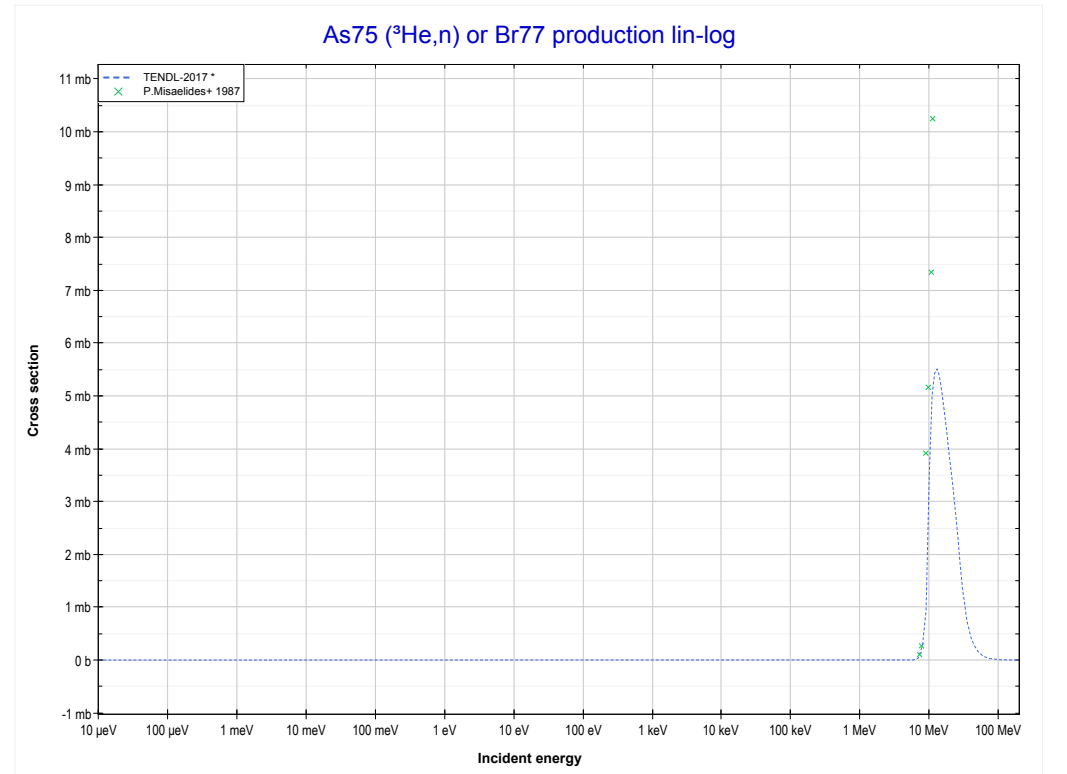
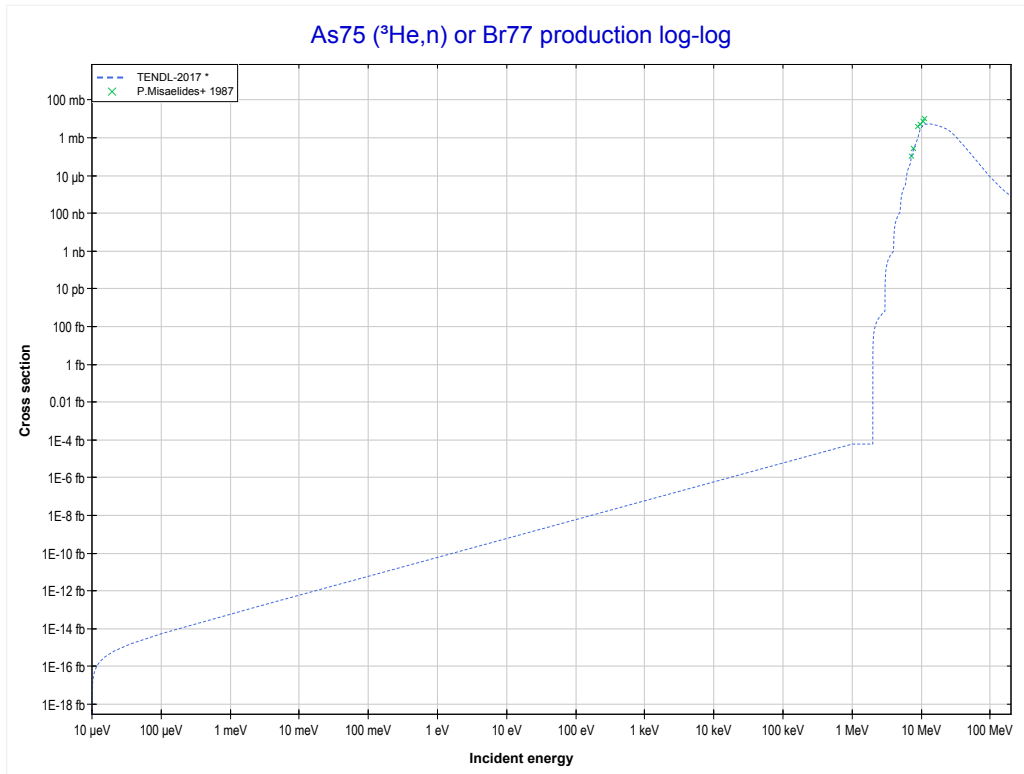
Reaction	Q-Value
Ga71(He3,γ)As74	15652.22 keV

<< 30-Zn-68	31-Ga-71	44-Ru-102 >>
<< MT102 (³ He,γ)	MT111 (³He,2p) or MT5 (Ga72 production)	33-As-75 MT4 (³ He,n) >>



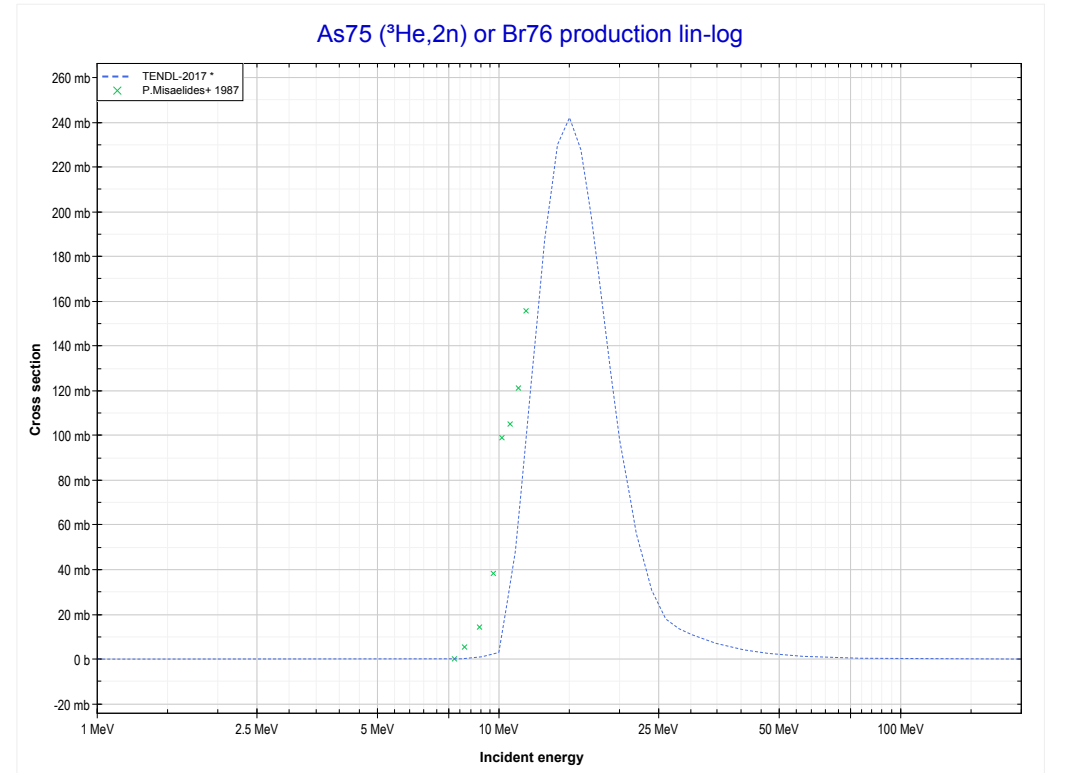
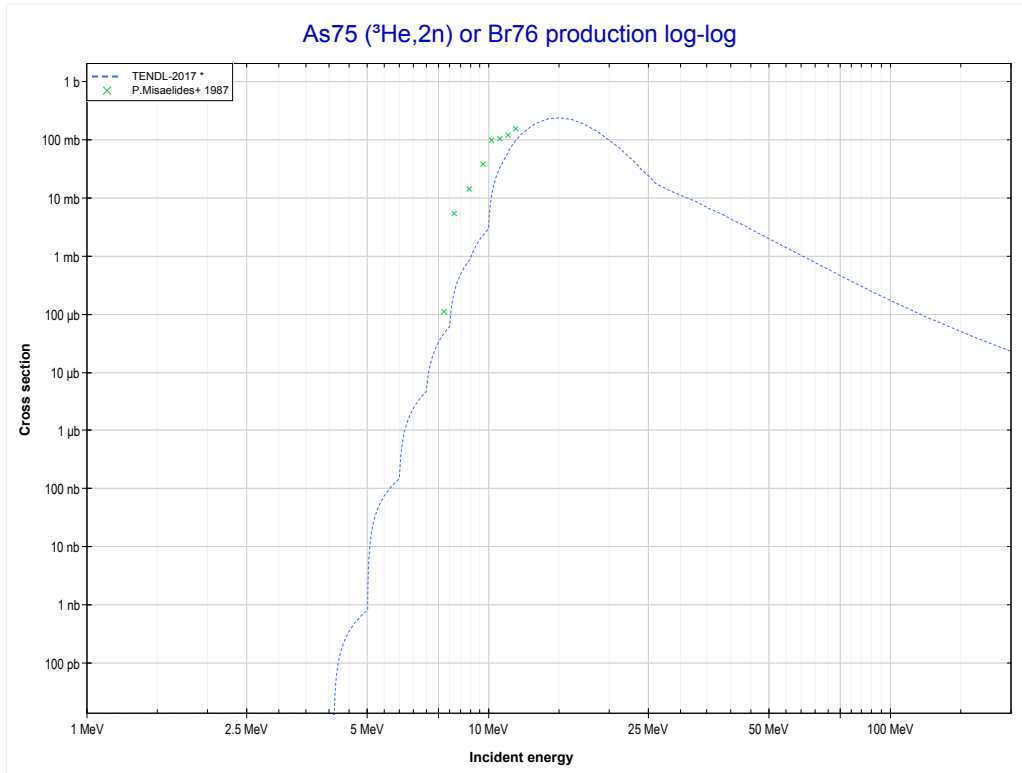
Reaction	Q-Value
Ga71(He3,2p)Ga72	-1197.53 keV

<< 31-Ga-69	33-As-75	34-Se-77 >>
<< 31-Ga-71 MT111 (³ He,2p)	MT4 (³He,n) or MT5 (Br77 production)	MT16 (³ He,2n) >>



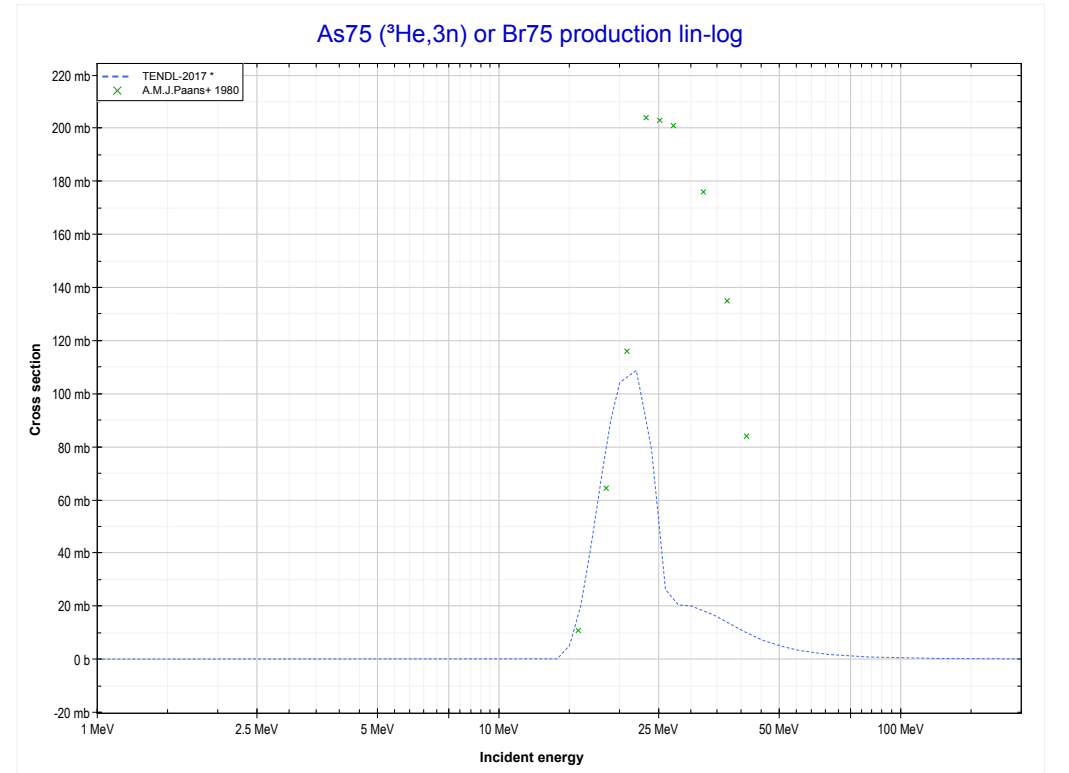
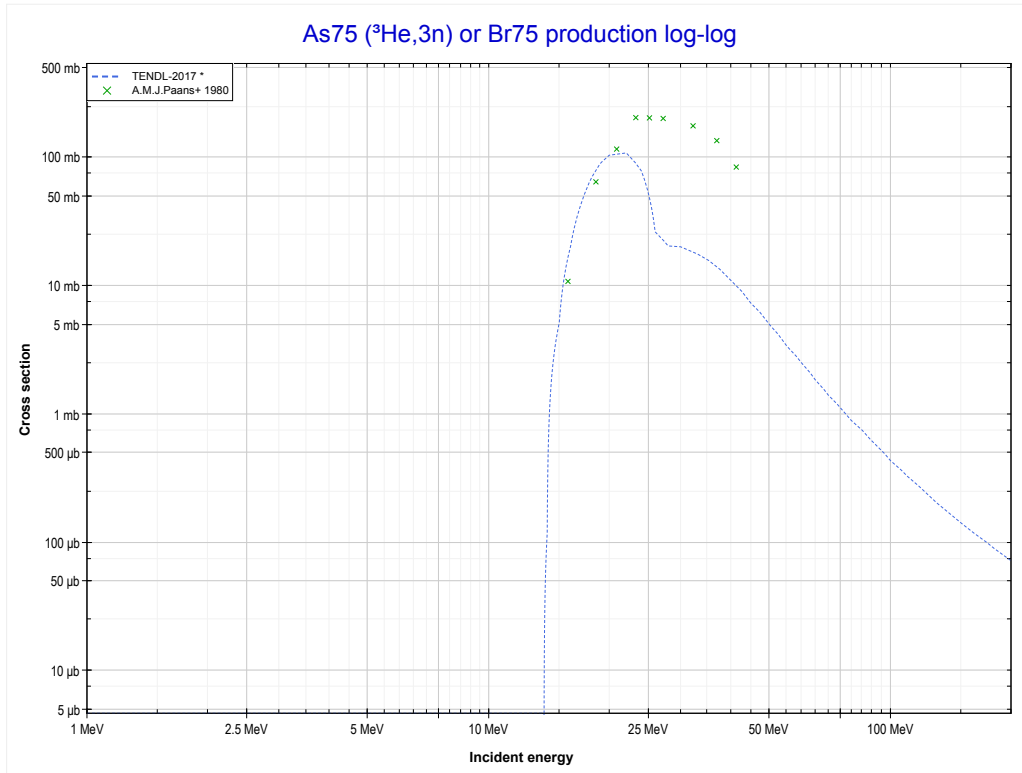
Reaction	Q-Value
As75(He3,n)Br77	7060.50 keV

<< 31-Ga-71	33-As-75	34-Se-76 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Br76 production)	MT17 (³ He,3n) >>



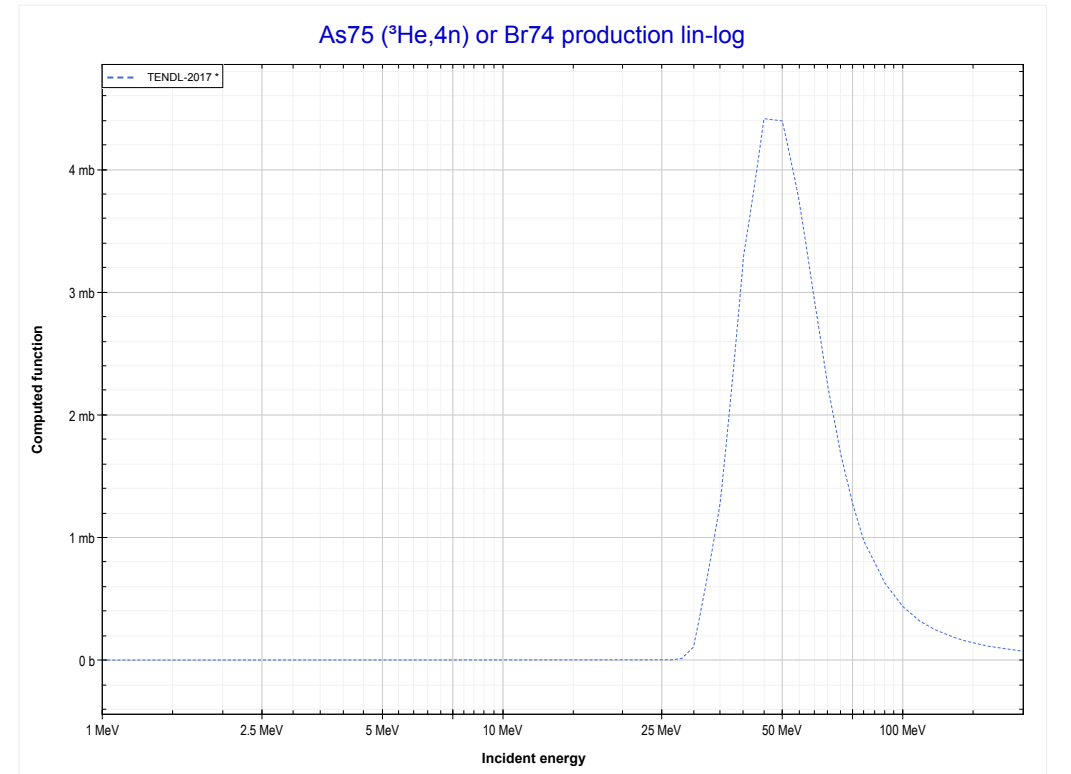
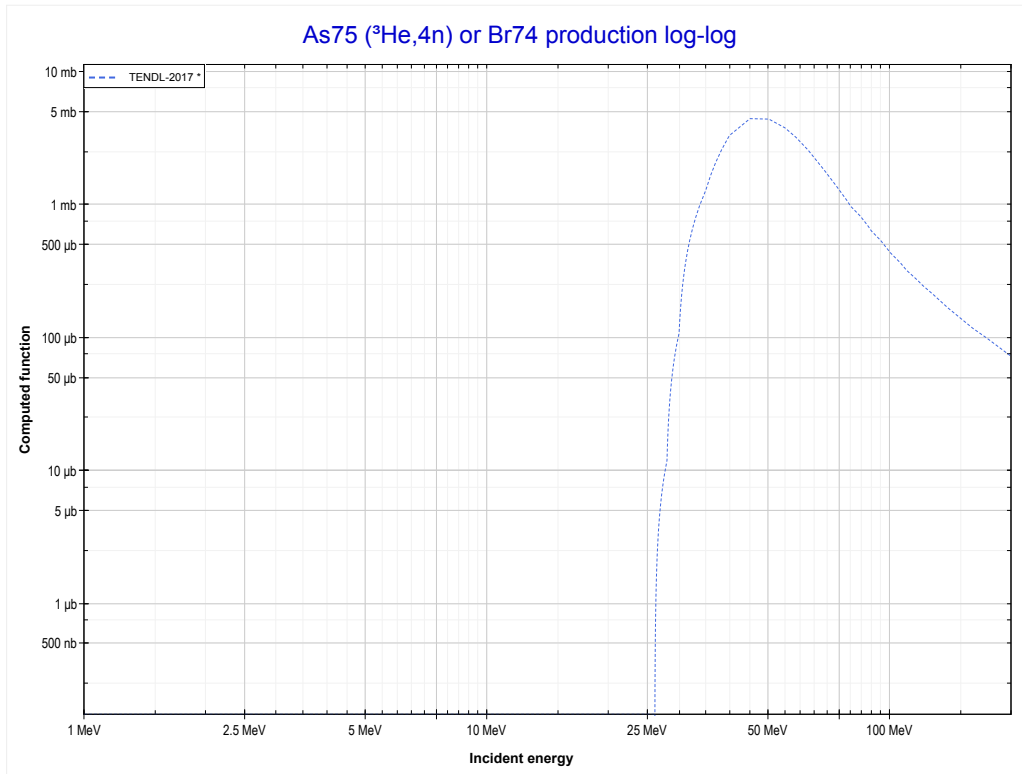
Reaction	Q-Value
As75(He3,2n)Br76	-3956.62 keV

<< 30-Zn-68	33-As-75	34-Se-76 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (Br75 production)	MT37 ($^3\text{He},4n$) >>



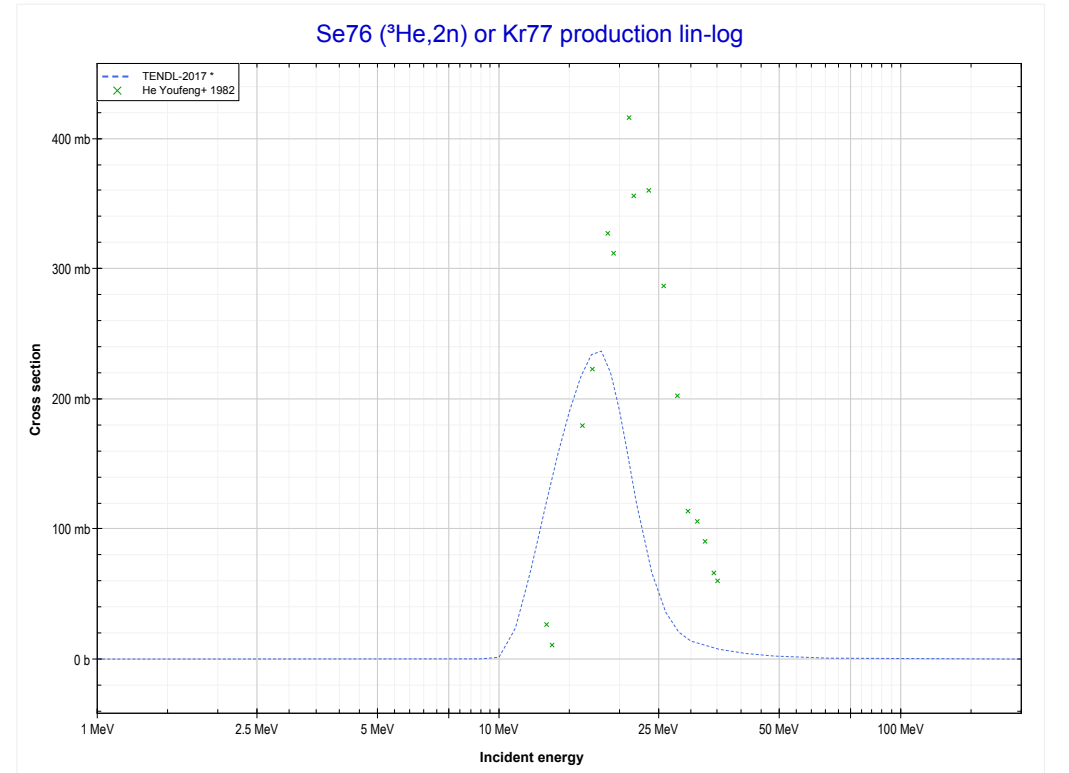
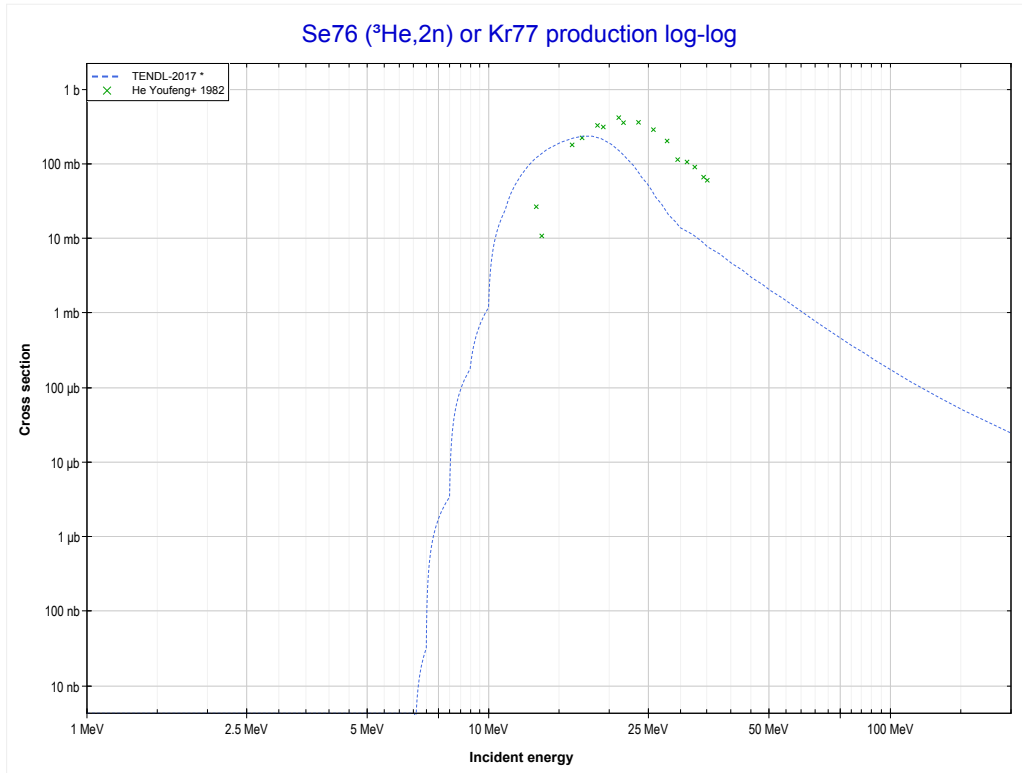
Reaction	Q-Value
As75(He3,3n)Br75	-13209.94 keV

<< 29-Cu-65	33-As-75	34-Se-77 >>
<< MT17 (³ He,3n)	MT37 (³He,4n) or MT5 (Br74 production)	34-Se-76 MT16 (³ He,2n) >>



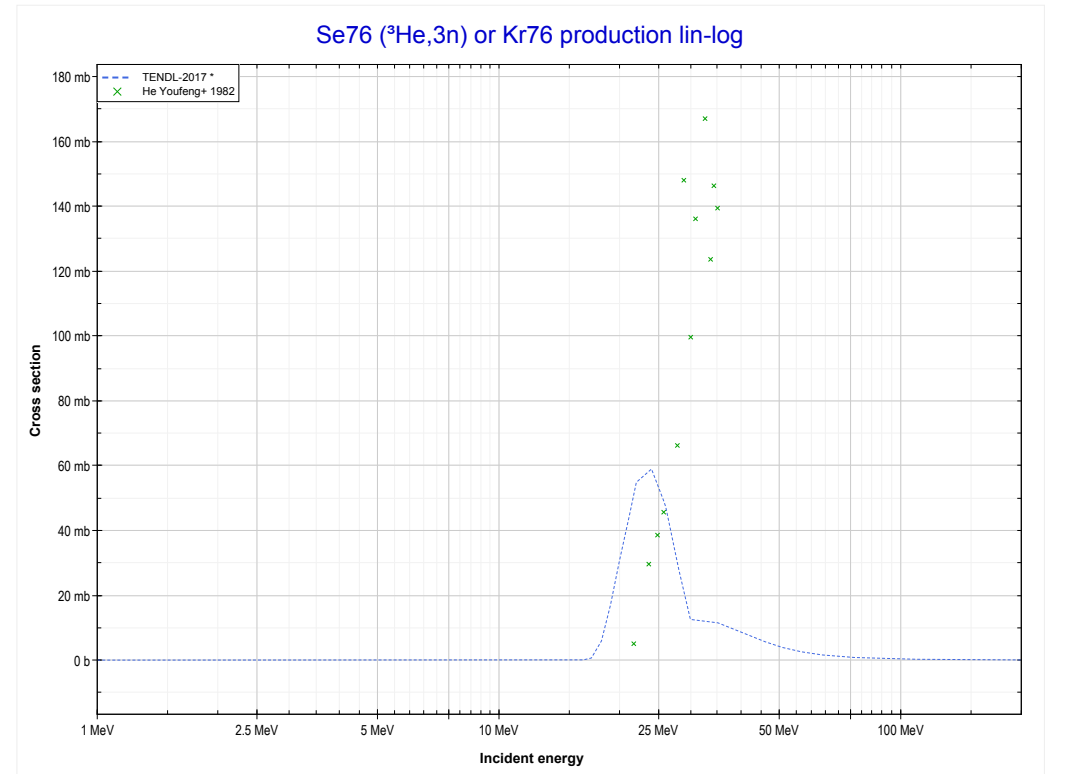
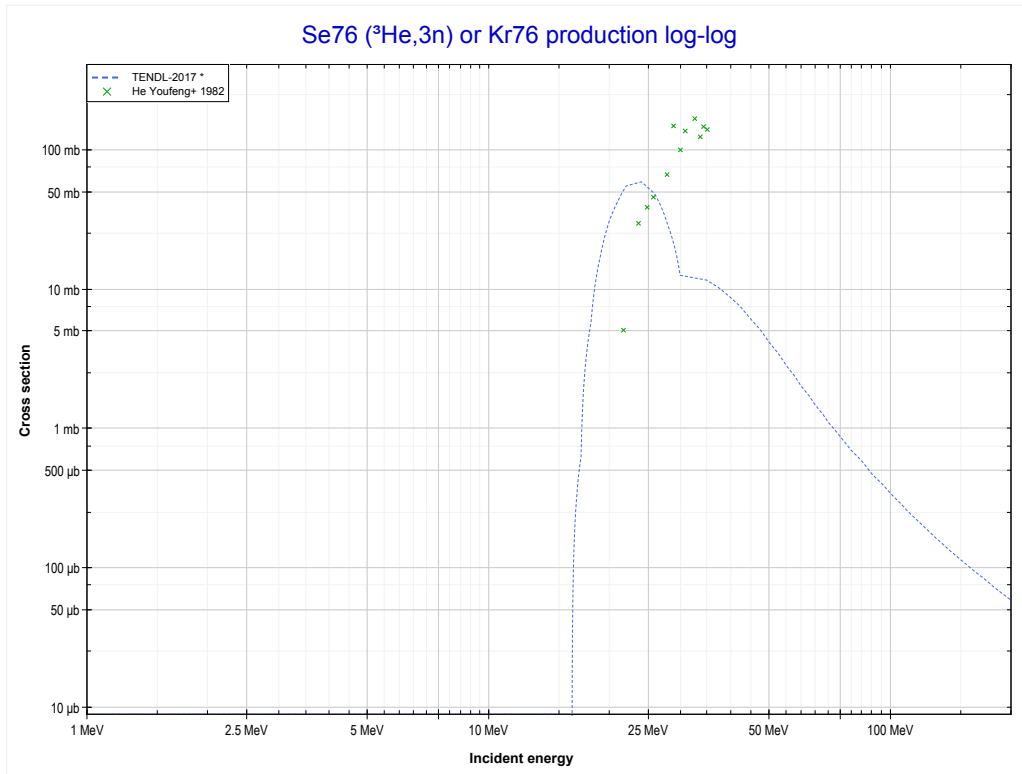
Reaction	Q-Value
As75(He3,4n)Br74	-25100.25 keV

<< 33-As-75	34-Se-76	35-Br-81 >>
<< 33-As-75 MT37 (³ He,4n)	MT16 (³He,2n) or MT5 (Kr77 production)	MT17 (³ He,3n) >>



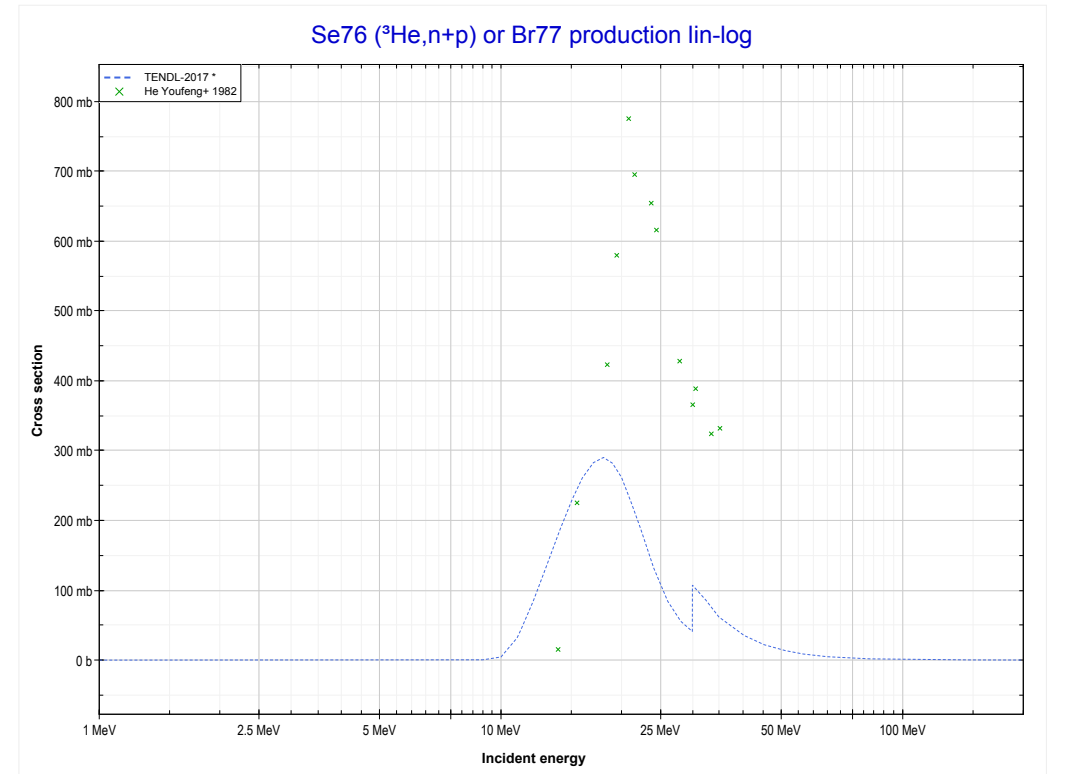
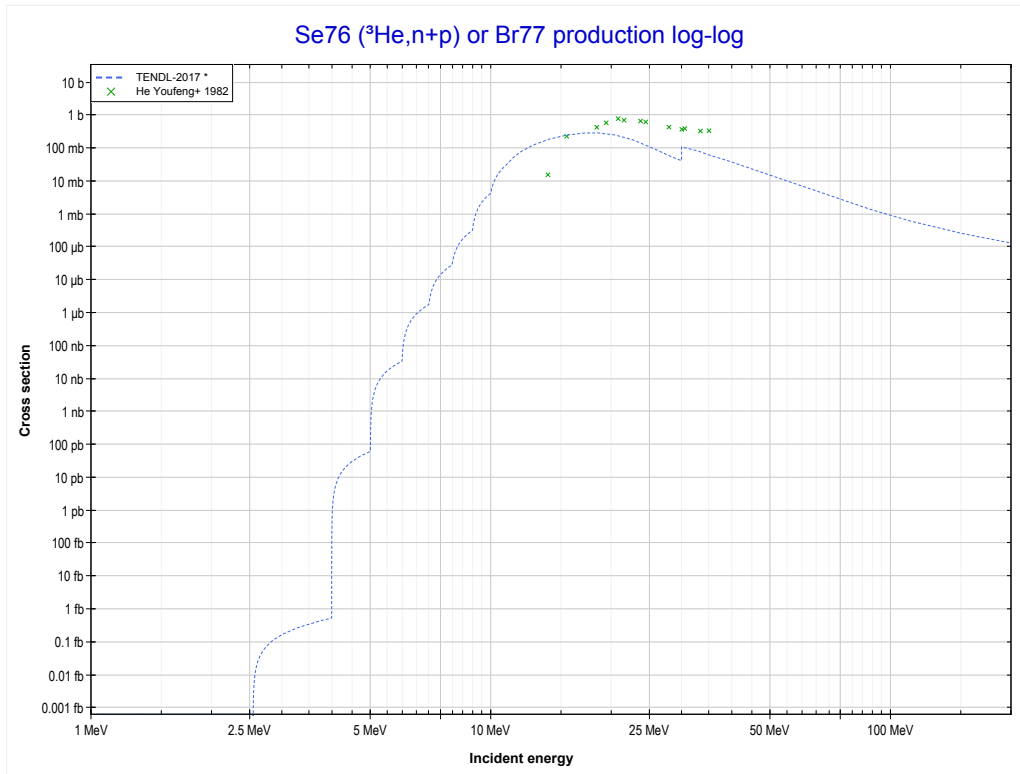
Reaction	Q-Value
Se76(He3,2n)Kr77	-6293.97 keV

<< 33-As-75	34-Se-76	34-Se-77 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (Kr76 production)	MT28 ($^3\text{He},n+p$) >>



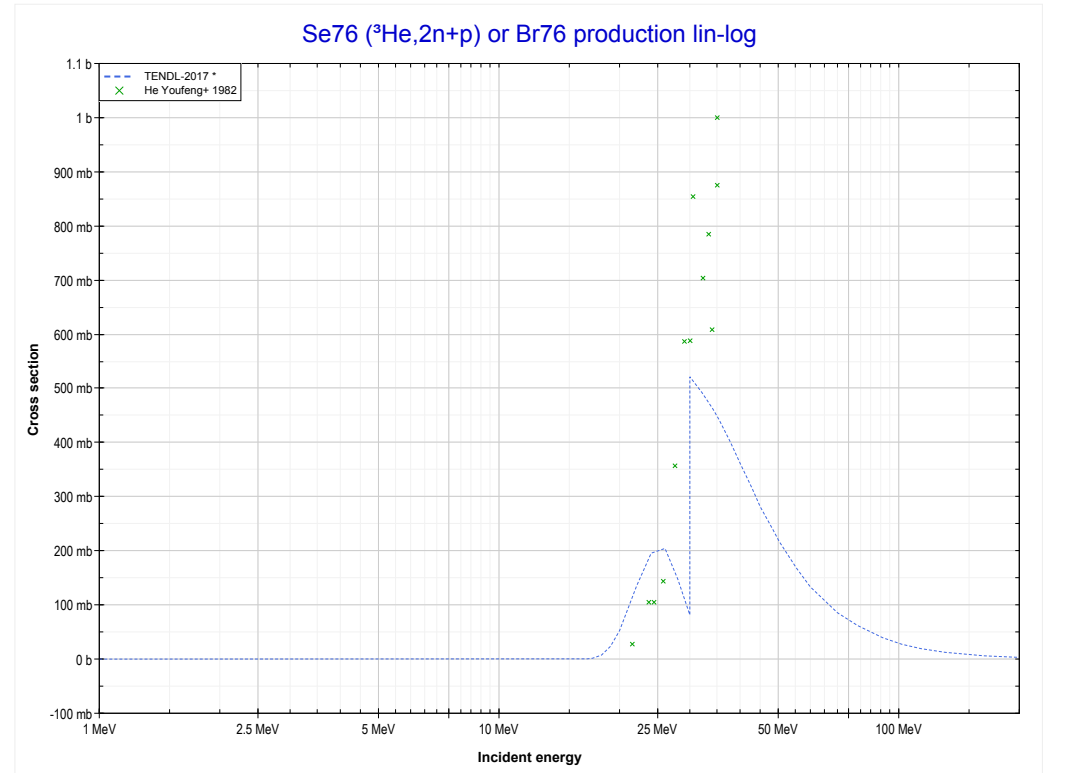
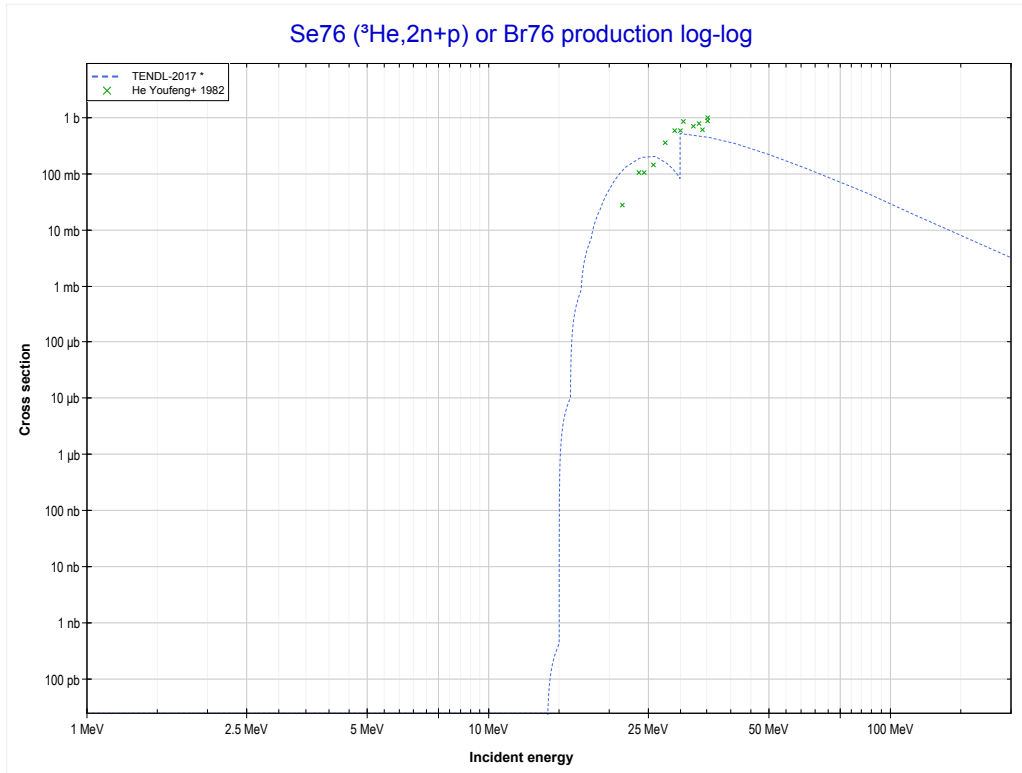
Reaction	Q-Value
Se76(He3,3n)Kr76	-15520.69 keV

<< 30-Zn-66	34-Se-76	34-Se-77 >>
<< MT17 (³ He,3n)	MT28 (³He,n+p) or MT5 (Br77 production)	MT41 (³ He,2n+p) >>



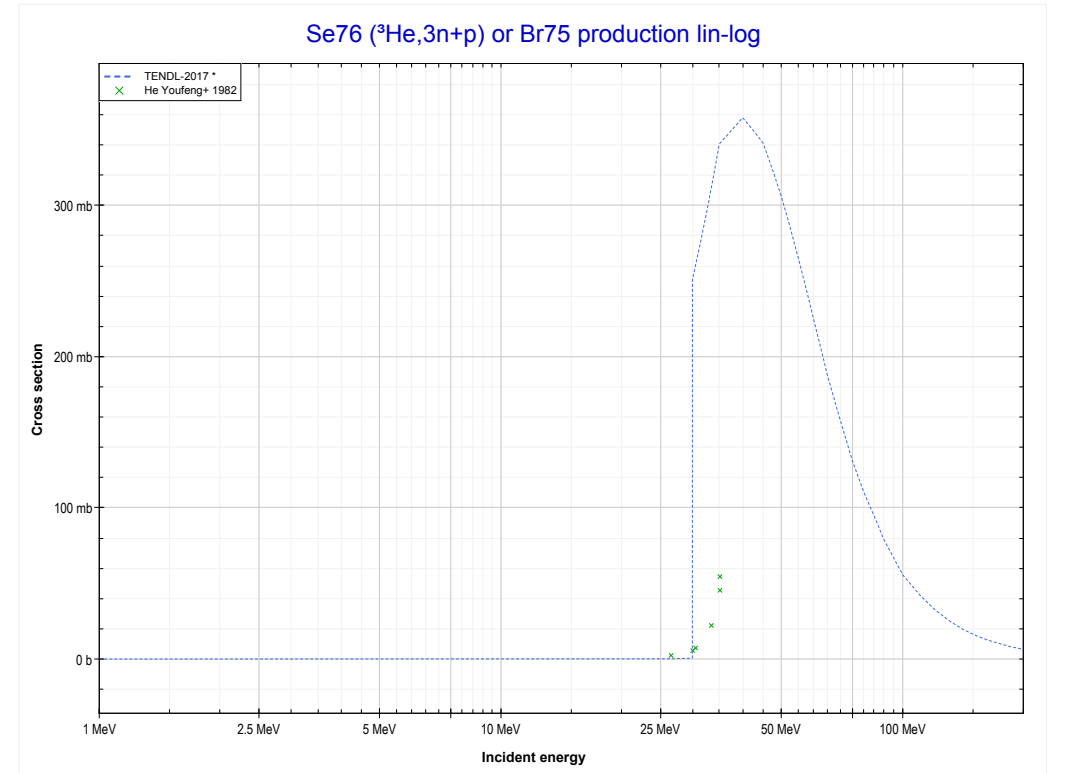
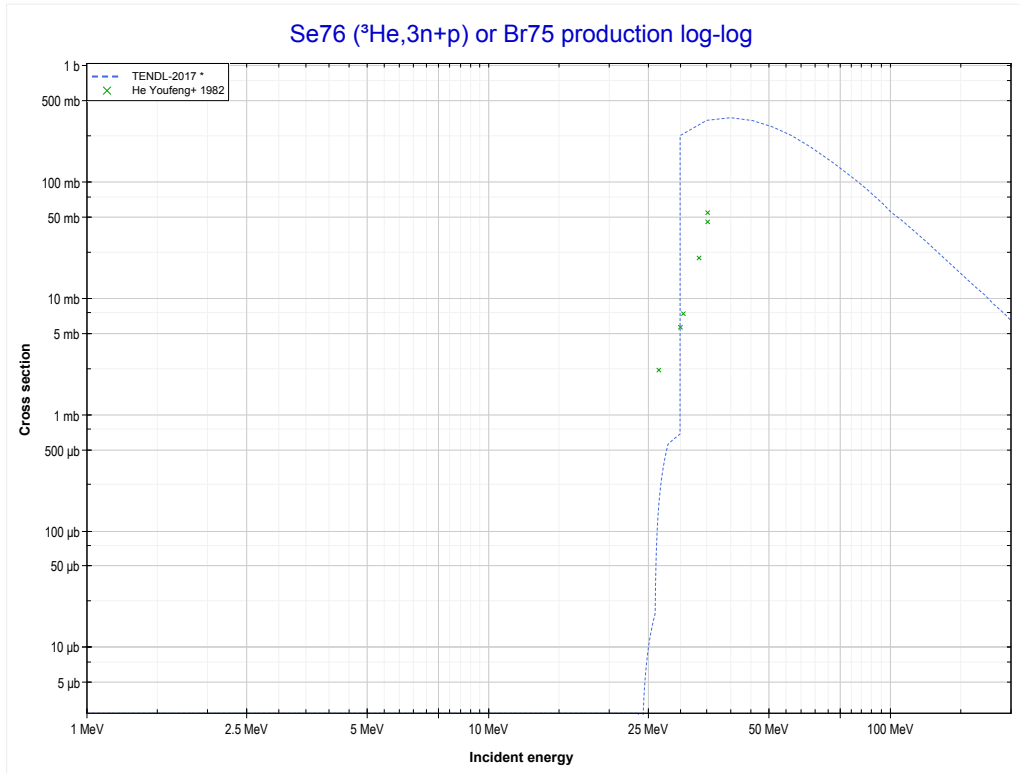
Reaction	Q-Value
Se76(He3,d)Br77	-221.66 keV
Se76(He3,n+p)Br77	-2446.22 keV

	34-Se-76	34-Se-77 >>
<< MT28 (³He,n+p)	MT41 (³He,2n+p) or MT5 (Br76 production)	MT42 (³He,3n+p) >>



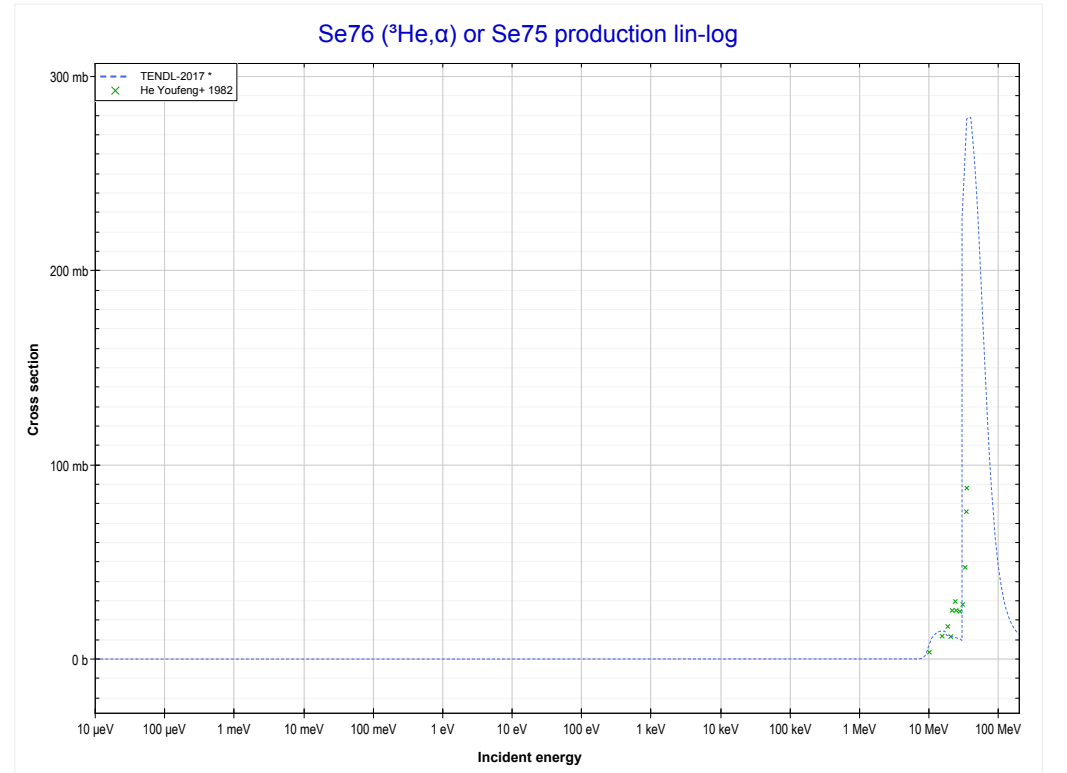
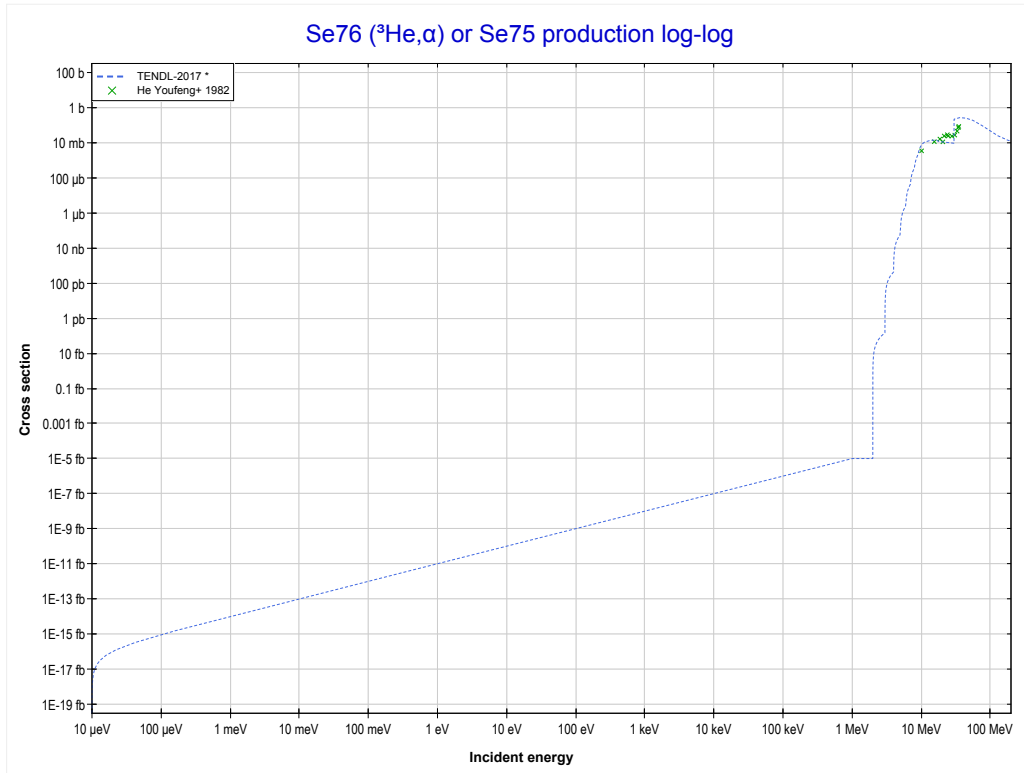
Reaction	Q-Value
Se76(He3,t)Br76	-4981.54 keV
Se76(He3,n+d)Br76	-11238.77 keV
Se76(He3,2n+p)Br76	-13463.34 keV

<< 29-Cu-63	34-Se-76	34-Se-77 >>
<< MT41 (³ He,2n+p)	MT42 (³He,3n+p) or MT5 (Br75 production)	MT107 (³ He,α) >>



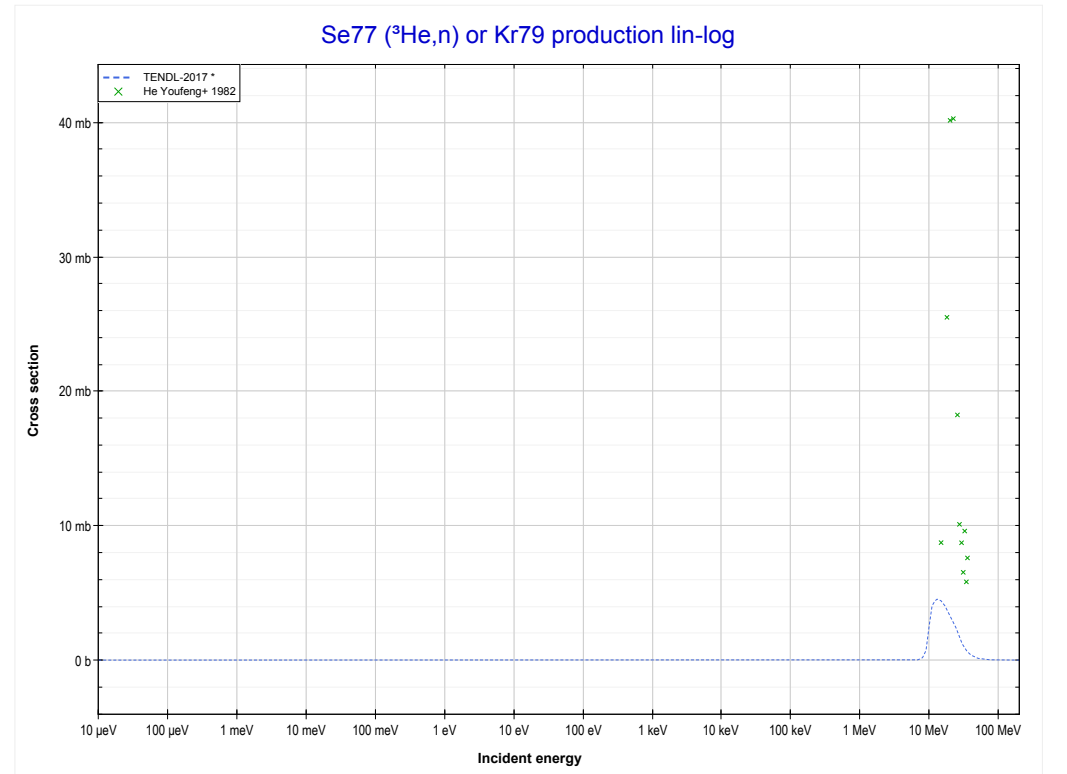
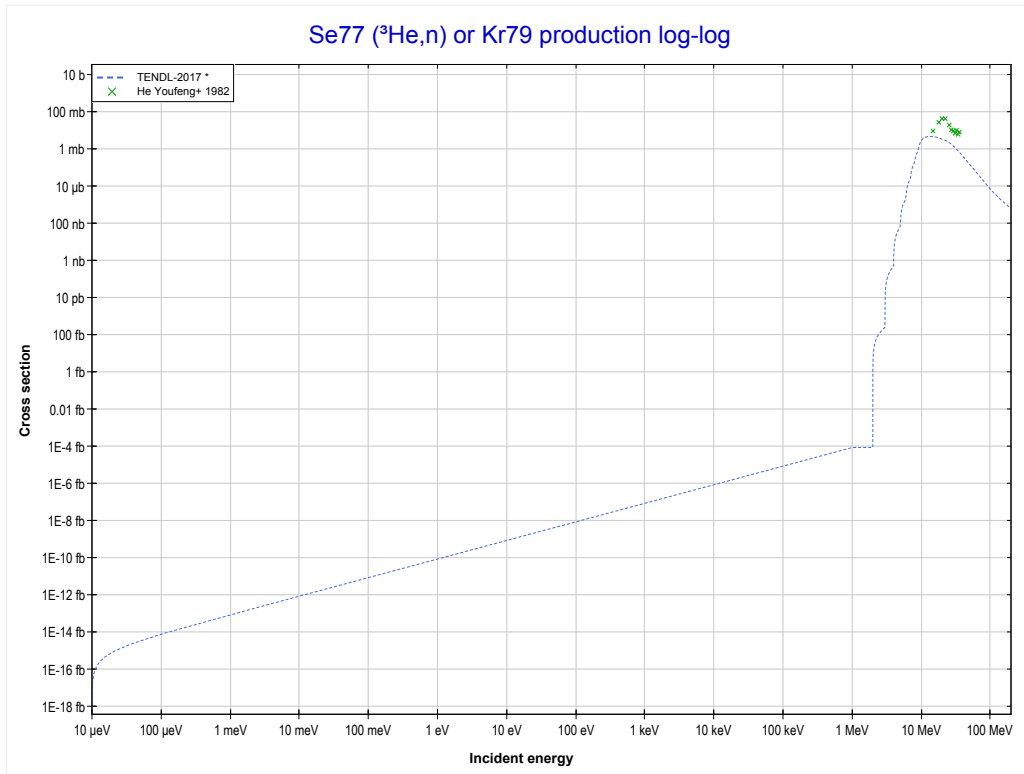
Reaction	Q-Value
Se76(He3,n+t)Br75	-14234.86 keV
Se76(He3,2n+d)Br75	-20492.09 keV
Se76(He3,3n+p)Br75	-22716.66 keV

<< 31-Ga-69	34-Se-76	47-Ag-107 >>
<< MT42 (³ He,3n+p)	MT107 (³He,α) or MT5 (Se75 production)	34-Se-77 MT4 (³ He,n) >>



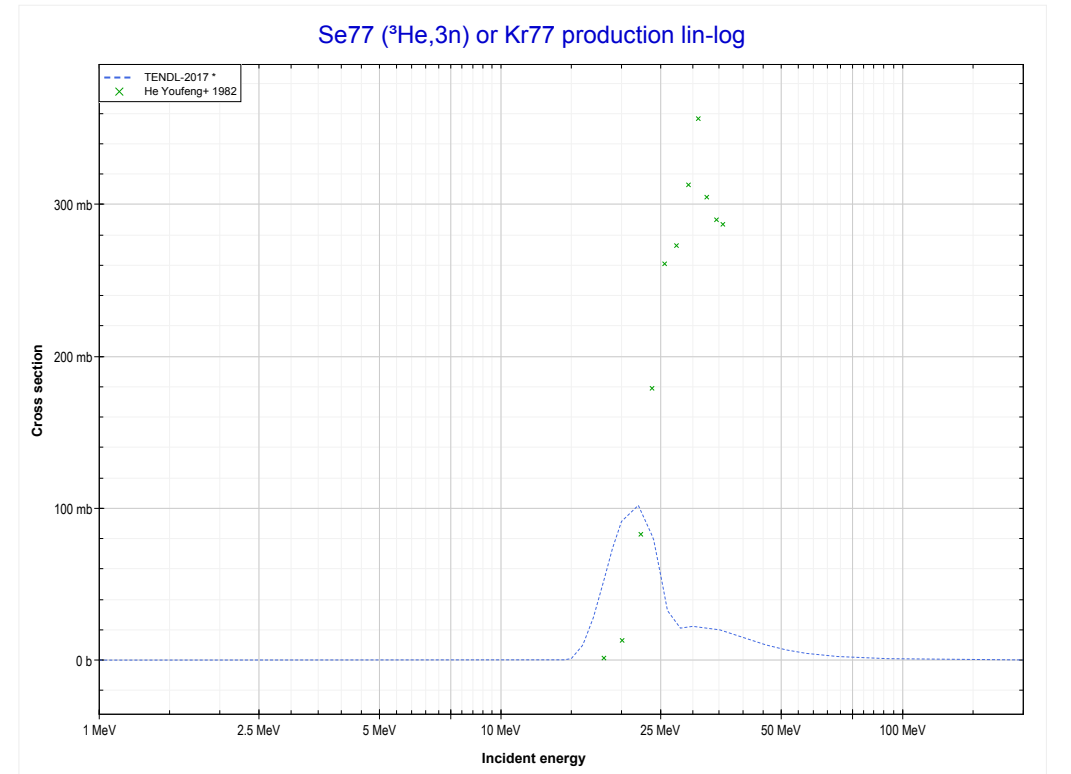
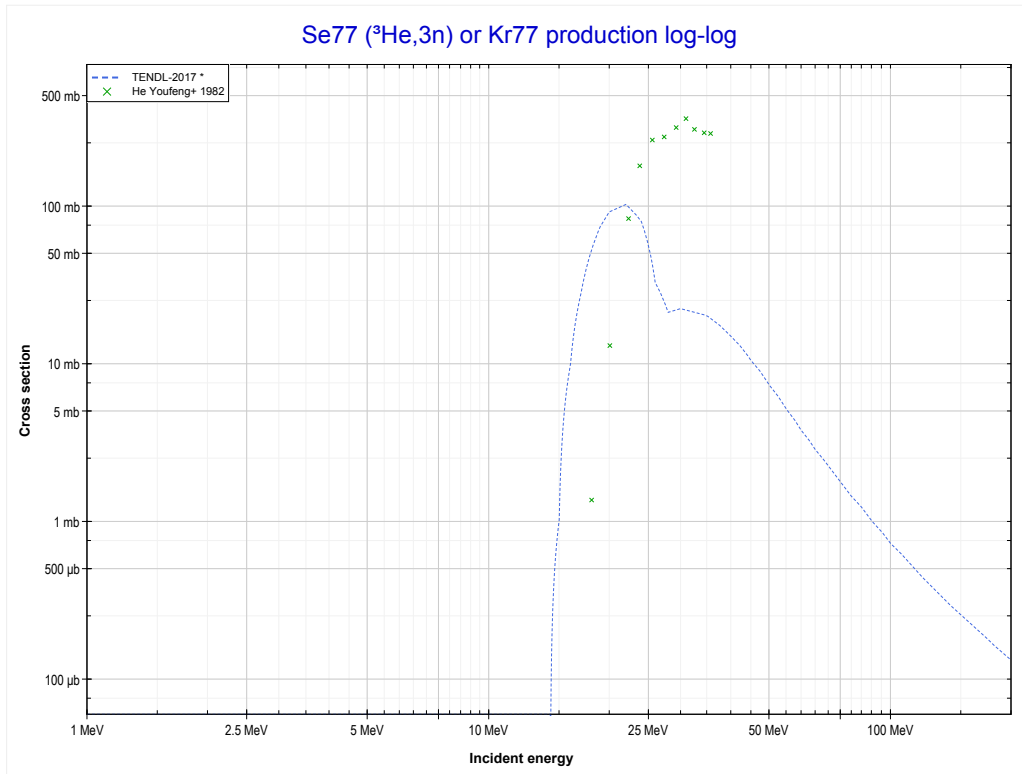
Reaction	Q-Value
Se76(He3,α)Se75	9423.83 keV
Se76(He3,p+t)Se75	-10390.03 keV
Se76(He3,n+He3)Se75	-11153.79 keV
Se76(He3,2d)Se75	-14422.70 keV
Se76(He3,n+p+d)Se75	-16647.26 keV
Se76(He3,2n+2p)Se75	-18871.83 keV

<< 33-As-75	34-Se-77	41-Nb-93 >>
<< 34-Se-76 MT107 (³ He, α)	MT4 (³He,n) or MT5 (Kr79 production)	MT17 (³ He,3n) >>



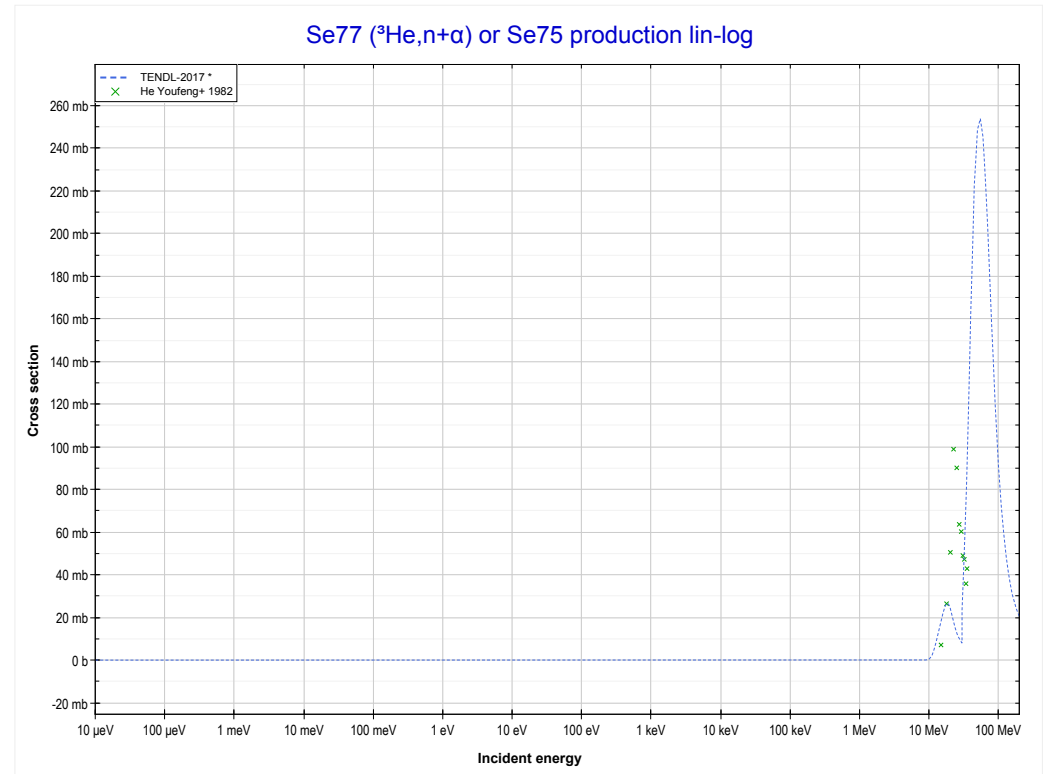
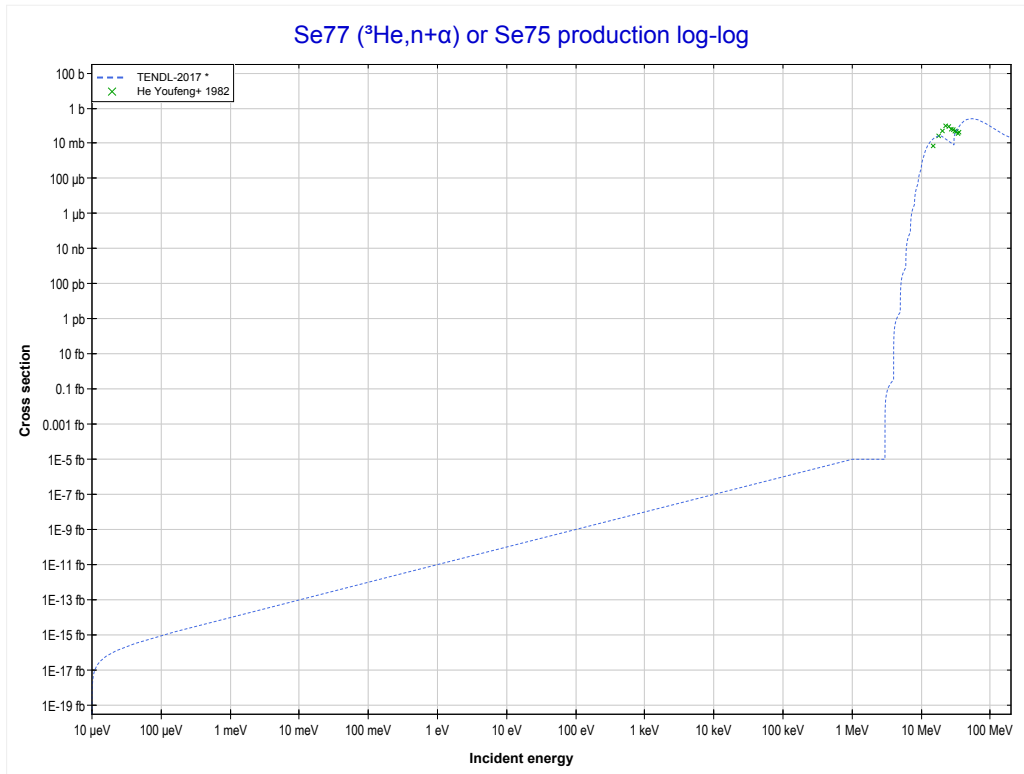
Reaction	Q-Value
Se77(He3,n)Kr79	6702.42 keV

<< 34-Se-76	34-Se-77	41-Nb-93 >>
<< MT4 ($^3\text{He},n$)	MT17 ($^3\text{He},3n$) or MT5 (Kr77 production)	MT22 ($^3\text{He},n+\alpha$) >>



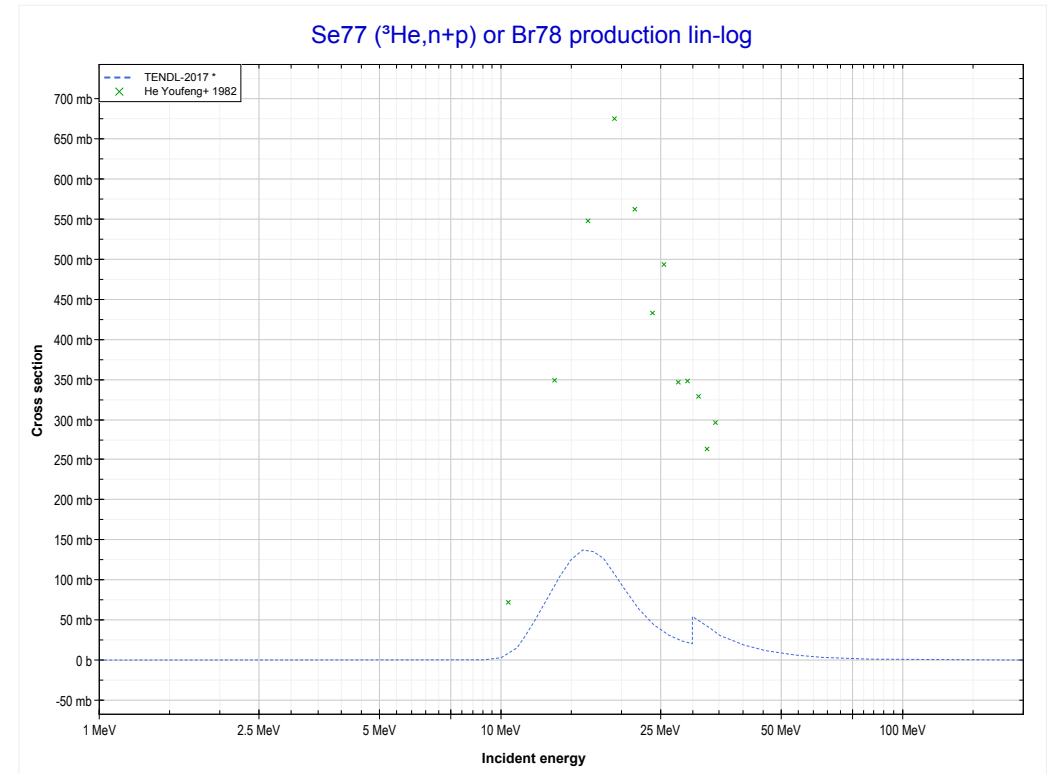
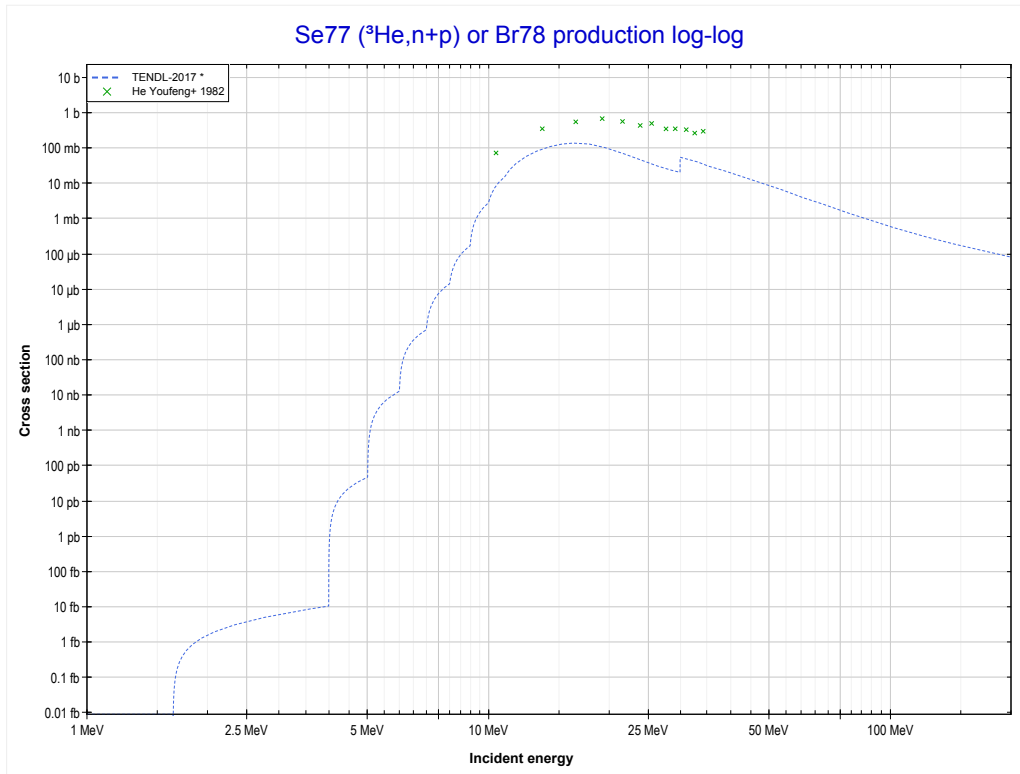
Reaction	Q-Value
Se77(He3,3n)Kr77	-13712.82 keV

<< 31-Ga-69	34-Se-77	
<< MT17 (³ He,3n)	MT22 (³He,n+α) or MT5 (Se75 production)	MT28 (³ He,n+p) >>



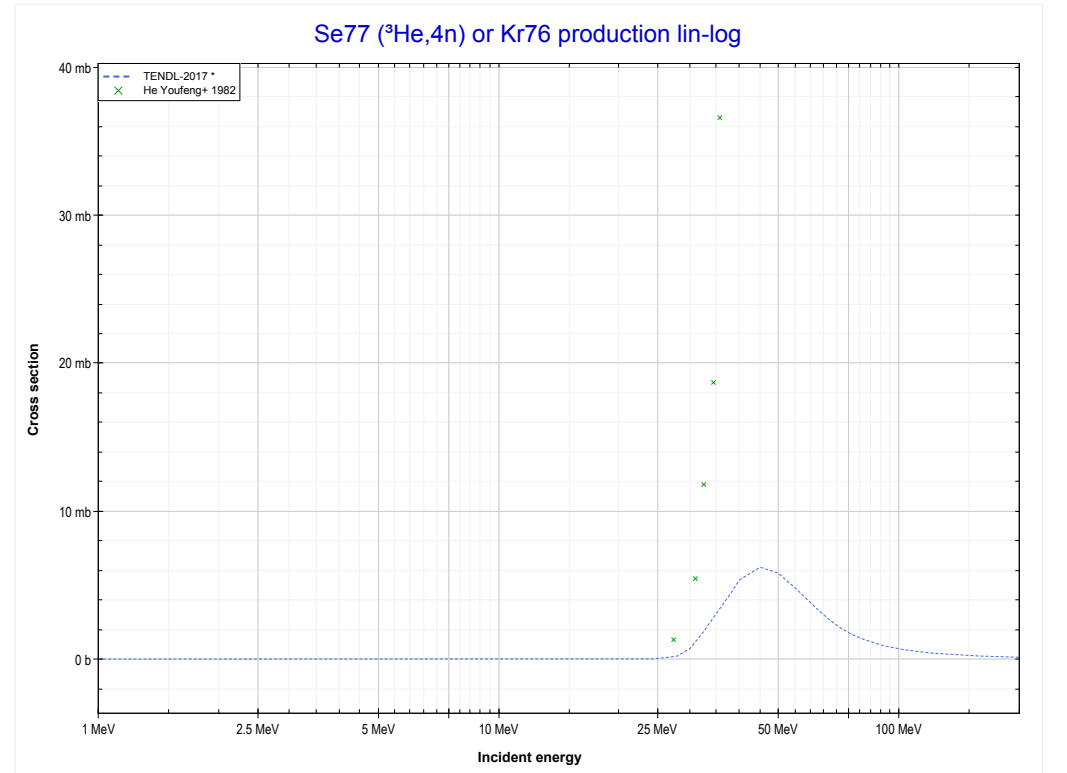
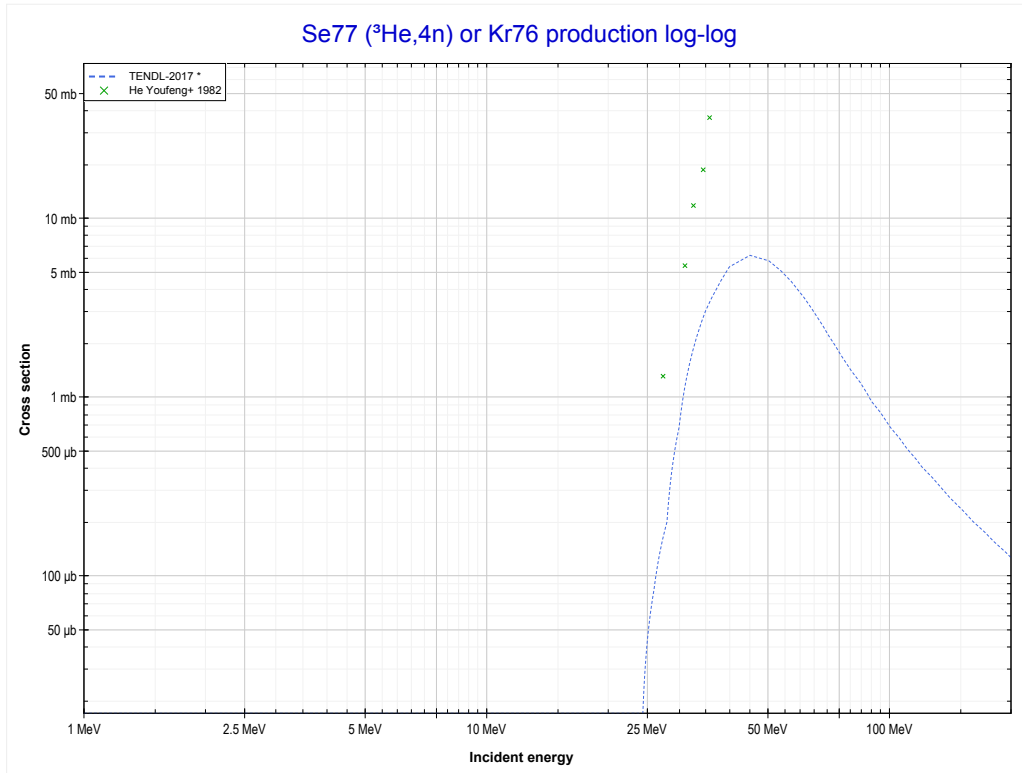
Reaction	Q-Value
Se77(He3,n+α)Se75	2004.98 keV
Se77(He3,d+t)Se75	-15584.31 keV
Se77(He3,n+p+t)Se75	-17808.88 keV
Se77(He3,2n+He3)Se75	-18572.63 keV
Se77(He3,n+2d)Se75	-21841.54 keV
Se77(He3,2n+p+d)Se75	-24066.11 keV
Se77(He3,3n+2p)Se75	-26290.68 keV

<< 34-Se-76	34-Se-77	
<< MT22 (³ He,n+α)	MT28 (³He,n+p) or MT5 (Br78 production)	MT37 (³ He,4n) >>



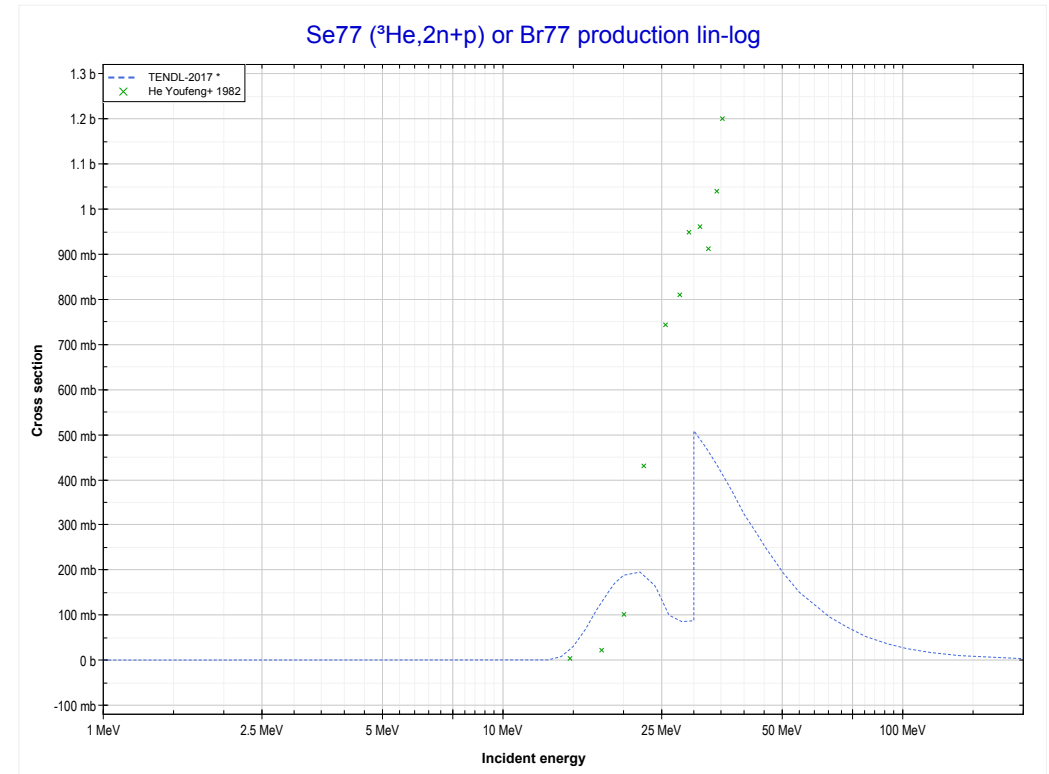
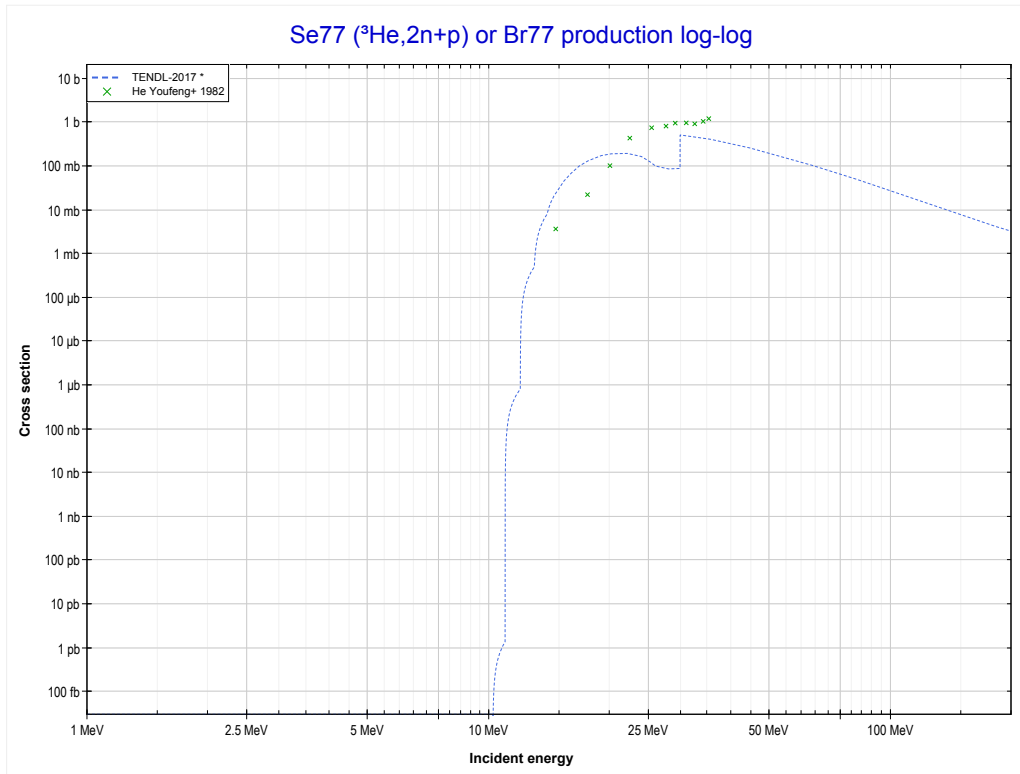
Reaction	Q-Value
Se77(He3,d)Br78	648.01 keV
Se77(He3,n+p)Br78	-1576.55 keV

<< 33-As-75	34-Se-77	41-Nb-93 >>
<< MT28 (³ He,n+p)	MT37 (³He,4n) or MT5 (Kr76 production)	MT41 (³ He,2n+p) >>



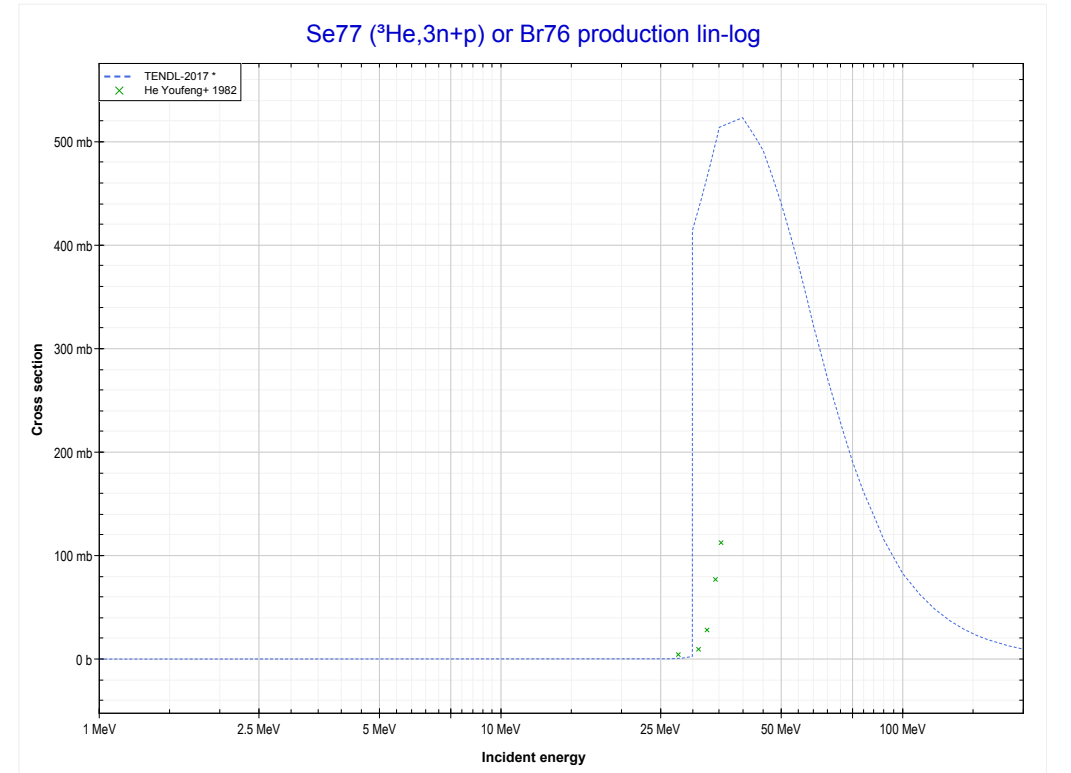
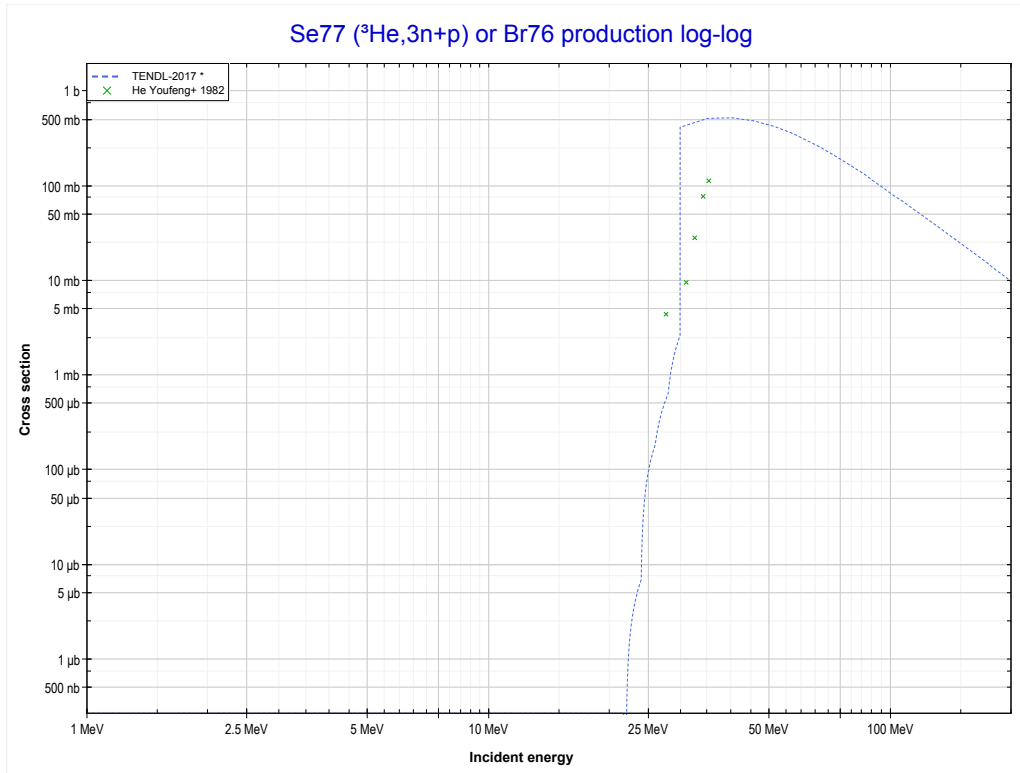
Reaction	Q-Value
Se77(He3,4n)Kr76	-22939.53 keV

<< 34-Se-76	34-Se-77	47-Ag-109 >>
<< MT37 (³ He,4n)	MT41 (³He,2n+p) or MT5 (Br77 production)	MT42 (³ He,3n+p) >>



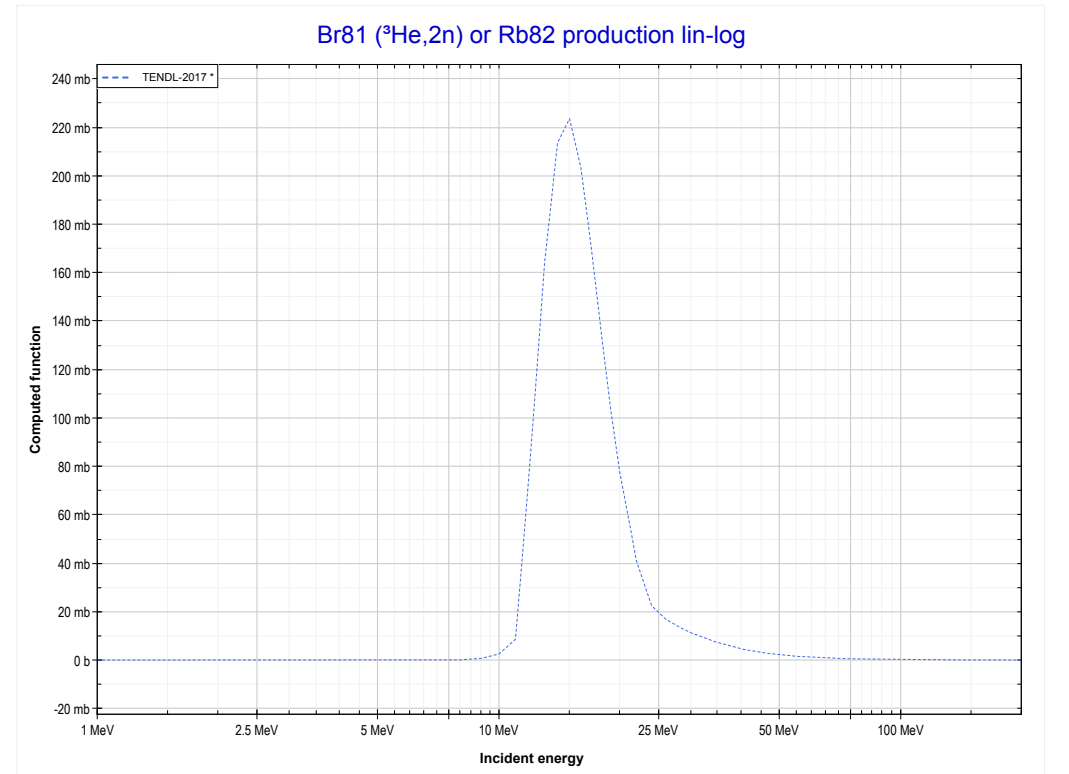
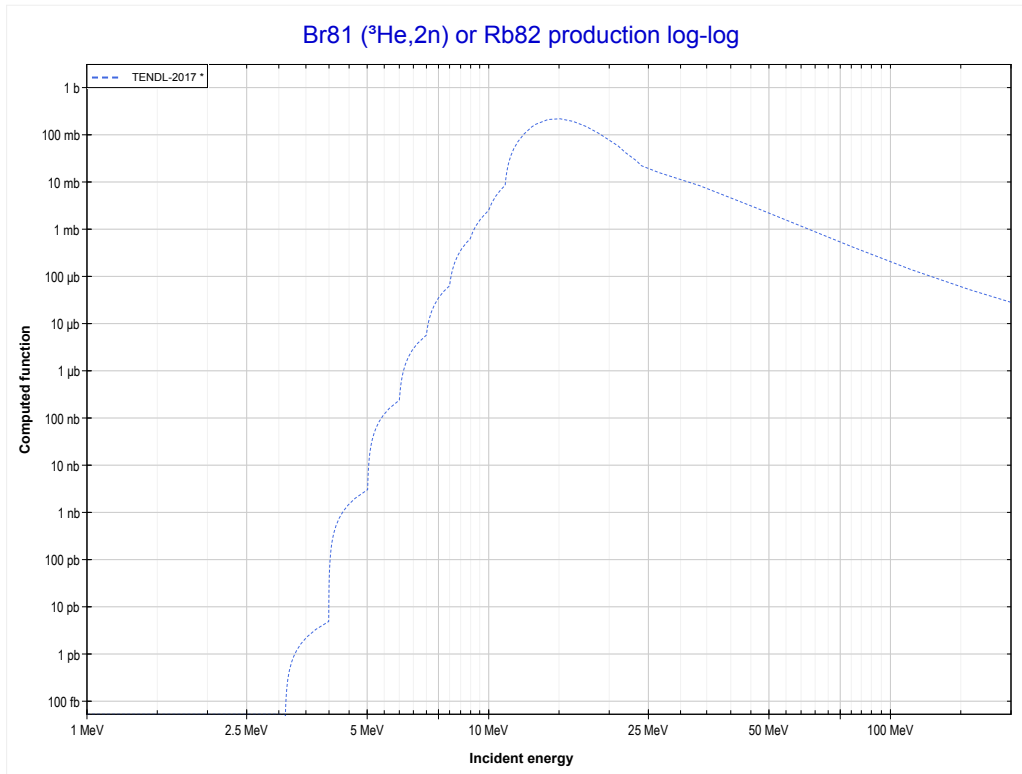
Reaction	Q-Value
Se77(He3,t)Br77	-1383.27 keV
Se77(He3,n+d)Br77	-7640.50 keV
Se77(He3,2n+p)Br77	-9865.07 keV

<< 34-Se-76	34-Se-77	
<< MT41 (³ He,2n+p)	MT42 (³He,3n+p) or MT5 (Br76 production)	35-Br-81 MT16 (³ He,2n) >>



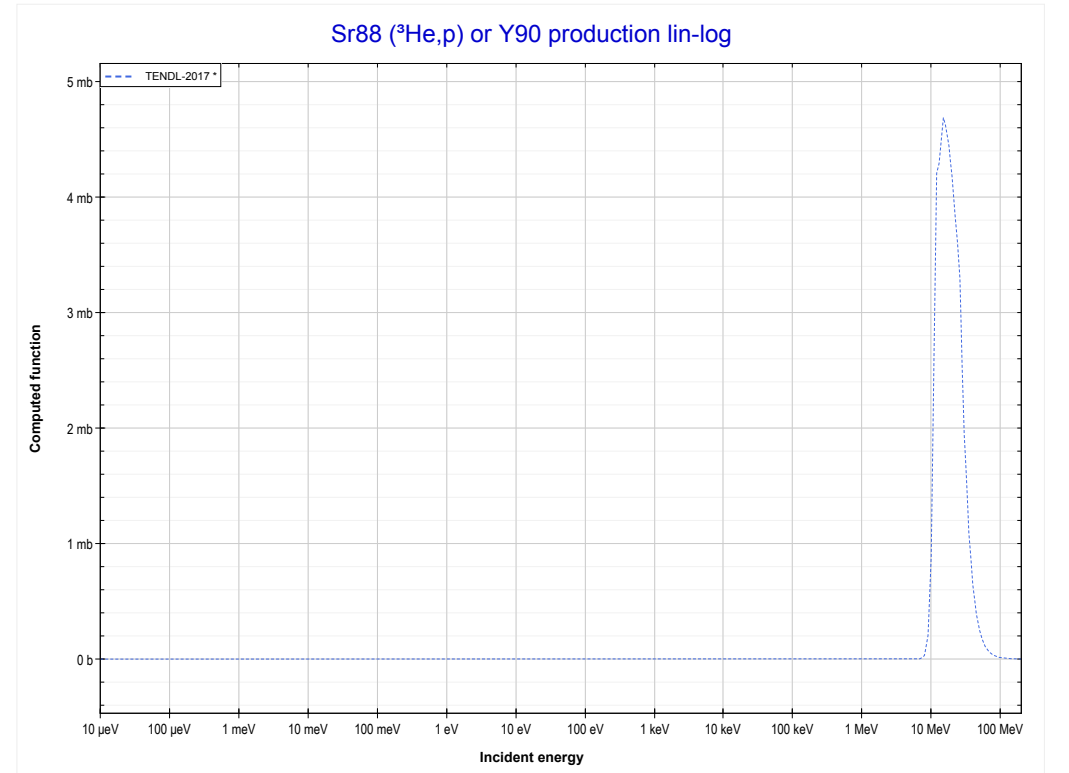
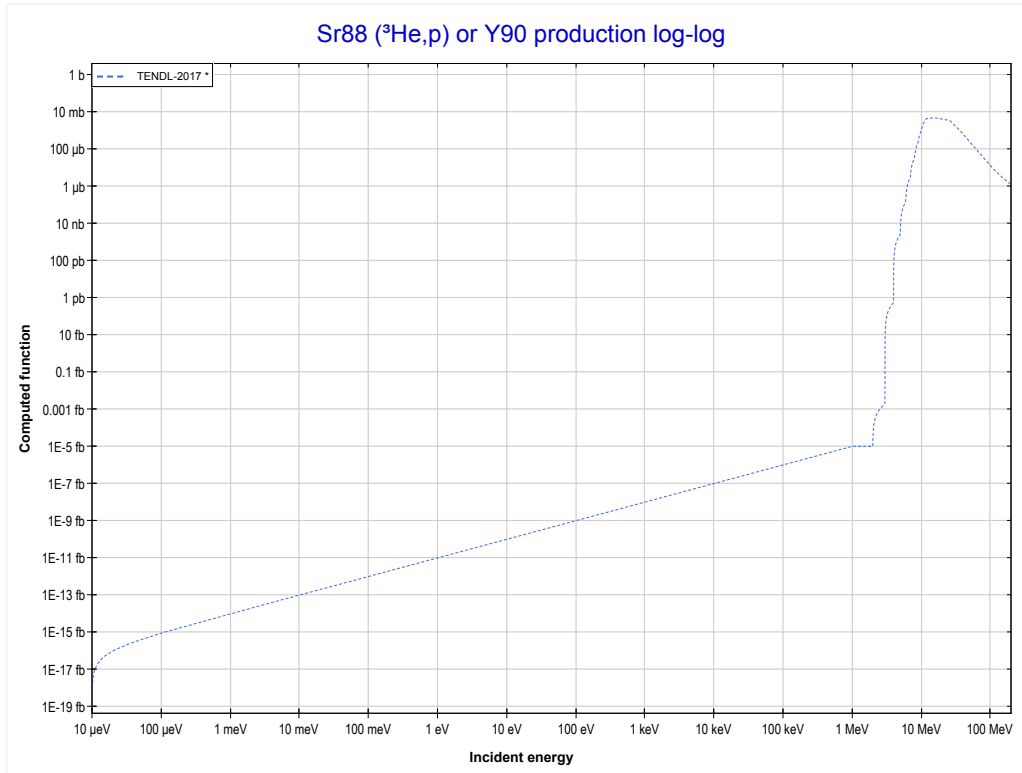
Reaction	Q-Value
Se77(He3,n+t)Br76	-12400.39 keV
Se77(He3,2n+d)Br76	-18657.62 keV
Se77(He3,3n+p)Br76	-20882.19 keV

<< 34-Se-76	35-Br-81	41-Nb-93 >>
<< 34-Se-77 MT42 (³ He,3n+p)	MT16 (³He,2n) or MT5 (Rb82 production)	38-Sr-88 MT103 (³ He,p) >>



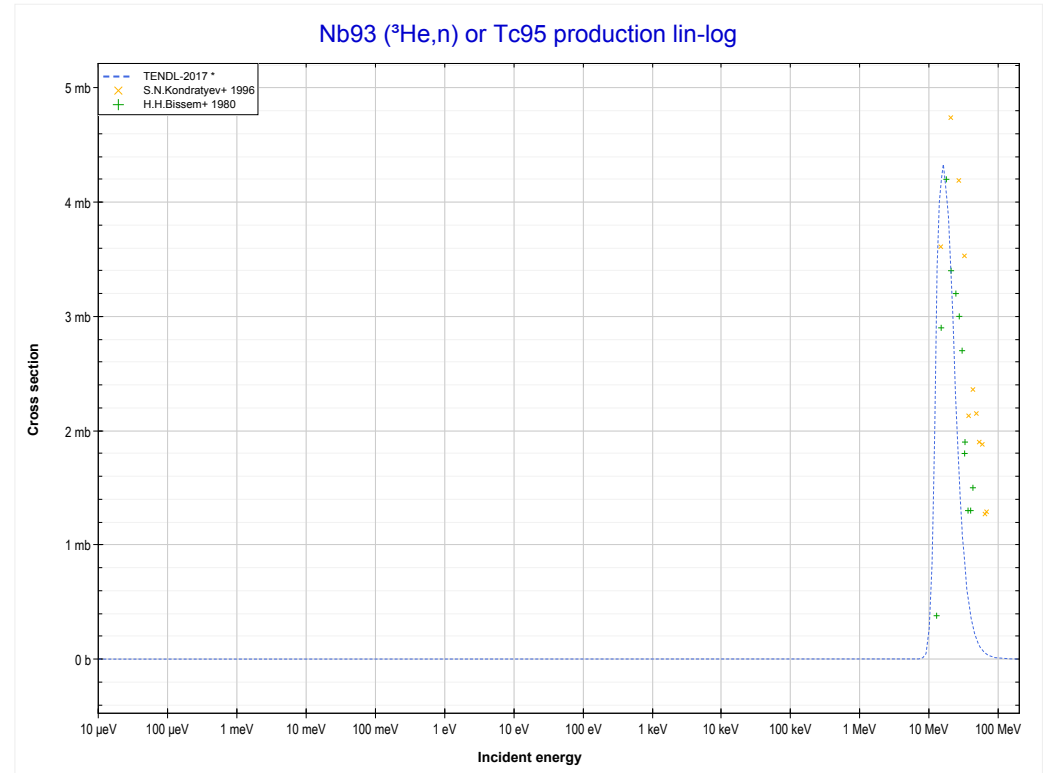
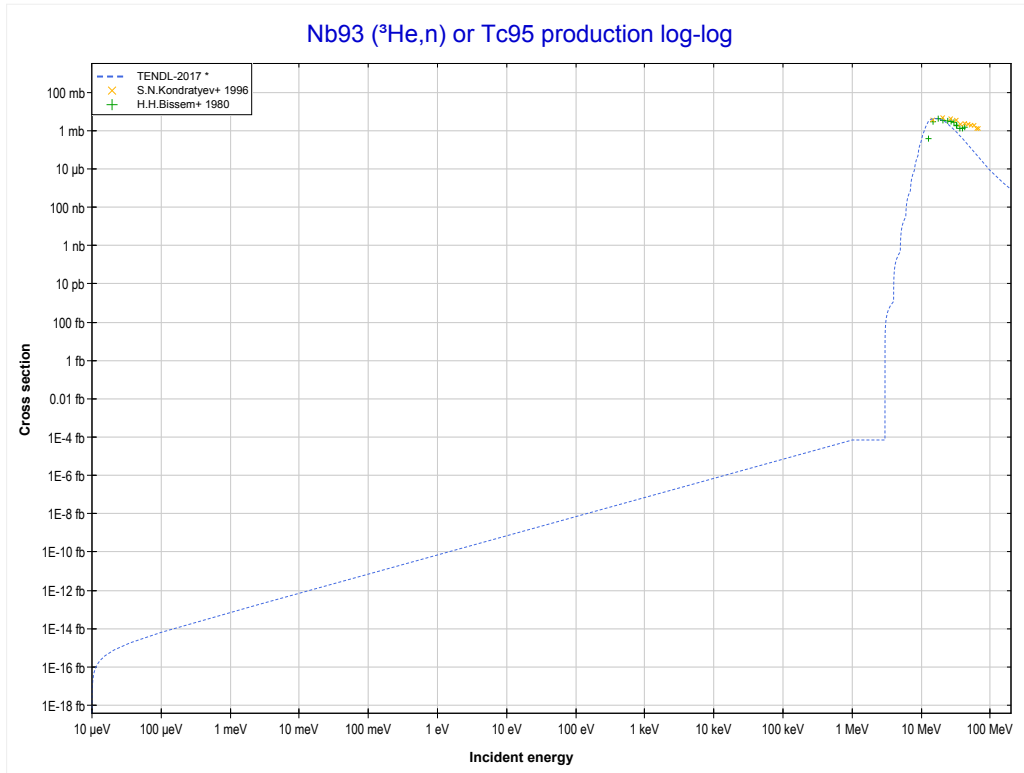
Reaction	Q-Value
Br81(He3,2n)Rb82	-2999.12 keV

<< 30-Zn-64	38-Sr-88	74-W-186 >>
<< 35-Br-81 MT16 (³ He,2n)	MT103 (³He,p) or MT5 (Y90 production)	41-Nb-93 MT4 (³ He,n) >>



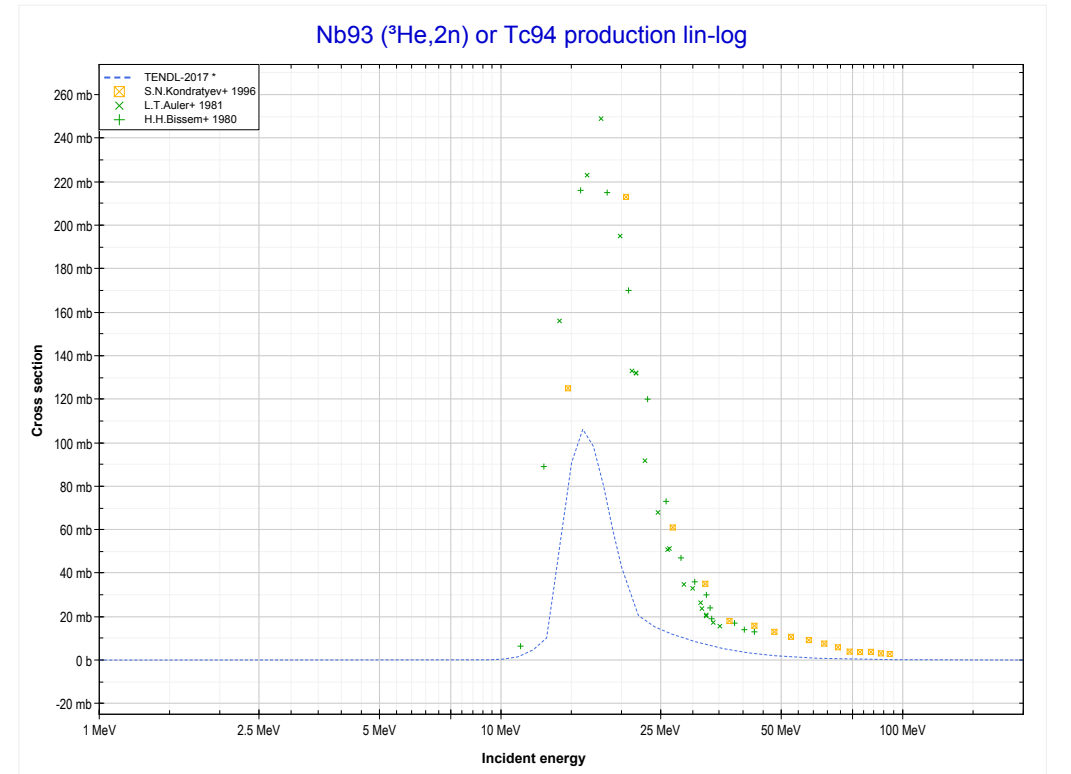
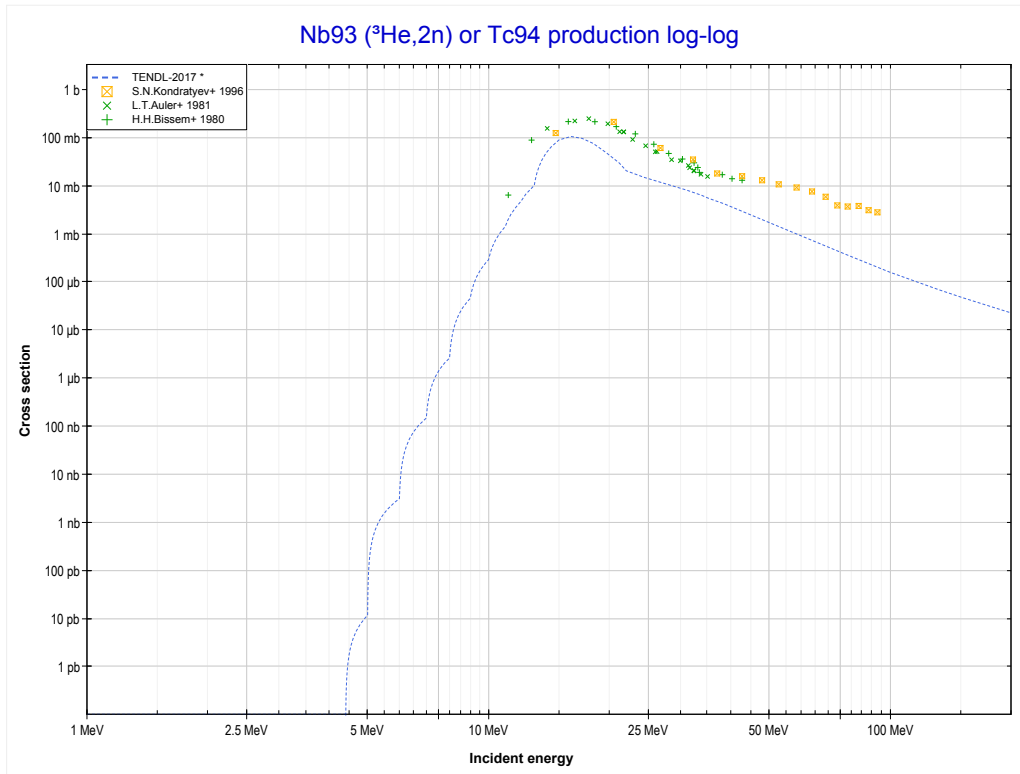
Reaction	Q-Value
Sr88(He3,p)Y90	6215.75 keV

<< 34-Se-77	41-Nb-93	44-Ru-101 >>
<< 38-Sr-88 MT103 (³ He,p)	MT4 (³He,n) or MT5 (Tc95 production)	MT16 (³ He,2n) >>



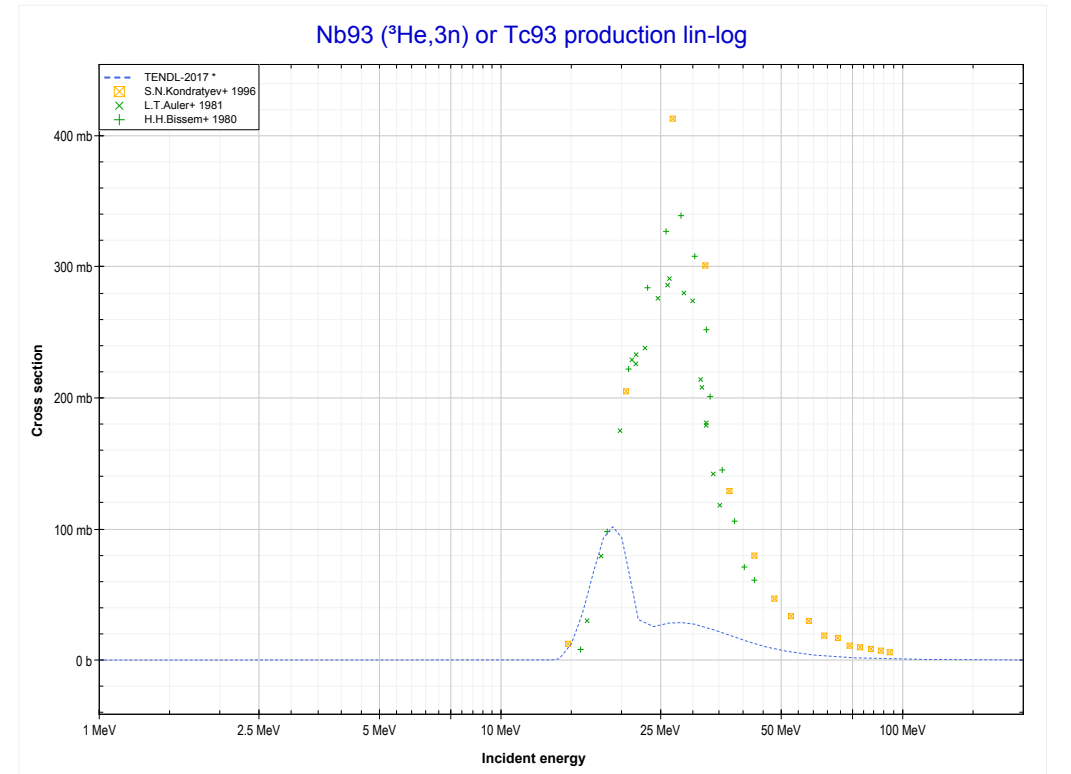
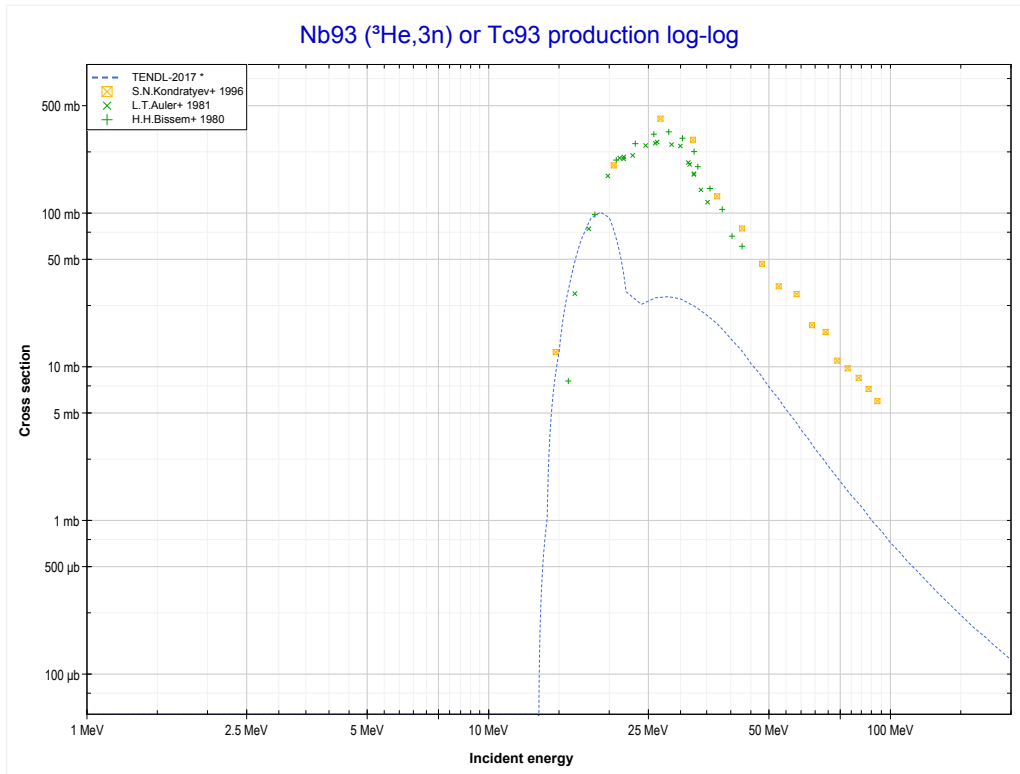
Reaction	Q-Value
Nb93(He3,n)Tc95	5666.90 keV

<< 35-Br-81	41-Nb-93	44-Ru-102 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Tc94 production)	MT17 (³ He,3n) >>



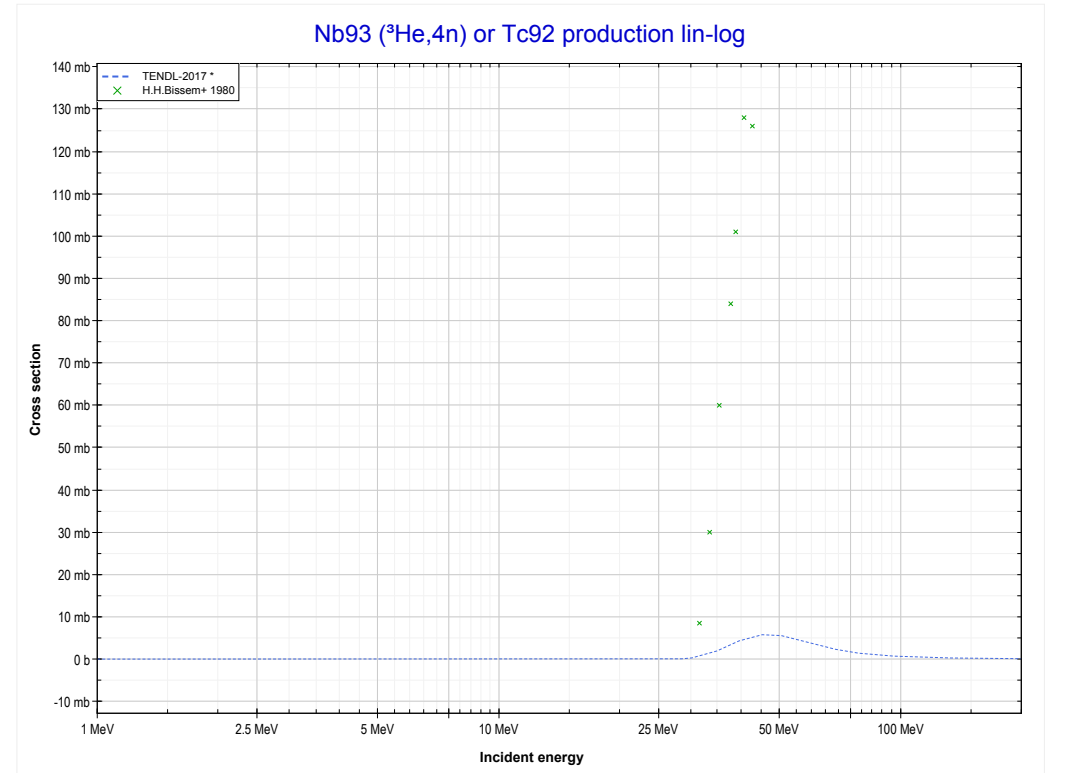
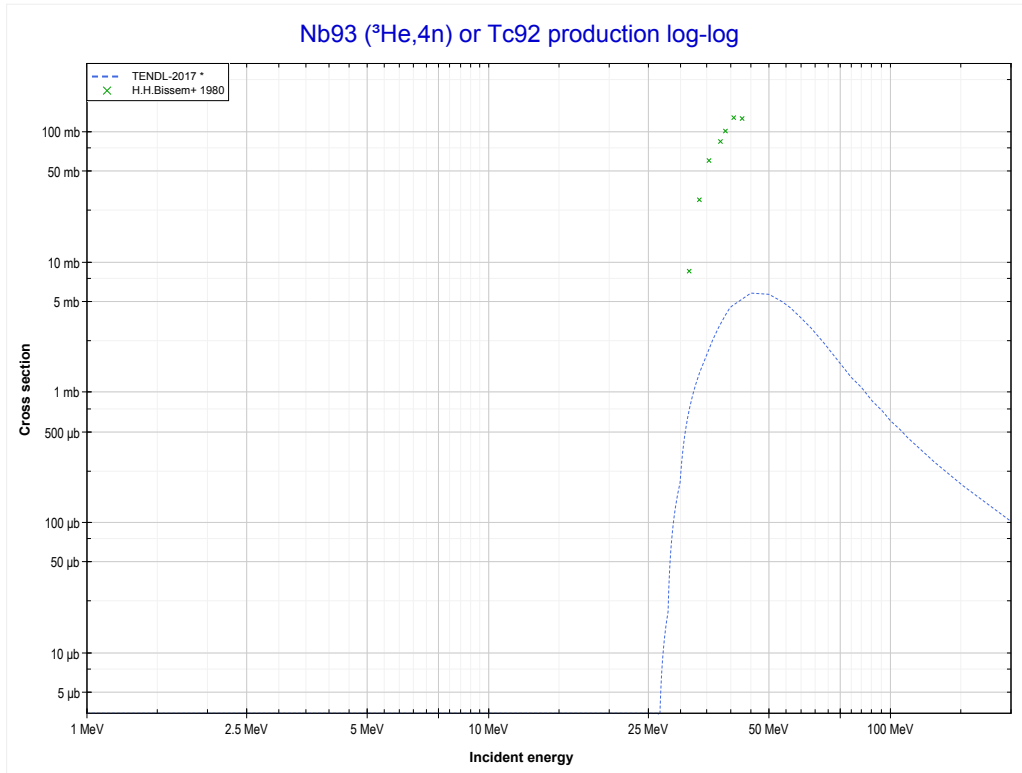
Reaction	Q-Value
Nb93(He3,2n)Tc94	-4267.42 keV

<< 34-Se-77	41-Nb-93	44-Ru-101 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (Tc93 production)	MT37 ($^3\text{He},4n$) >>



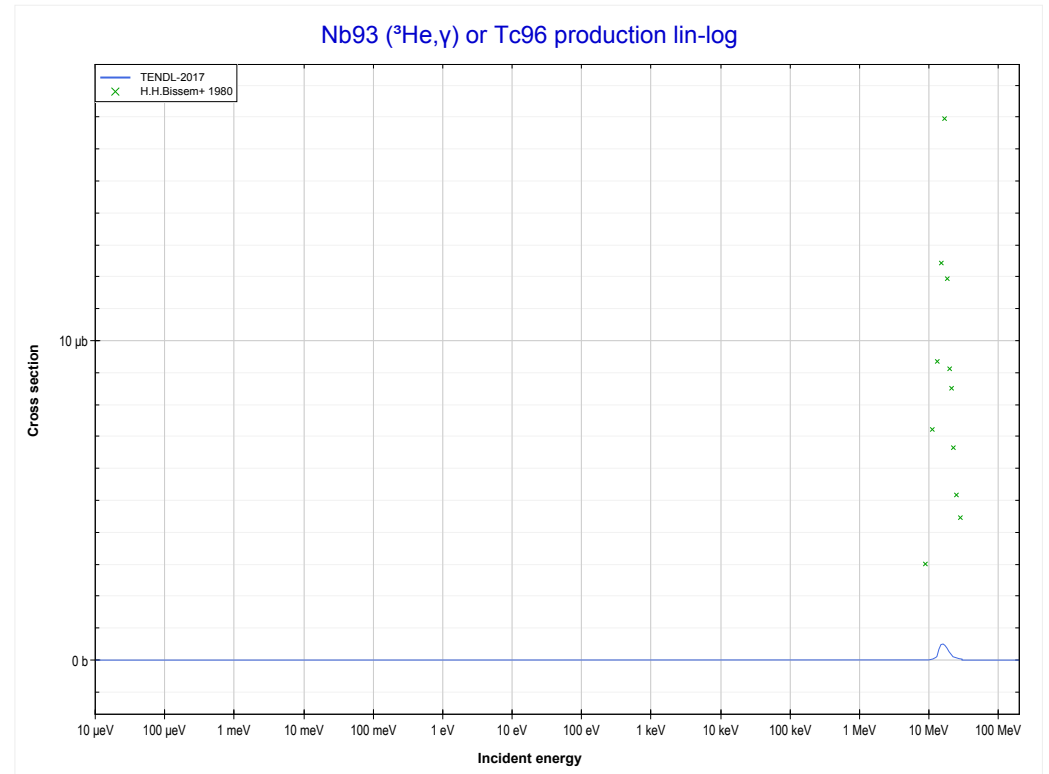
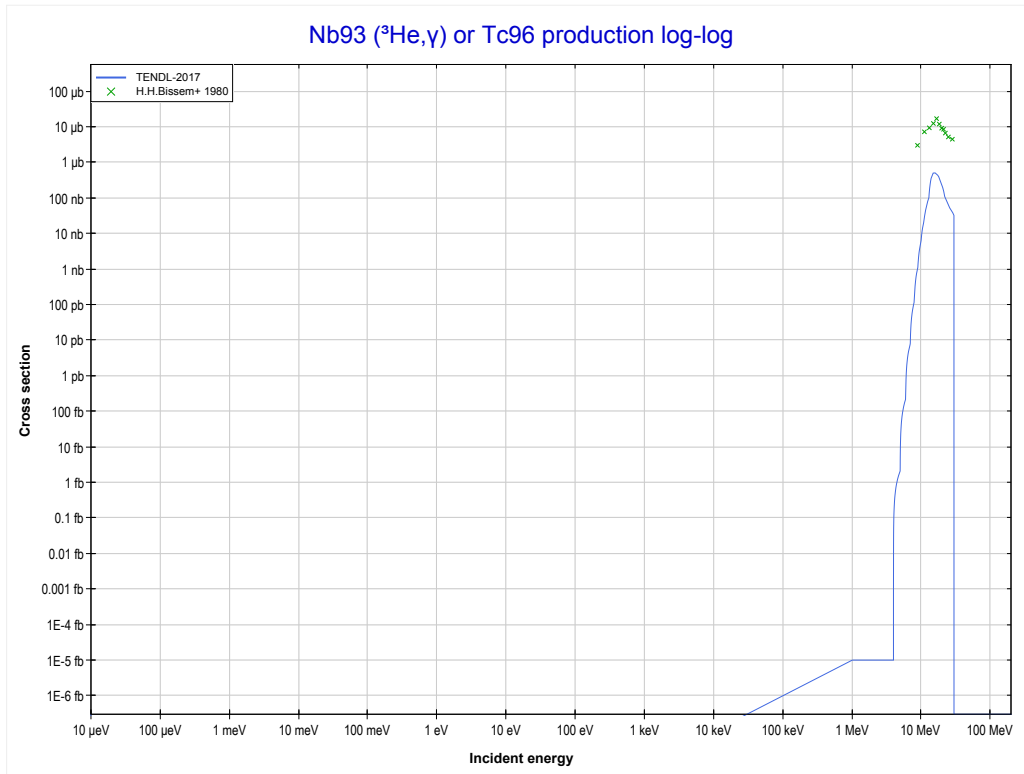
Reaction	Q-Value
Nb93($\text{He}3,3n$)Tc93	-12890.34 keV

<< 34-Se-77	41-Nb-93	44-Ru-101 >>
<< MT17 (³ He,3n)	MT37 (³He,4n) or MT5 (Tc92 production)	MT102 (³ He,γ) >>



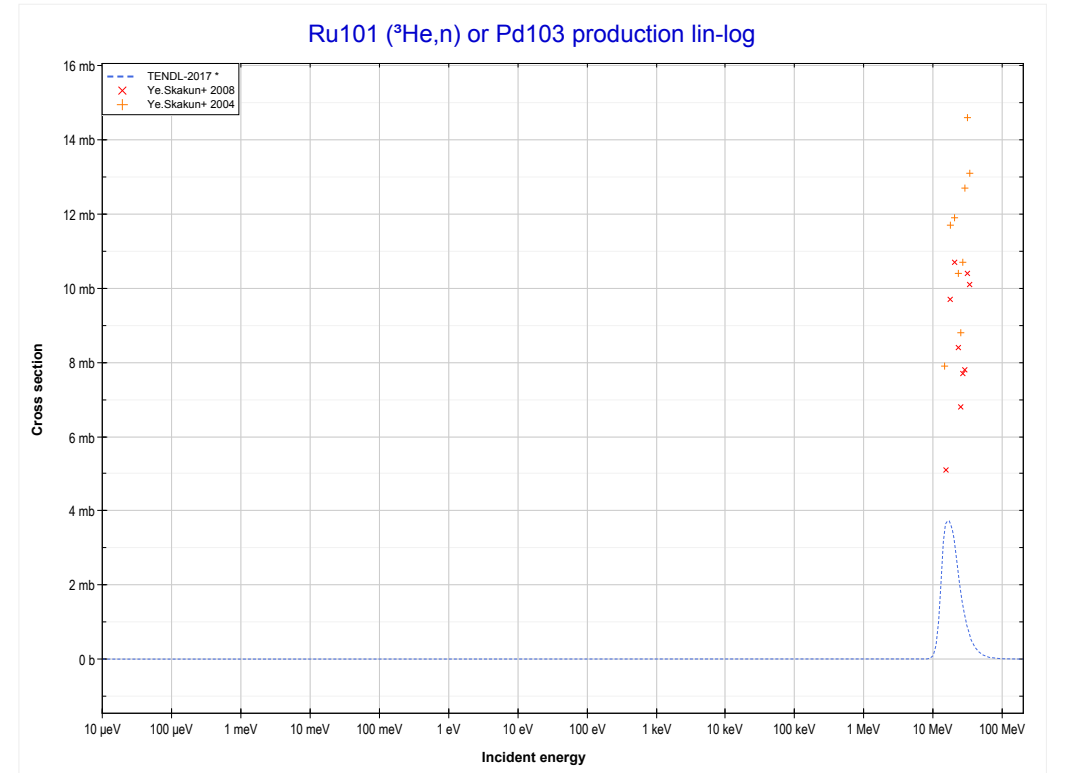
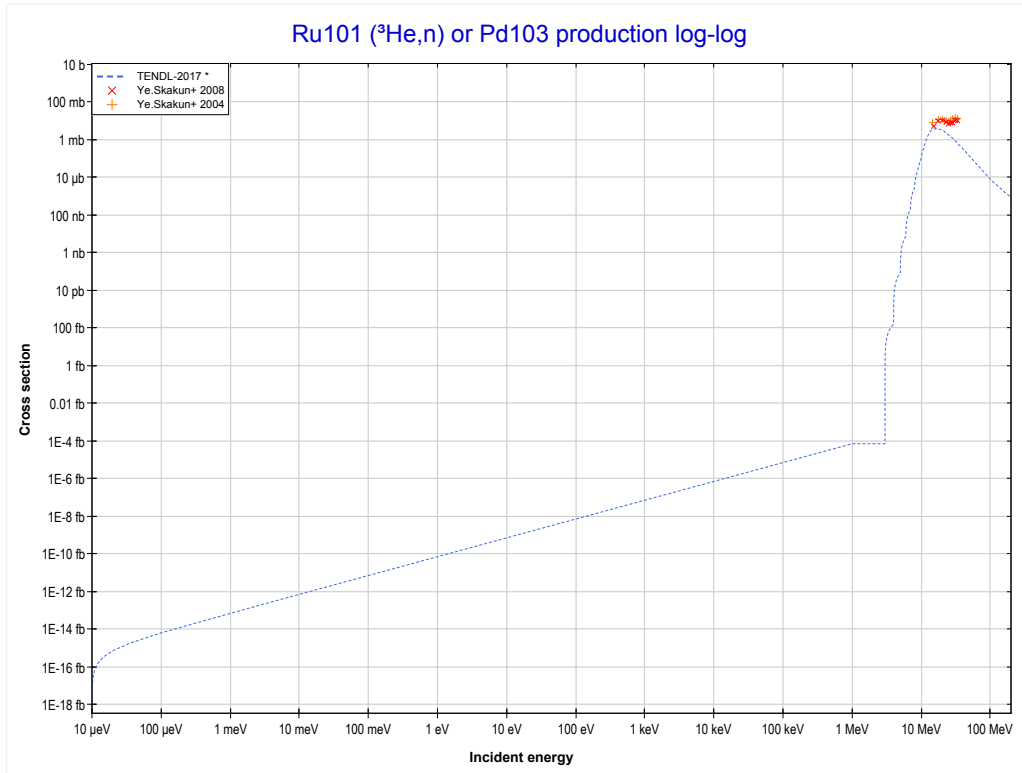
Reaction	Q-Value
Nb93(He3,4n)Tc92	-25641.05 keV

<< 31-Ga-71	41-Nb-93	
<< MT37 (³ He,4n)	MT102 (³He,γ) or MT5 (Tc96 production)	44-Ru-101 MT4 (³ He,n) >>



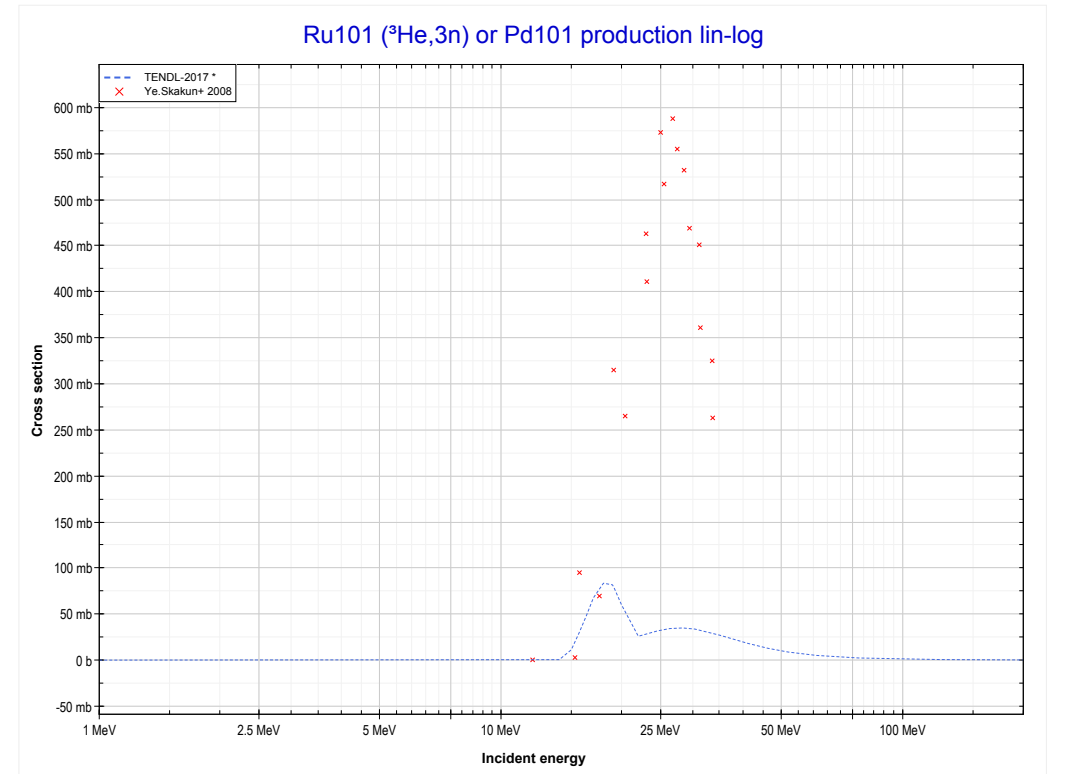
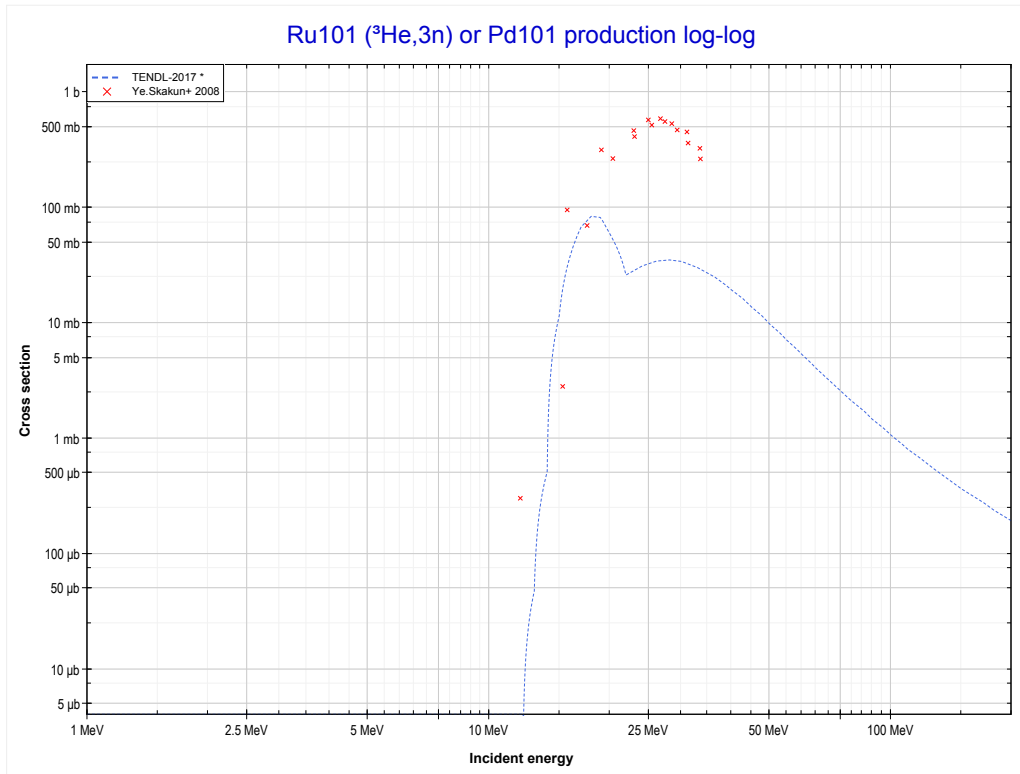
Reaction	Q-Value
Nb93(He3,γ)Tc96	13538.22 keV

<< 41-Nb-93	44-Ru-101	47-Ag-107 >>
<< 41-Nb-93 MT102 ($^3\text{He},\gamma$)	MT4 ($^3\text{He},n$) or MT5 (Pd103 production)	MT17 ($^3\text{He},3n$) >>



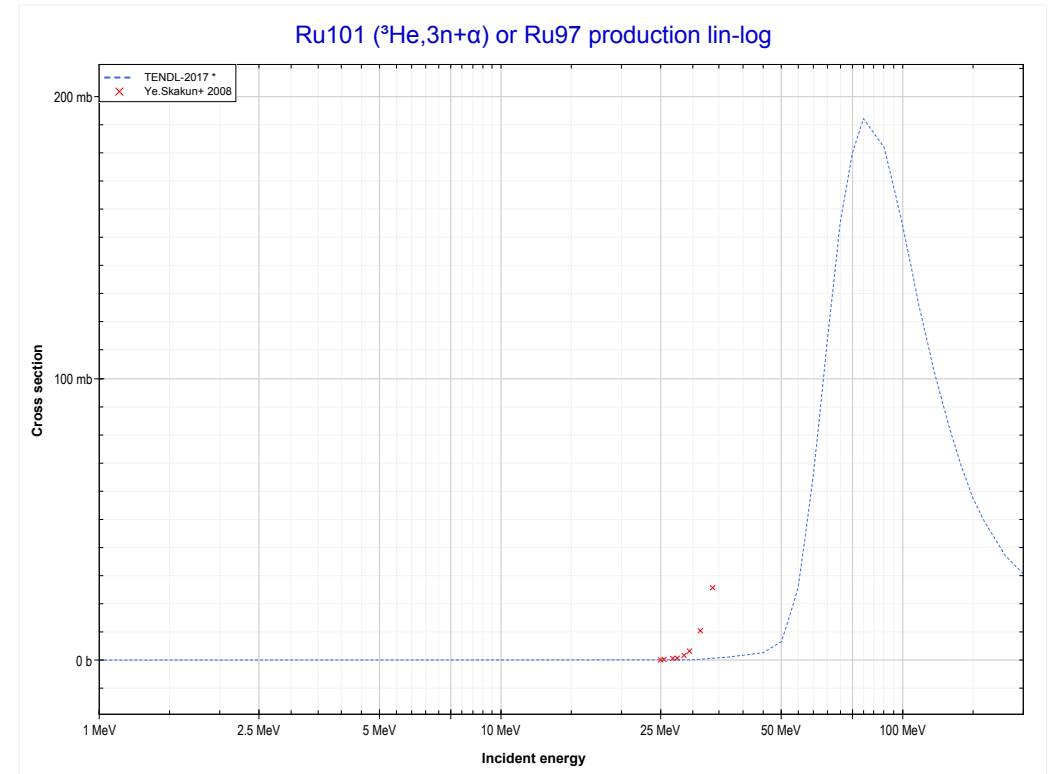
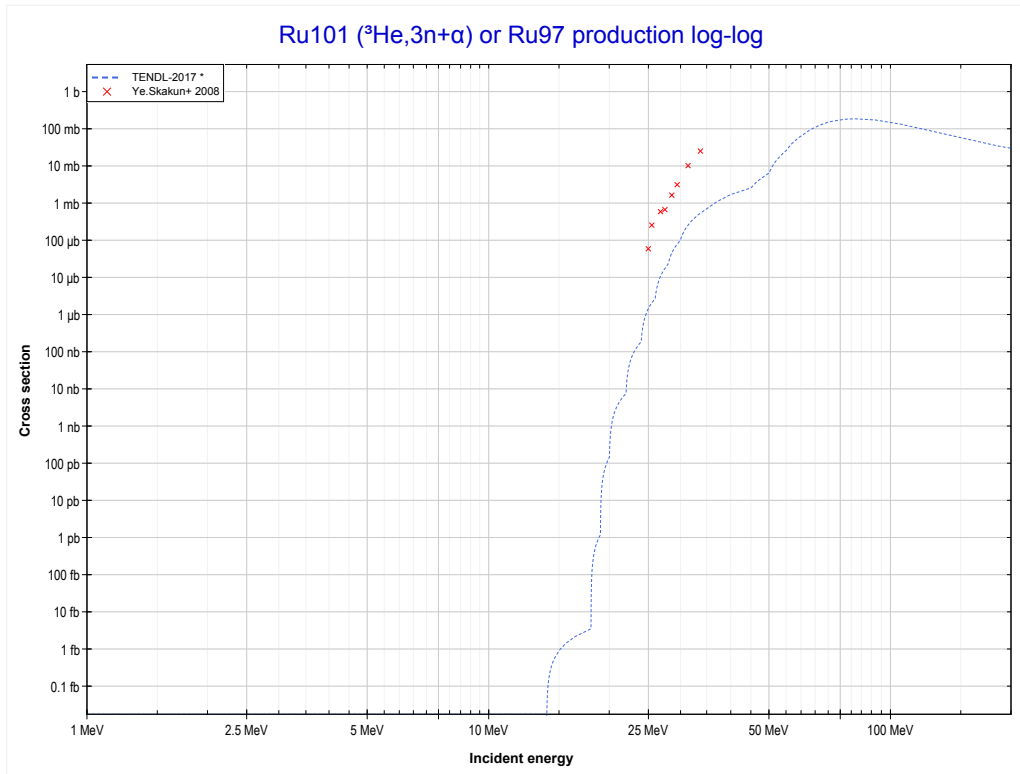
Reaction	Q-Value
Ru101(He3,n)Pd103	6390.30 keV

<< 41-Nb-93	44-Ru-101	47-Ag-107 >>
<< MT4 (³ He,n)	MT17 (³He,3n) or MT5 (Pd101 production)	MT25 (³ He,3n+α) >>



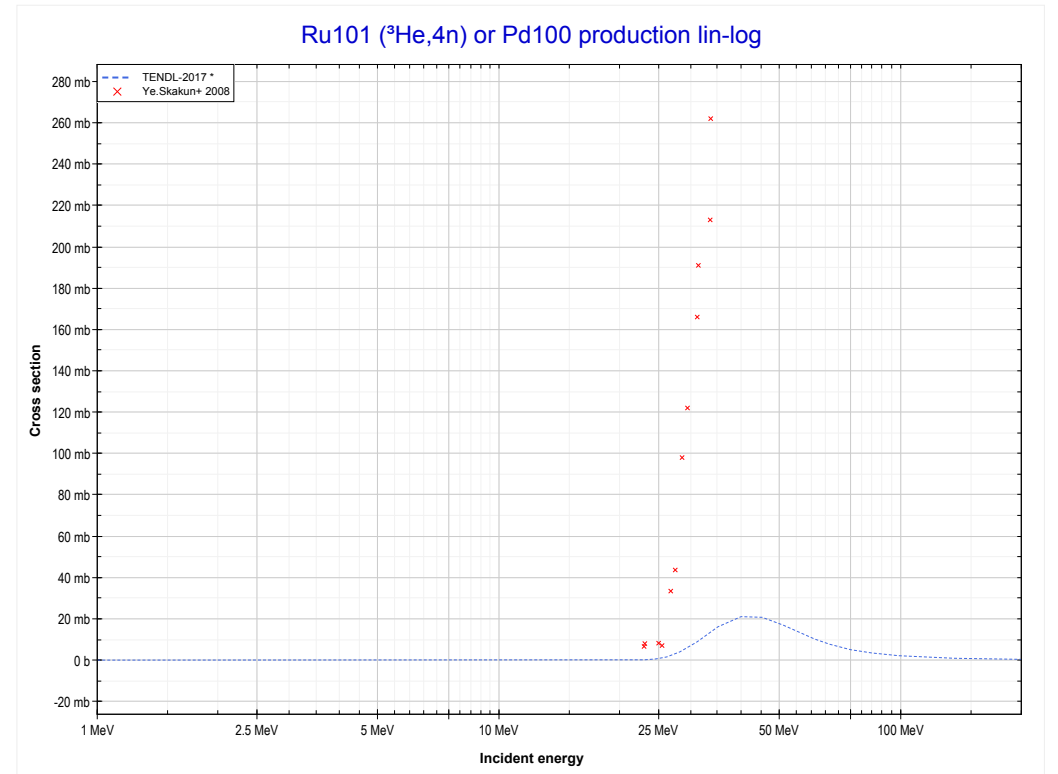
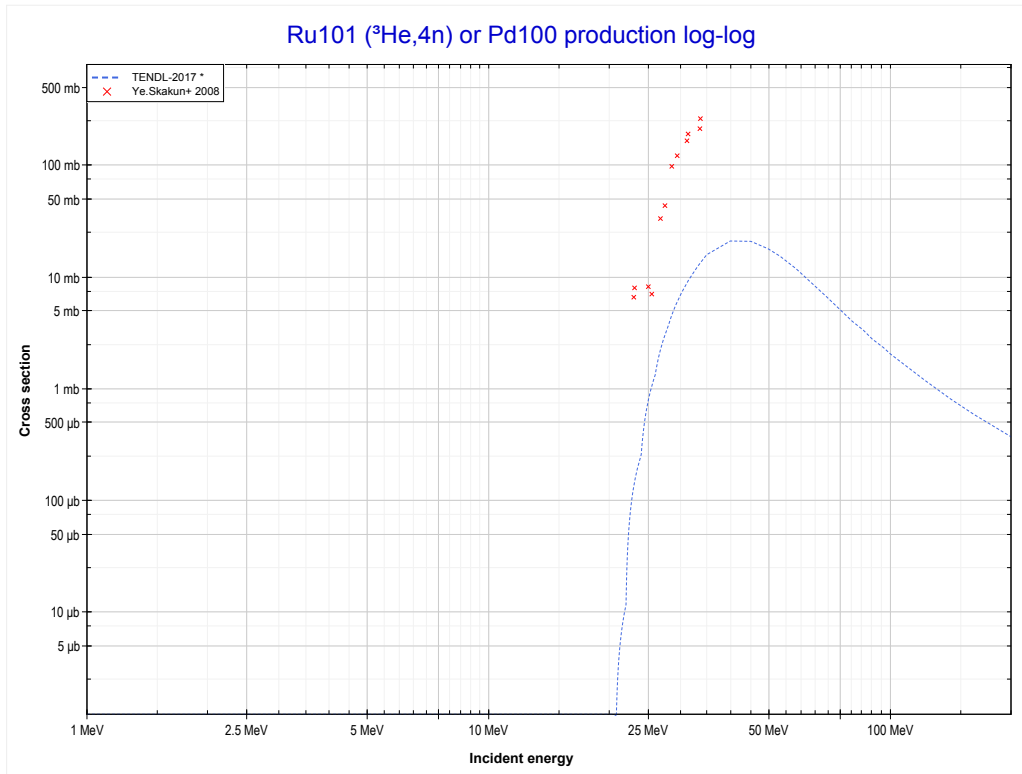
Reaction	Q-Value
Ru101(He3,3n)Pd101	-11806.34 keV

	44-Ru-101	
<< MT17 ($^3\text{He},3n$)	MT25 ($^3\text{He},3n+\alpha$) or MT5 (Ru97 production)	MT37 ($^3\text{He},4n$) >>



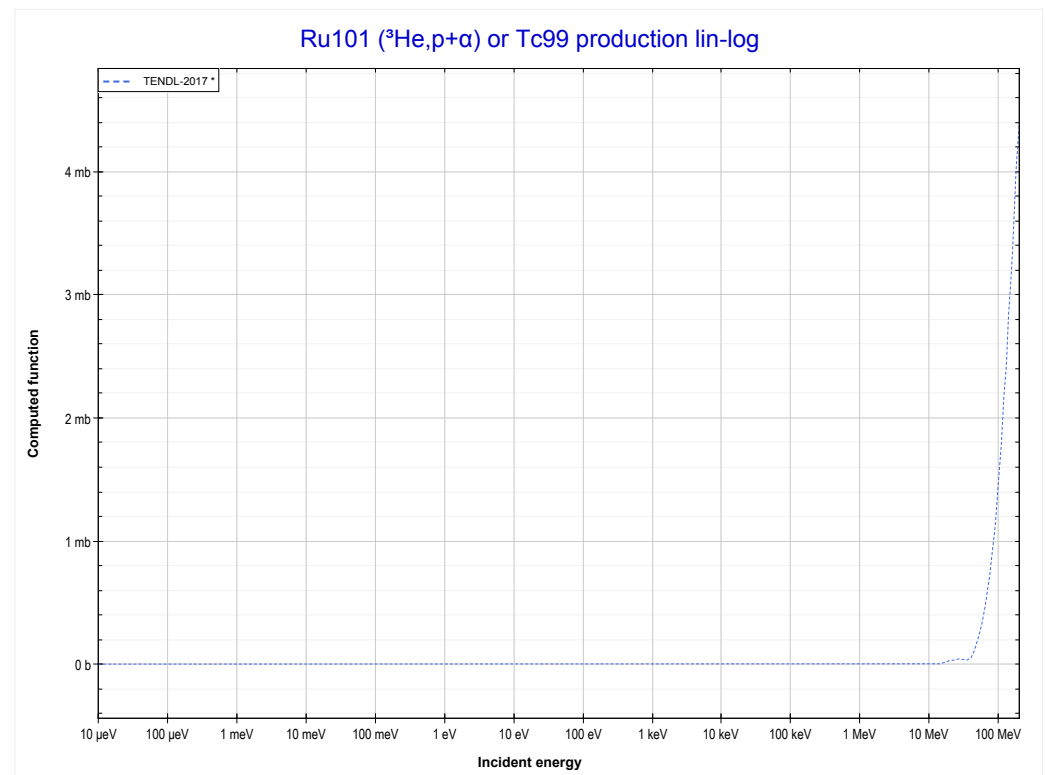
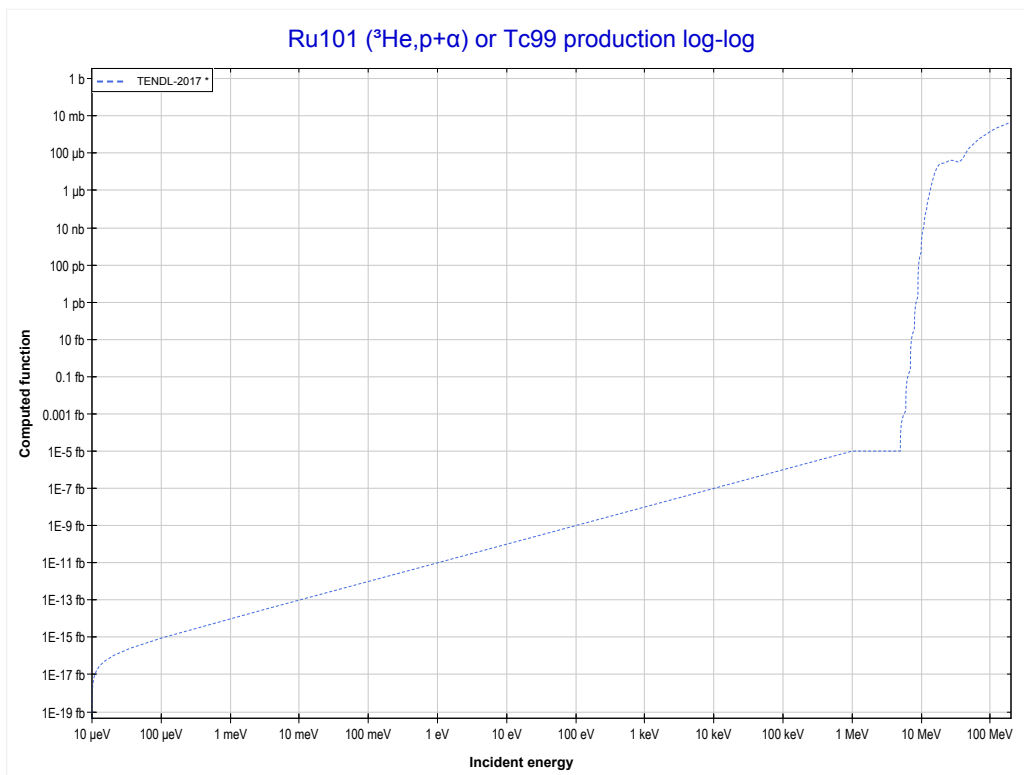
Reaction	Q-Value
Ru101(He3,3n+alpha)Ru97	-13542.95 keV
Ru101(He3,n+2t)Ru97	-24875.01 keV
Ru101(He3,2n+d+t)Ru97	-31132.25 keV
Ru101(He3,3n+p+t)Ru97	-33356.81 keV
Ru101(He3,4n+He3)Ru97	-34120.57 keV
Ru101(He3,3n+2d)Ru97	-37389.48 keV
Ru101(He3,4n+p+d)Ru97	-39614.05 keV
Ru101(He3,5n+2p)Ru97	-41838.61 keV

<< 41-Nb-93	44-Ru-101	44-Ru-102 >>
<< MT25 ($^3\text{He},3n+\alpha$)	MT37 ($^3\text{He},4n$) or MT5 (Pd100 production)	MT112 ($^3\text{He},p+\alpha$) >>



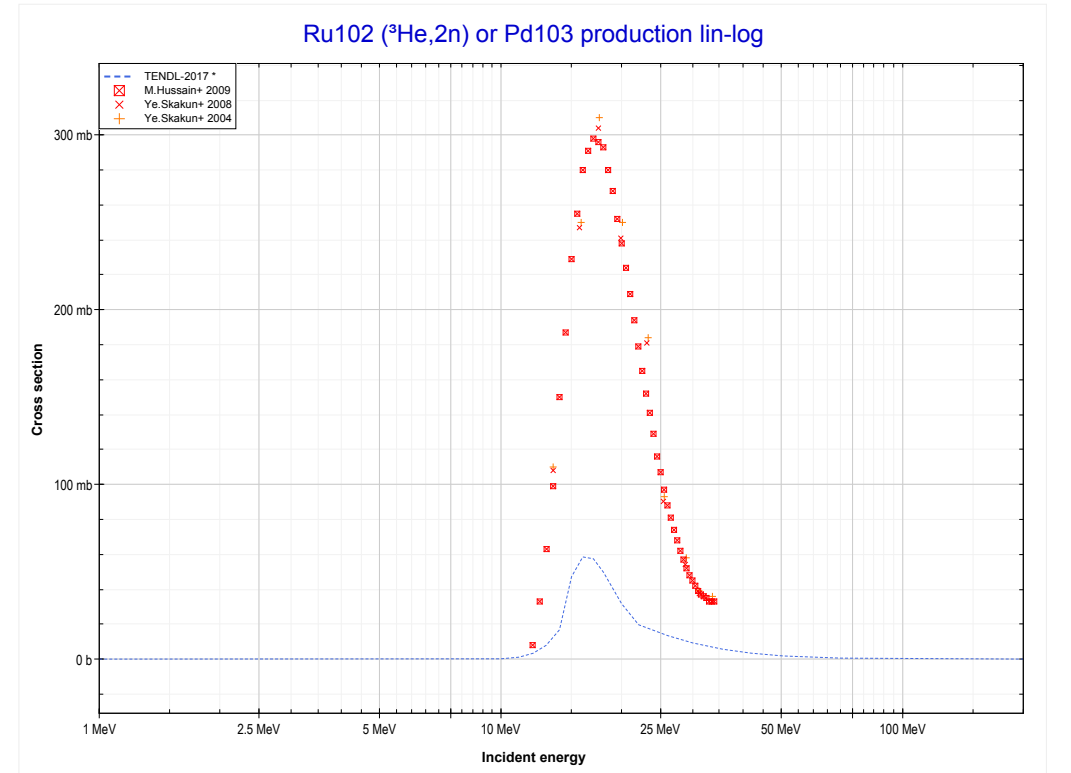
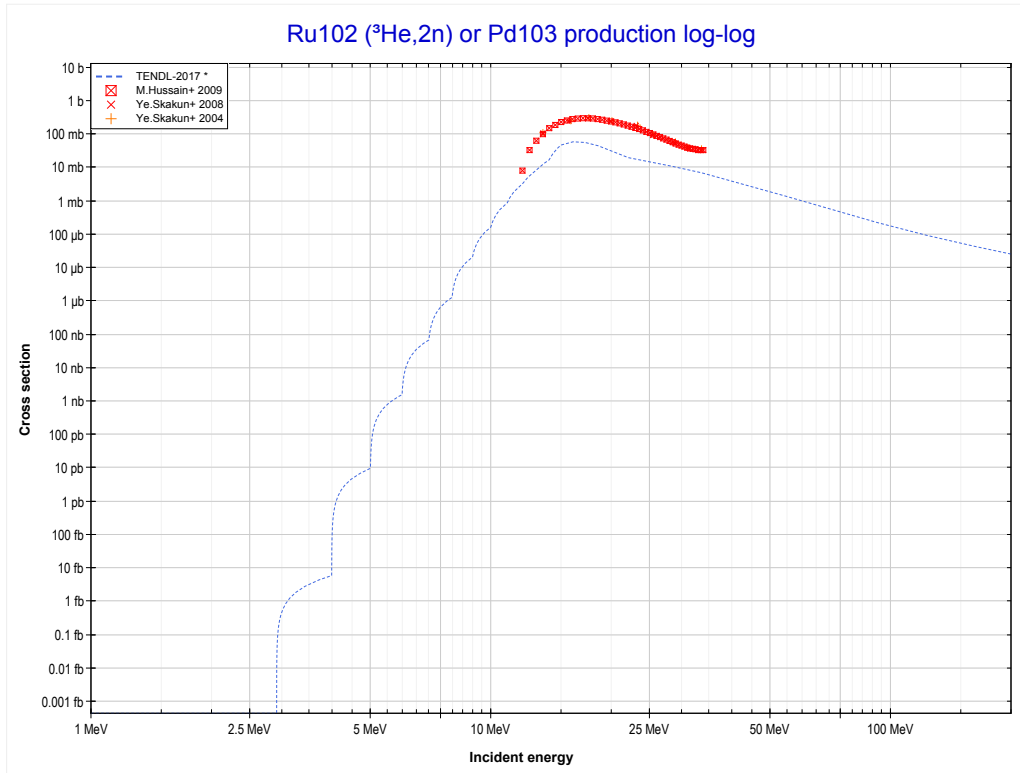
Reaction	Q-Value
Ru101($\text{He}3,4n$)Pd100	-20081.65 keV

<< 3-Li-6	44-Ru-101	
<< MT37 (³ He,4n)	MT112 (³He,p+α) or MT5 (Tc99 production)	44-Ru-102 MT16 (³ He,2n) >>



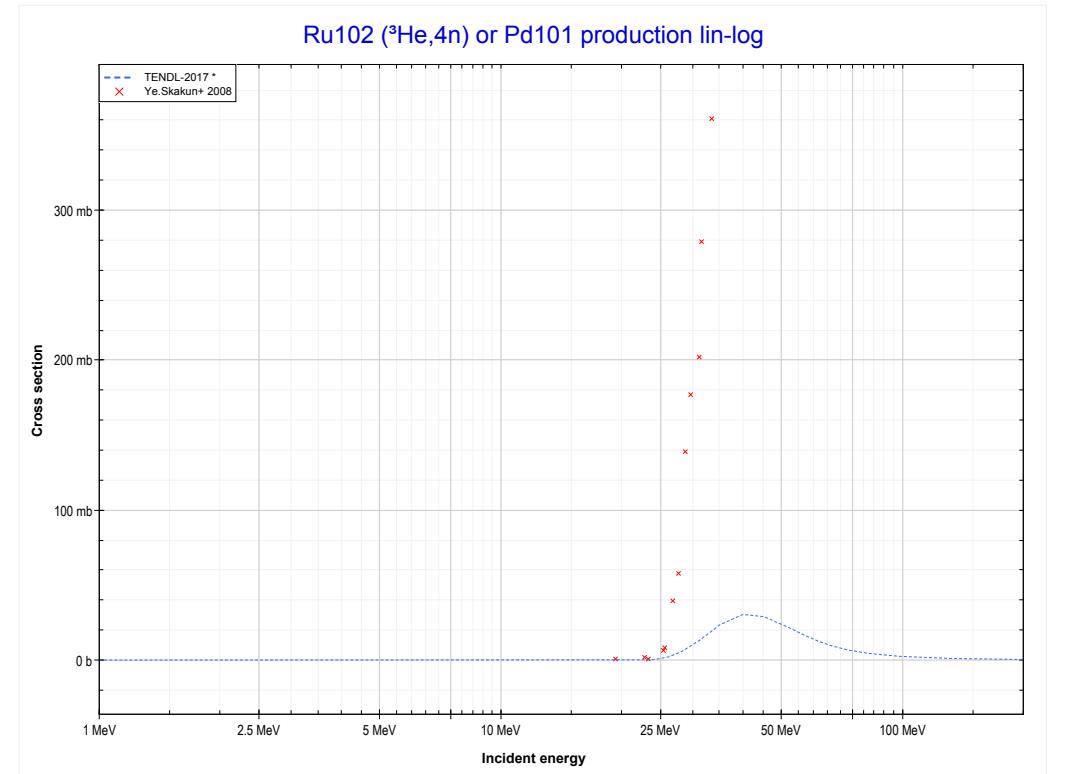
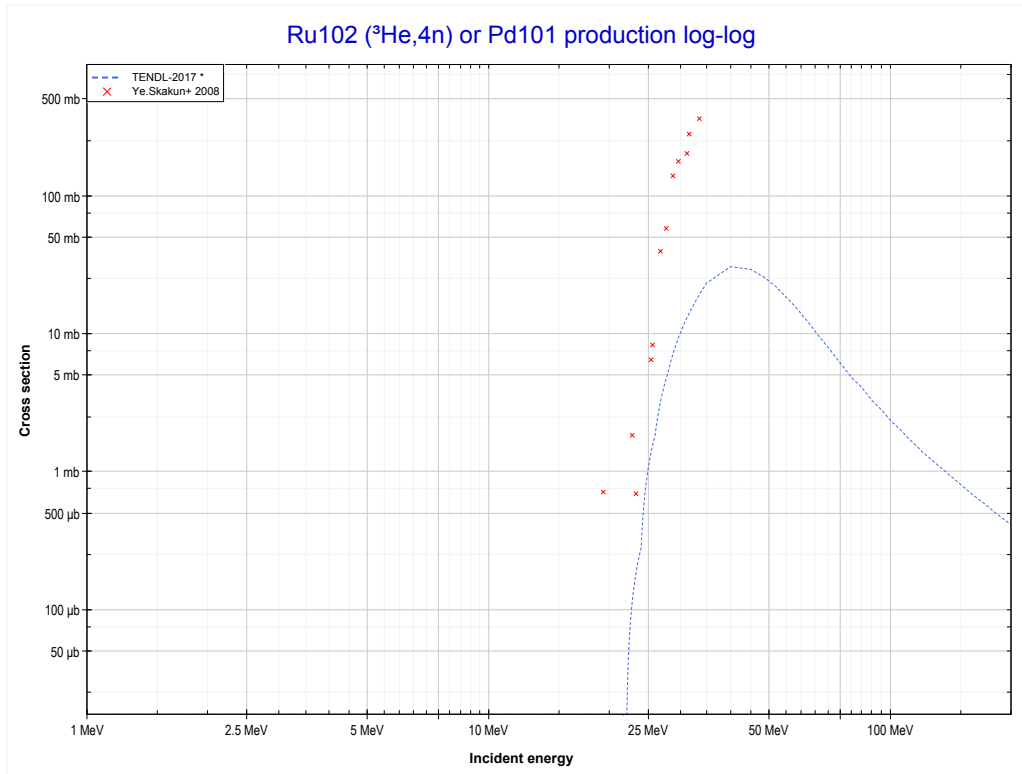
Reaction	Q-Value
Ru101(He3,p+α)Tc99	4589.53 keV
Ru101(He3,d+He3)Tc99	-13763.52 keV
Ru101(He3,2p+t)Tc99	-15224.33 keV
Ru101(He3,n+p+He3)Tc99	-15988.09 keV
Ru101(He3,p+2d)Tc99	-19257.00 keV
Ru101(He3,n+2p+d)Tc99	-21481.56 keV
Ru101(He3,2n+3p)Tc99	-23706.13 keV

<< 41-Nb-93	44-Ru-102	47-Ag-107 >>
<< 44-Ru-101 MT112 (³ He,p+α)	MT16 (³He,2n) or MT5 (Pd103 production)	MT37 (³ He,4n) >>



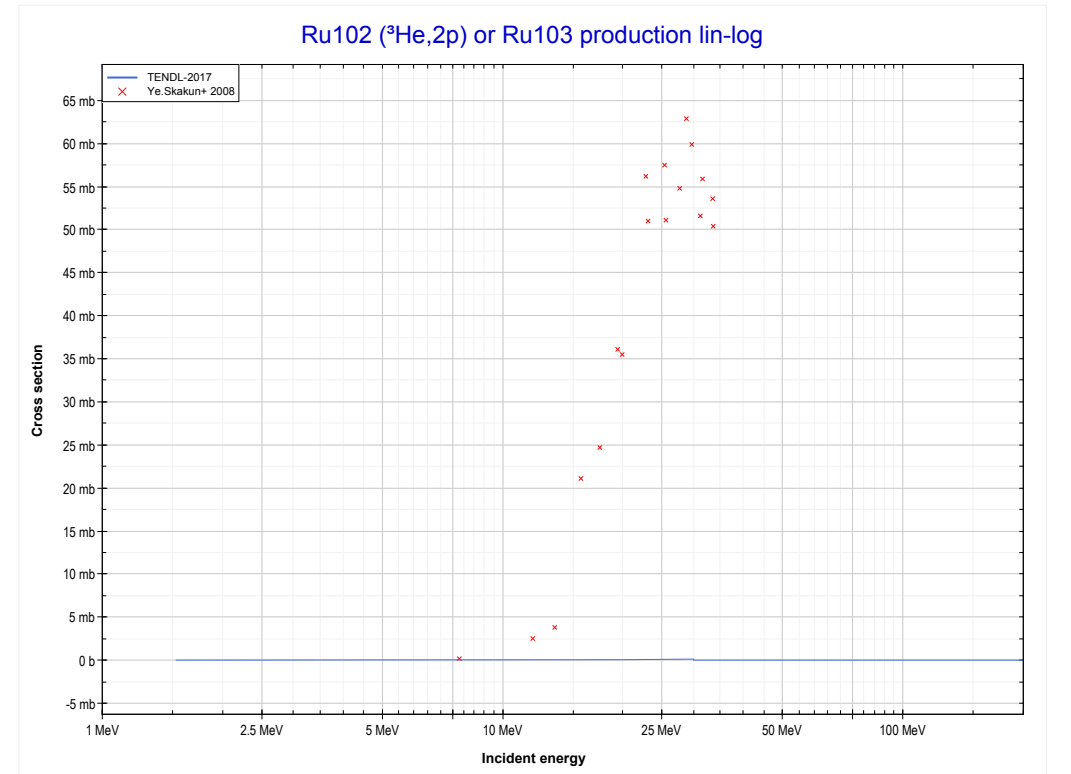
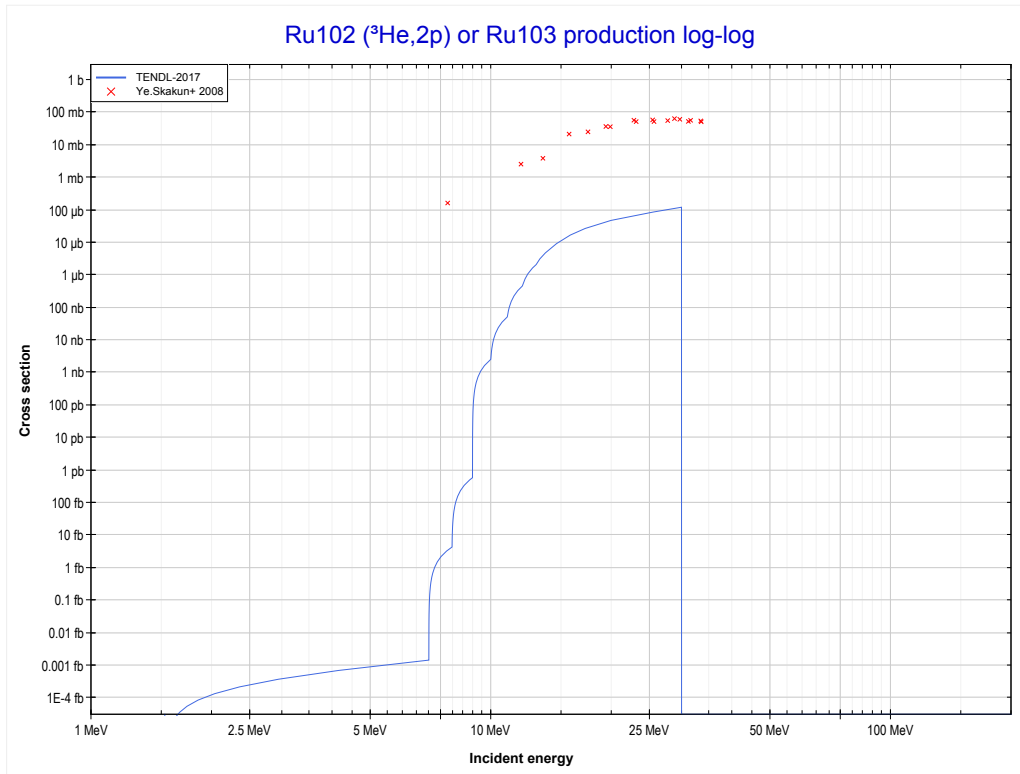
Reaction	Q-Value
Ru102(He3,2n)Pd103	-2829.32 keV

<< 44-Ru-101	44-Ru-102	47-Ag-107 >>
<< MT16 ($^3\text{He},2n$)	MT37 ($^3\text{He},4n$) or MT5 (Pd101 production)	MT111 ($^3\text{He},2p$) >>



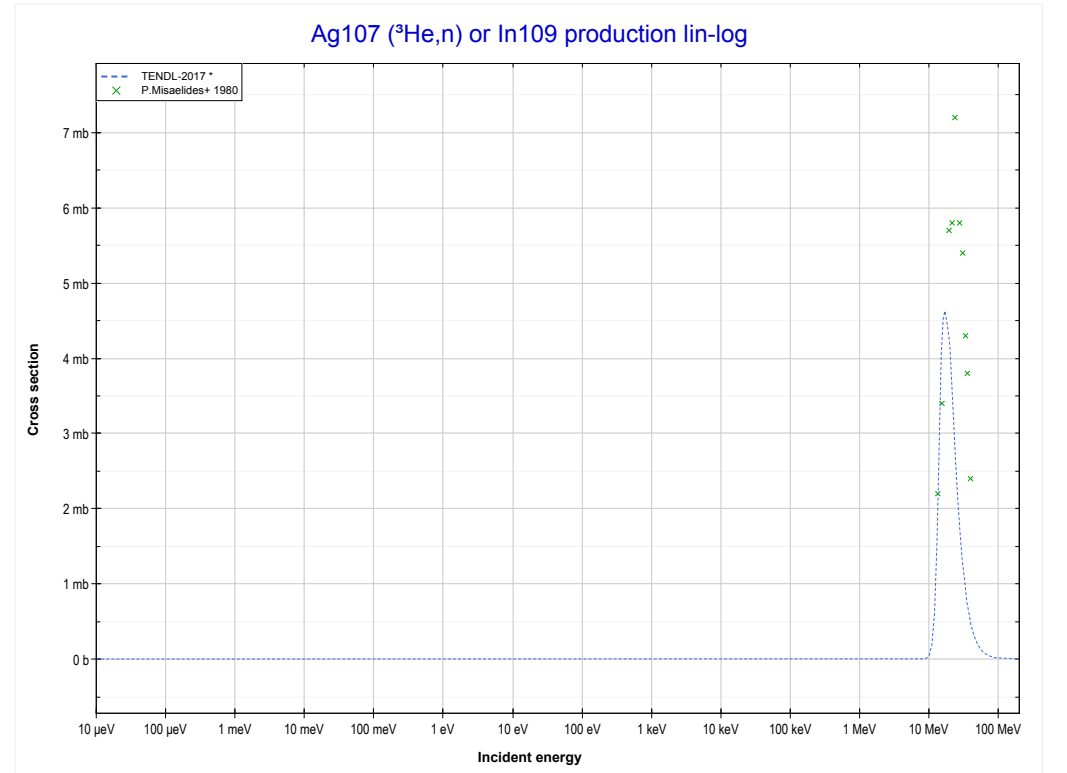
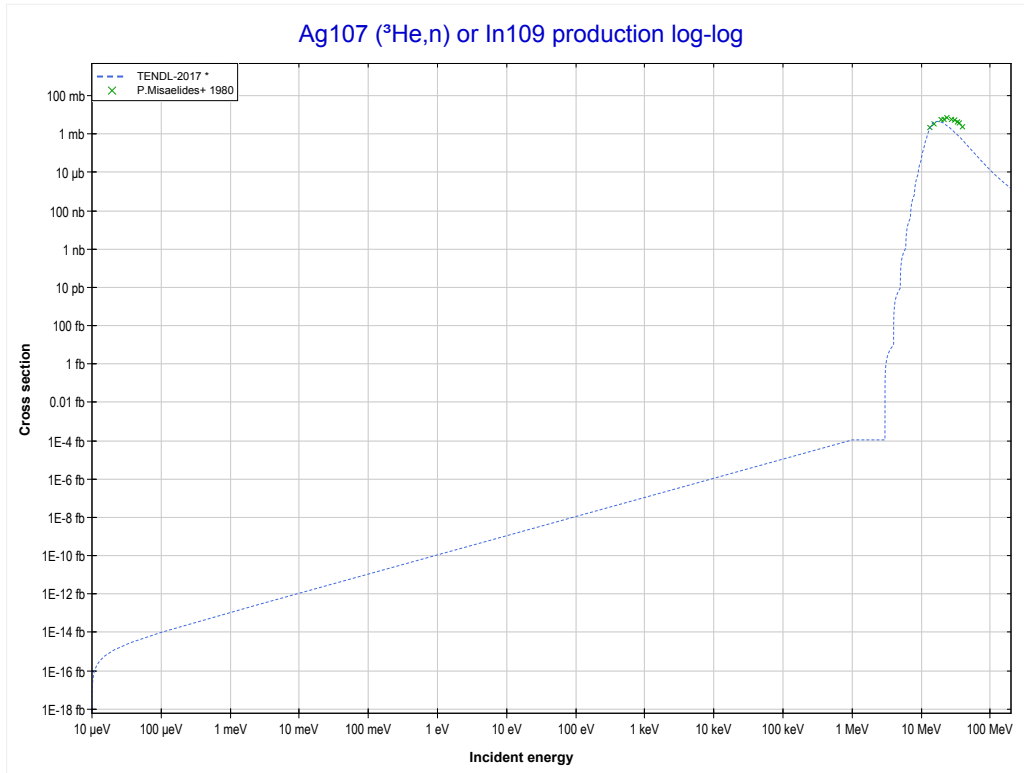
Reaction	Q-Value
Ru102(He3,4n)Pd101	-21025.95 keV

<< 31-Ga-71	44-Ru-102	74-W-186 >>
<< MT37 (³ He,4n)	MT111 (³He,2p) or MT5 (Ru103 production)	47-Ag-107 MT4 (³ He,n) >>



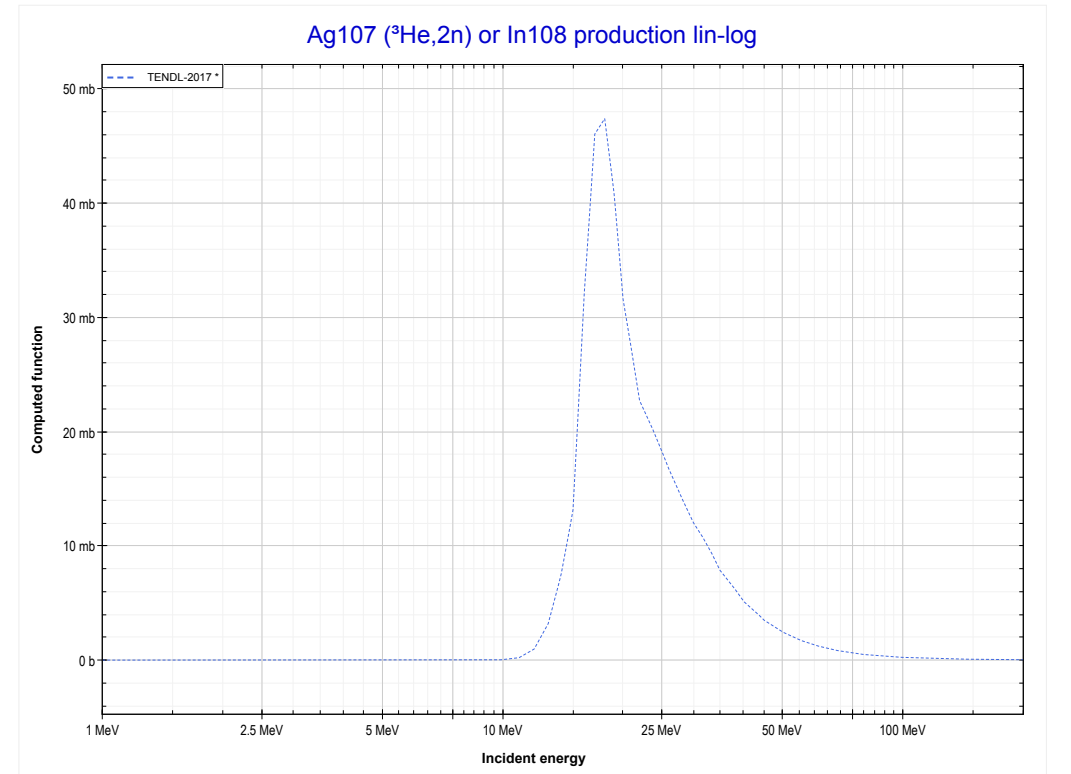
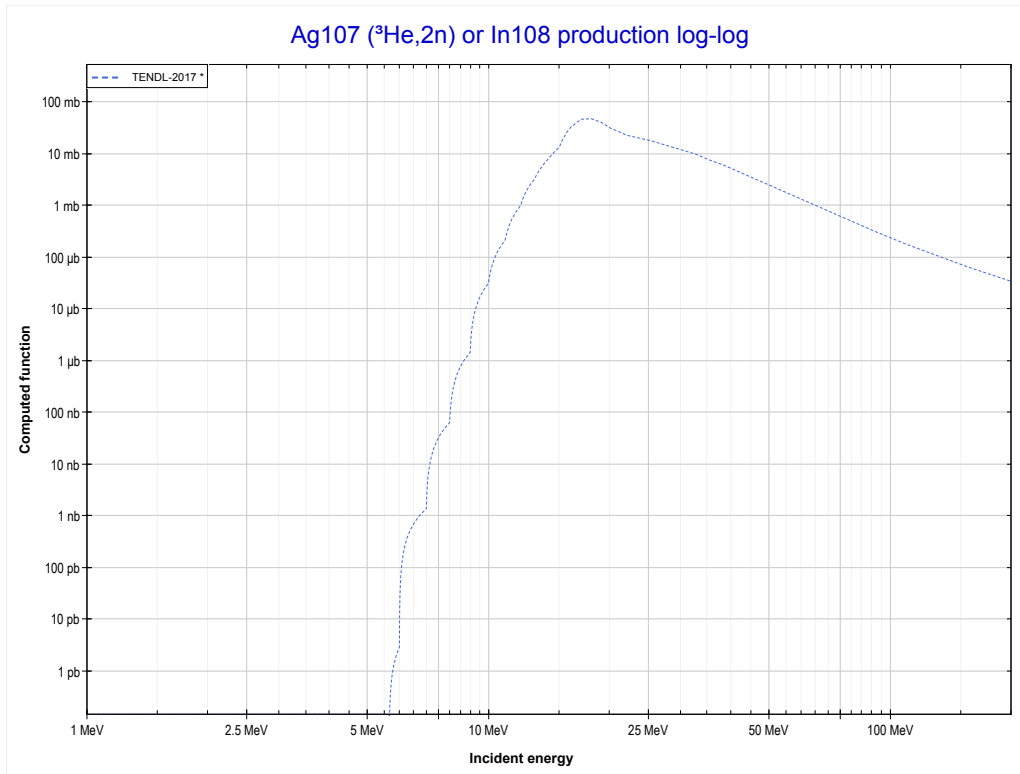
Reaction	Q-Value
Ru102(He3,2p)Ru103	-1486.03 keV

<< 44-Ru-101	47-Ag-107	47-Ag-109 >>
<< 44-Ru-102 MT111 (³ He,2p)	MT4 (³He,n) or MT5 (In109 production)	MT16 (³ He,2n) >>



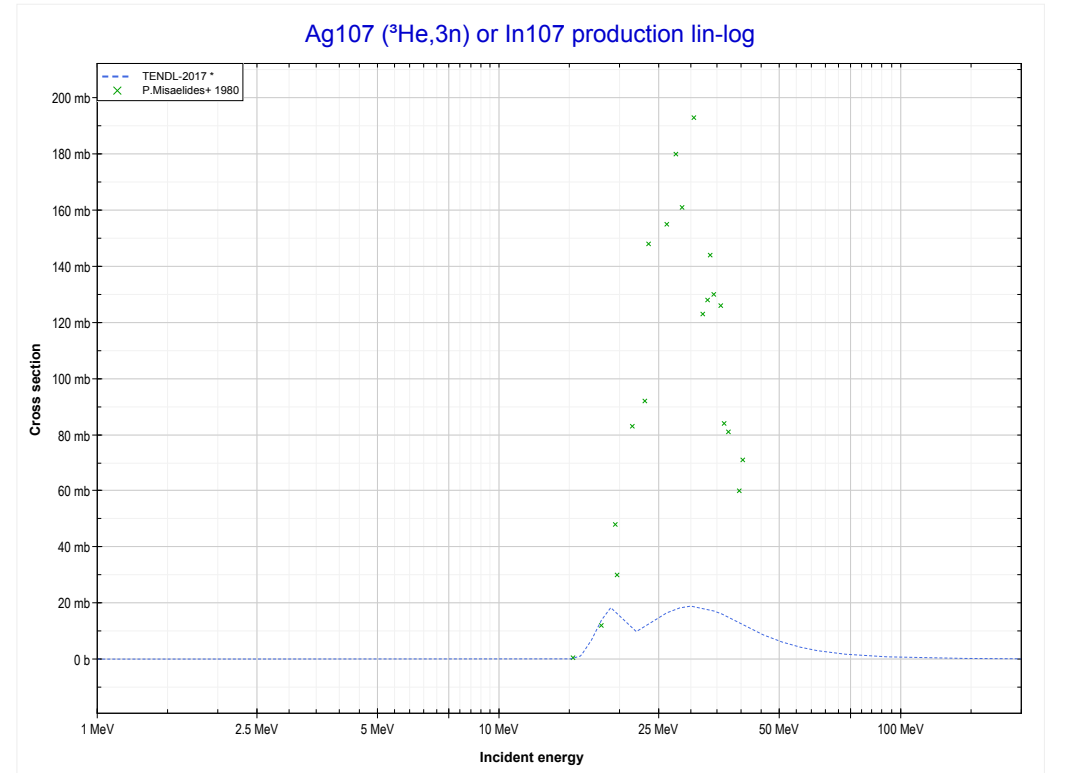
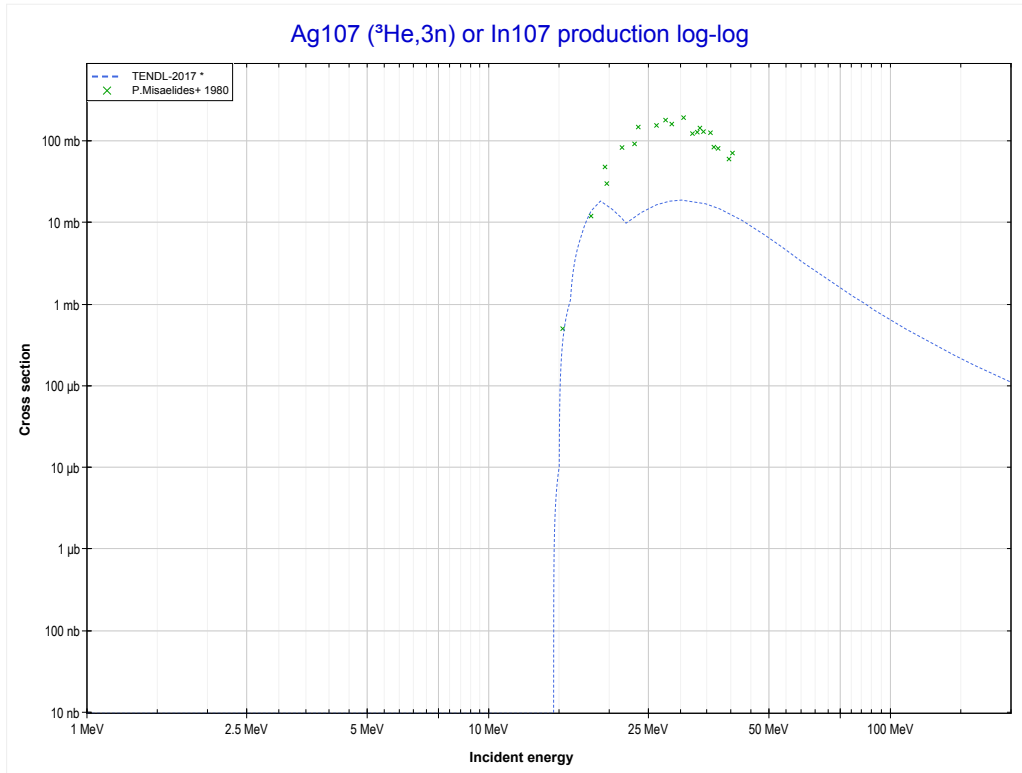
Reaction	Q-Value
Ag107(He3,n)In109	4941.30 keV

<< 44-Ru-102	47-Ag-107	47-Ag-109 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (In108 production)	MT17 (³ He,3n) >>



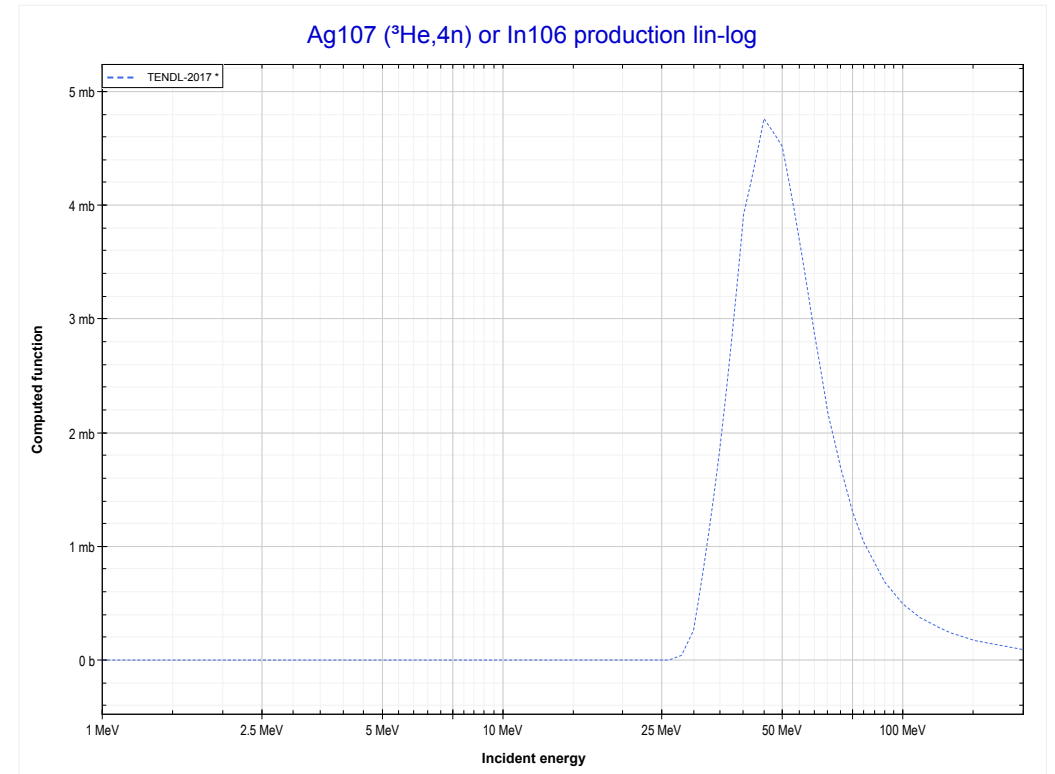
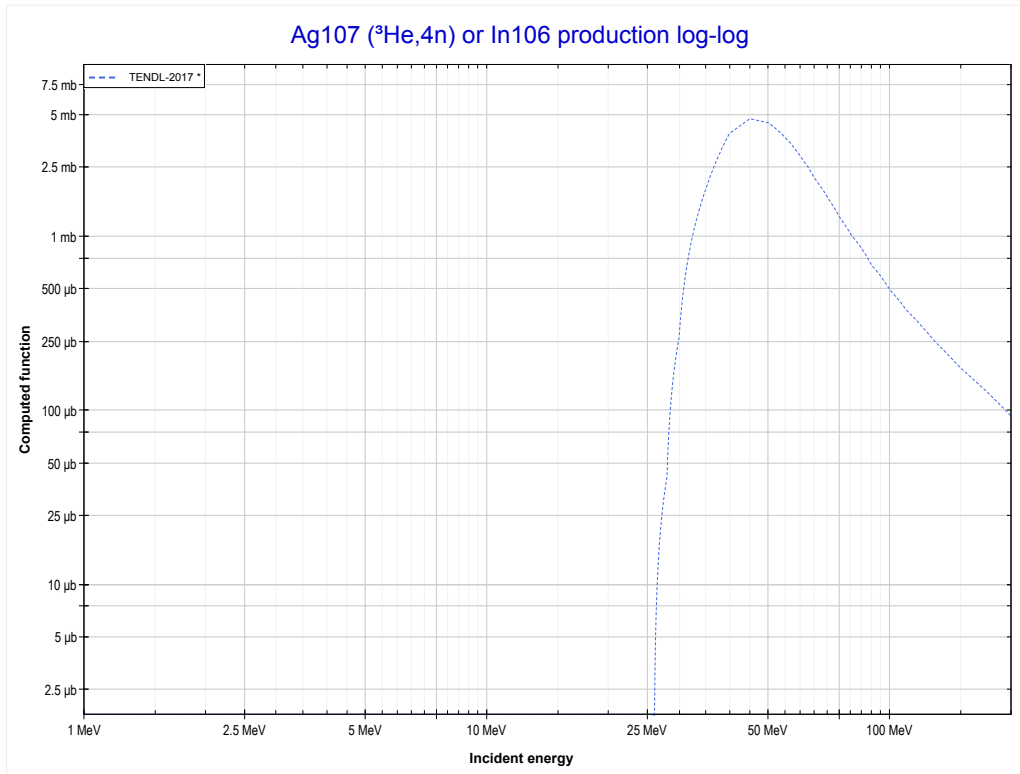
Reaction	Q-Value
Ag107(He3,2n)In108	-5498.02 keV

<< 44-Ru-101	47-Ag-107	47-Ag-109 >>
<< MT16 (³ He,2n)	MT17 (³He,3n) or MT5 (In107 production)	MT37 (³ He,4n) >>



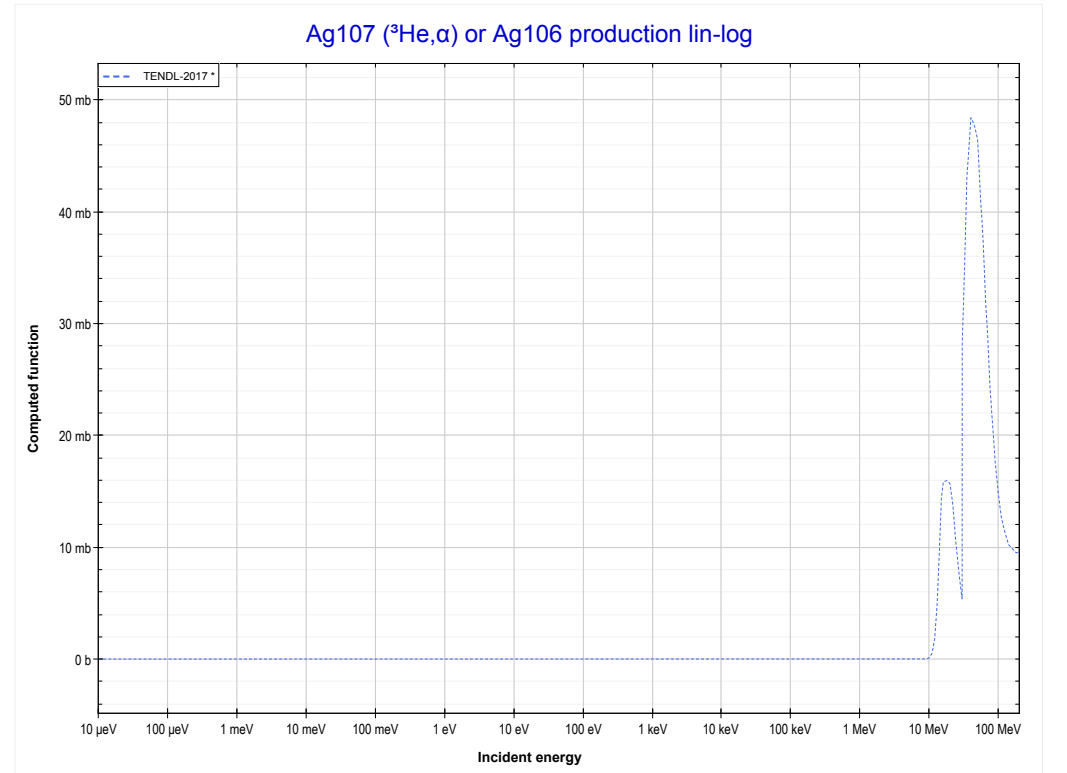
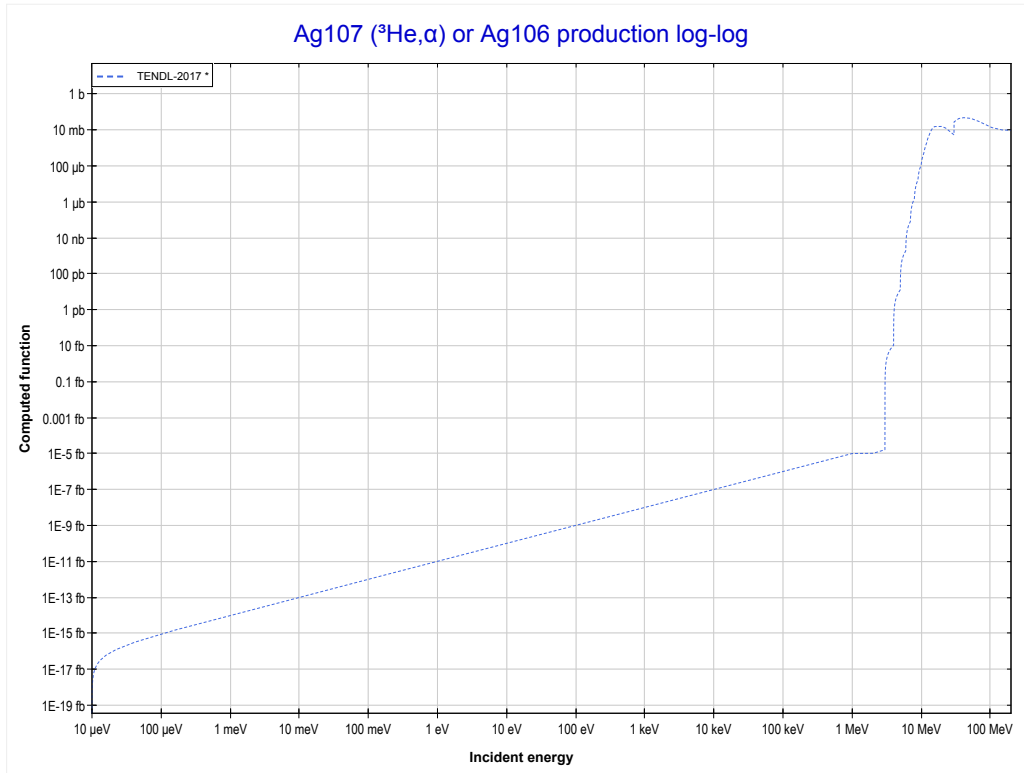
Reaction	Q-Value
Ag107(He3,3n)In107	-14125.34 keV

<< 44-Ru-102	47-Ag-107	47-Ag-109 >>
<< MT17 (³ He,3n)	MT37 (³He,4n) or MT5 (In106 production)	MT107 (³ He,α) >>



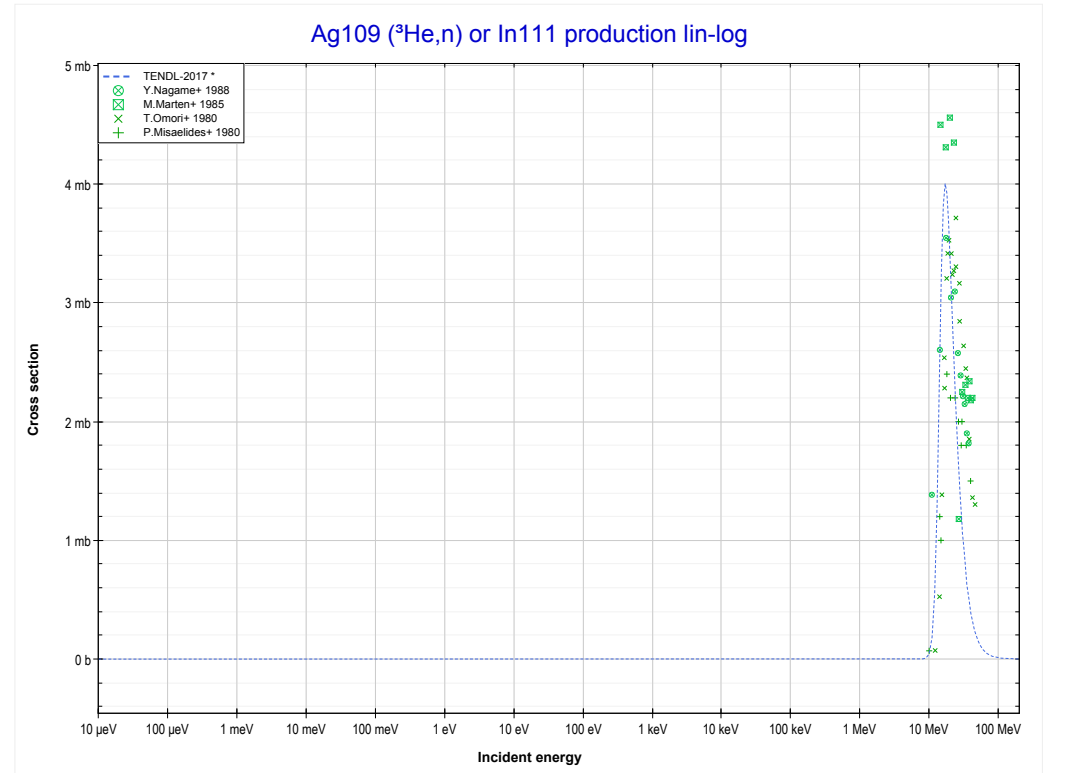
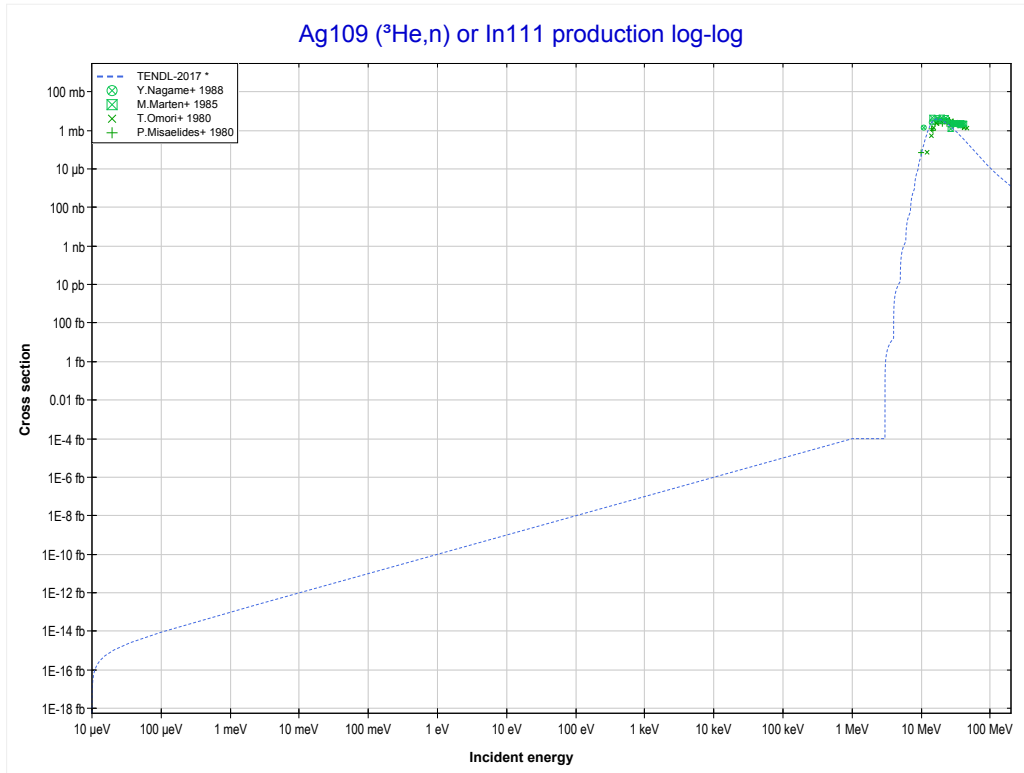
Reaction	Q-Value
Ag107(He3,4n)In106	-25152.65 keV

<< 34-Se-76	47-Ag-107	48-Cd-116 >>
<< MT37 (³ He,4n)	MT107 (³He,α) or MT5 (Ag106 production)	47-Ag-109 MT4 (³ He,n) >>



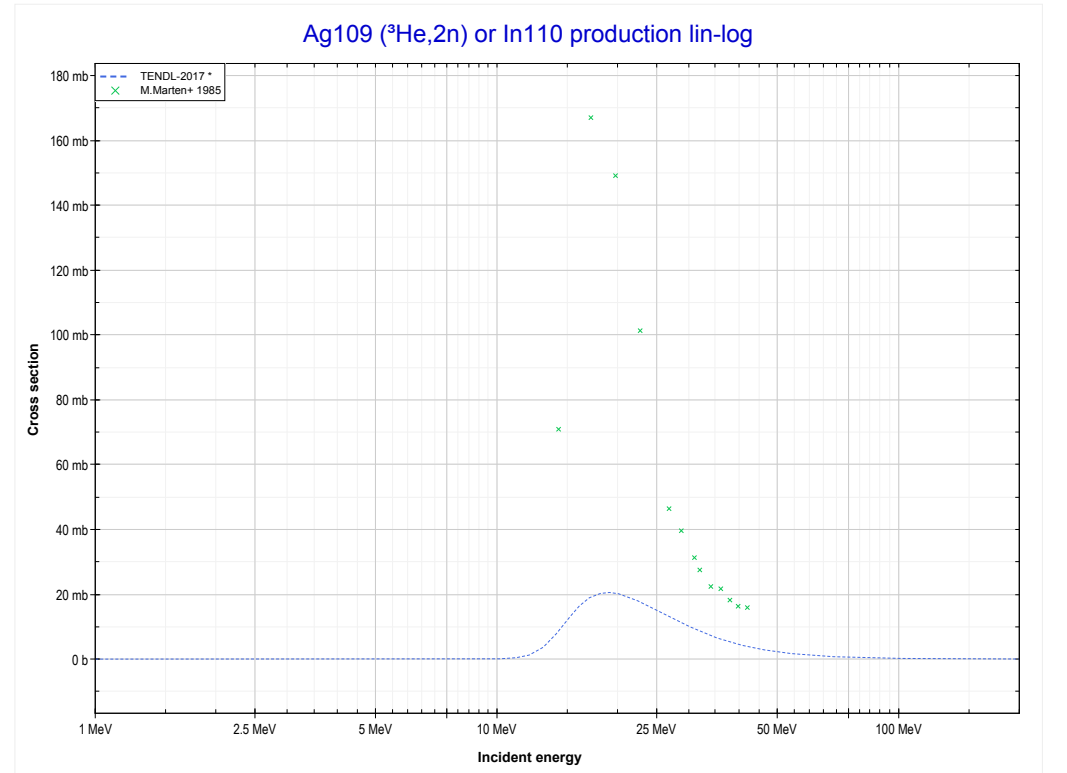
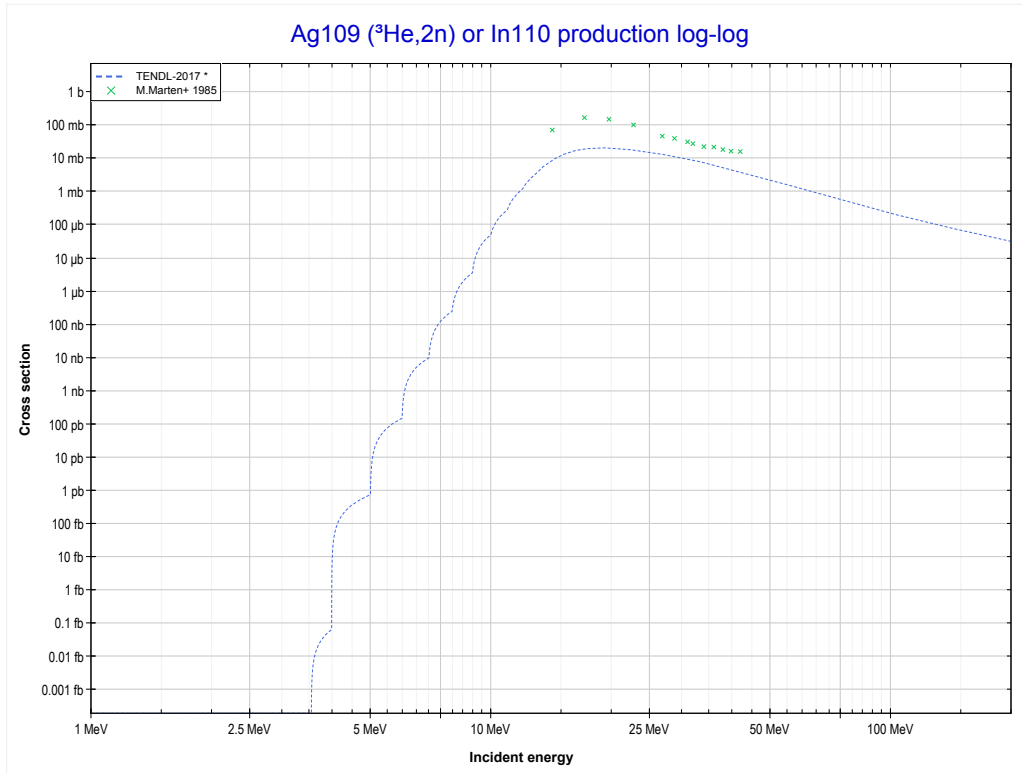
Reaction	Q-Value
Ag107(He3,α)Ag106	11041.70 keV
Ag107(He3,p+t)Ag106	-8772.16 keV
Ag107(He3,n+He3)Ag106	-9535.92 keV
Ag107(He3,2d)Ag106	-12804.83 keV
Ag107(He3,n+p+d)Ag106	-15029.39 keV
Ag107(He3,2n+2p)Ag106	-17253.96 keV

<< 47-Ag-107	47-Ag-109	73-Ta-181 >>
<< 47-Ag-107 MT107 ($^3\text{He},\alpha$)	MT4 ($^3\text{He},n$) or MT5 (In111 production)	MT16 ($^3\text{He},2n$) >>



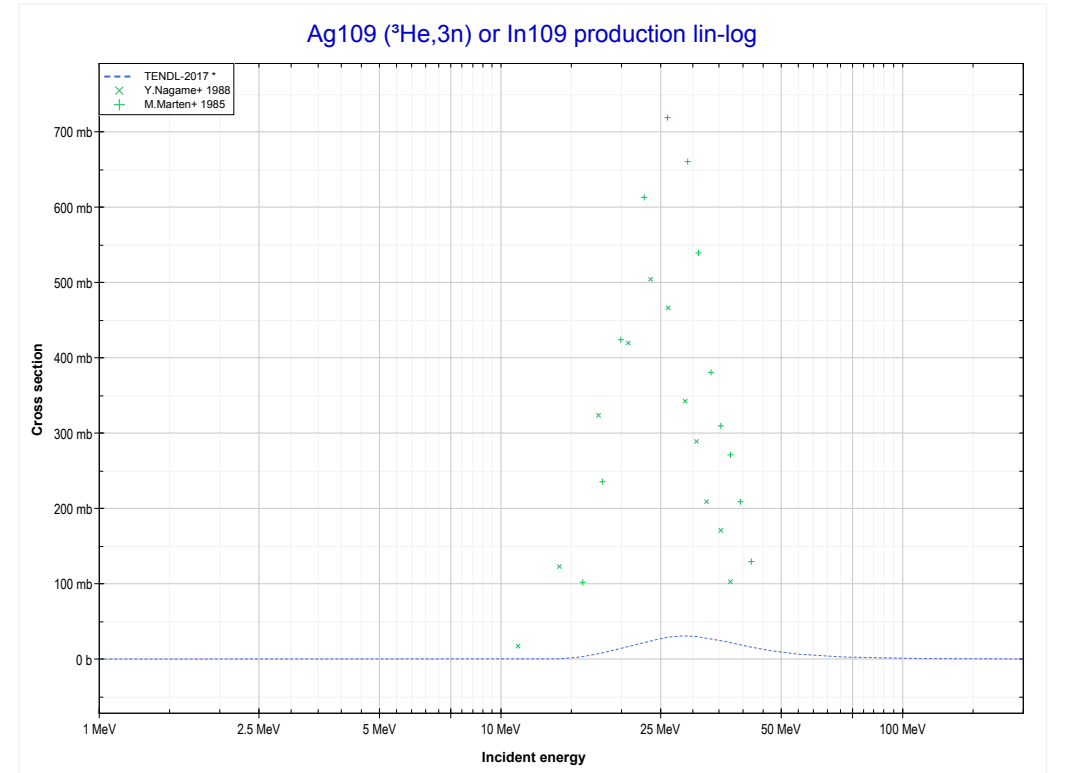
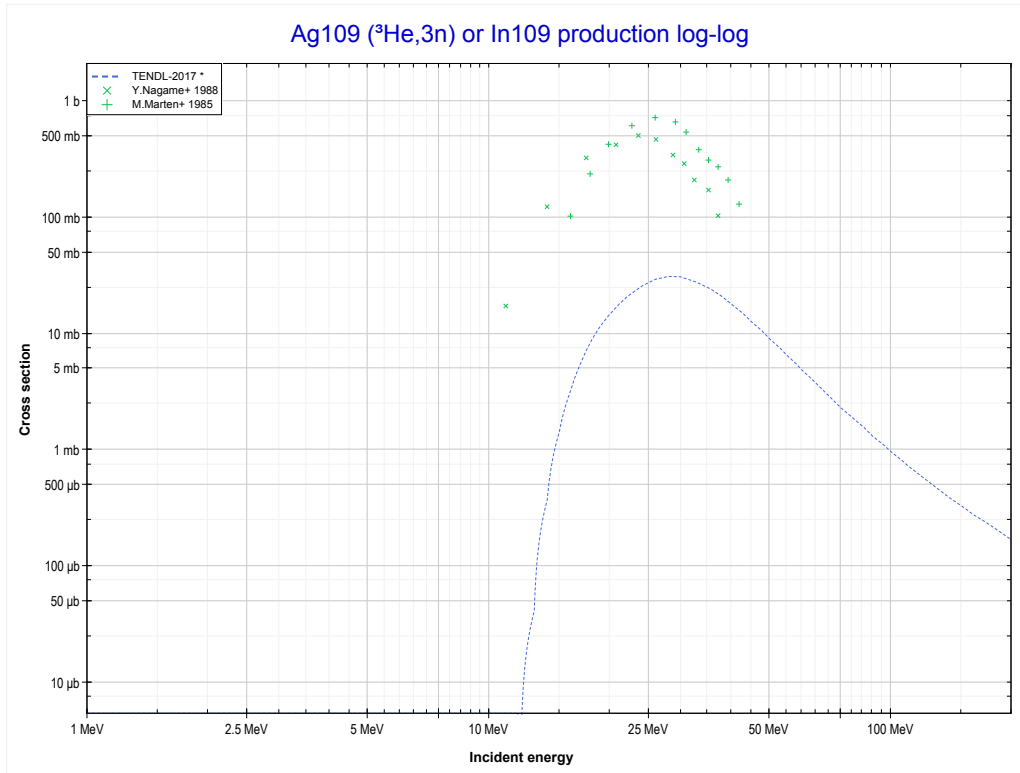
Reaction	Q-Value
Ag109(He3,n)In111	6531.00 keV

<< 47-Ag-107	47-Ag-109	48-Cd-116 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (In110 production)	MT17 (³ He,3n) >>



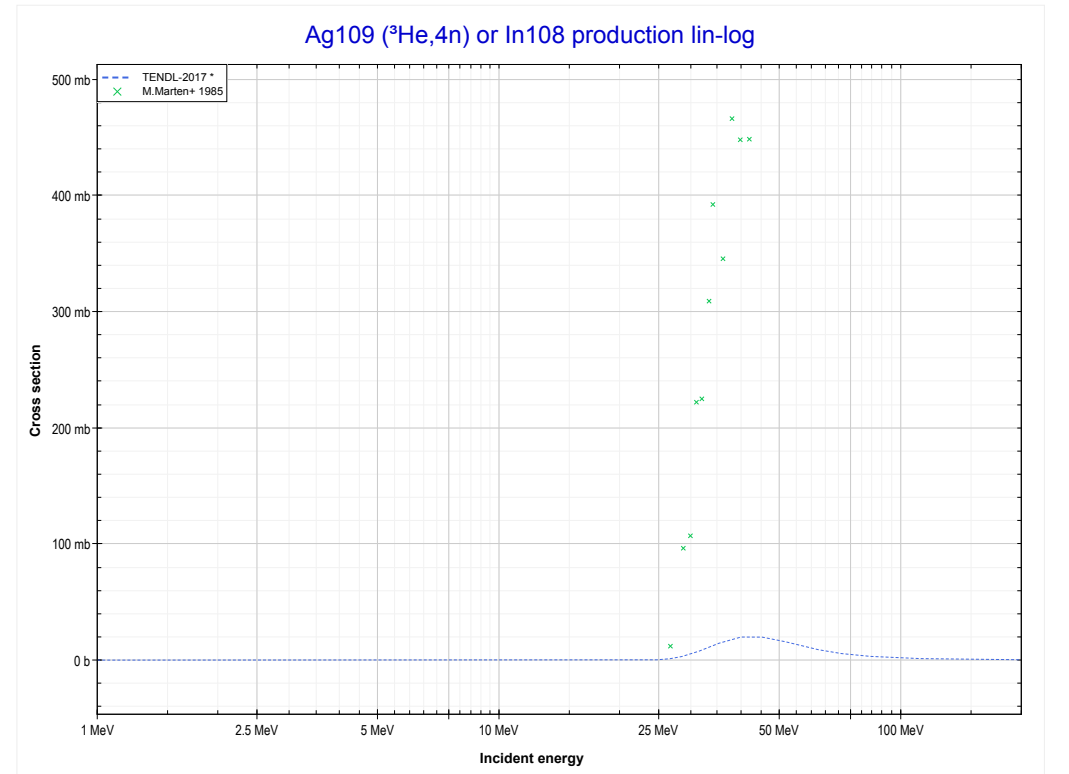
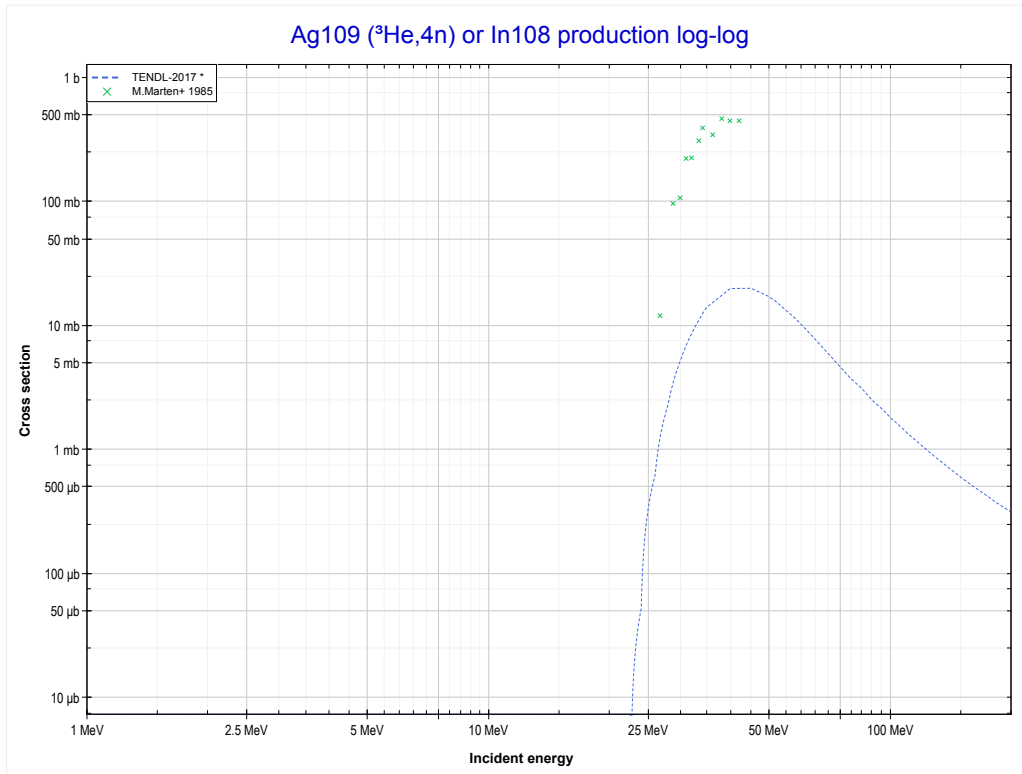
Reaction	Q-Value
Ag109(He3,2n)In110	-3460.32 keV

<< 47-Ag-107	47-Ag-109	51-Sb-123 >>
<< MT16 (³ He,2n)	MT17 (³He,3n) or MT5 (In109 production)	MT37 (³ He,4n) >>



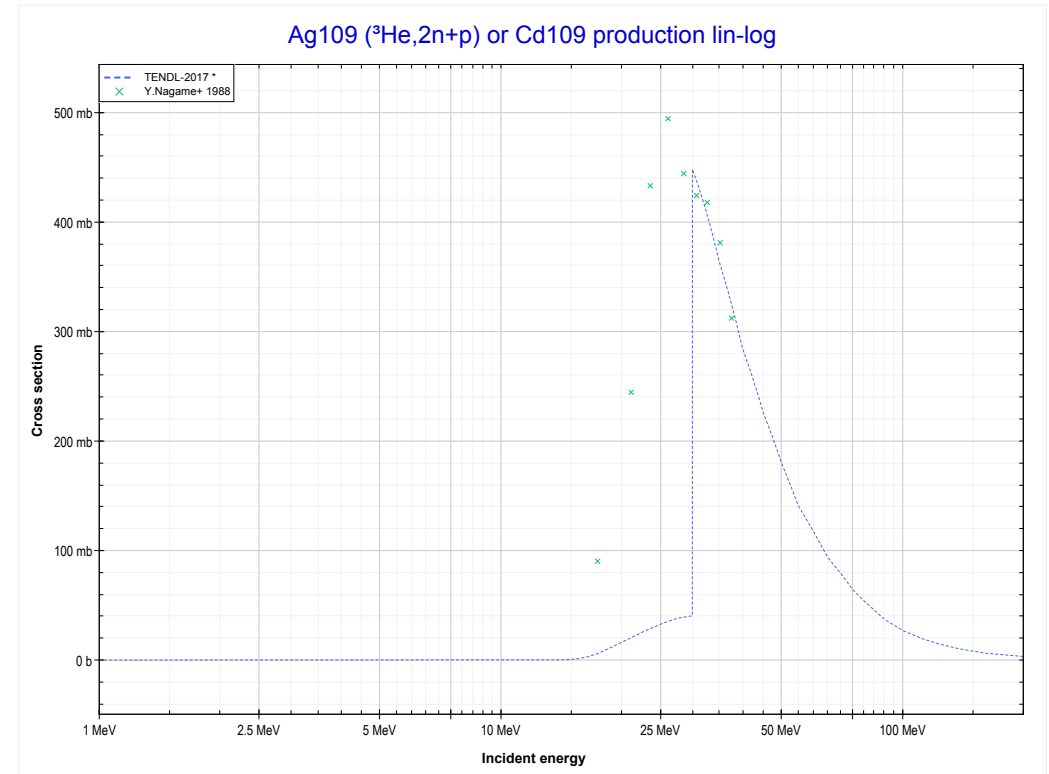
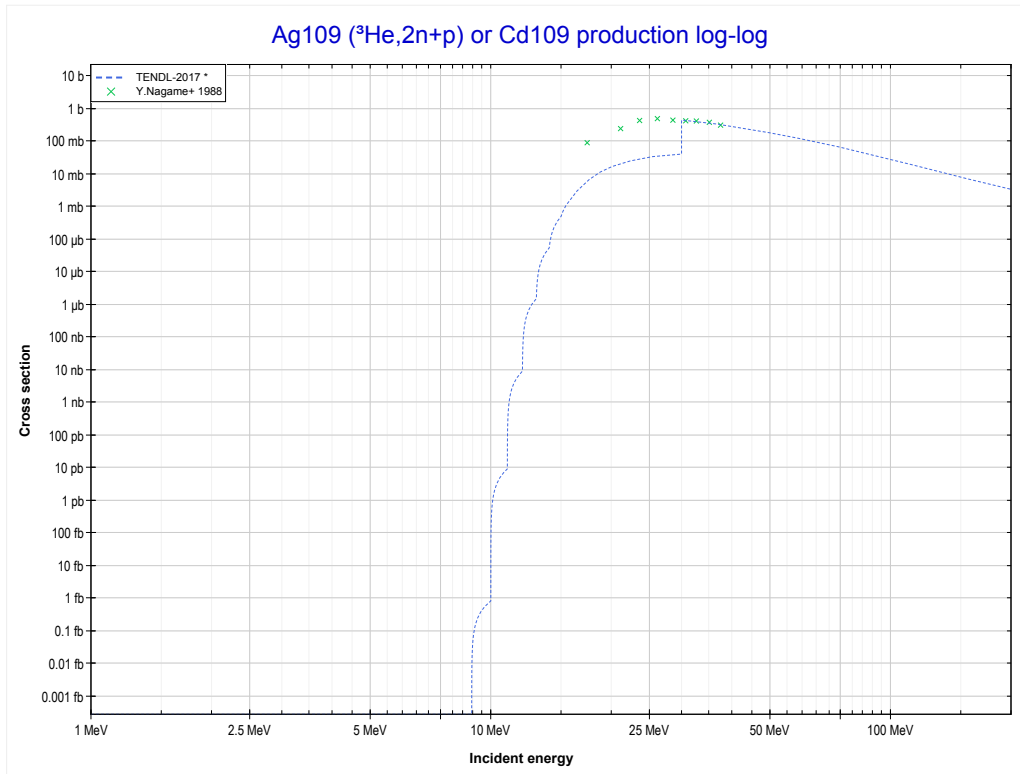
Reaction	Q-Value
Ag109(He3,3n)In109	-11514.64 keV

<< 47-Ag-107	47-Ag-109	73-Ta-181 >>
<< MT17 (³ He,3n)	MT37 (³He,4n) or MT5 (In108 production)	MT41 (³ He,2n+p) >>



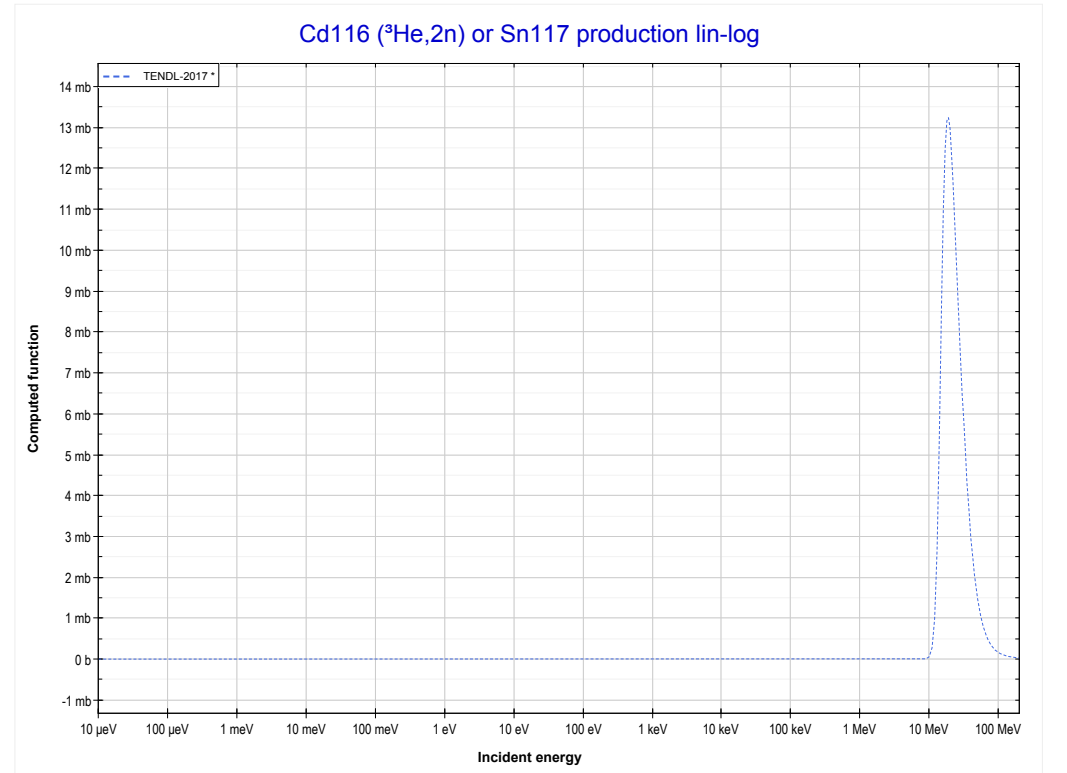
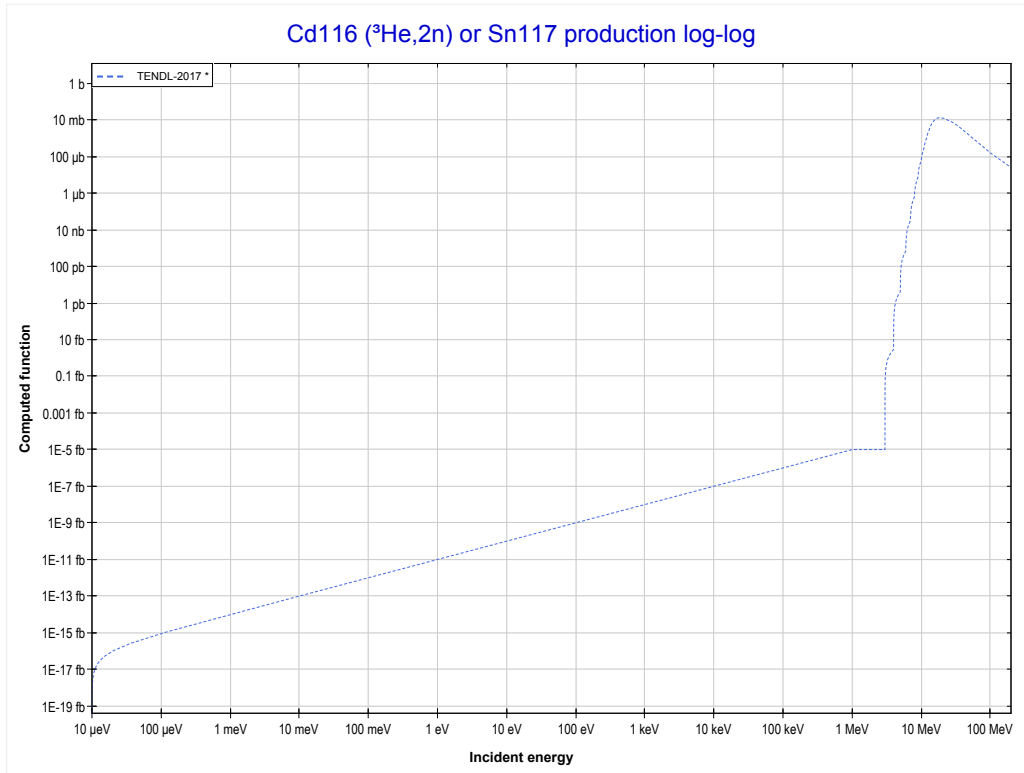
Reaction	Q-Value
Ag109(He3,4n)In108	-21953.95 keV

<< 34-Se-77	47-Ag-109	
<< MT37 (³ He,4n)	MT41 (³He,2n+p) or MT5 (Cd109 production)	48-Cd-116 MT16 (³ He,2n) >>



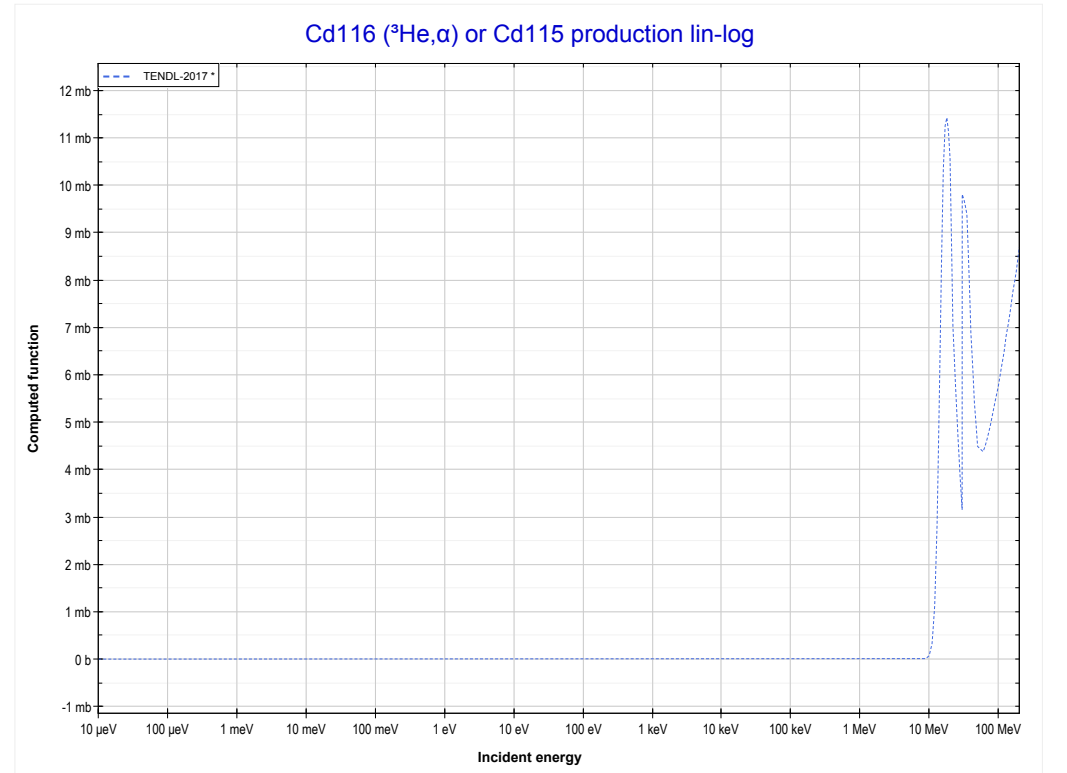
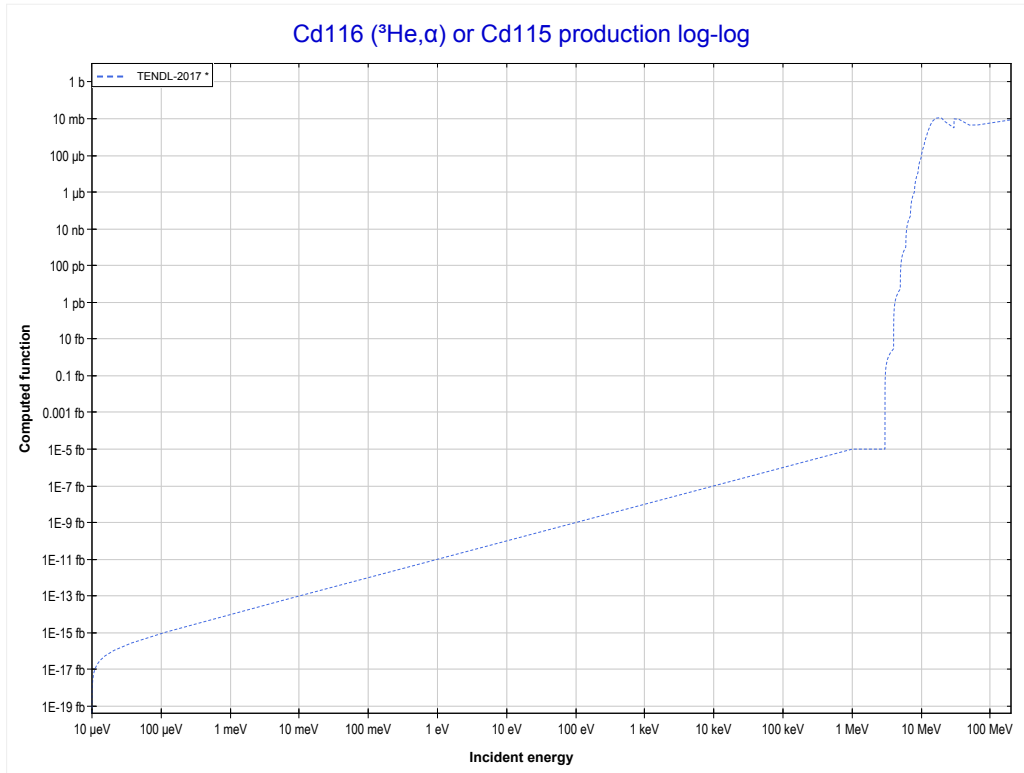
Reaction	Q-Value
Ag109(He3,t)Cd109	-234.09 keV
Ag109(He3,n+d)Cd109	-6491.32 keV
Ag109(He3,2n+p)Cd109	-8715.89 keV

<< 47-Ag-109	48-Cd-116	51-Sb-123 >>
<< 47-Ag-109 MT41 ($^3\text{He},2n+p$)	MT16 ($^3\text{He},2n$) or MT5 (Sn117 production)	MT107 ($^3\text{He},\alpha$) >>



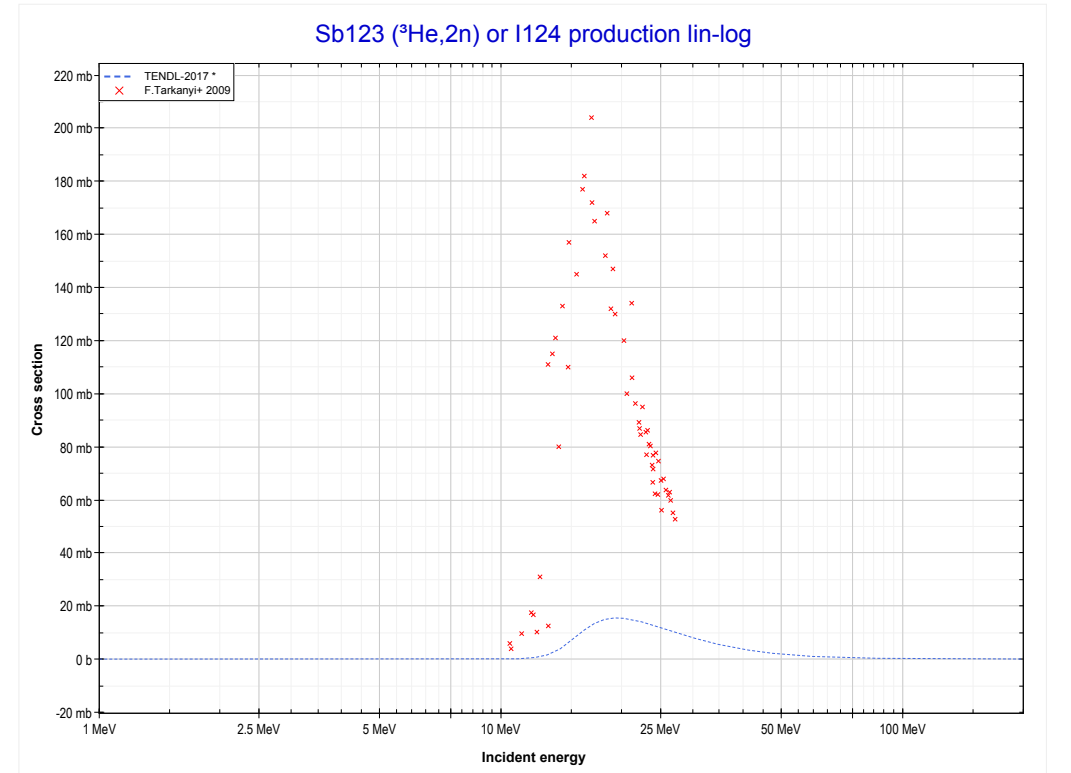
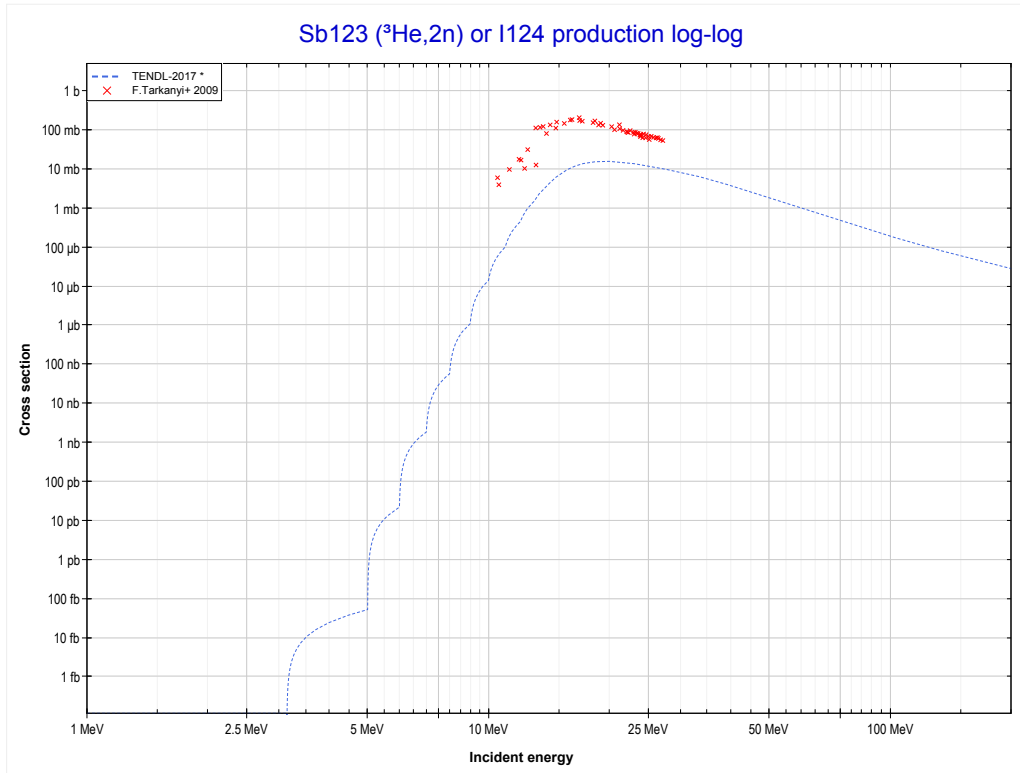
Reaction	Q-Value
Cd116(He3,2n)Sn117	473.82 keV

<< 47-Ag-107	48-Cd-116	73-Ta-181 >>
<< MT16 (³ He,2n)	MT107 (³He,α) or MT5 (Cd115 production)	51-Sb-123 MT16 (³ He,2n) >>



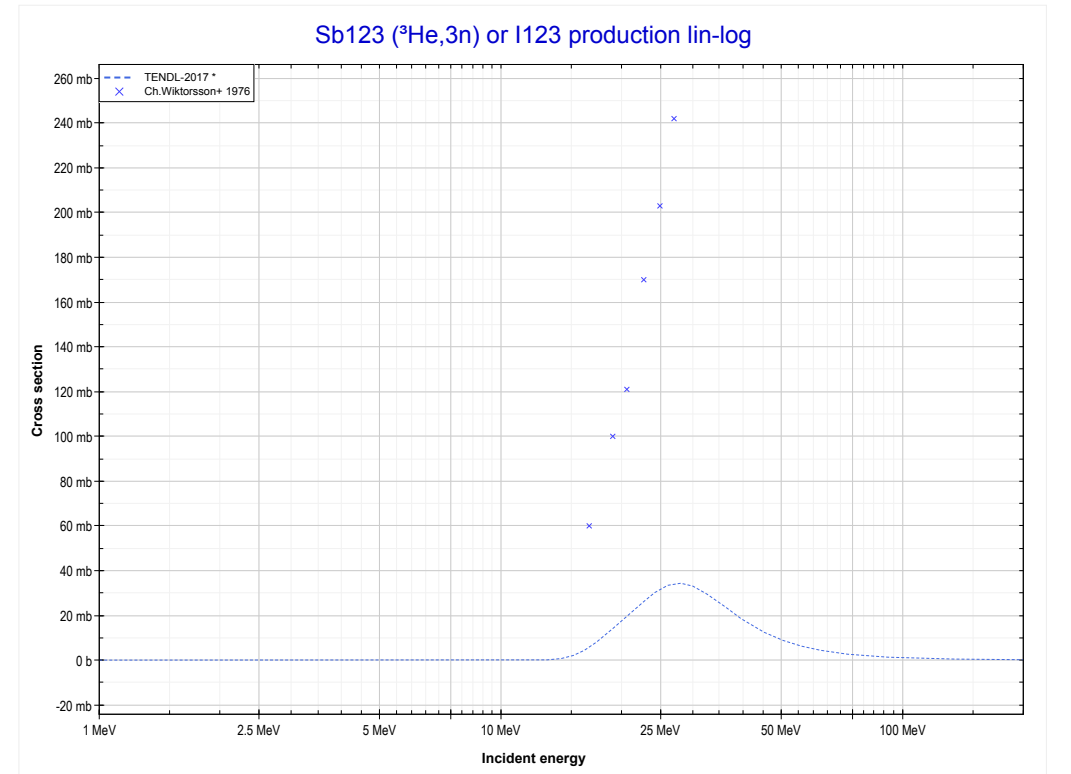
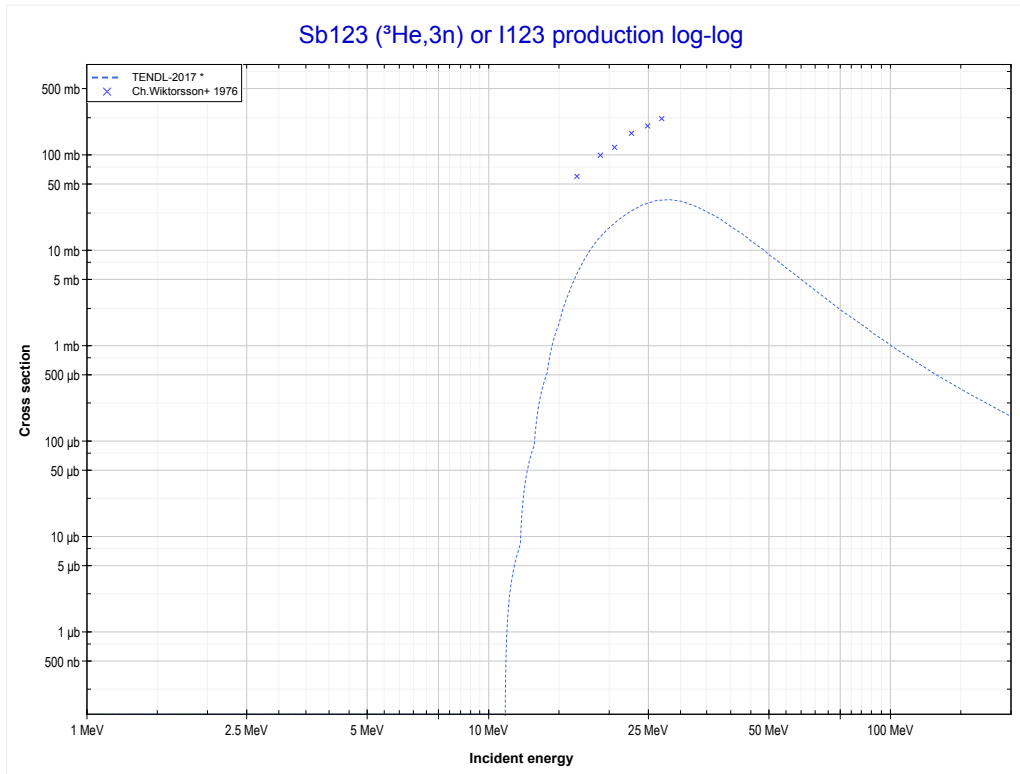
Reaction	Q-Value
Cd116(He3,α)Cd115	11878.14 keV
Cd116(He3,p+t)Cd115	-7935.72 keV
Cd116(He3,n+He3)Cd115	-8699.48 keV
Cd116(He3,2d)Cd115	-11968.39 keV
Cd116(He3,n+p+d)Cd115	-14192.95 keV
Cd116(He3,2n+2p)Cd115	-16417.52 keV

<< 48-Cd-116	51-Sb-123	73-Ta-181 >>
<< 48-Cd-116 MT107 ($^3\text{He},\alpha$)	MT16 ($^3\text{He},2n$) or MT5 (I124 production)	MT17 ($^3\text{He},3n$) >>



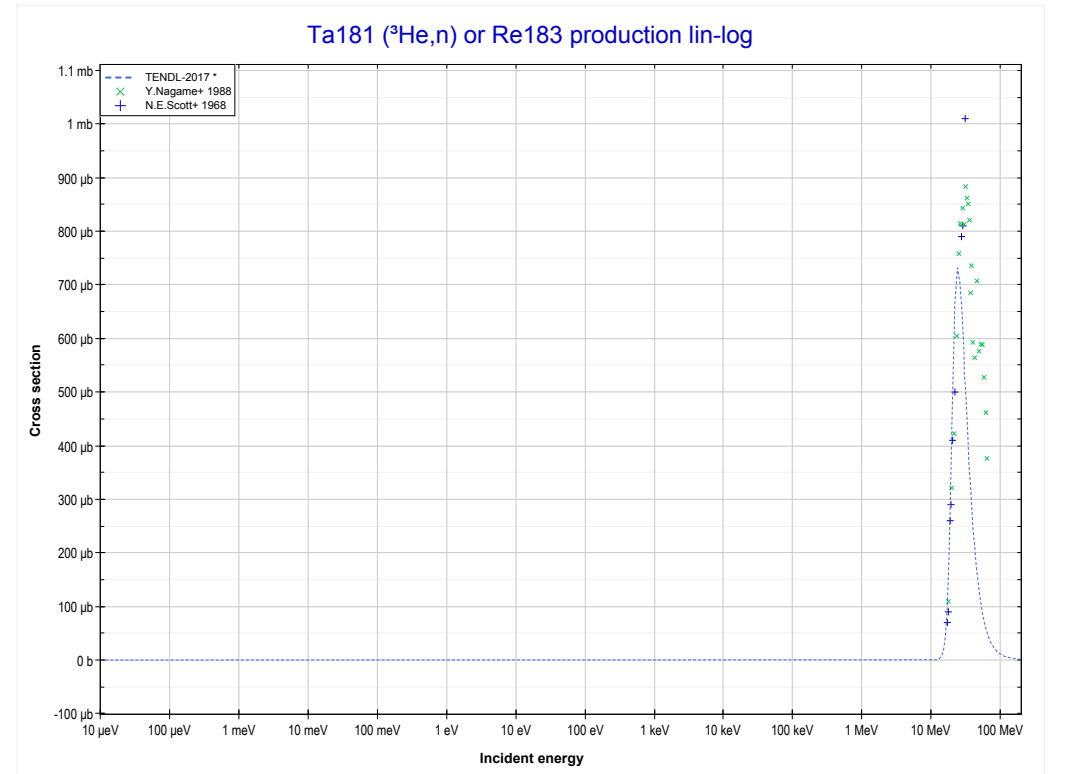
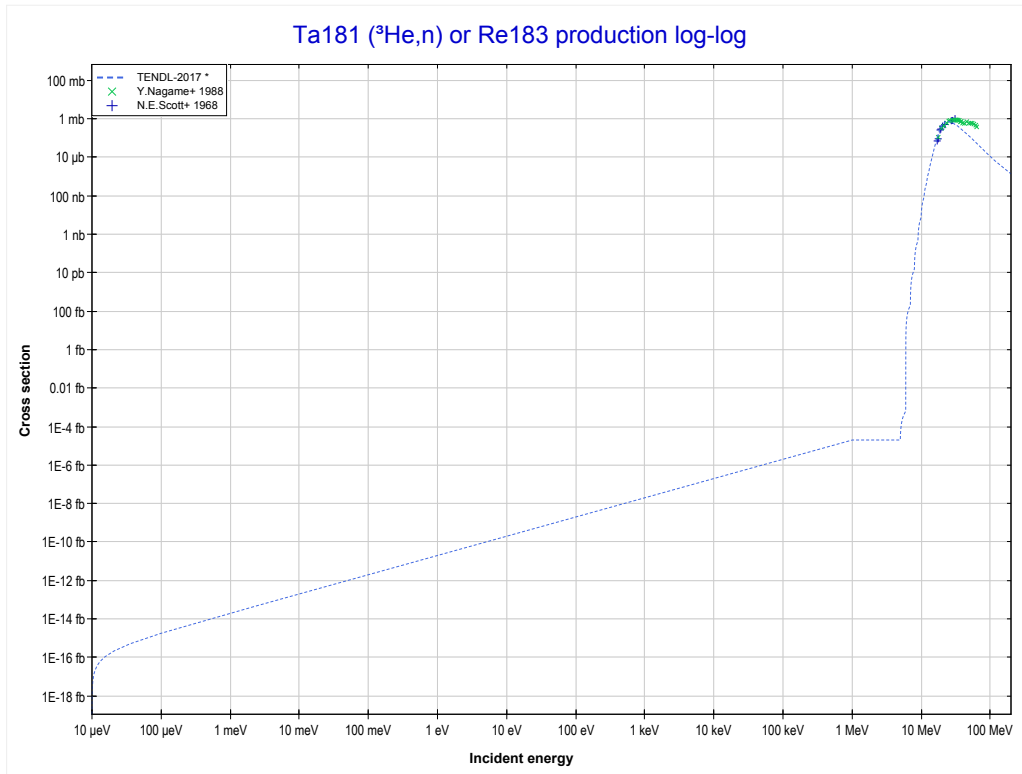
Reaction	Q-Value
Sb123(He3,2n)I124	-3070.52 keV

<< 47-Ag-109	51-Sb-123	73-Ta-181 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (I123 production)	73-Ta-181 MT4 ($^3\text{He},n$) >>



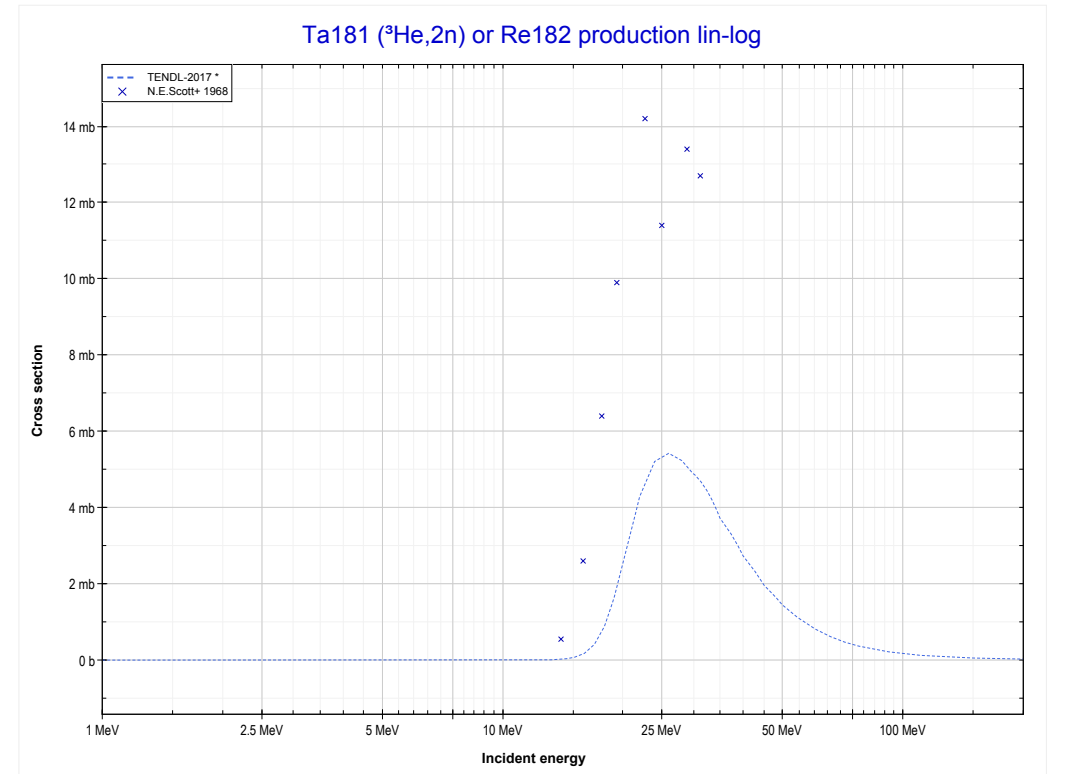
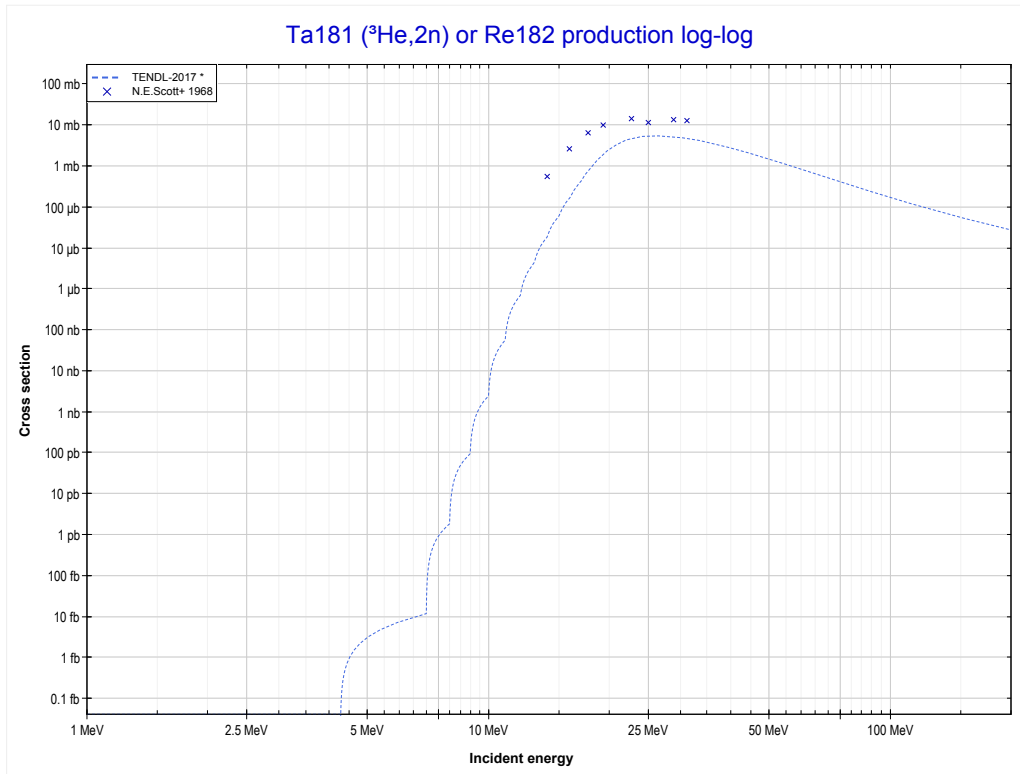
Reaction	Q-Value
Sb123(He3,3n)I123	-10563.54 keV

<< 47-Ag-109	73-Ta-181	82-Pb-208 >>
<< 51-Sb-123 MT17 (³ He,3n)	MT4 (³He,n) or MT5 (Re183 production)	MT16 (³ He,2n) >>



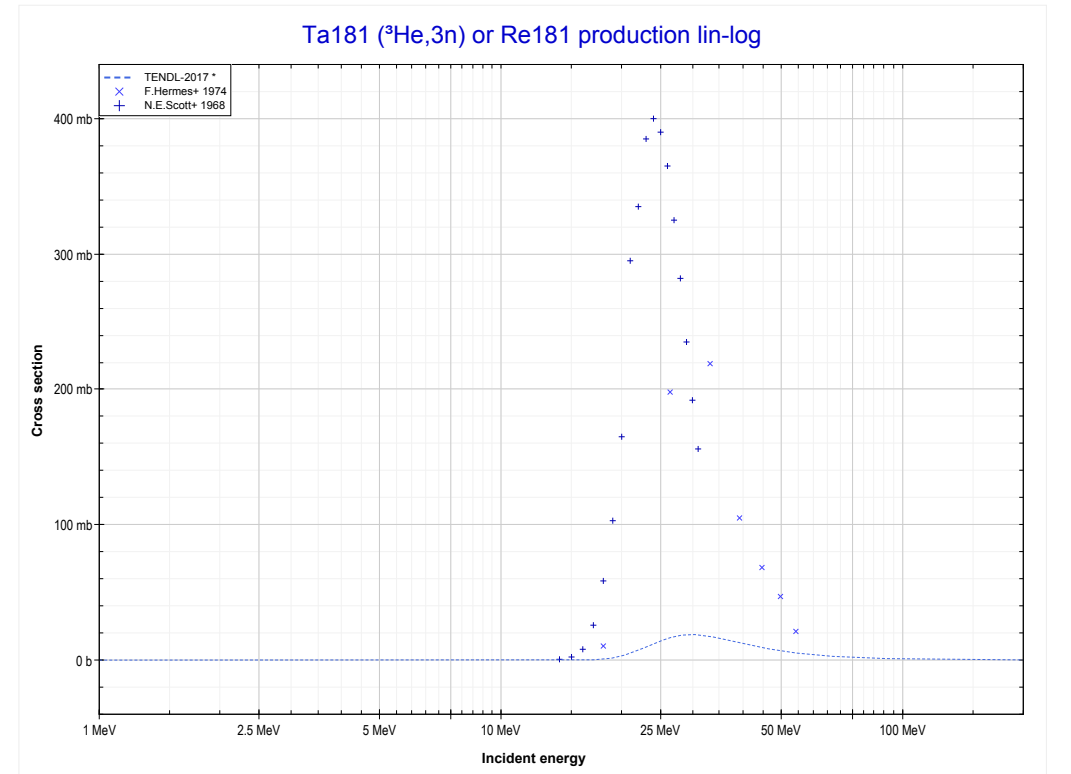
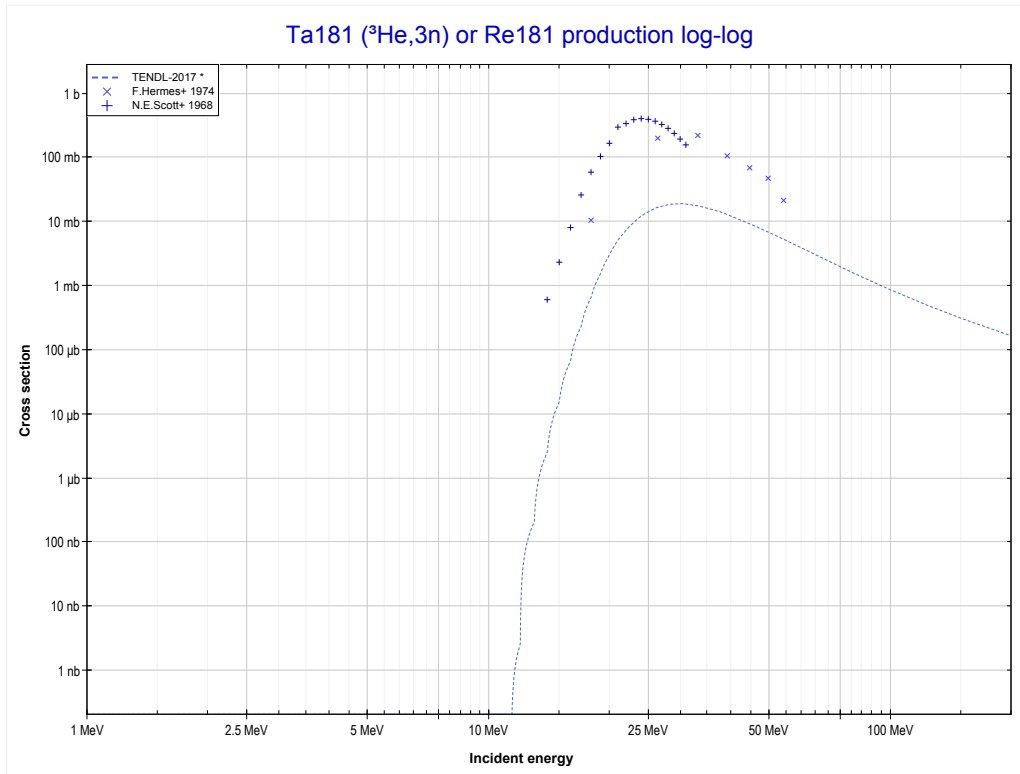
Reaction	Q-Value
Ta181(He3,n)Re183	4229.30 keV

<< 51-Sb-123	73-Ta-181	78-Pt-194 >>
<< MT4 ($^3\text{He},n$)	MT16 ($^3\text{He},2n$) or MT5 (Re182 production)	MT17 ($^3\text{He},3n$) >>



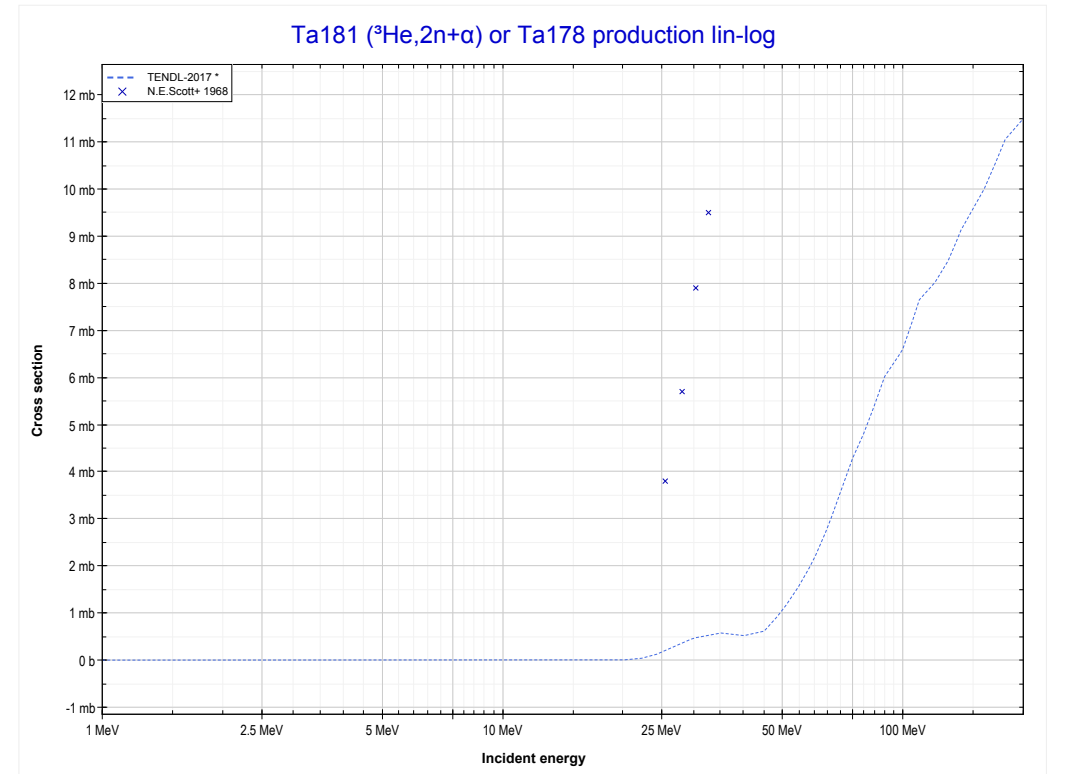
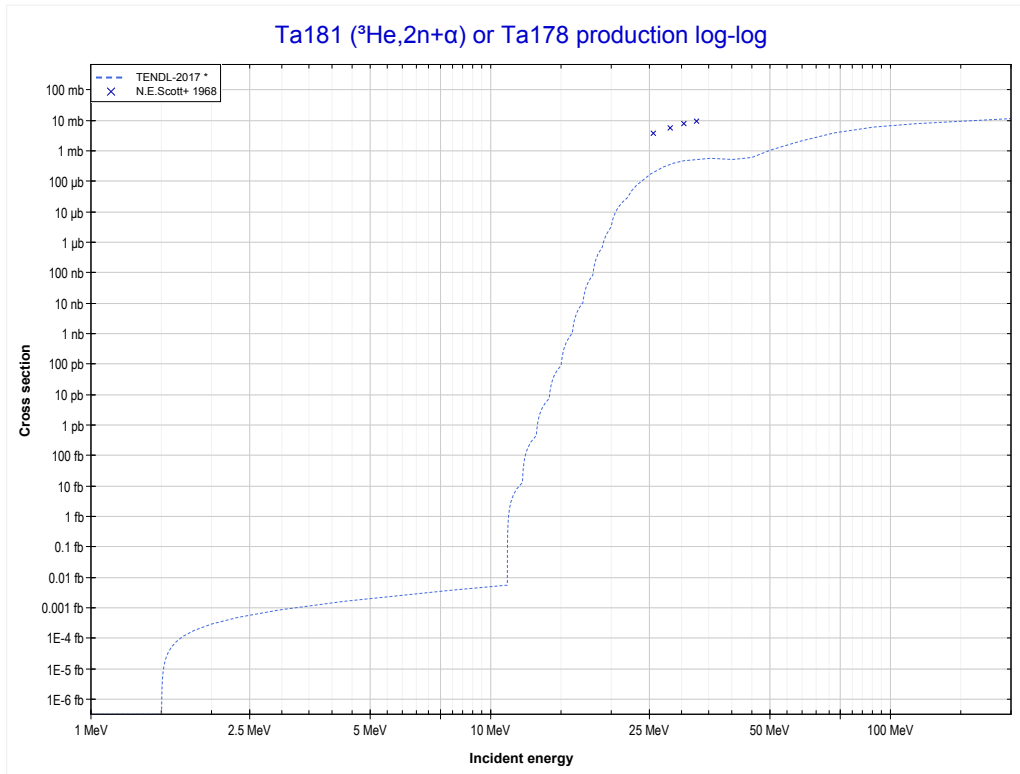
Reaction	Q-Value
Ta181($\text{He}3,2n$)Re182	-4203.02 keV

<< 51-Sb-123	73-Ta-181	75-Re-187 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (Re181 production)	MT24 ($^3\text{He},2n+\alpha$) >>



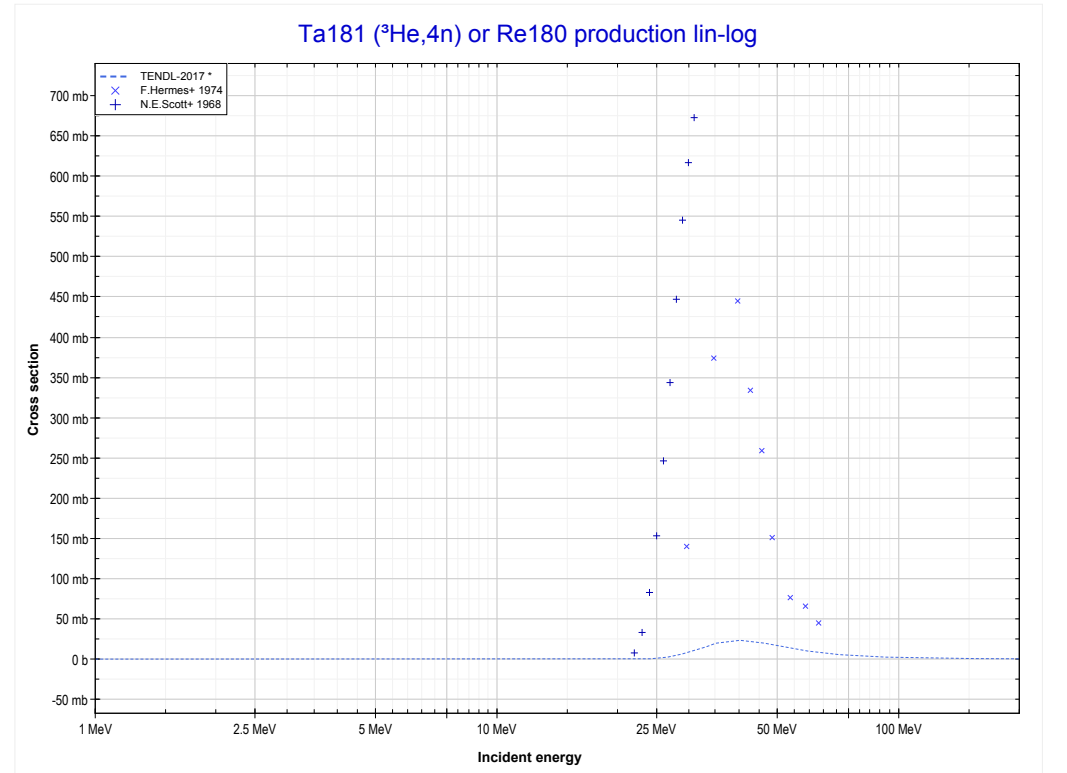
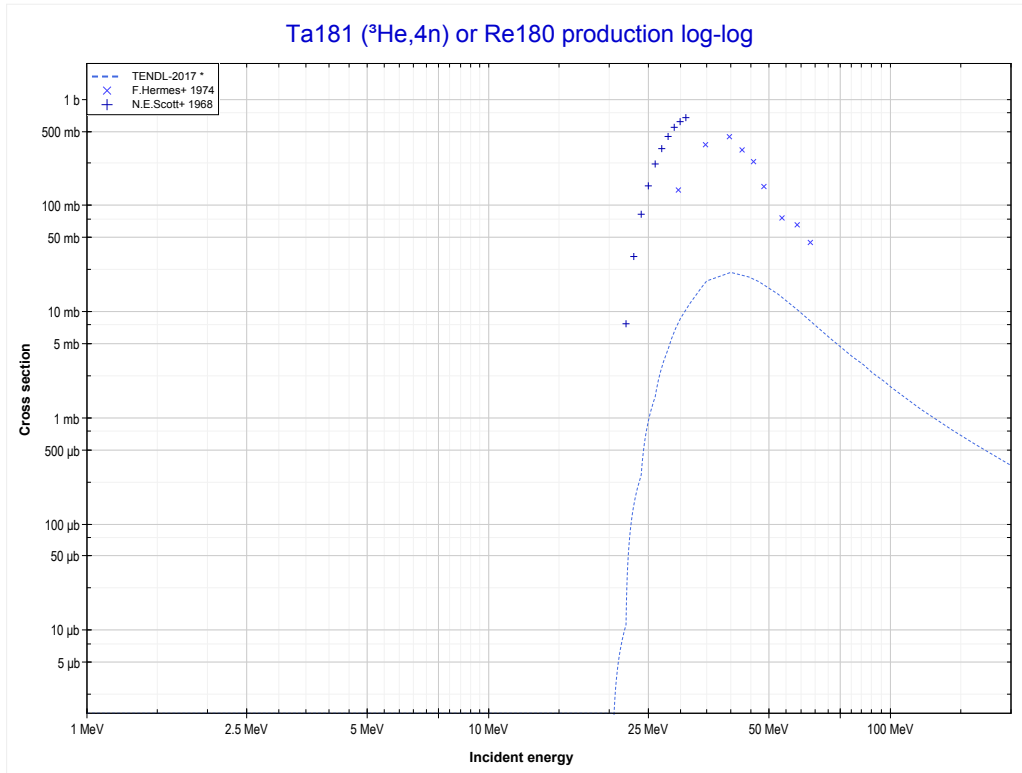
Reaction	Q-Value
Ta181(He3,3n)Re181	-11203.34 keV

<< 27-Co-59	73-Ta-181	83-Bi-209 >>
<< MT17 (³ He,3n)	MT24 (³He,2n+α) or MT5 (Ta178 production)	MT37 (³ He,4n) >>



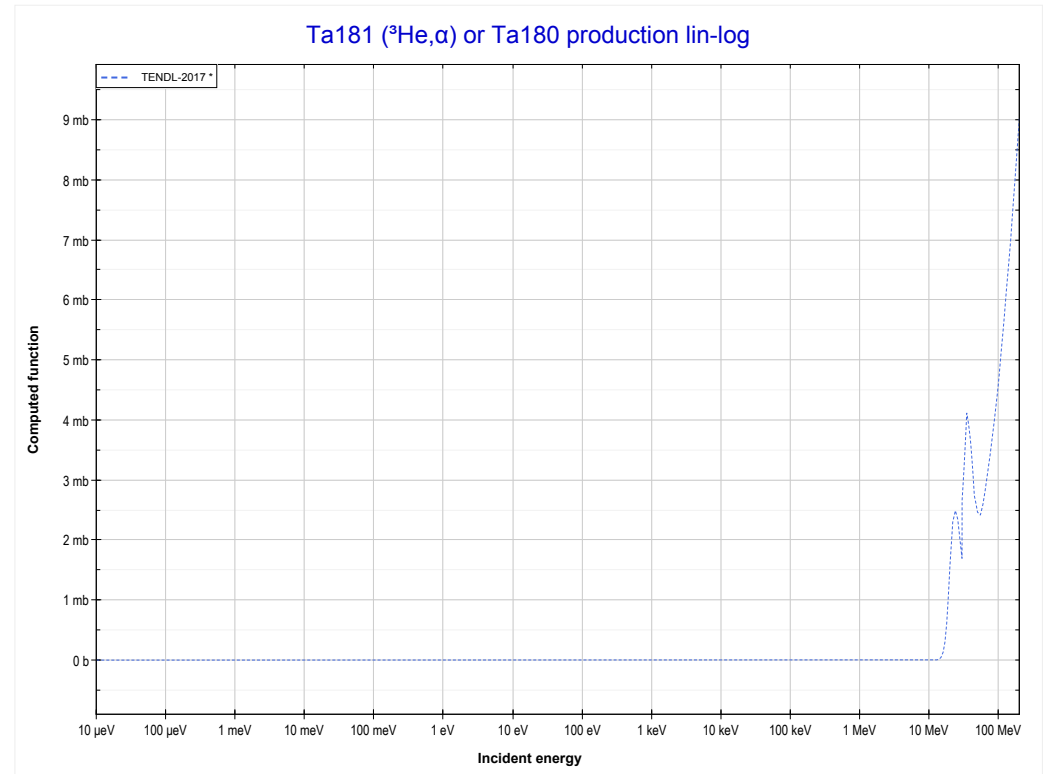
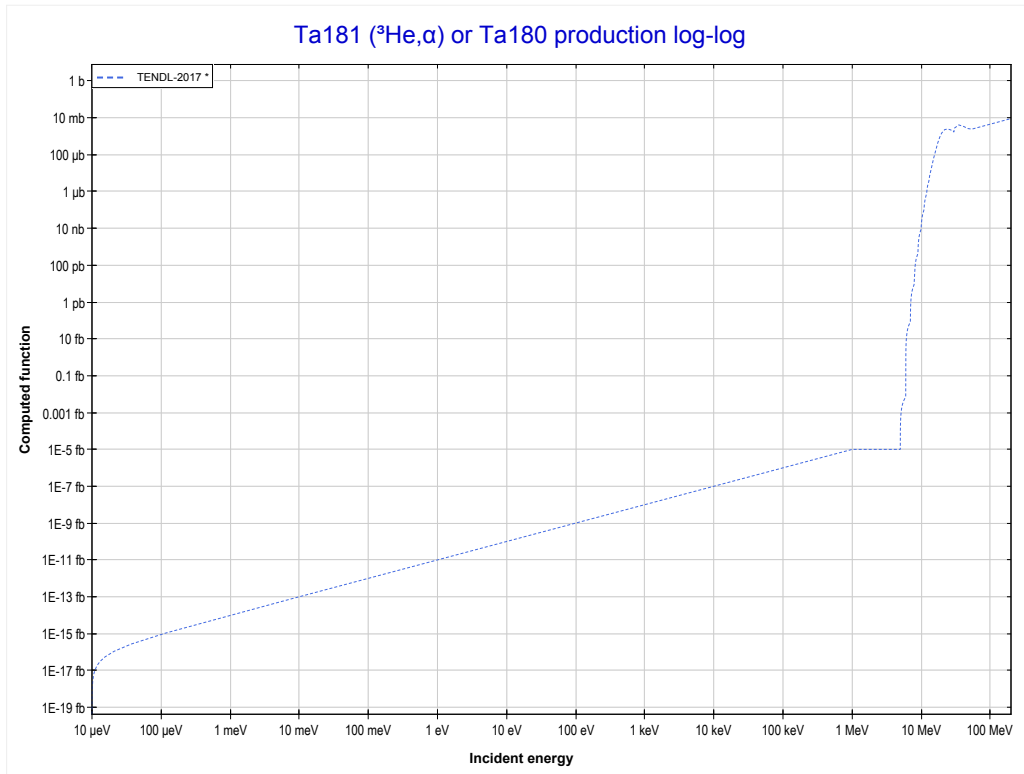
Reaction	Q-Value
Ta181(He3,2n+α)Ta178	-1477.93 keV
Ta181(He3,2t)Ta178	-12810.00 keV
Ta181(He3,n+d+t)Ta178	-19067.23 keV
Ta181(He3,2n+p+t)Ta178	-21291.80 keV
Ta181(He3,3n+He3)Ta178	-22055.55 keV
Ta181(He3,2n+2d)Ta178	-25324.46 keV
Ta181(He3,3n+p+d)Ta178	-27549.03 keV
Ta181(He3,4n+2p)Ta178	-29773.59 keV

<< 47-Ag-109	73-Ta-181	75-Re-187 >>
<< MT24 ($^3\text{He}, 2n+\alpha$)	MT37 ($^3\text{He}, 4n$) or MT5 (Re180 production)	MT107 ($^3\text{He}, \alpha$) >>



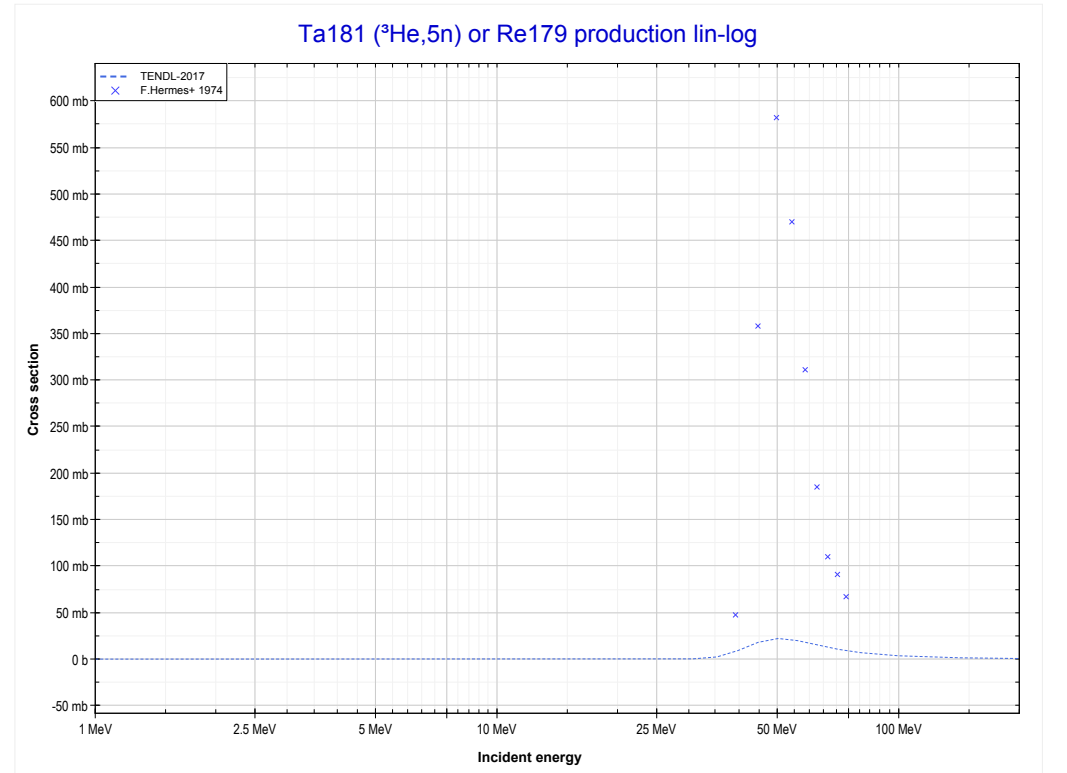
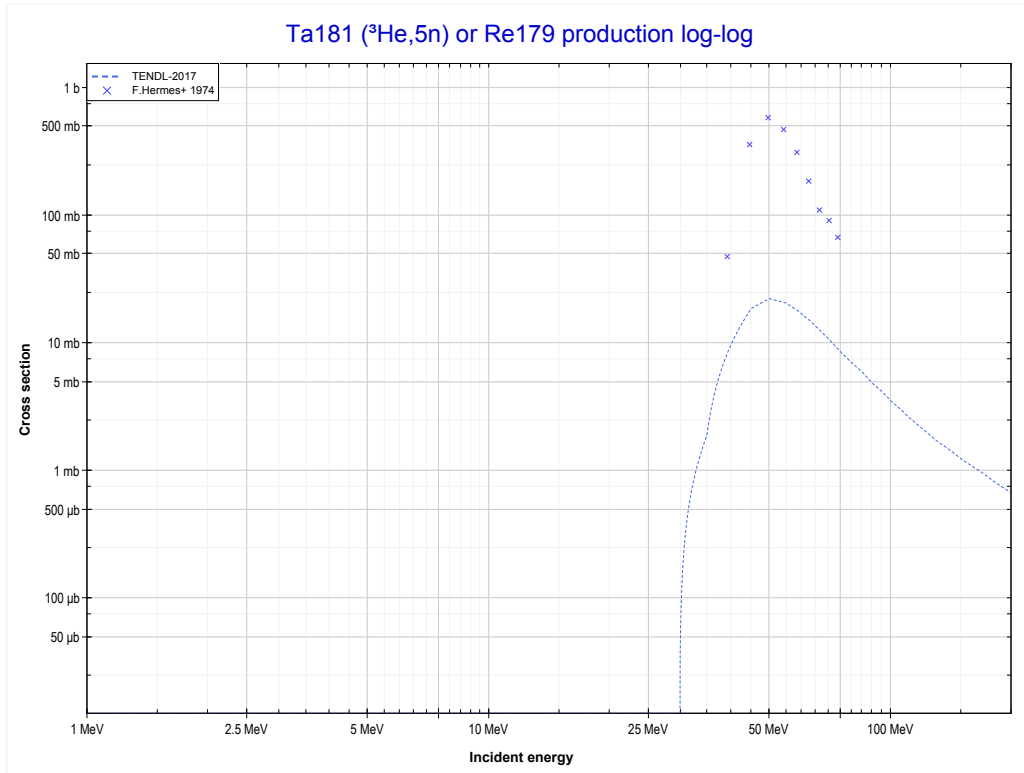
Reaction	Q-Value
Ta181($\text{He}3,4n$)Re180	-19958.65 keV

<< 48-Cd-116	73-Ta-181	75-Re-185 >>
<< MT37 (³ He,4n)	MT107 (³He,α) or MT5 (Ta180 production)	MT152 (³ He,5n) >>



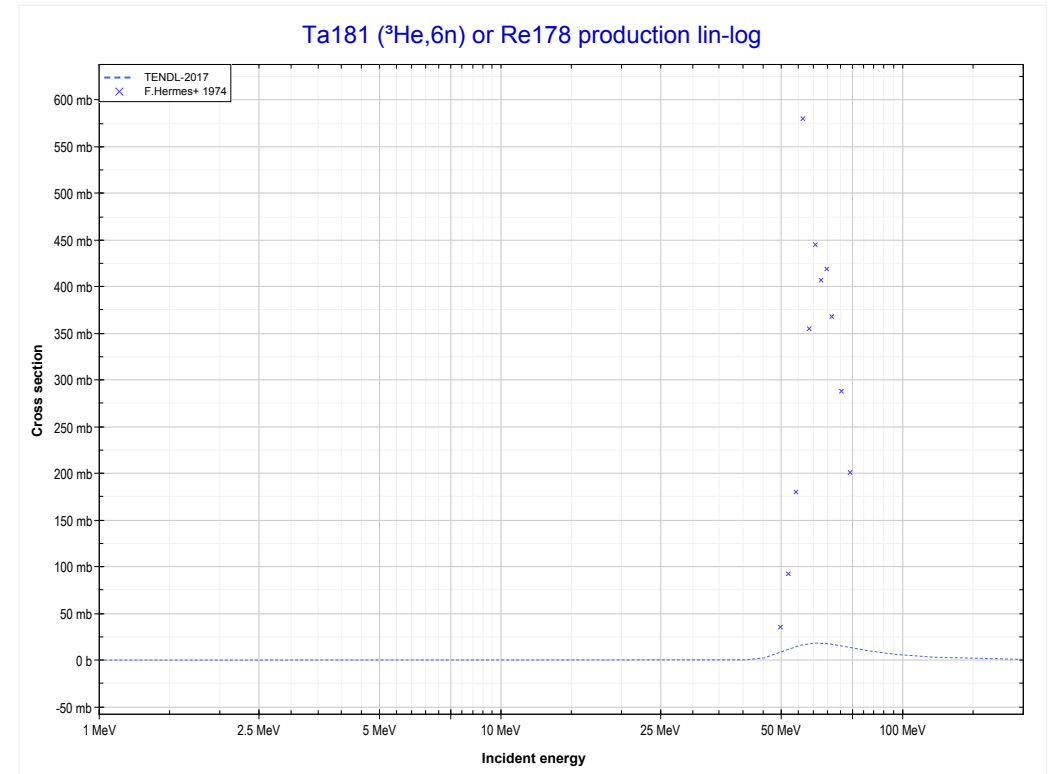
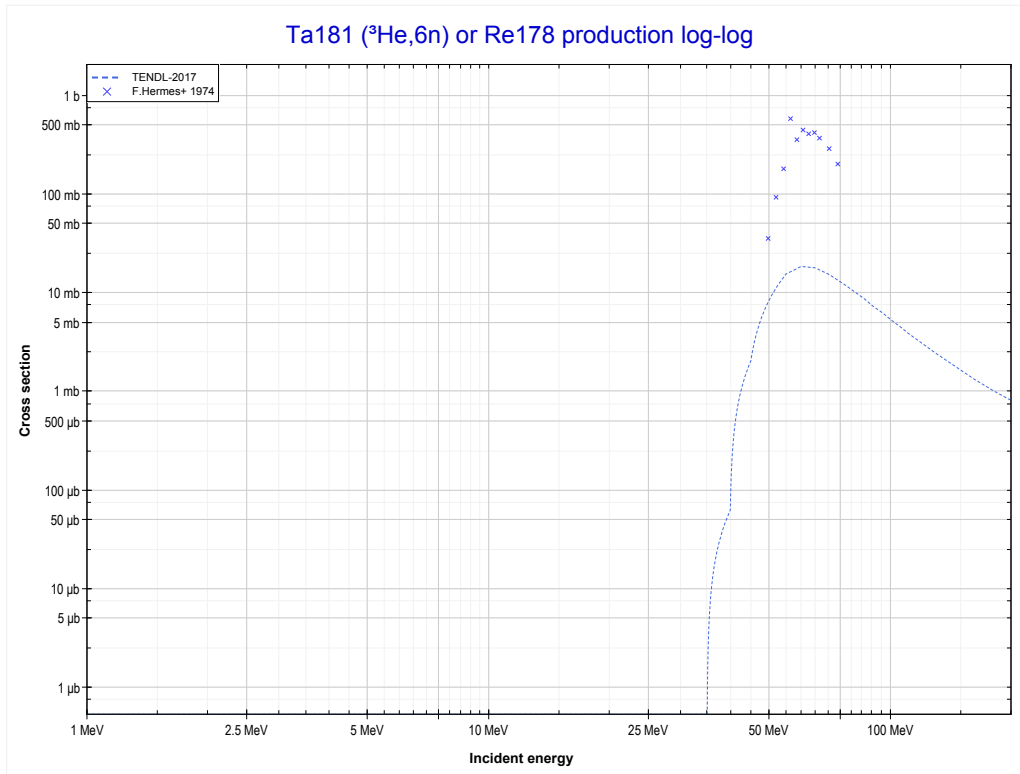
Reaction	Q-Value
Ta181(He3,α)Ta180	13000.90 keV
Ta181(He3,p+t)Ta180	-6812.96 keV
Ta181(He3,n+He3)Ta180	-7576.72 keV
Ta181(He3,2d)Ta180	-10845.63 keV
Ta181(He3,n+p+d)Ta180	-13070.19 keV
Ta181(He3,2n+2p)Ta180	-15294.76 keV

	73-Ta-181	75-Re-187 >>
<< MT107 (³He,α)	MT152 (³He,5n) or MT5 (Re179 production)	MT153 (³He,6n) >>



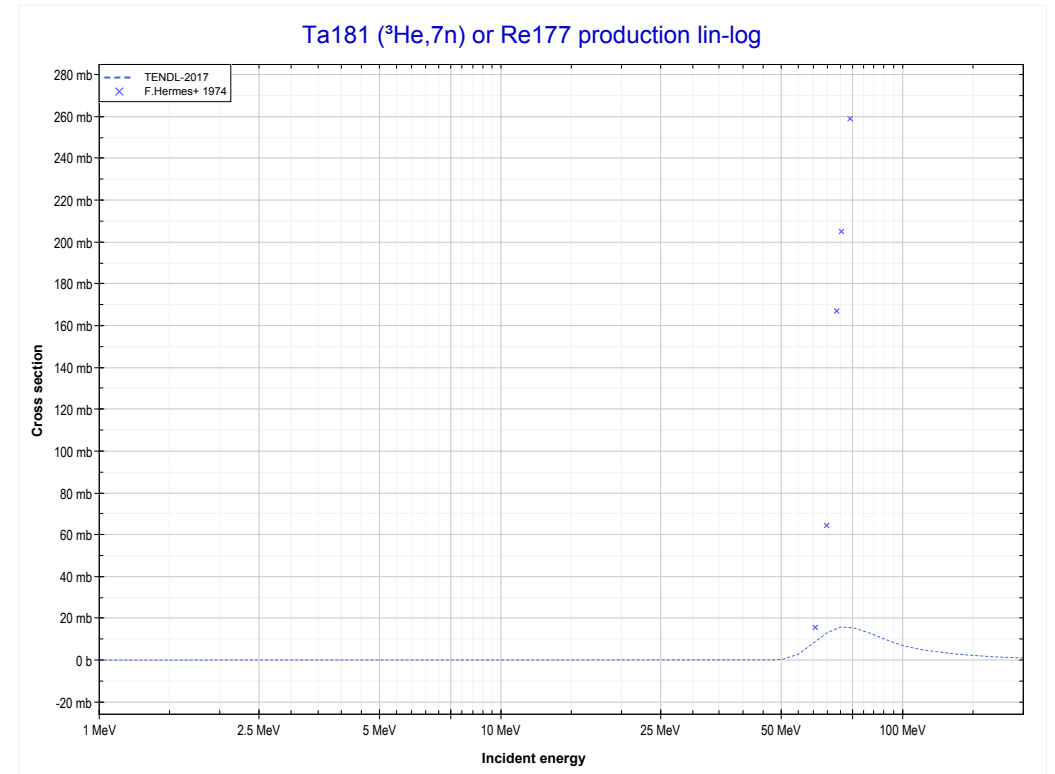
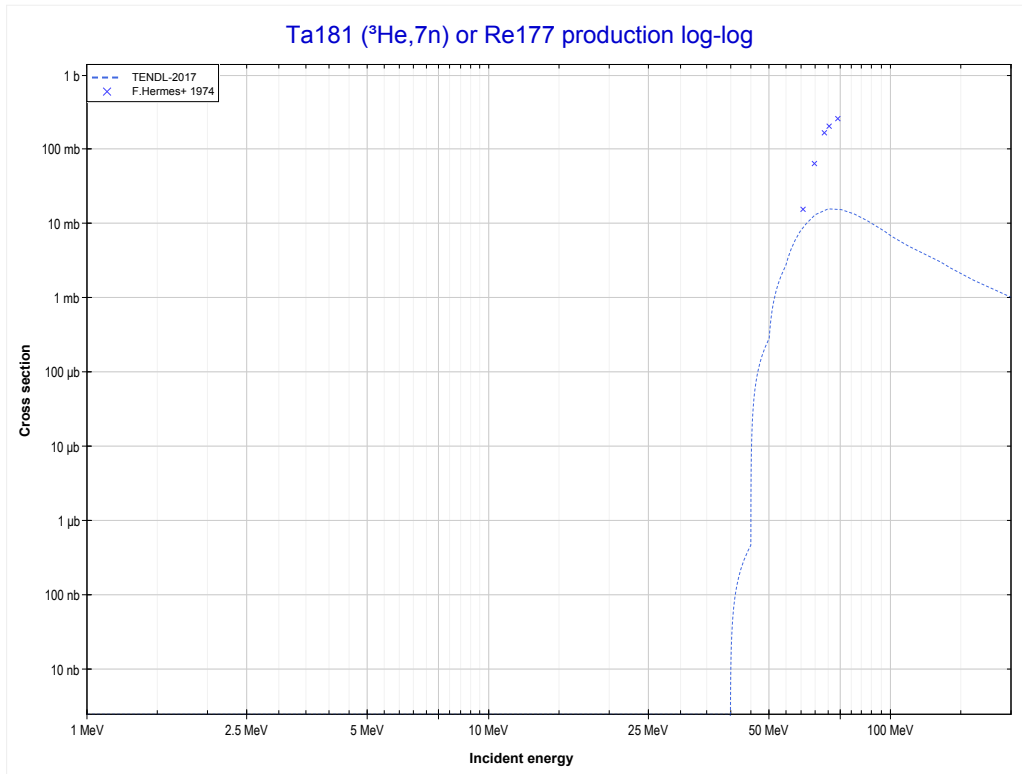
Reaction	Q-Value
Ta181(He3,5n)Re179	-27281.97 keV

	73-Ta-181	75-Re-187 >>
<< MT152 (³He,5n)	MT153 (³He,6n) or MT5 (Re178 production)	MT160 (³He,7n) >>



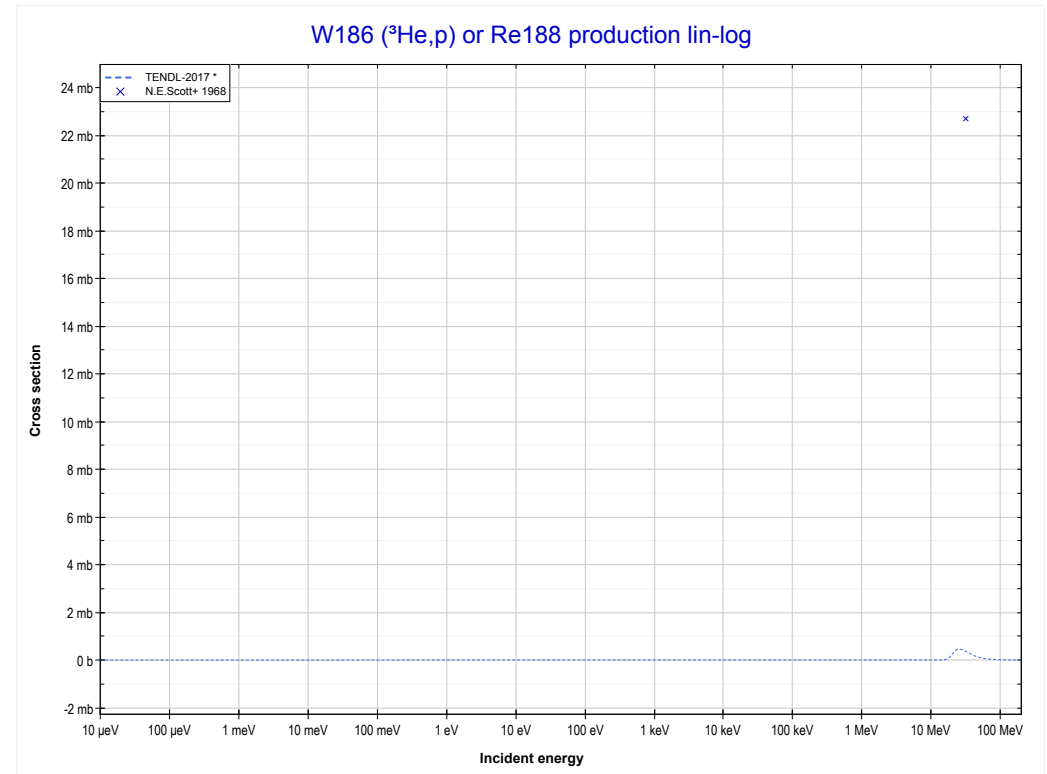
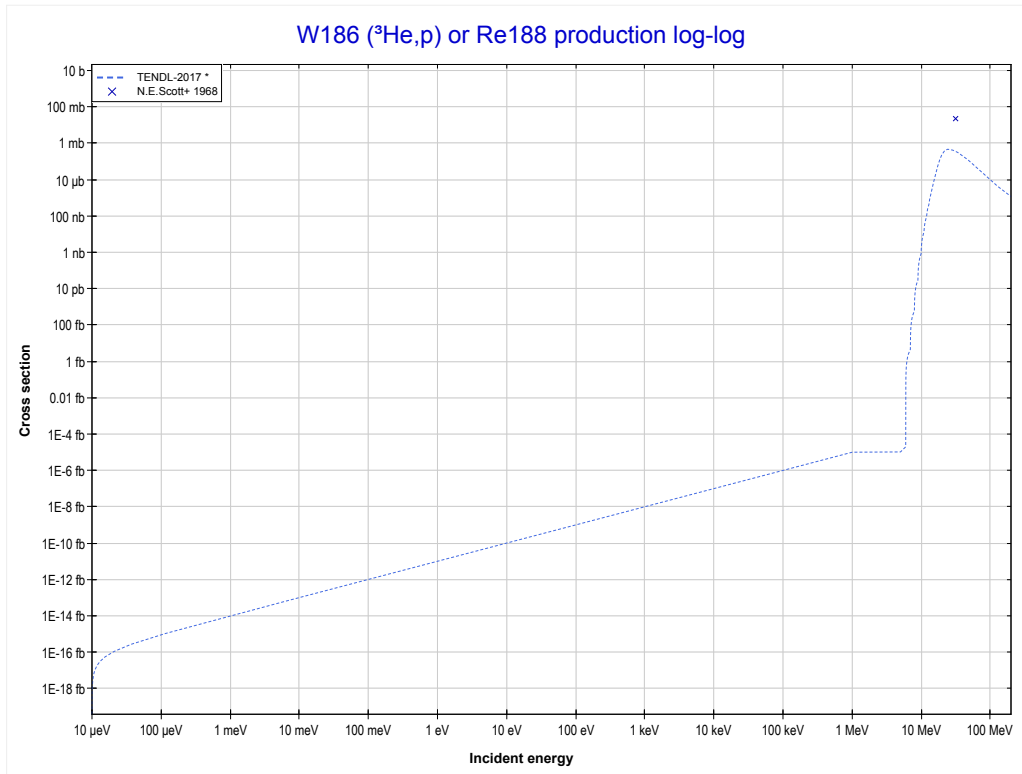
Reaction	Q-Value
Ta181(He3,6n)Re178	-36285.29 keV

	73-Ta-181	83-Bi-209 >>
<< MT153 (³ He,6n)	MT160 (³He,7n) or MT5 (Re177 production)	74-W-186 MT103 (³ He,p) >>



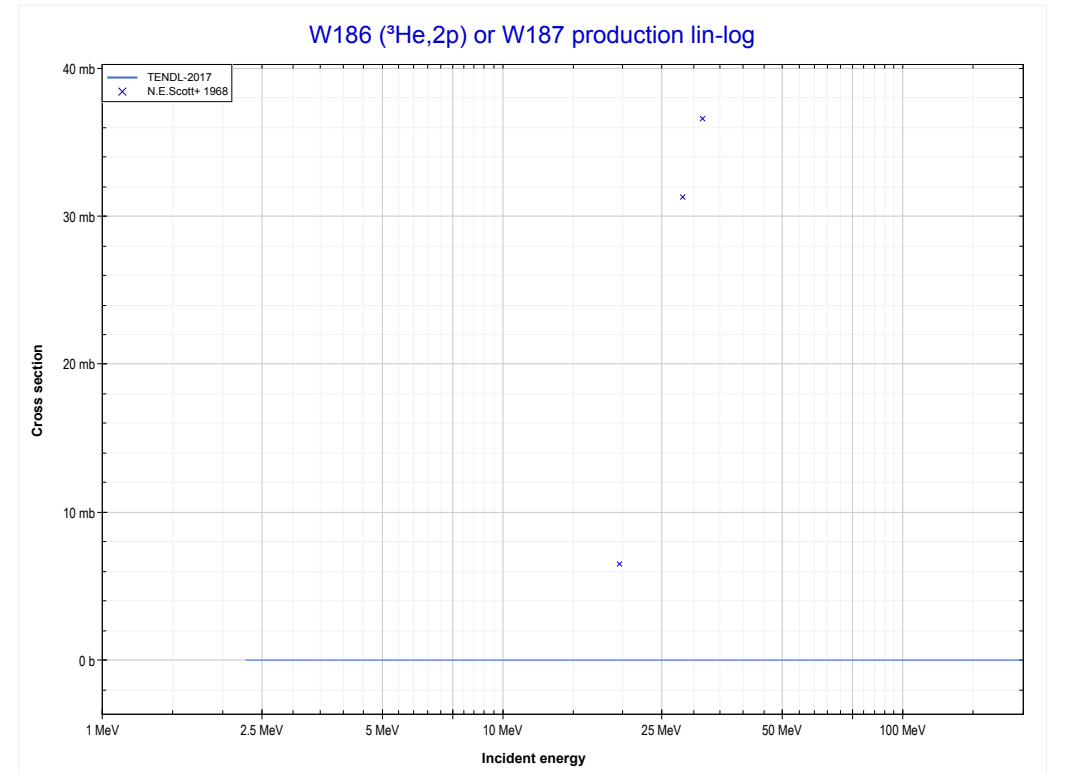
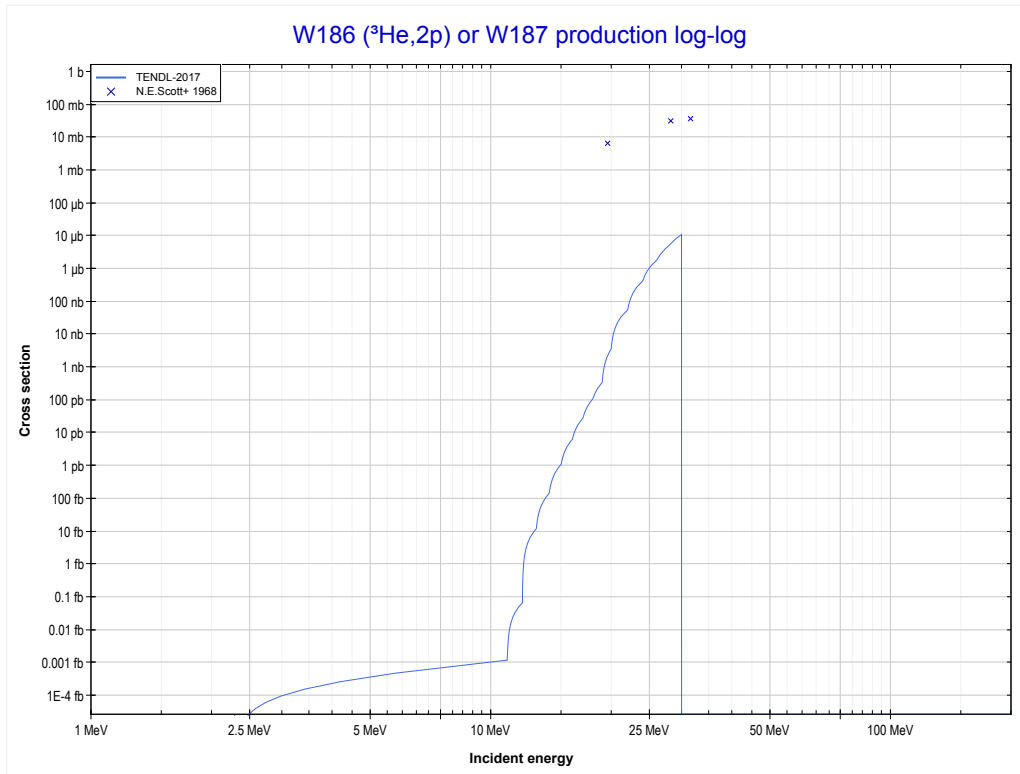
Reaction	Q-Value
Ta181(He3,7n)Re177	-43740.60 keV

<< 38-Sr-88	74-W-186	
<< 73-Ta-181 MT160 (³ He,7n)	MT103 (³He,p) or MT5 (Re188 production)	MT111 (³ He,2p) >>



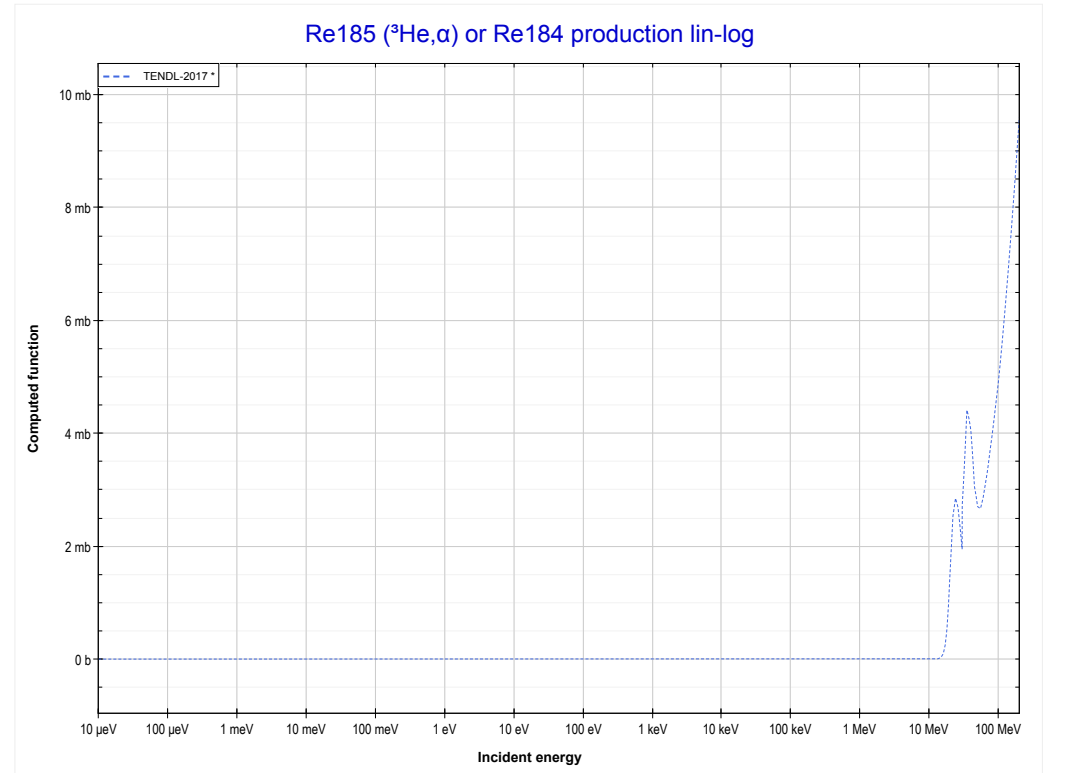
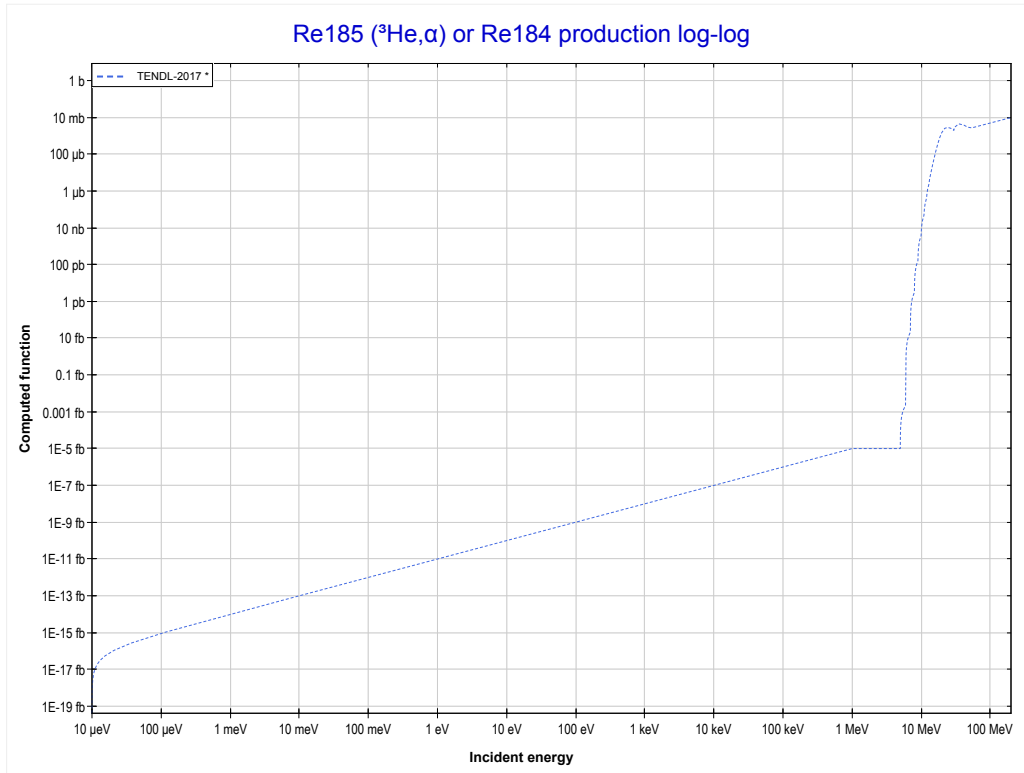
Reaction	Q-Value
W186(He3,p)Re188	4150.34 keV

<< 44-Ru-102	74-W-186	75-Re-185 >>
<< MT103 (³ He,p)	MT111 (³He,2p) or MT5 (W187 production)	75-Re-185 MT107 (³ He,α) >>



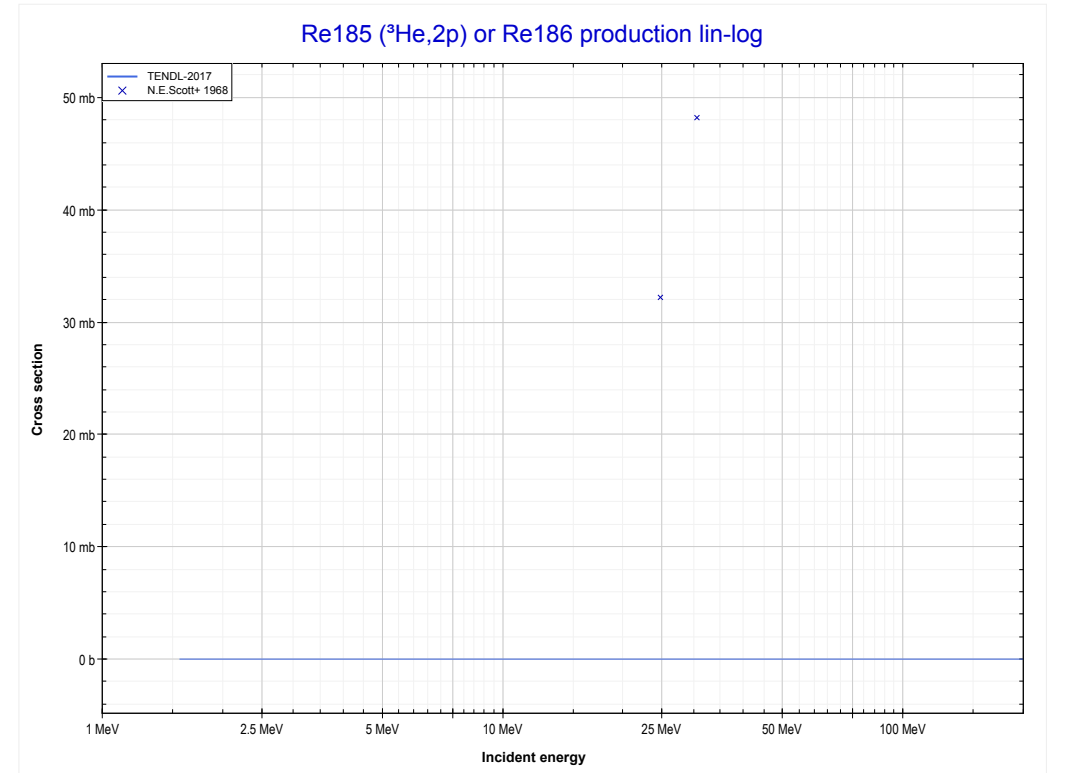
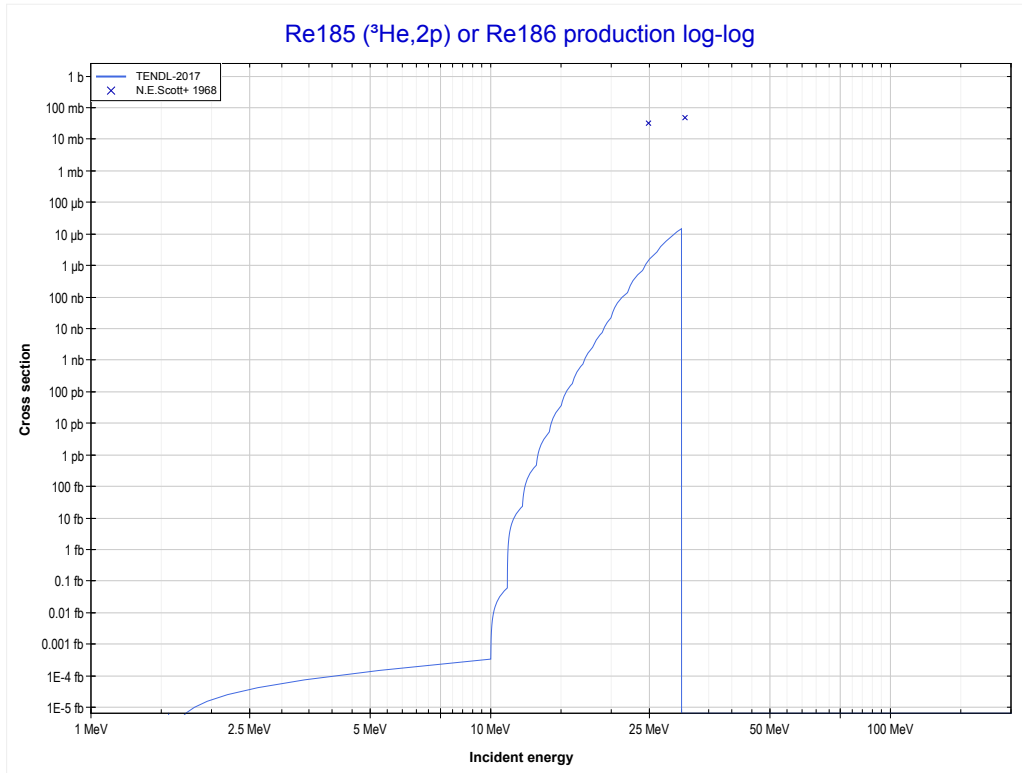
Reaction	Q-Value
W186(He3,2p)W187	-2251.23 keV

<< 73-Ta-181	75-Re-185	75-Re-187 >>
<< 74-W-186 MT111 (³ He,2p)	MT107 (³He,α) or MT5 (Re184 production)	MT111 (³ He,2p) >>



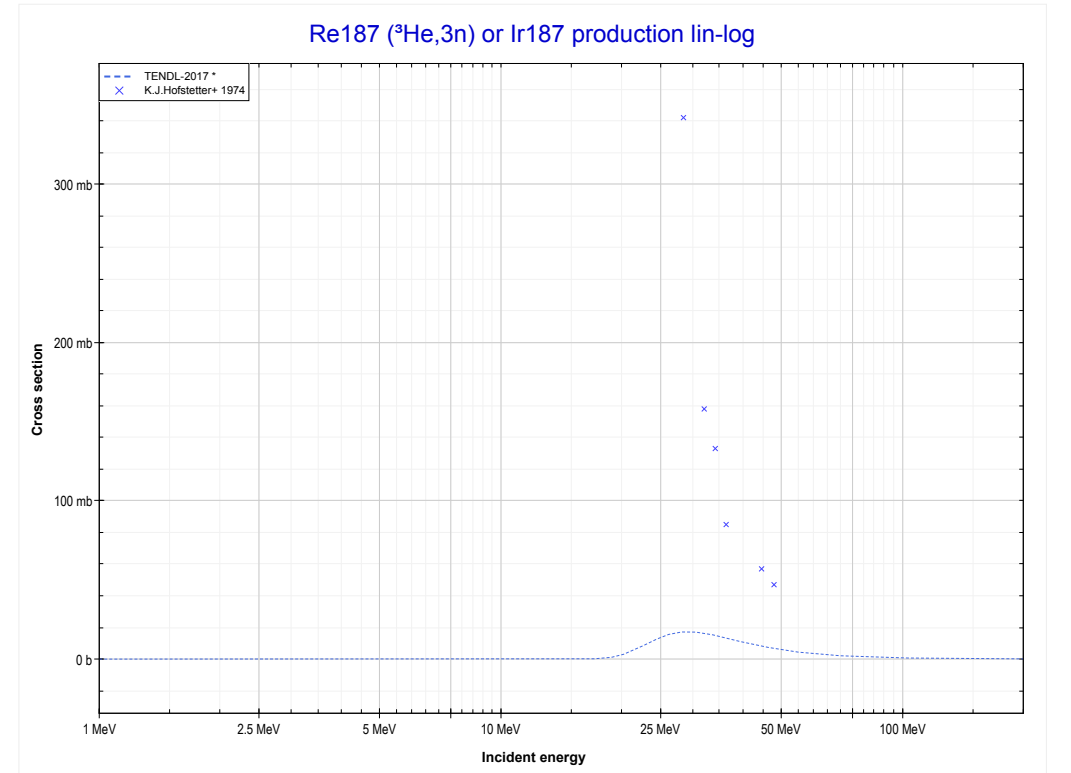
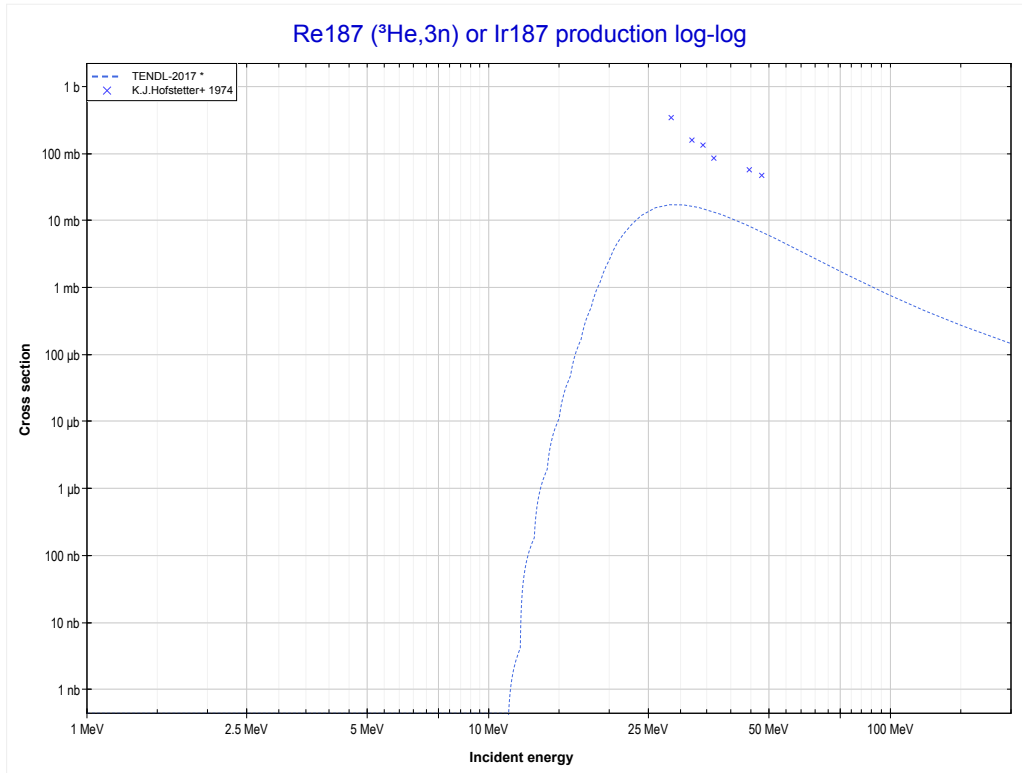
Reaction	Q-Value
Re185(He3,α)Re184	12908.70 keV
Re185(He3,p+t)Re184	-6905.16 keV
Re185(He3,n+He3)Re184	-7668.92 keV
Re185(He3,2d)Re184	-10937.83 keV
Re185(He3,n+p+d)Re184	-13162.39 keV
Re185(He3,2n+2p)Re184	-15386.96 keV

<< 74-W-186	75-Re-185	79-Au-197 >>
<< MT107 ($^3\text{He},\alpha$)	MT111 ($^3\text{He},2p$) or MT5 (Re186 production)	75-Re-187 MT17 ($^3\text{He},3n$) >>



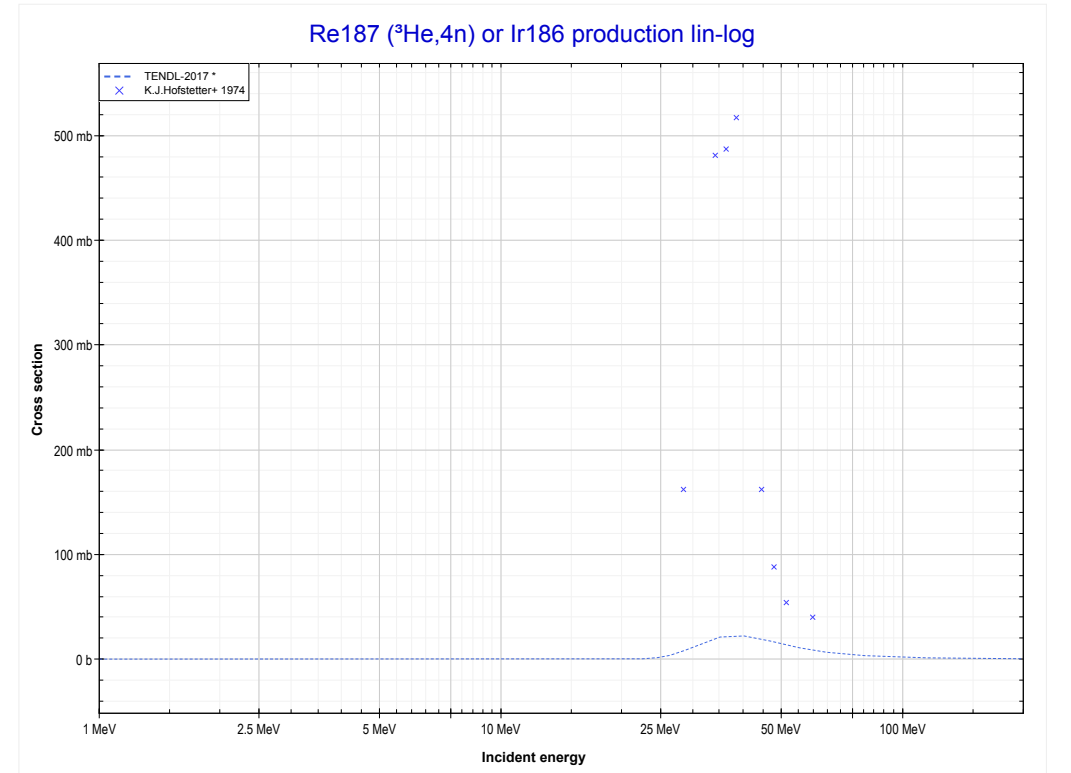
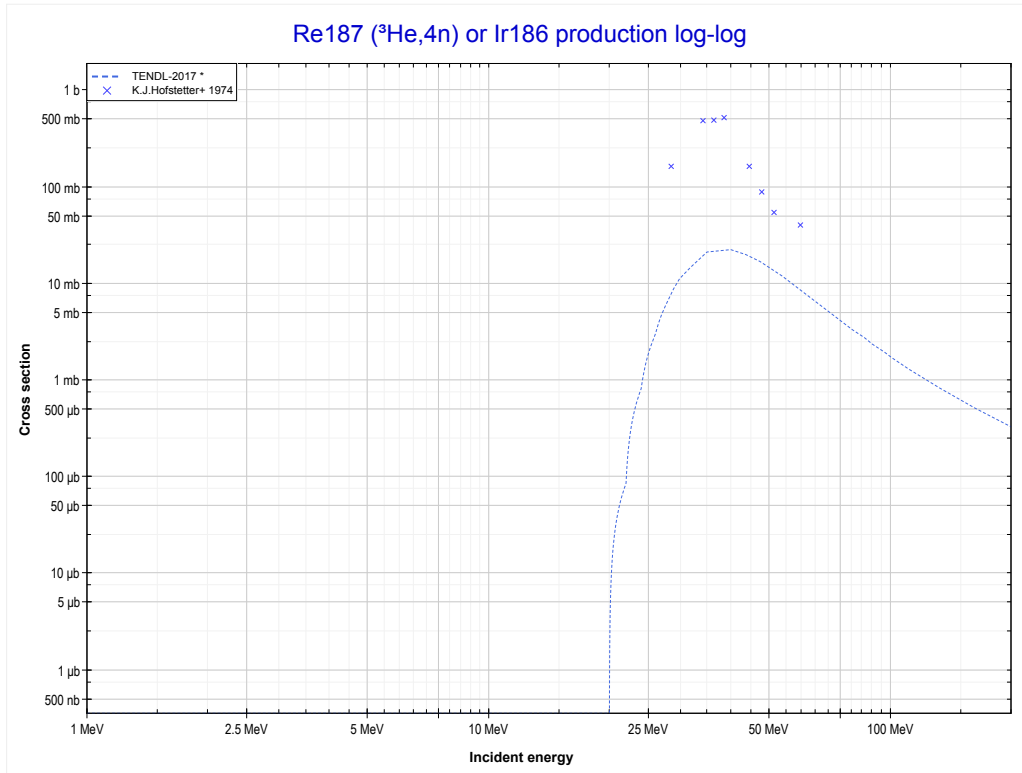
Reaction	Q-Value
Re185($\text{He}3,2p$)Re186	-1538.73 keV

<< 73-Ta-181	75-Re-187	79-Au-197 >>
<< 75-Re-185 MT111 (³ He,2p)	MT17 (³He,3n) or MT5 (Ir187 production)	MT37 (³ He,4n) >>



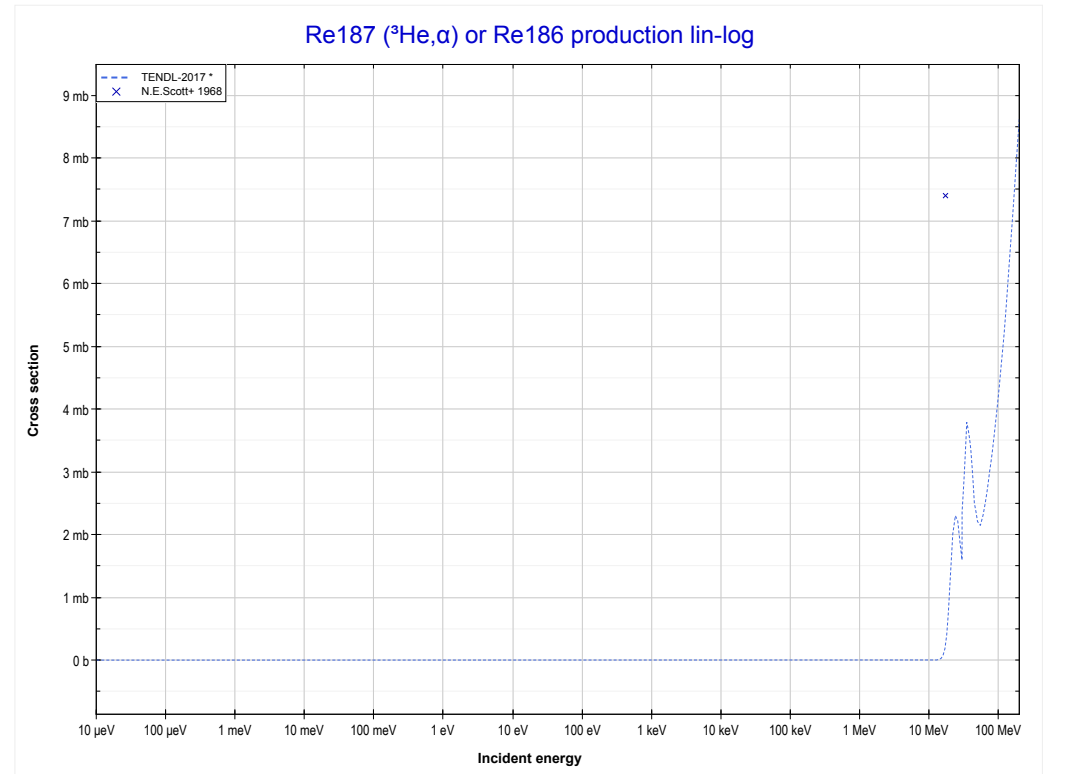
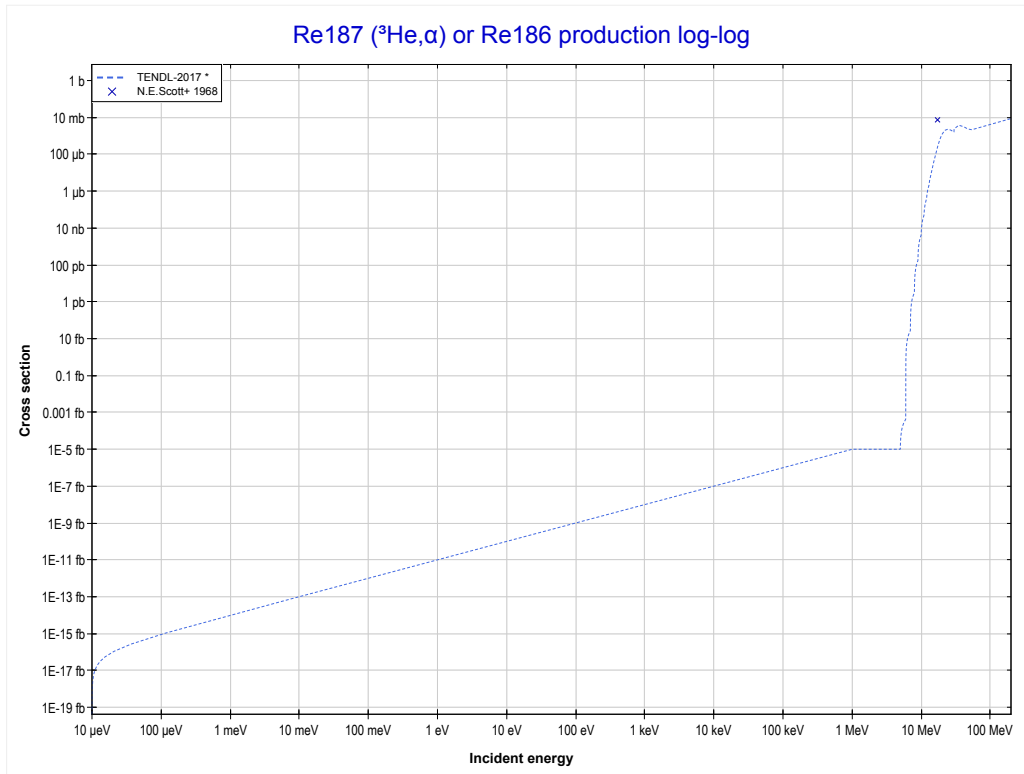
Reaction	Q-Value
Re187(He3,3n)Ir187	-10952.24 keV

<< 73-Ta-181	75-Re-187	76-Os-192 >>
<< MT17 ($^3\text{He},3n$)	MT37 ($^3\text{He},4n$) or MT5 (Ir186 production)	MT107 ($^3\text{He},\alpha$) >>



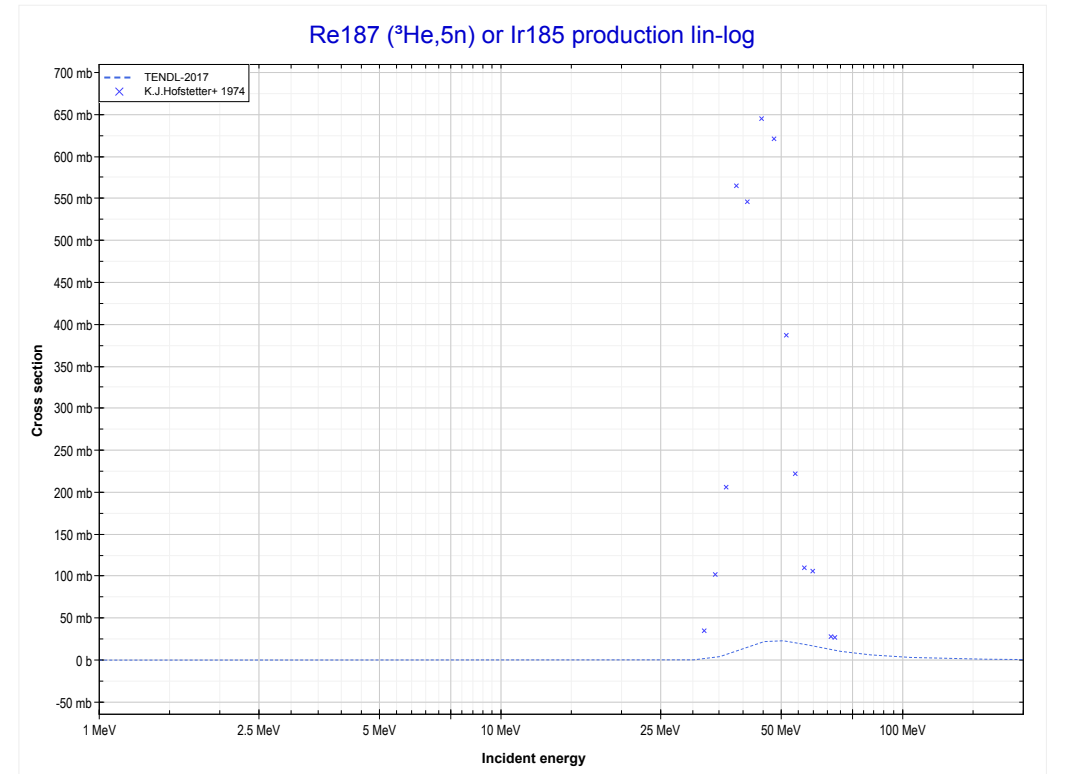
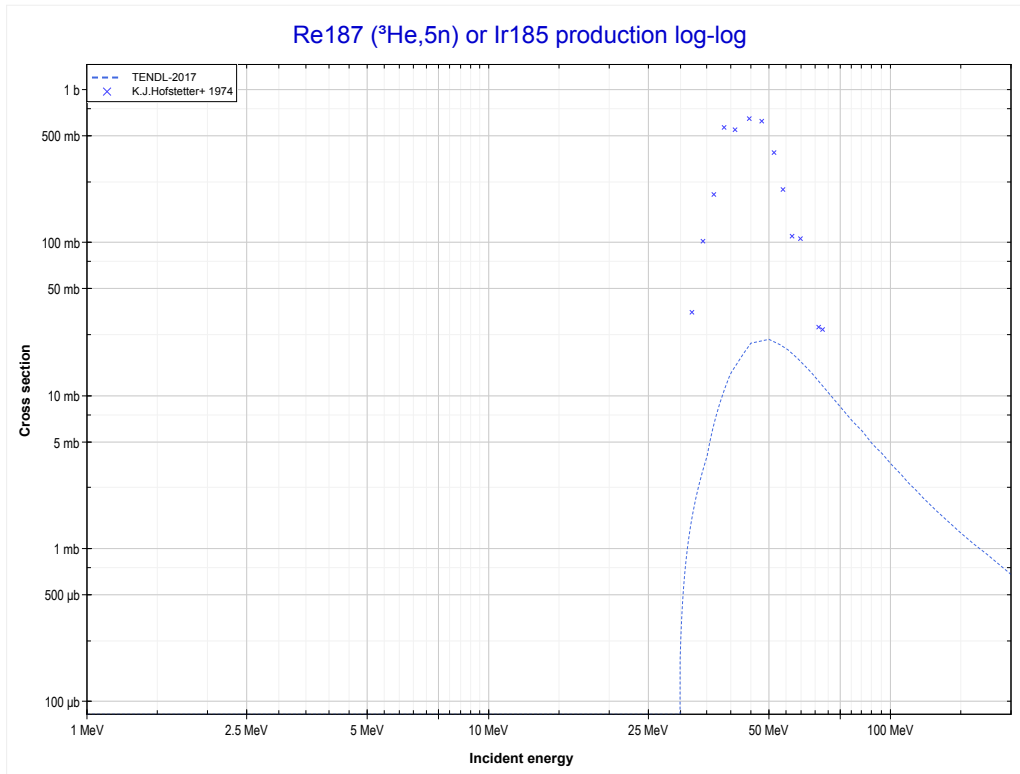
Reaction	Q-Value
Re187($\text{He}3,4n$)Ir186	-19397.55 keV

<< 75-Re-185	75-Re-187	79-Au-197 >>
<< MT37 (³ He,4n)	MT107 (³He,α) or MT5 (Re186 production)	MT152 (³ He,5n) >>



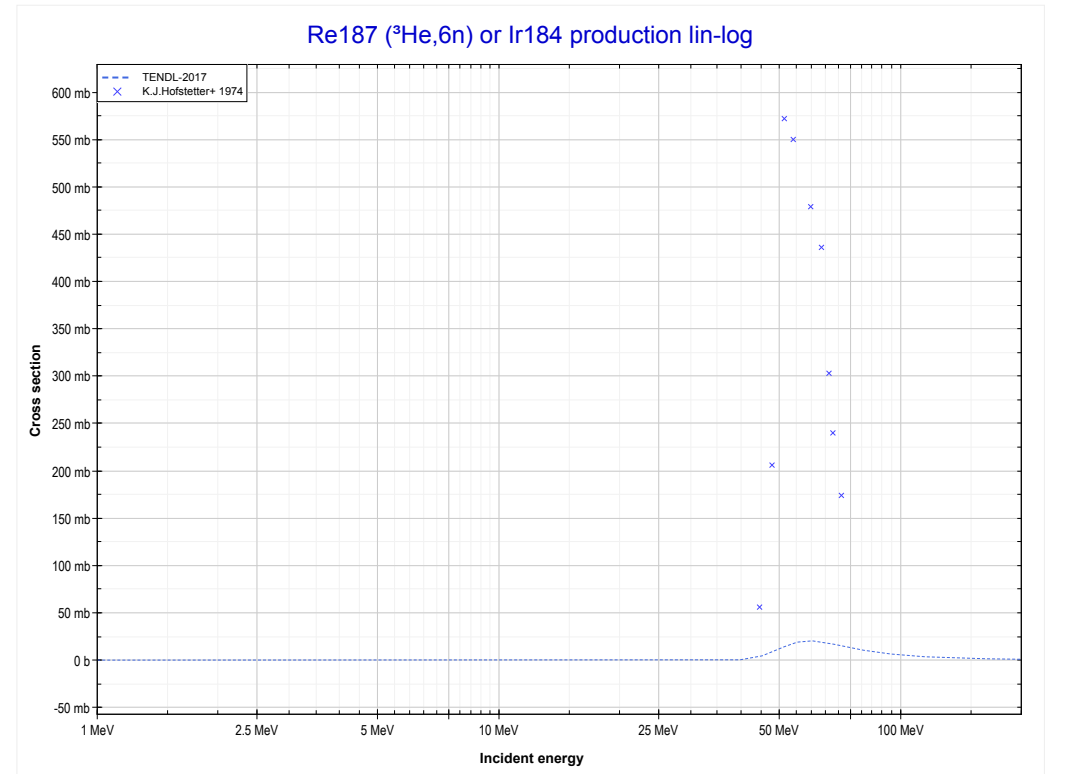
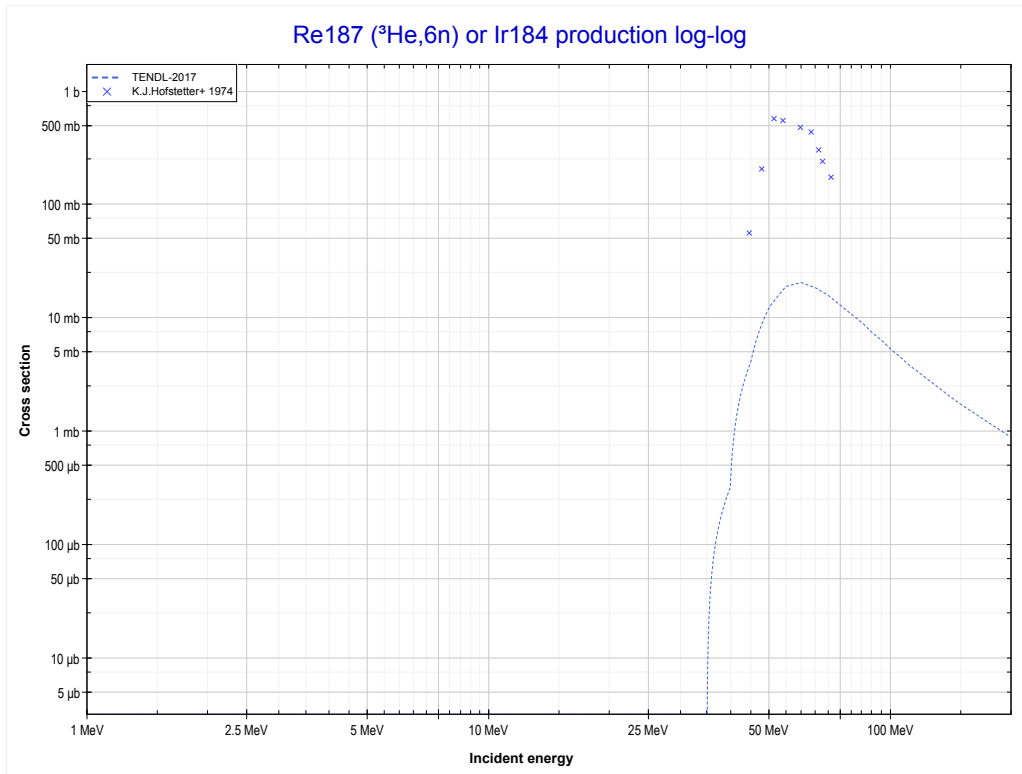
Reaction	Q-Value
Re187(He3,α)Re186	13218.40 keV
Re187(He3,p+t)Re186	-6595.46 keV
Re187(He3,n+He3)Re186	-7359.22 keV
Re187(He3,2d)Re186	-10628.13 keV
Re187(He3,n+p+d)Re186	-12852.69 keV
Re187(He3,2n+2p)Re186	-15077.26 keV

<< 73-Ta-181	75-Re-187	79-Au-197 >>
<< MT107 ($^3\text{He},\alpha$)	MT152 ($^3\text{He},5n$) or MT5 (Ir185 production)	MT153 ($^3\text{He},6n$) >>



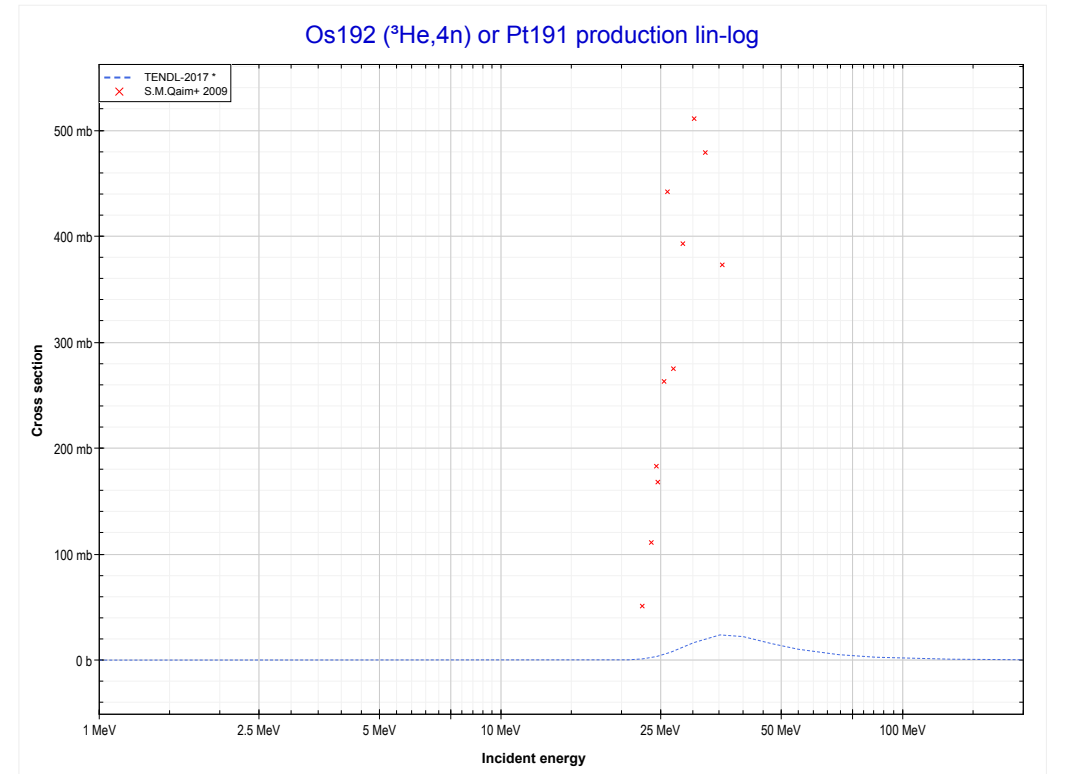
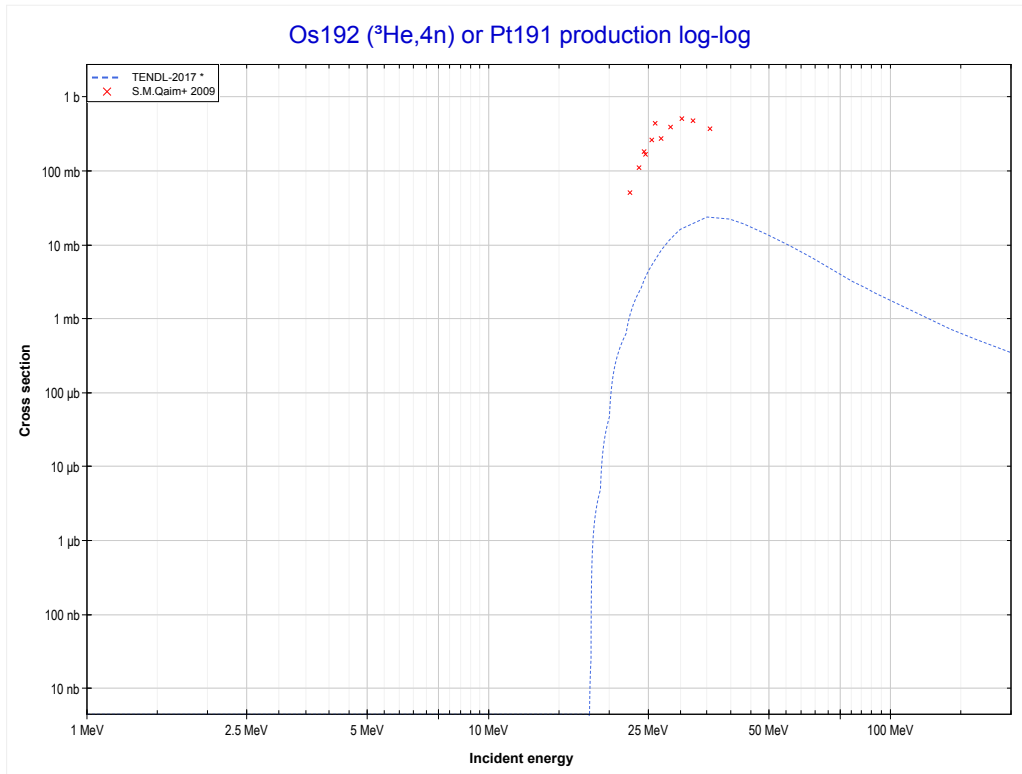
Reaction	Q-Value
Re187($\text{He}3,5n$)Ir185	-26307.87 keV

<< 73-Ta-181	75-Re-187	79-Au-197 >>
<< MT152 (³ He,5n)	MT153 (³He,6n) or MT5 (Ir184 production)	76-Os-192 MT37 (³ He,4n) >>



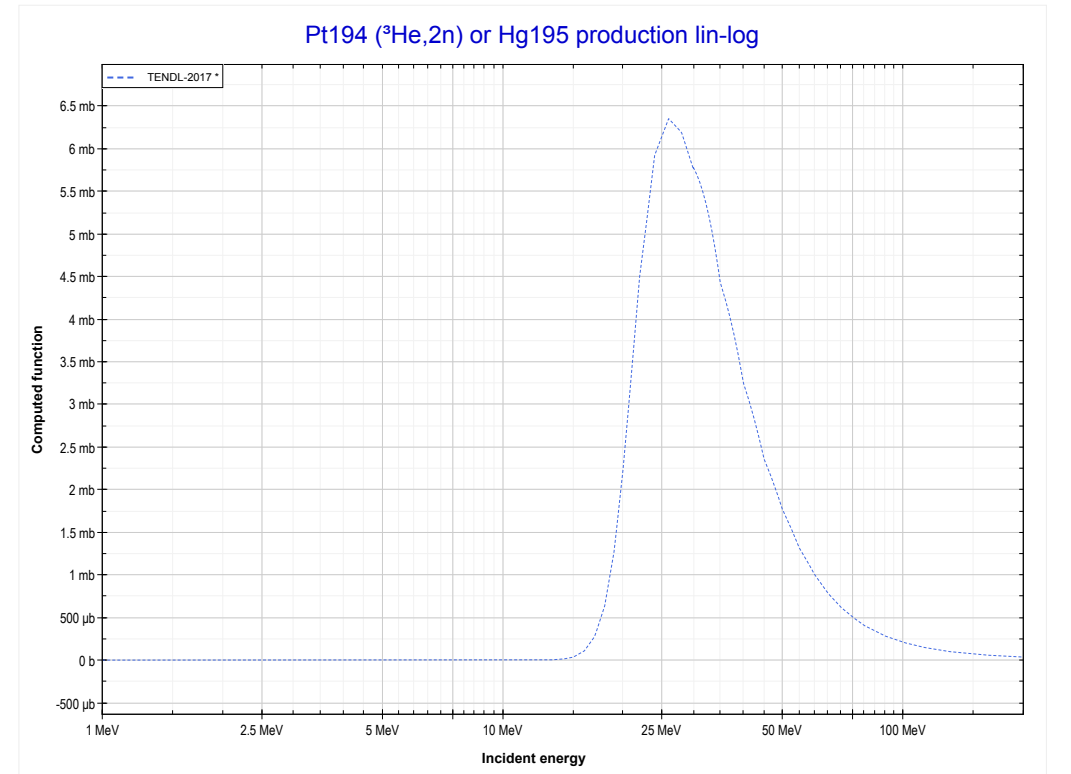
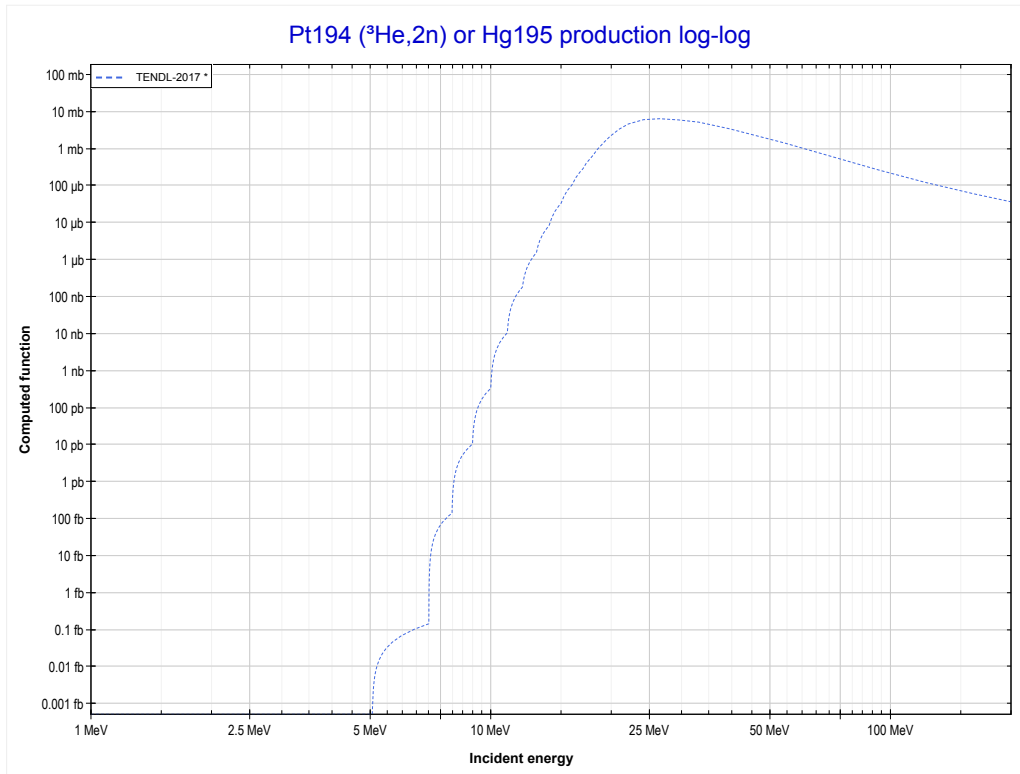
Reaction	Q-Value
Re187(He3,6n)Ir184	-35104.19 keV

<< 75-Re-187	76-Os-192	79-Au-197 >>
<< 75-Re-187 MT153 (³ He,6n)	MT37 (³He,4n) or MT5 (Pt191 production)	78-Pt-194 MT16 (³ He,2n) >>



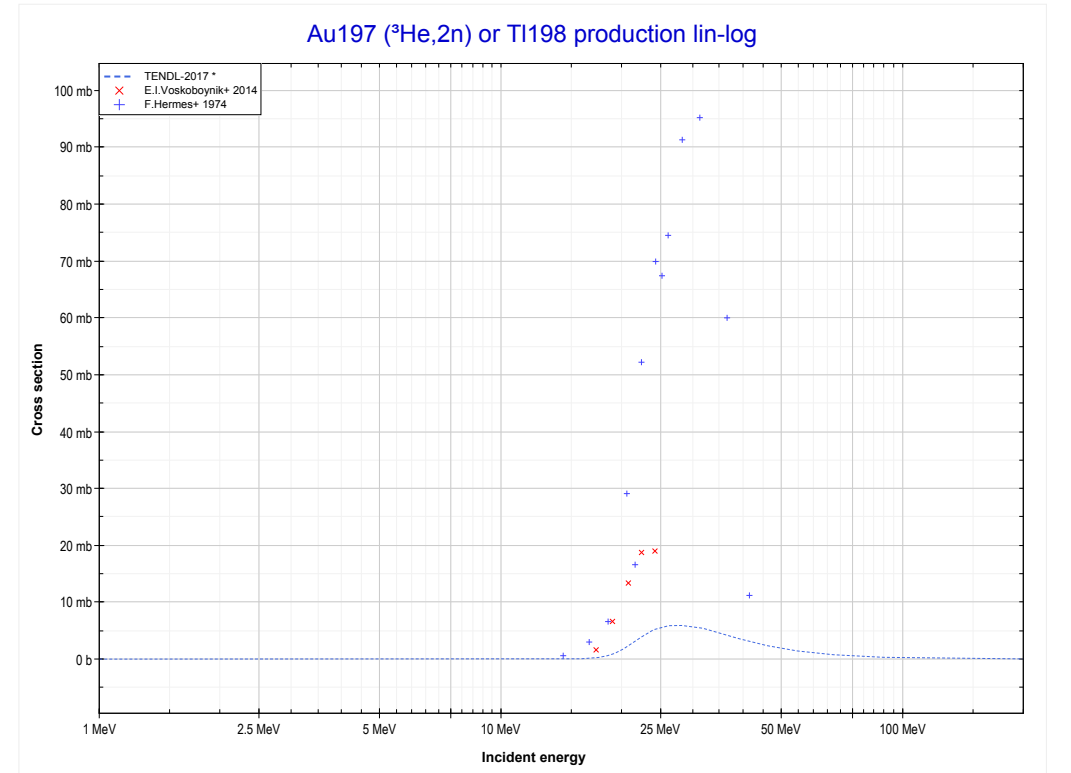
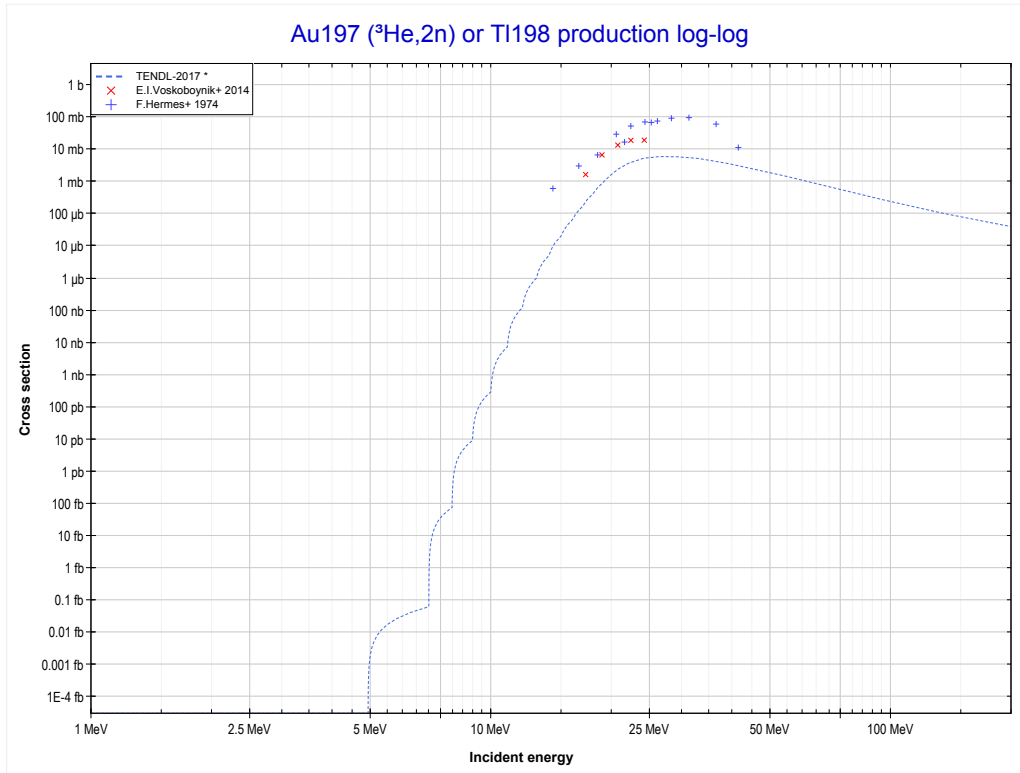
Reaction	Q-Value
Os192(He3,4n)Pt191	-17536.95 keV

<< 73-Ta-181	78-Pt-194	79-Au-197 >>
<< 76-Os-192 MT37 (³ He,4n)	MT16 (³He,2n) or MT5 (Hg195 production)	79-Au-197 MT16 (³ He,2n) >>



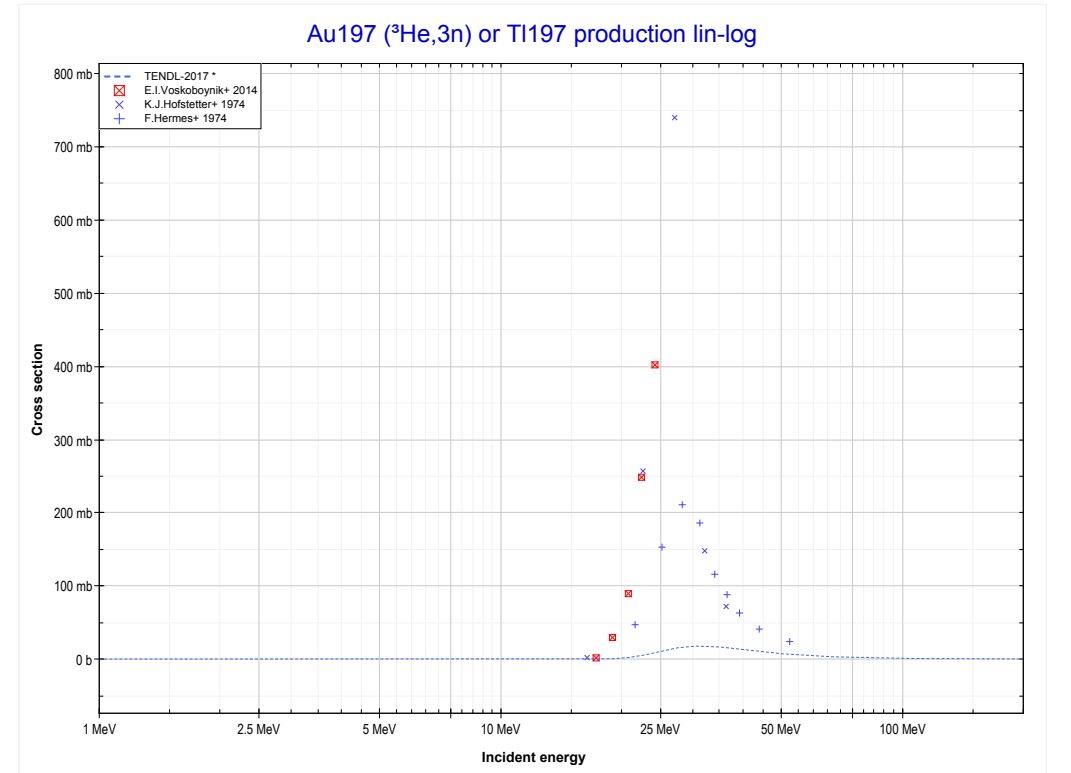
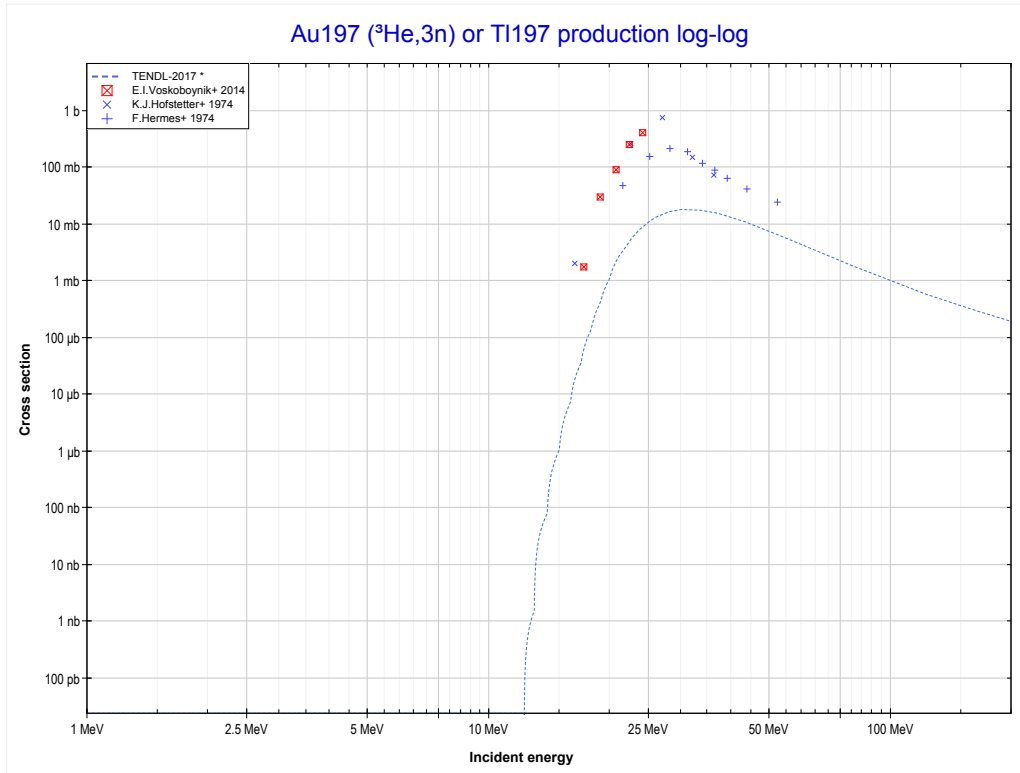
Reaction	Q-Value
Pt194(He3,2n)Hg195	-4974.02 keV

<< 78-Pt-194	79-Au-197	82-Pb-207 >>
<< 78-Pt-194 MT16 ($^3\text{He},2n$)	MT16 ($^3\text{He},2n$) or MT5 (Tl198 production)	MT17 ($^3\text{He},3n$) >>



Reaction	Q-Value
Au197(He3,2n)Tl198	-4862.42 keV

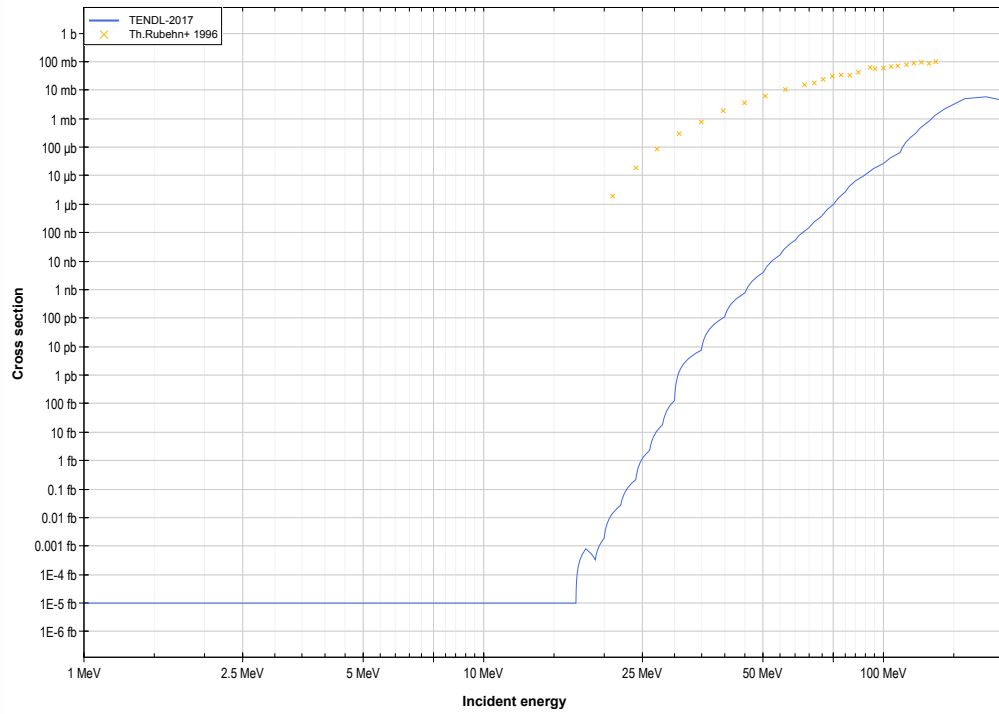
<< 75-Re-187	79-Au-197	82-Pb-207 >>
<< MT16 ($^3\text{He},2n$)	MT17 ($^3\text{He},3n$) or MT5 (Tl197 production)	MT18 ($^3\text{He},\text{fission}$) >>



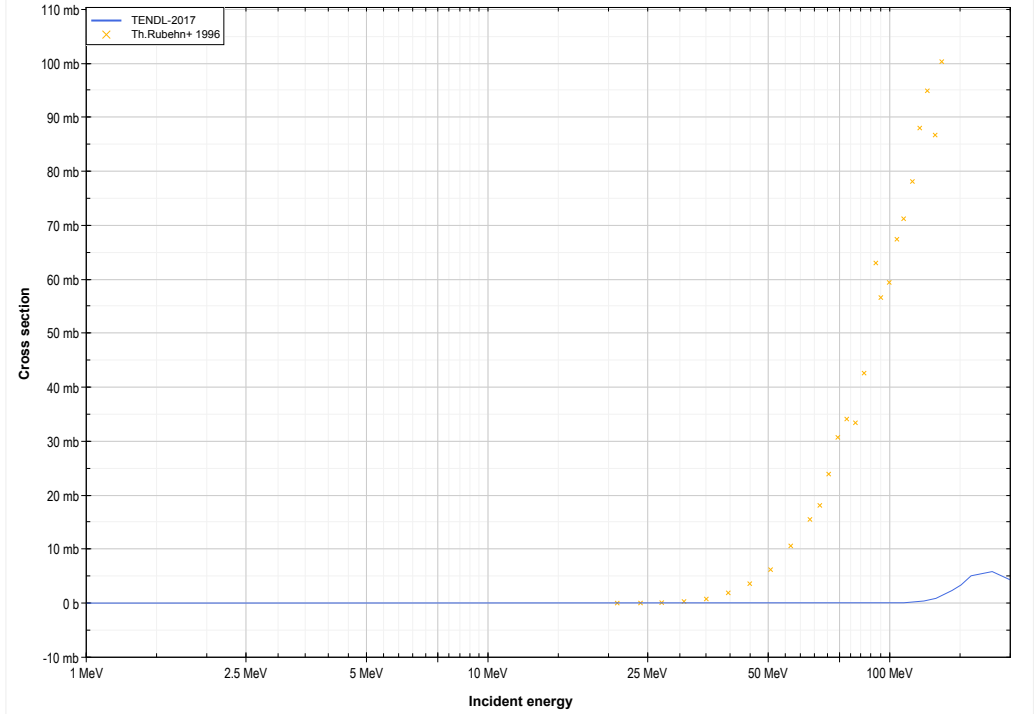
Reaction	Q-Value
Au197(He3,3n)Tl197	-12083.74 keV

	79-Au-197	82-Pb-208 >>
<< MT17 (³ He,3n)	MT18 (³He,fission)	MT37 (³ He,4n) >>

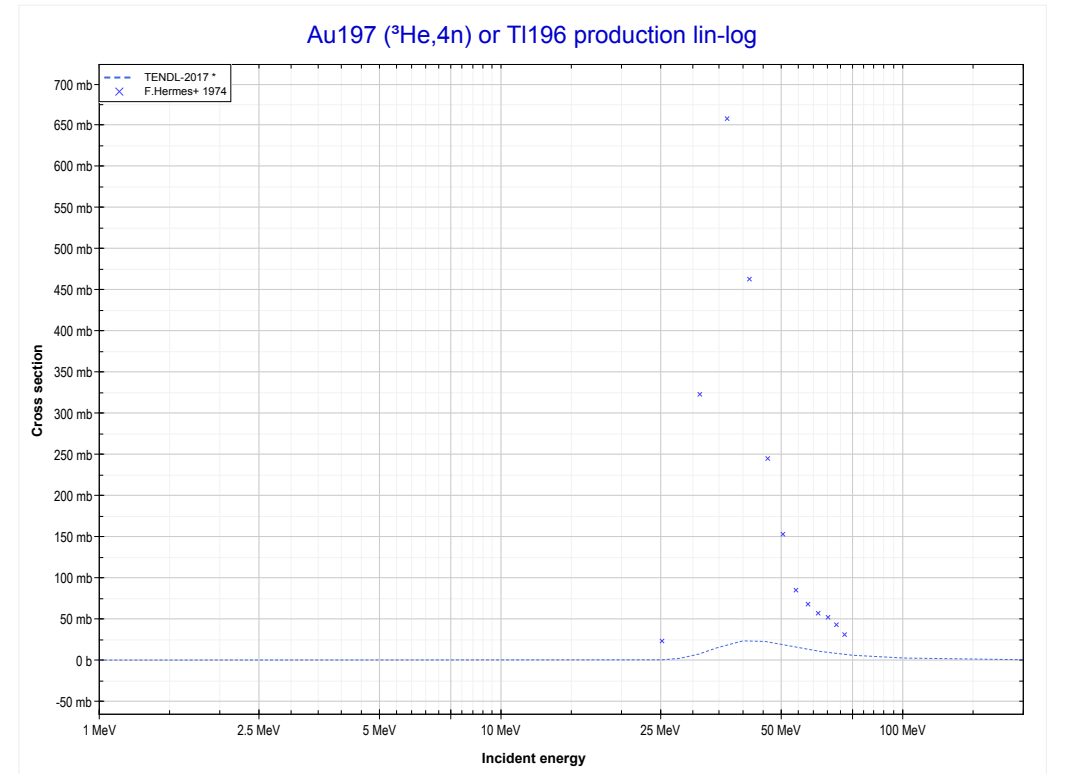
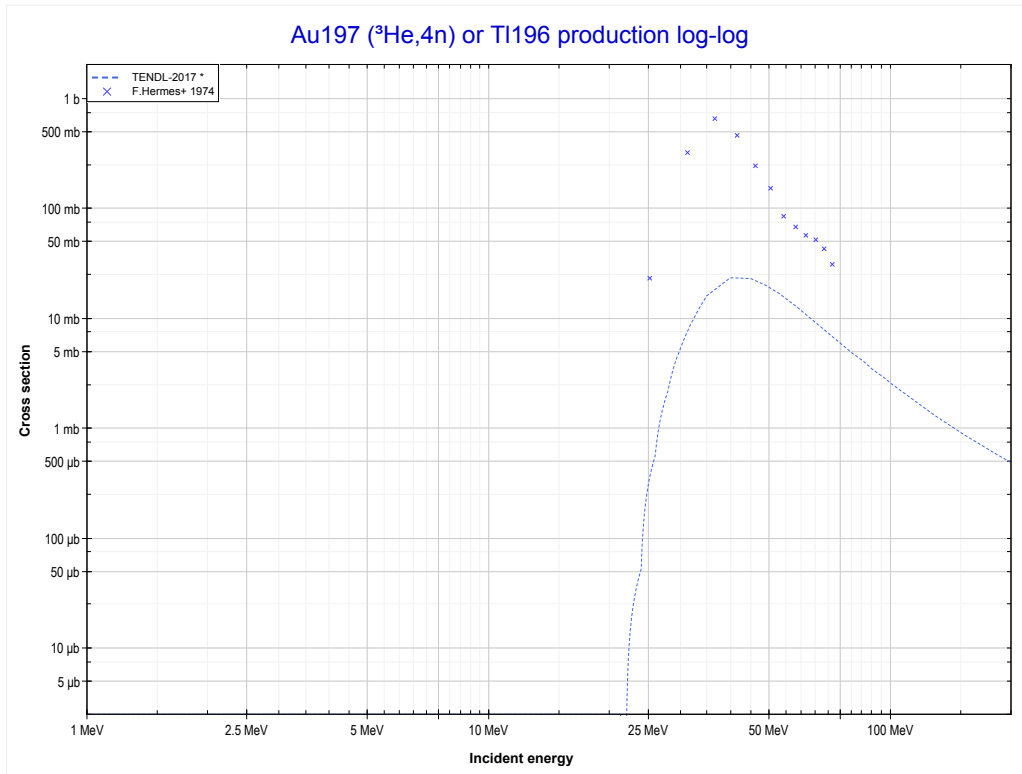
Au197 (³He,fission) log-log



Au197 (³He,fission) lin-log

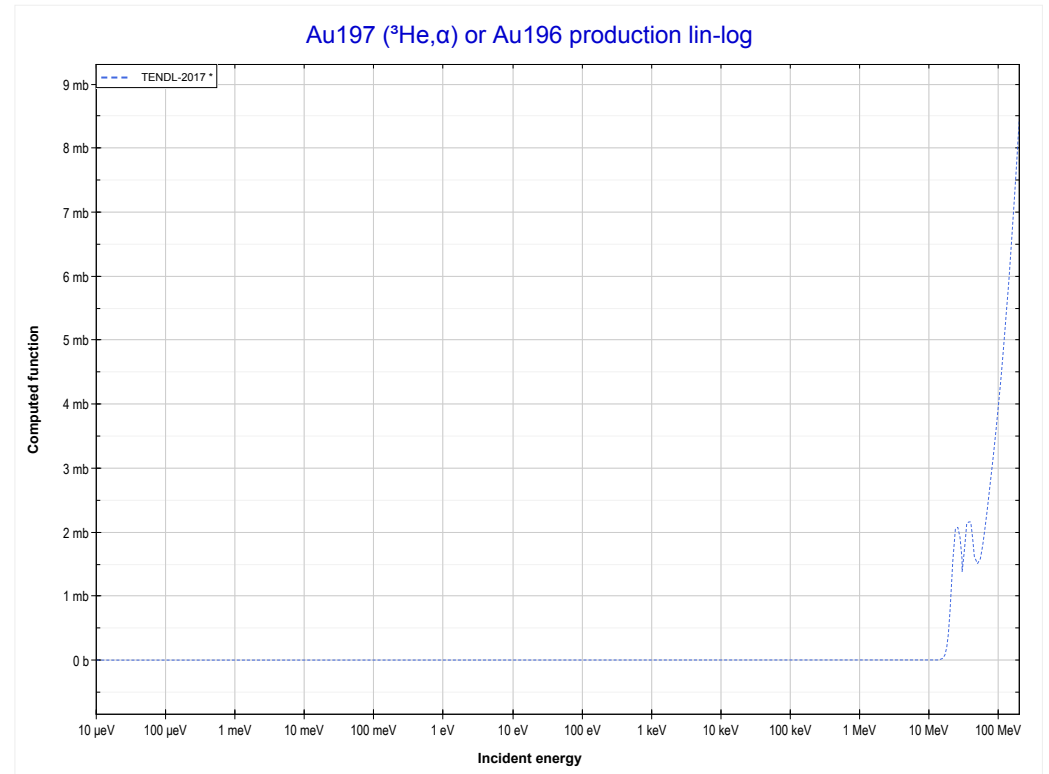
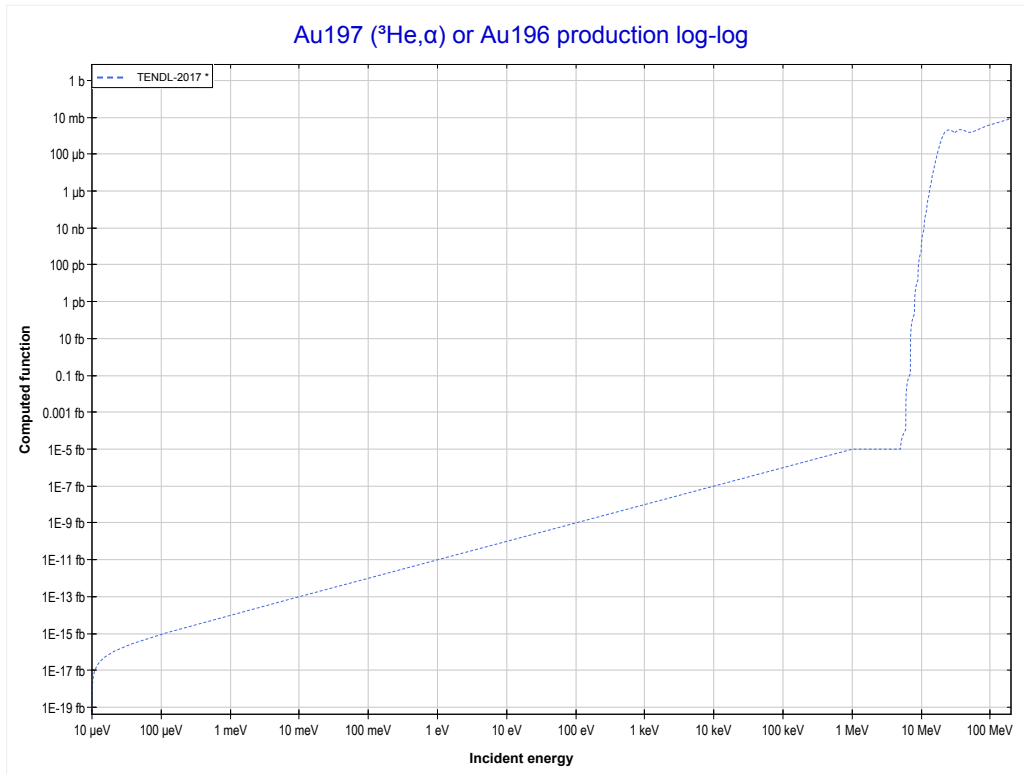


<< 76-Os-192	79-Au-197	81-Tl-203 >>
<< MT18 (³ He,fission)	MT37 (³He,4n) or MT5 (Tl196 production)	MT107 (³ He,α) >>



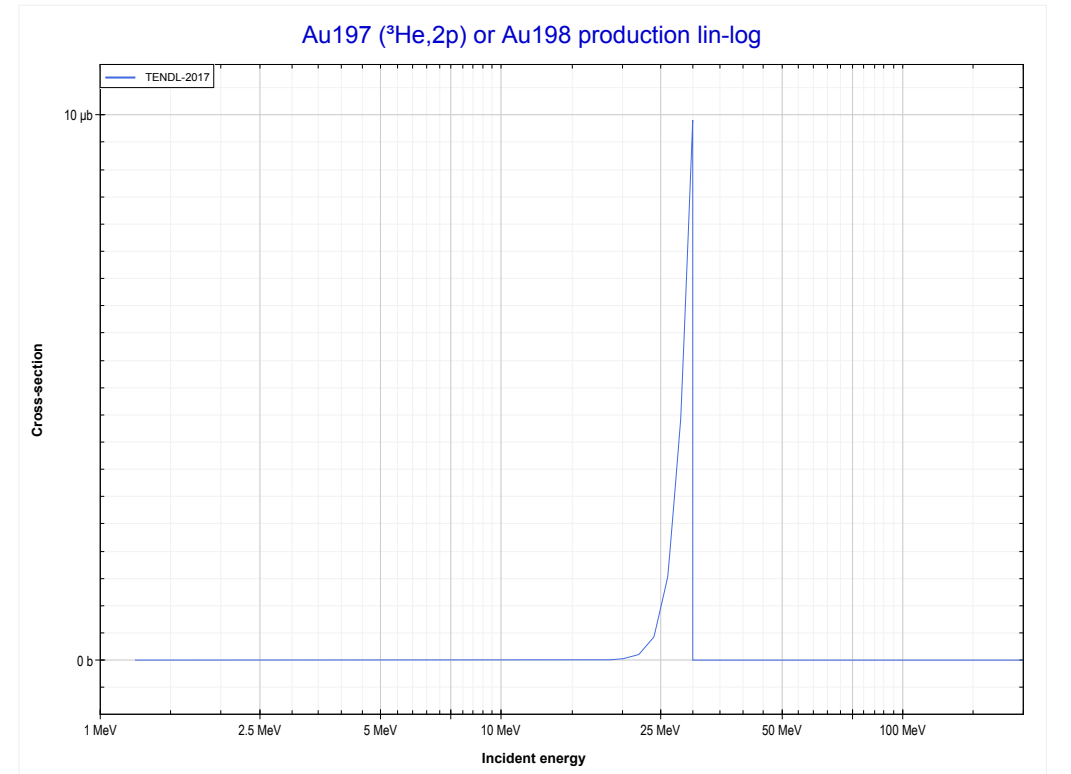
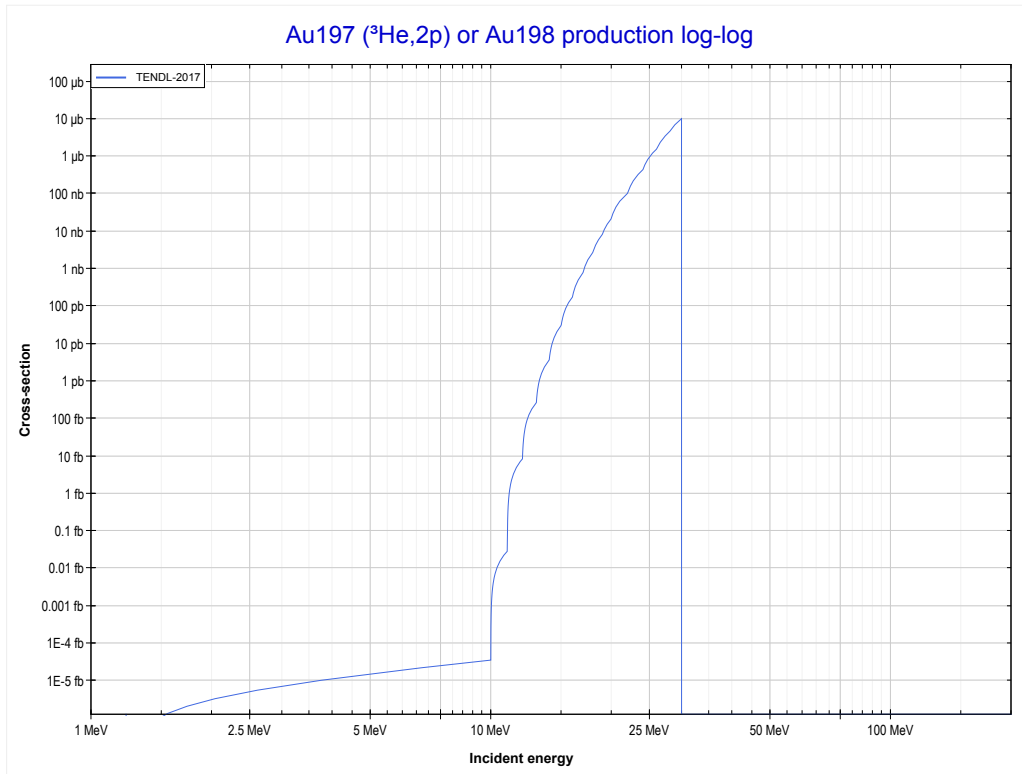
Reaction	Q-Value
Au197(He3,4n)Tl196	-20998.05 keV

<< 75-Re-187	79-Au-197	
<< MT37 (³ He,4n)	MT107 (³He,α) or MT5 (Au196 production)	MT111 (³ He,2p) >>



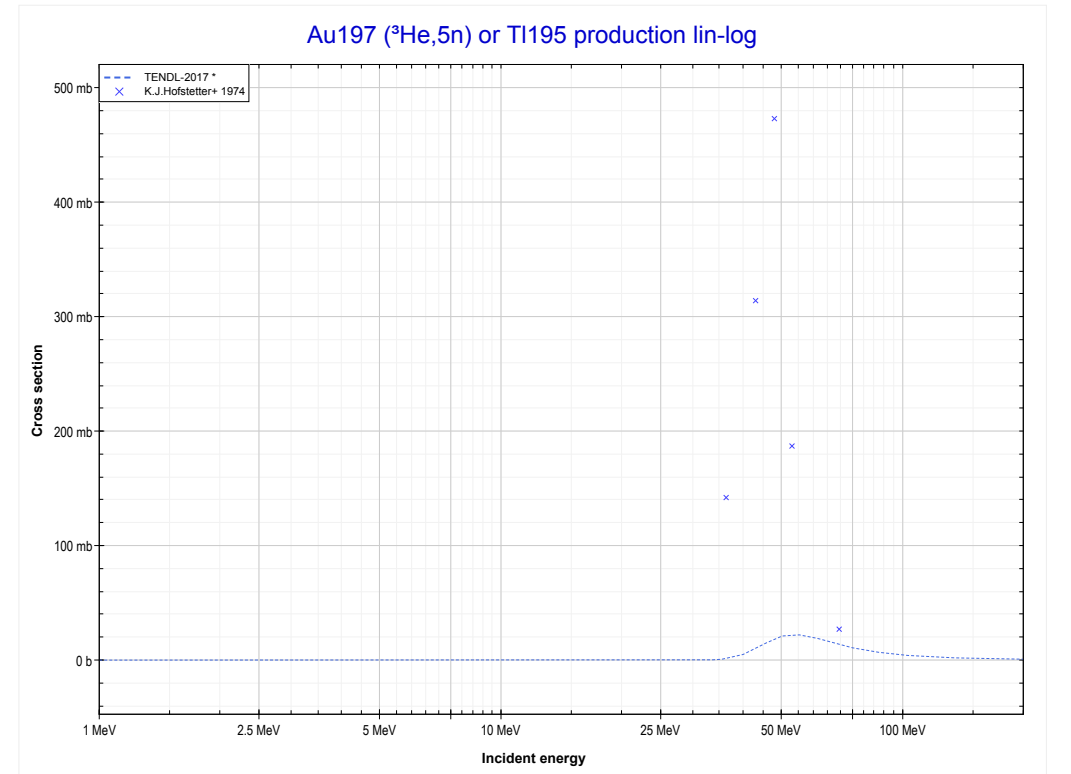
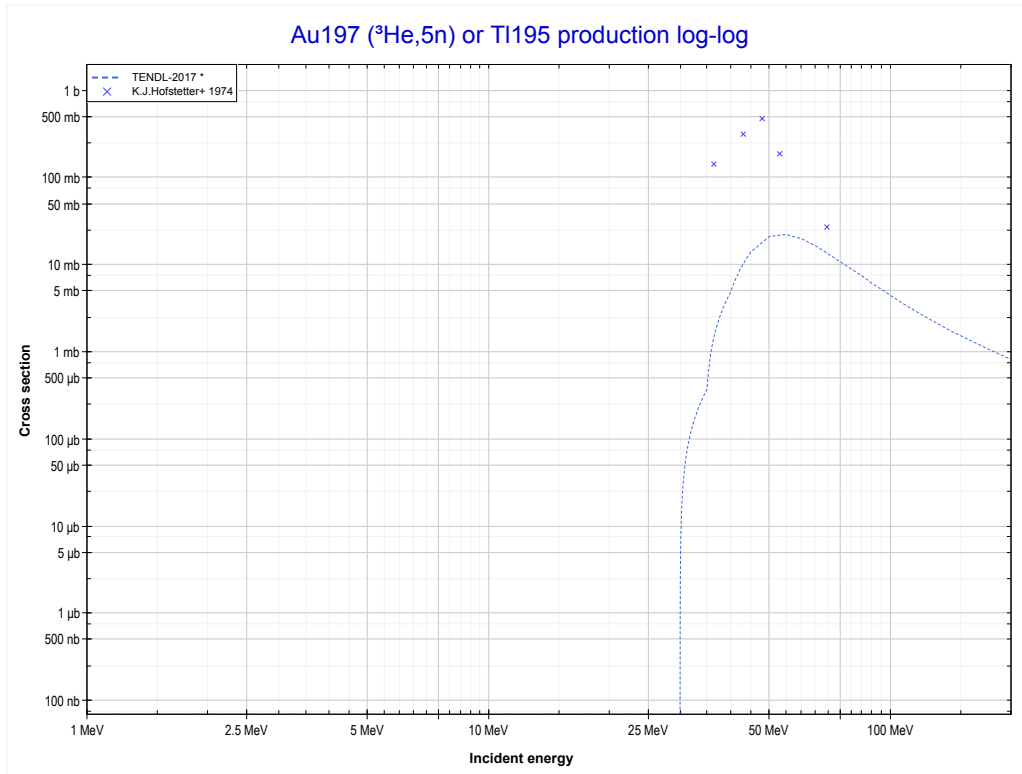
Reaction	Q-Value
Au197(He3,α)Au196	12505.20 keV
Au197(He3,p+t)Au196	-7308.66 keV
Au197(He3,n+He3)Au196	-8072.42 keV
Au197(He3,2d)Au196	-11341.33 keV
Au197(He3,n+p+d)Au196	-13565.89 keV
Au197(He3,2n+2p)Au196	-15790.46 keV

<< 75-Re-185	79-Au-197	93-Np-237 >>
<< MT107 ($^3\text{He},\alpha$)	MT111 ($^3\text{He},2p$) or MT5 (Au198 production)	MT152 ($^3\text{He},5n$) >>



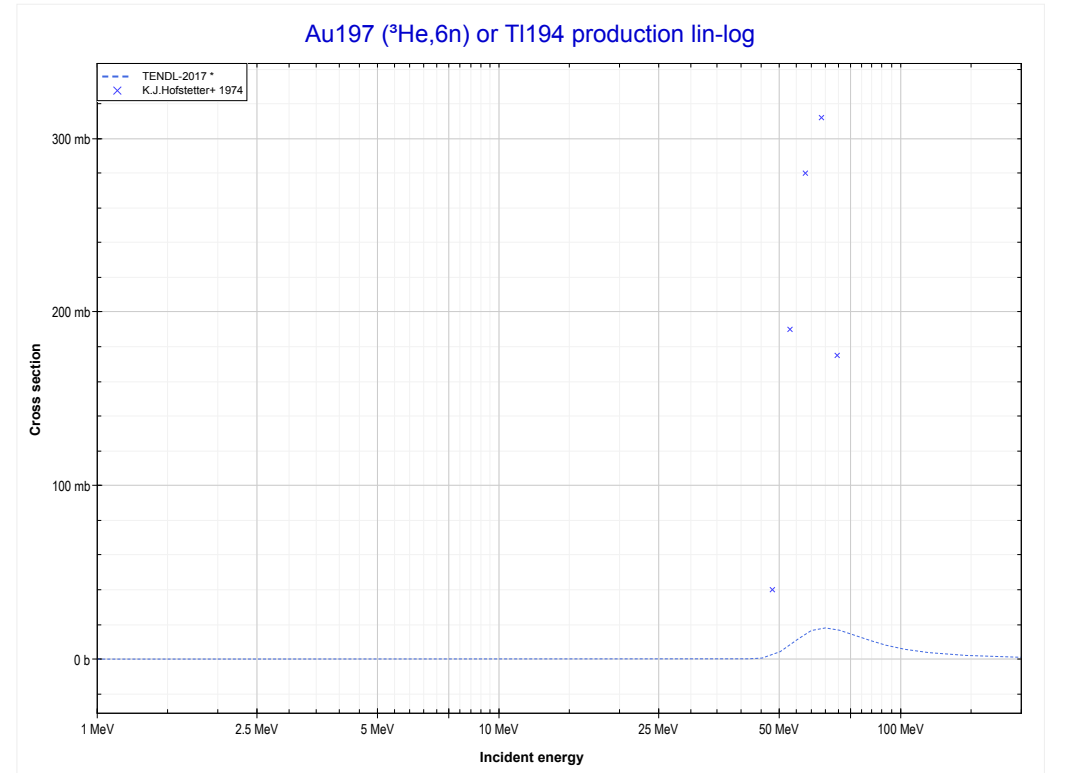
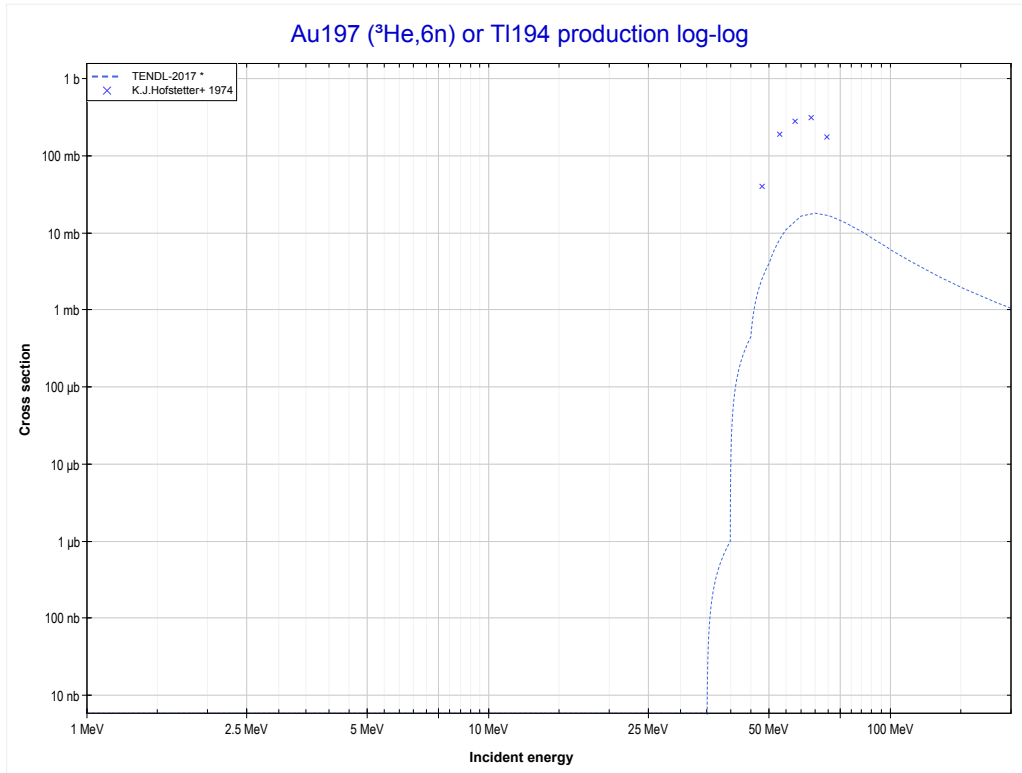
Reaction	Q-Value
Au197($\text{He}3,2p$)Au198	-1205.63 keV

<< 75-Re-187	79-Au-197	81-Tl-203 >>
<< MT111 (³ He,2p)	MT152 (³He,5n) or MT5 (Tl195 production)	MT153 (³ He,6n) >>



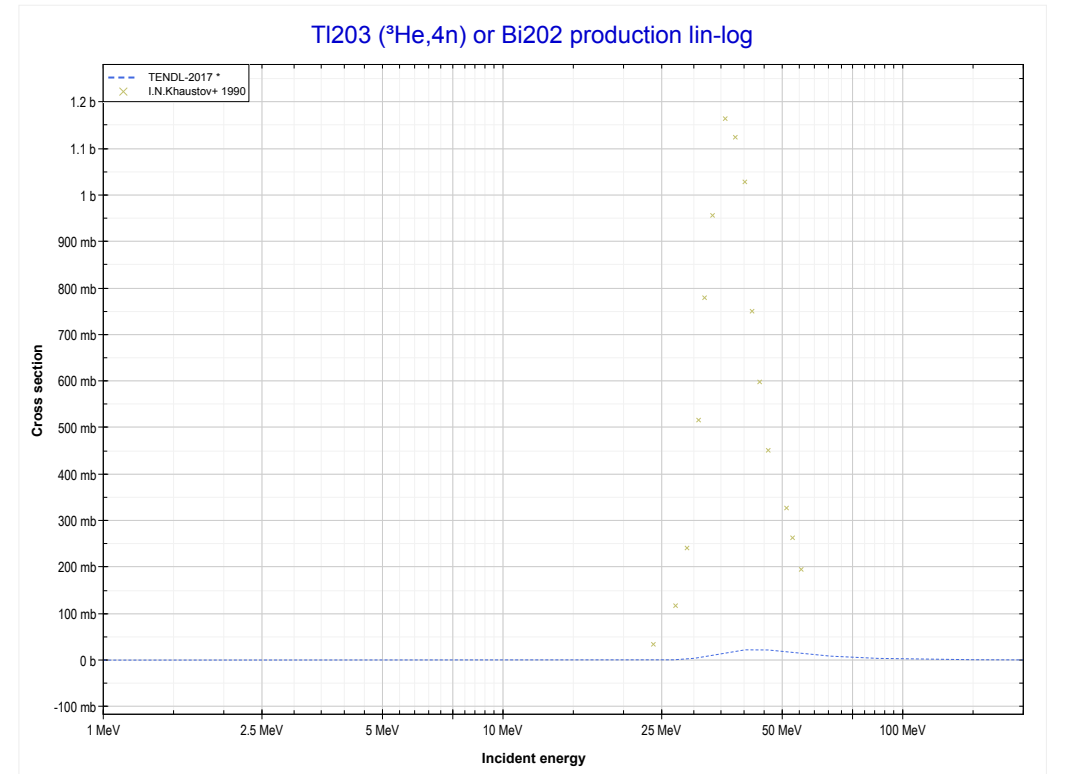
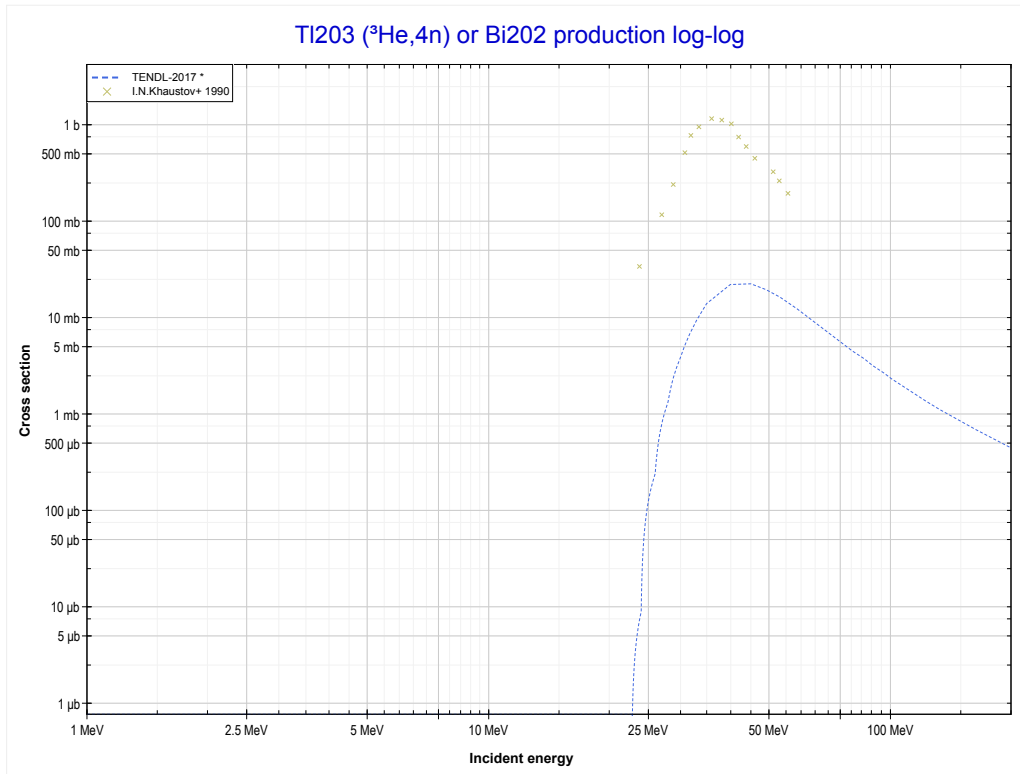
Reaction	Q-Value
Au197(He3,5n)Tl195	-28411.37 keV

<< 75-Re-187	79-Au-197	81-Tl-203 >>
<< MT152 (³ He,5n)	MT153 (³He,6n) or MT5 (Tl194 production)	81-Tl-203 MT37 (³ He,4n) >>



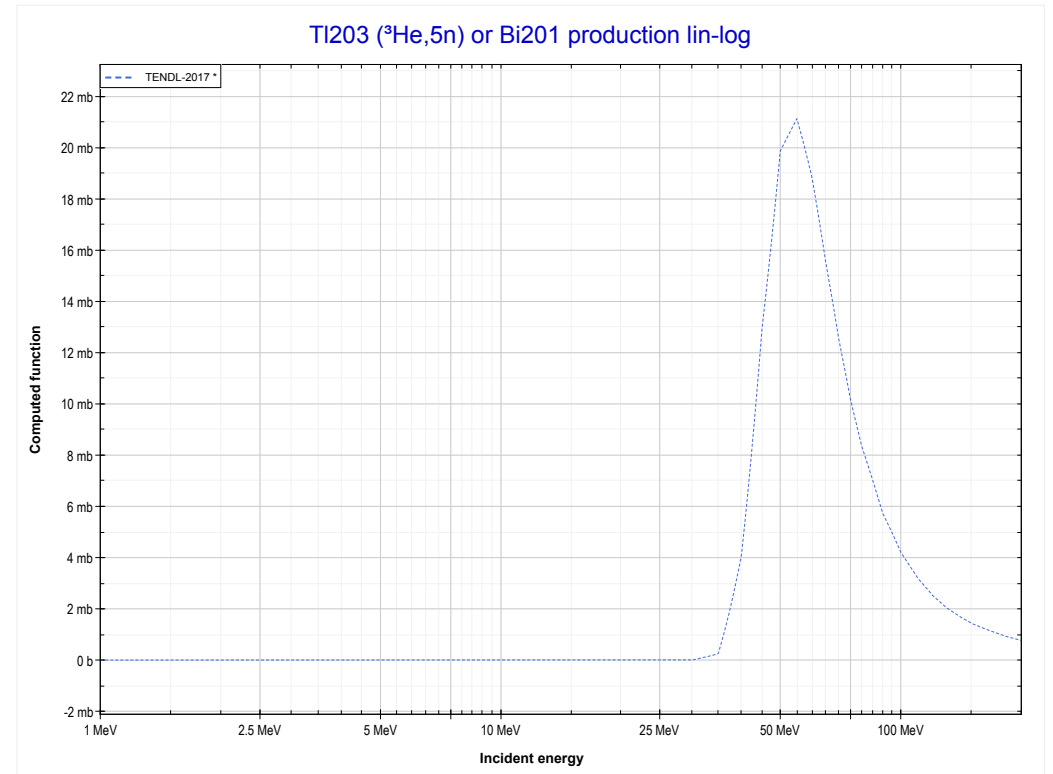
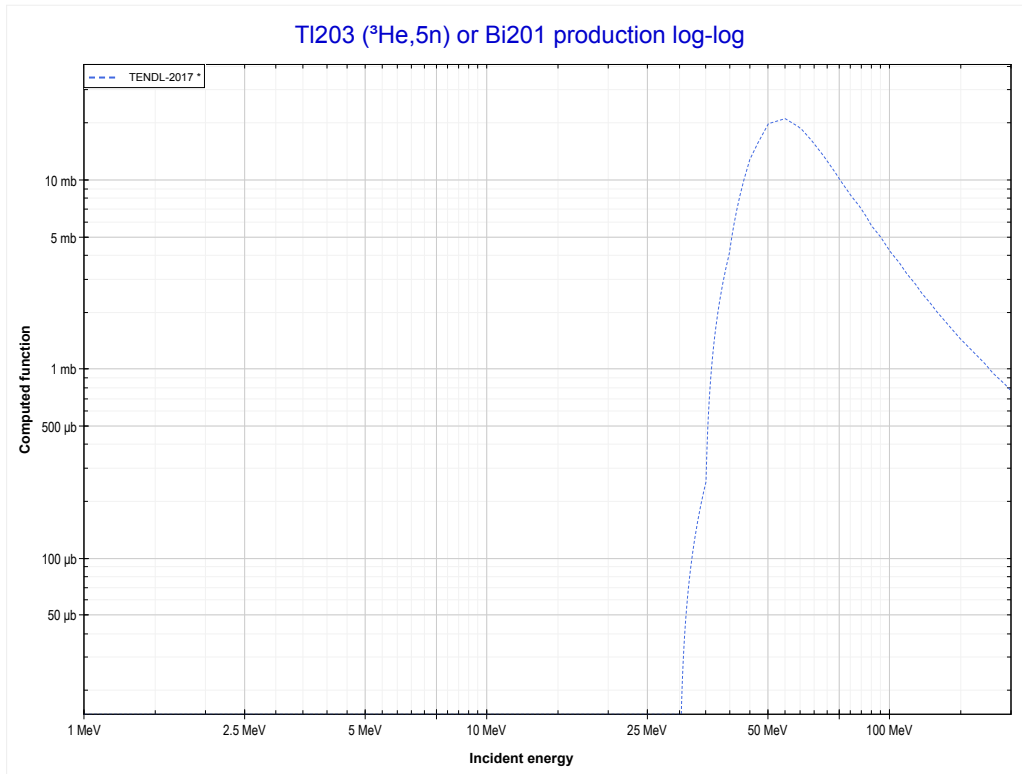
Reaction	Q-Value
Au197(He3,6n)Tl194	-37700.69 keV

<< 79-Au-197	81-Tl-203	82-Pb-207 >>
<< 79-Au-197 MT153 (³ He,6n)	MT37 (³He,4n) or MT5 (Bi202 production)	MT152 (³ He,5n) >>



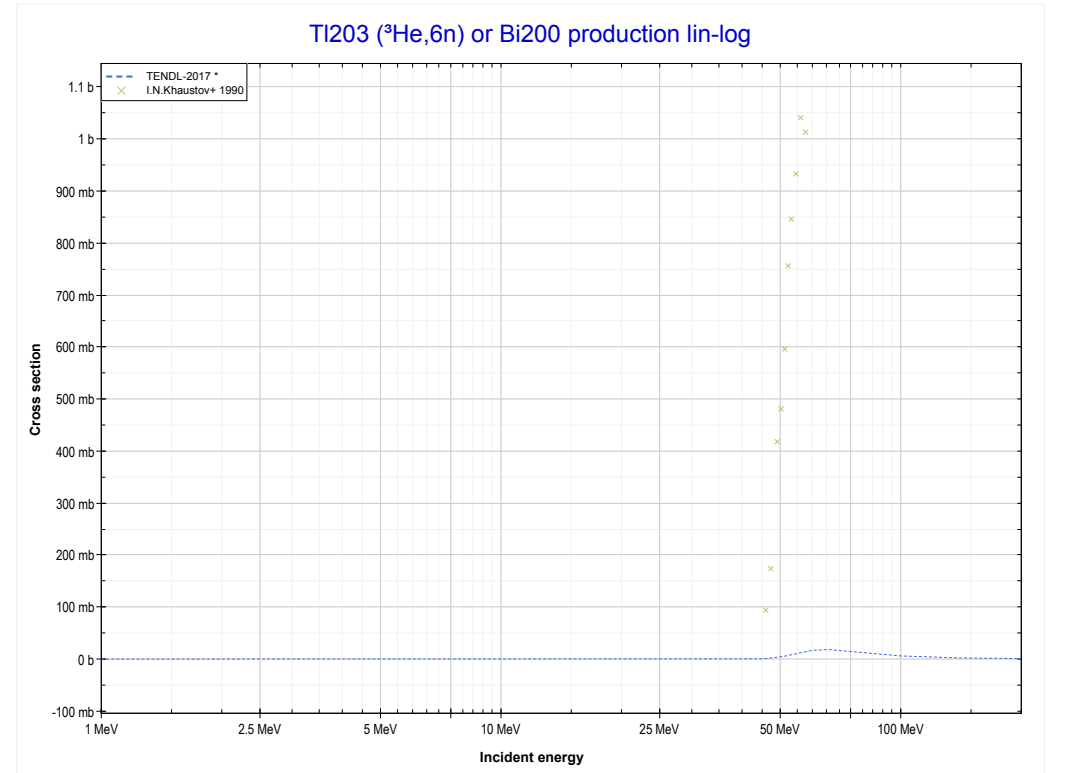
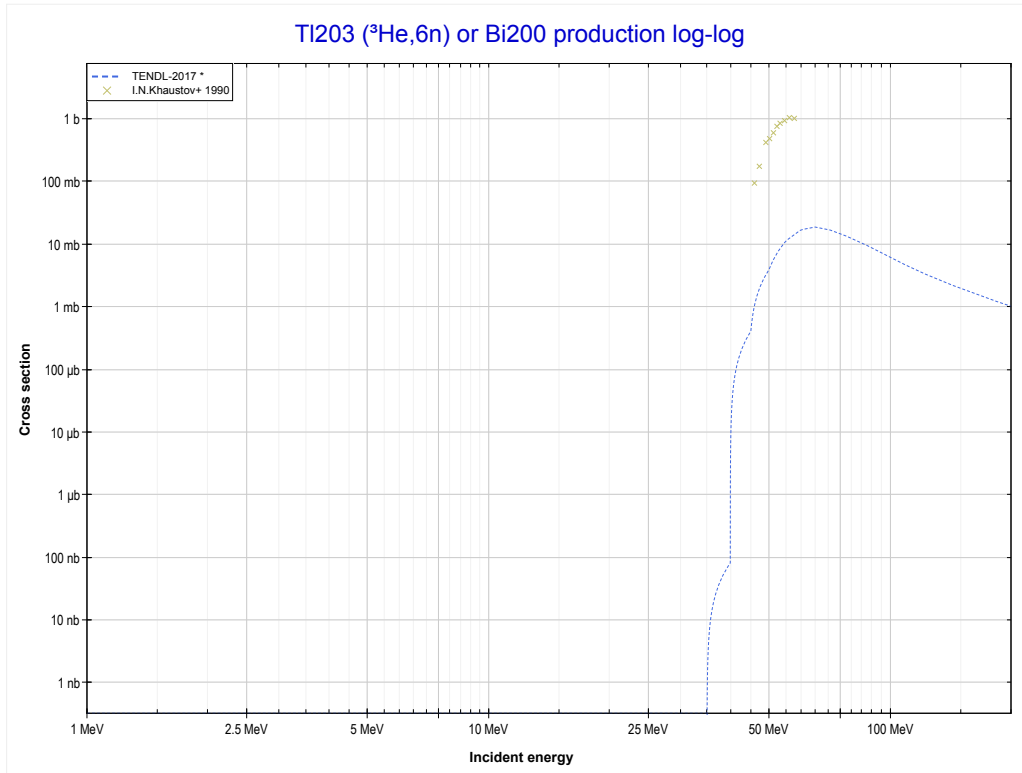
Reaction	Q-Value
Tl203(He3,4n)Bi202	-22373.85 keV

<< 79-Au-197	81-Tl-203	83-Bi-209 >>
<< MT37 (³ He,4n)	MT152 (³He,5n) or MT5 (Bi201 production)	MT153 (³ He,6n) >>



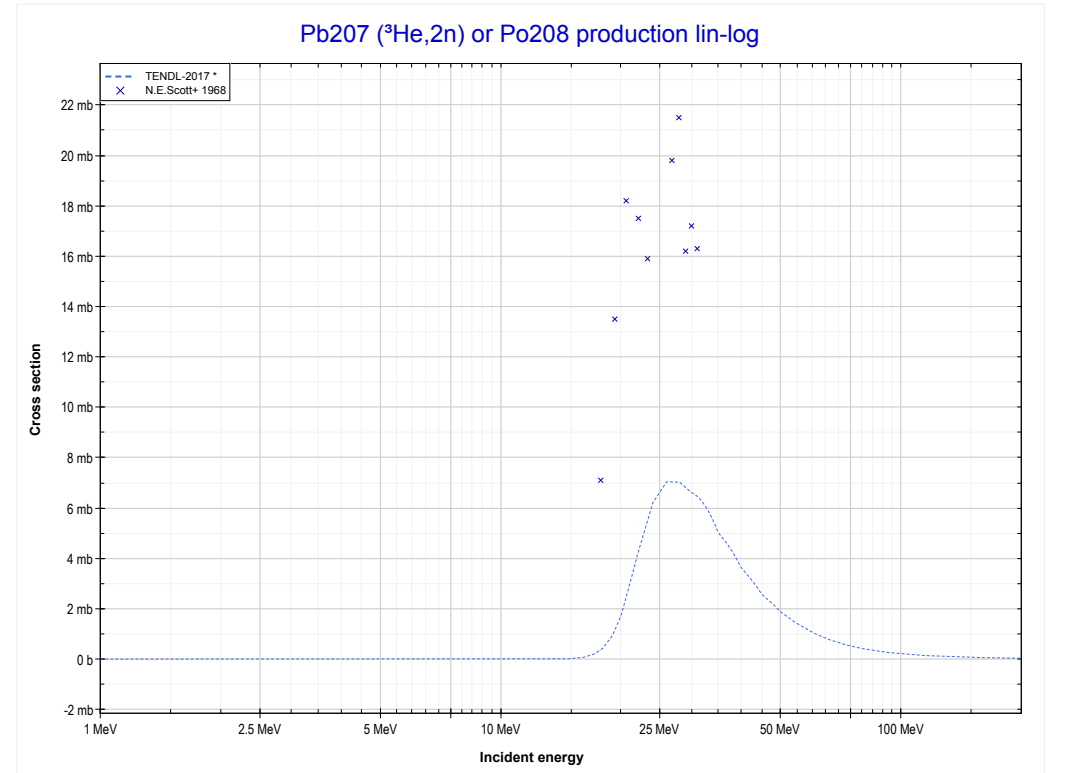
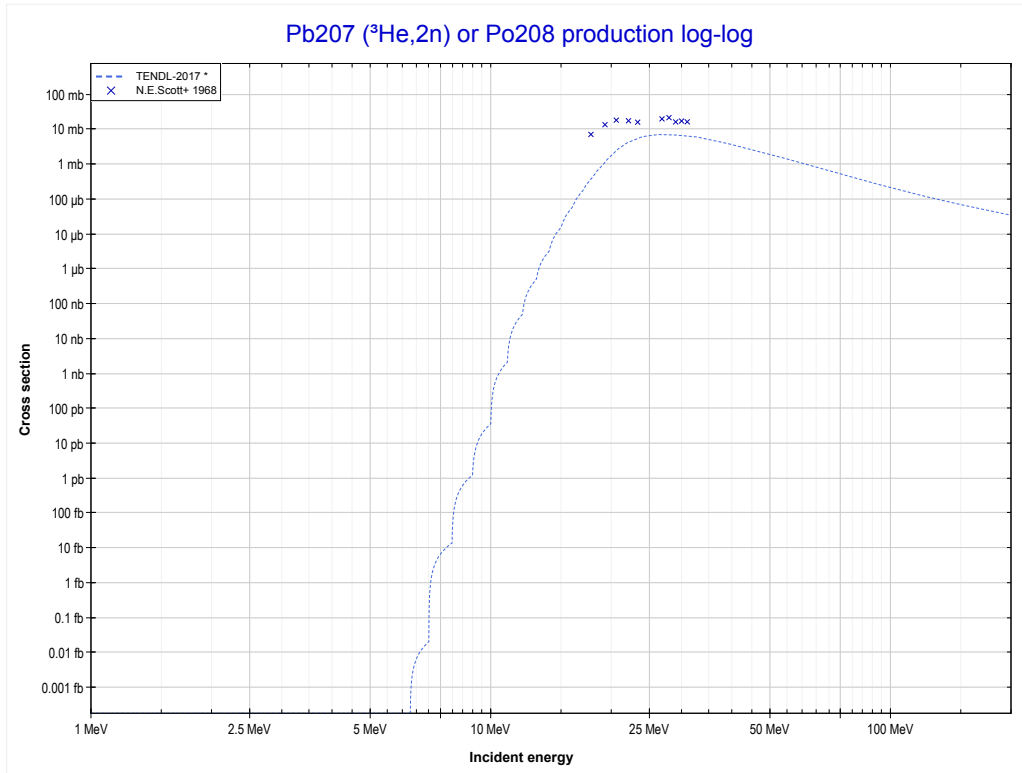
Reaction	Q-Value
Tl203(He3,5n)Bi201	-29771.17 keV

<< 79-Au-197	81-Tl-203	83-Bi-209 >>
<< MT152 (³ He,5n)	MT153 (³He,6n) or MT5 (Bi200 production)	82-Pb-207 MT16 (³ He,2n) >>



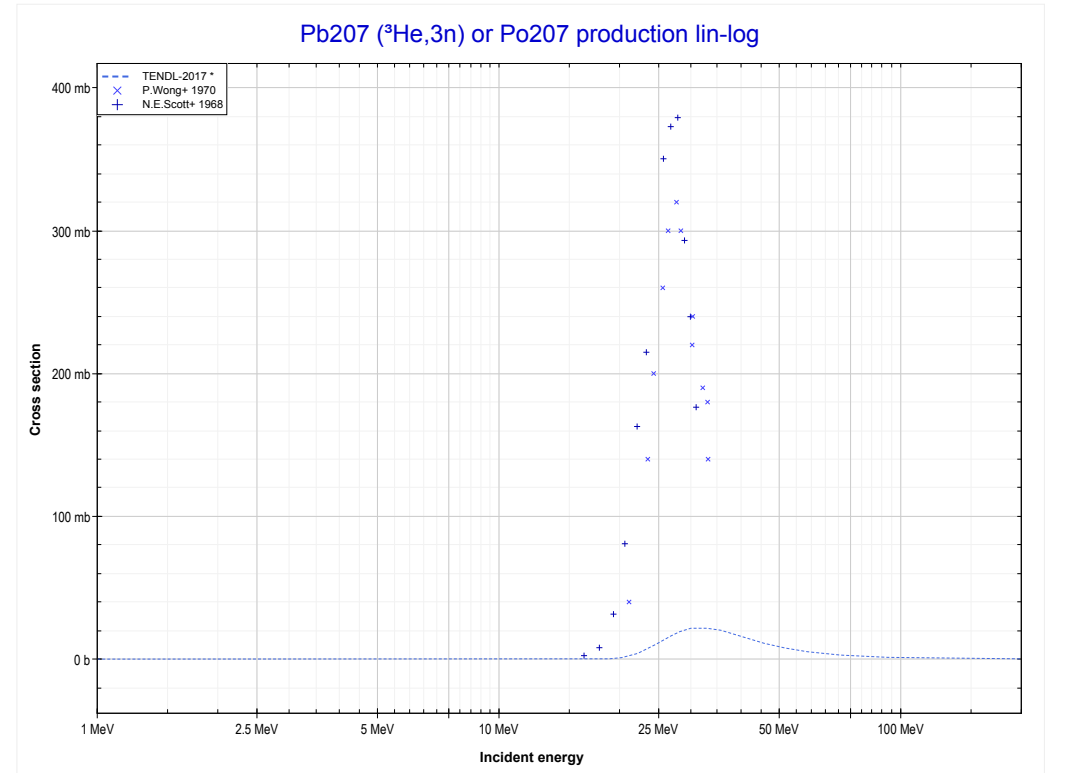
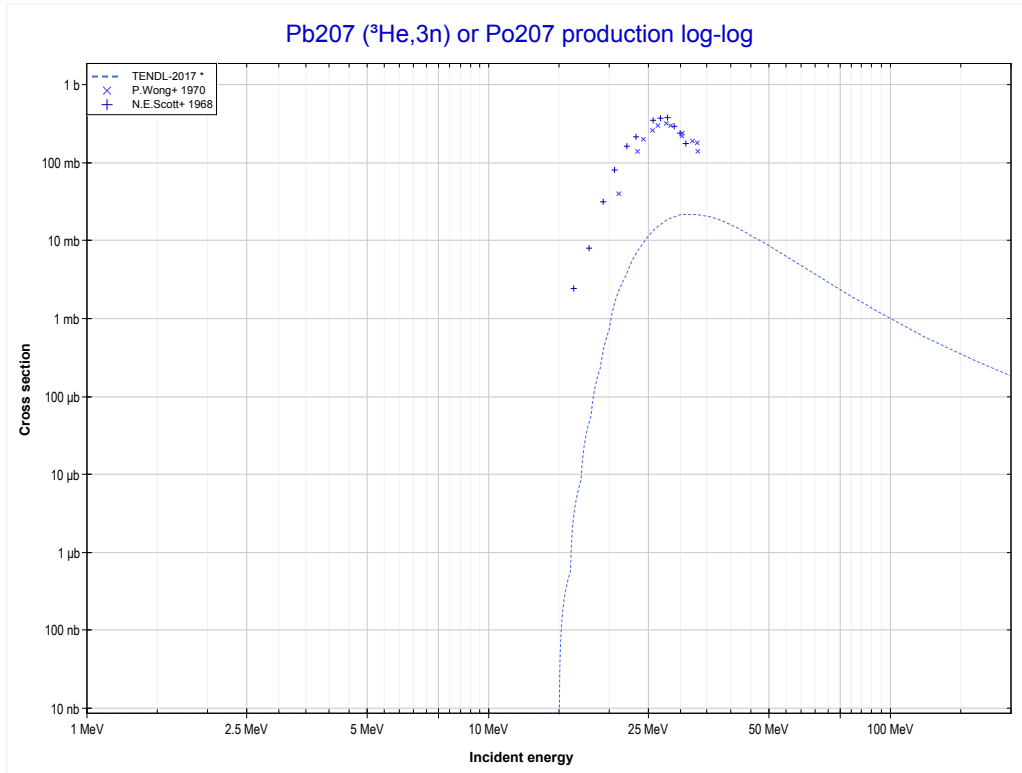
Reaction	Q-Value
Tl203(He3,6n)Bi200	-38886.49 keV

<< 79-Au-197	82-Pb-207	83-Bi-209 >>
<< 81-Tl-203 MT153 (³ He,6n)	MT16 (³He,2n) or MT5 (Po208 production)	MT17 (³ He,3n) >>



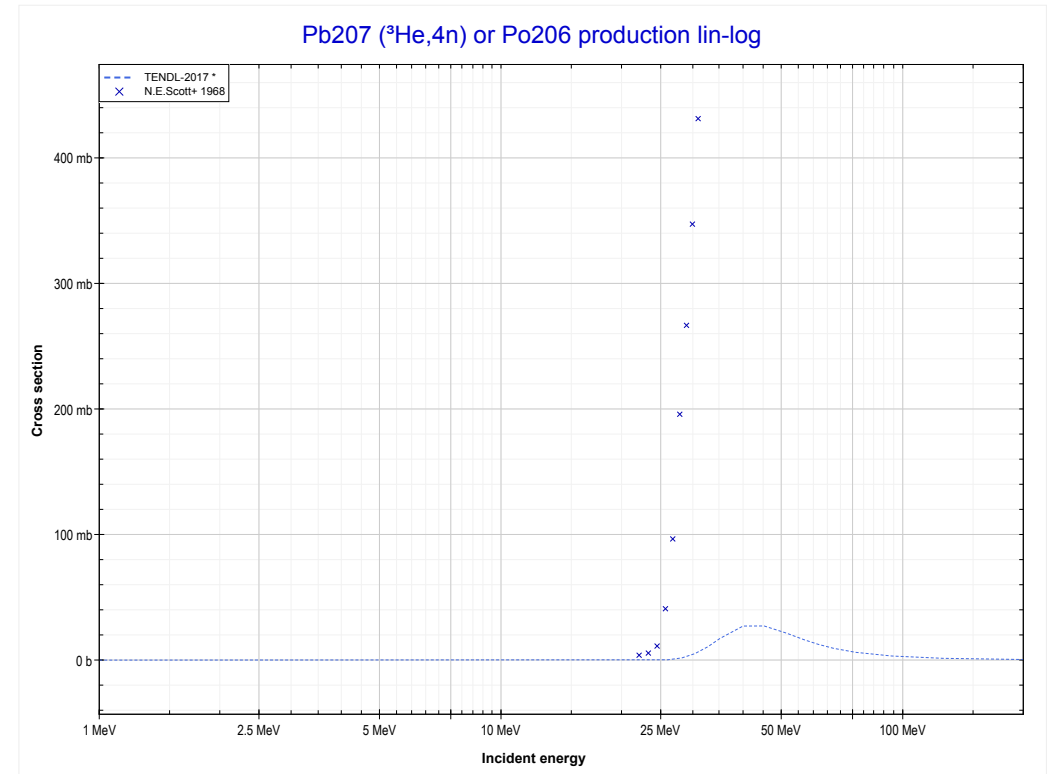
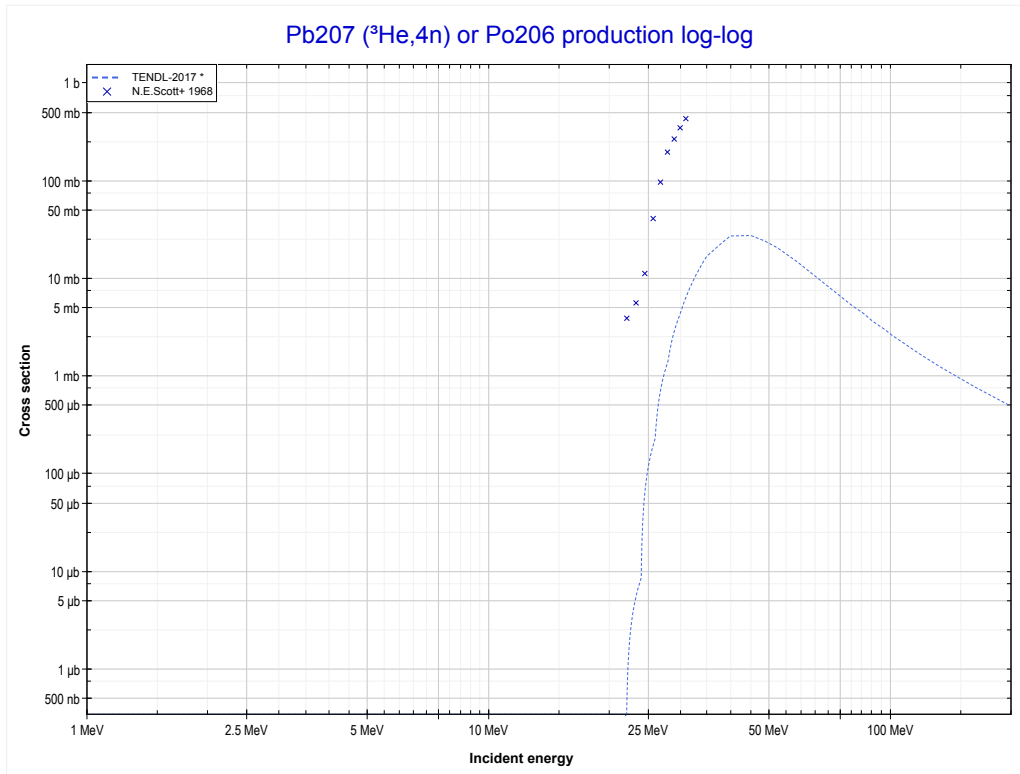
Reaction	Q-Value
Pb207(He3,2n)Po208	-6193.72 keV

<< 79-Au-197	82-Pb-207	82-Pb-208 >>
<< MT16 (³ He,2n)	MT17 (³He,3n) or MT5 (Po207 production)	MT37 (³ He,4n) >>



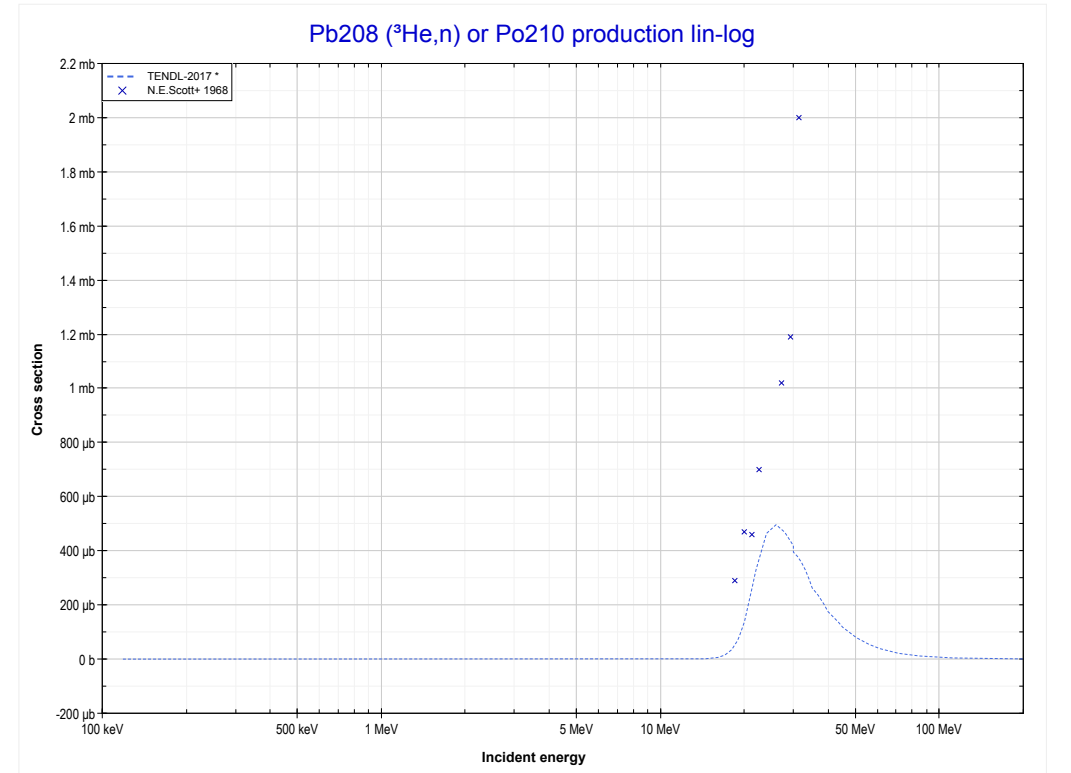
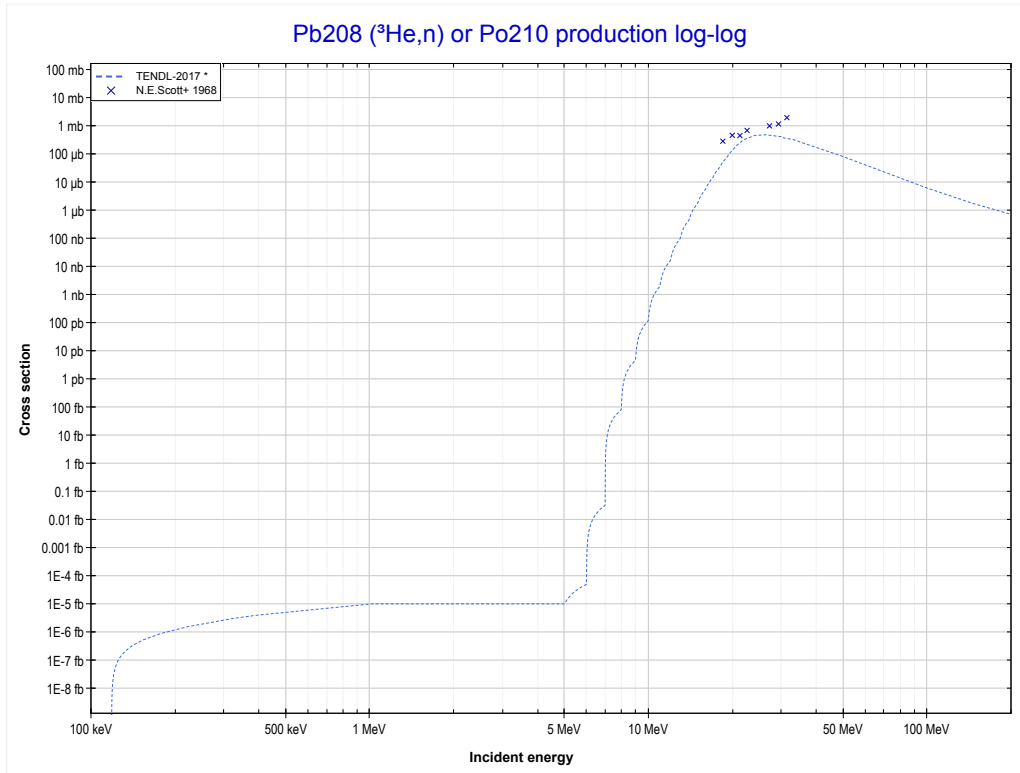
Reaction	Q-Value
Pb207(He3,3n)Po207	-14589.24 keV

<< 81-Tl-203	82-Pb-207	82-Pb-208 >>
<< MT17 ($^3\text{He},3n$)	MT37 ($^3\text{He},4n$) or MT5 (Po206 production)	82-Pb-208 MT4 ($^3\text{He},n$) >>



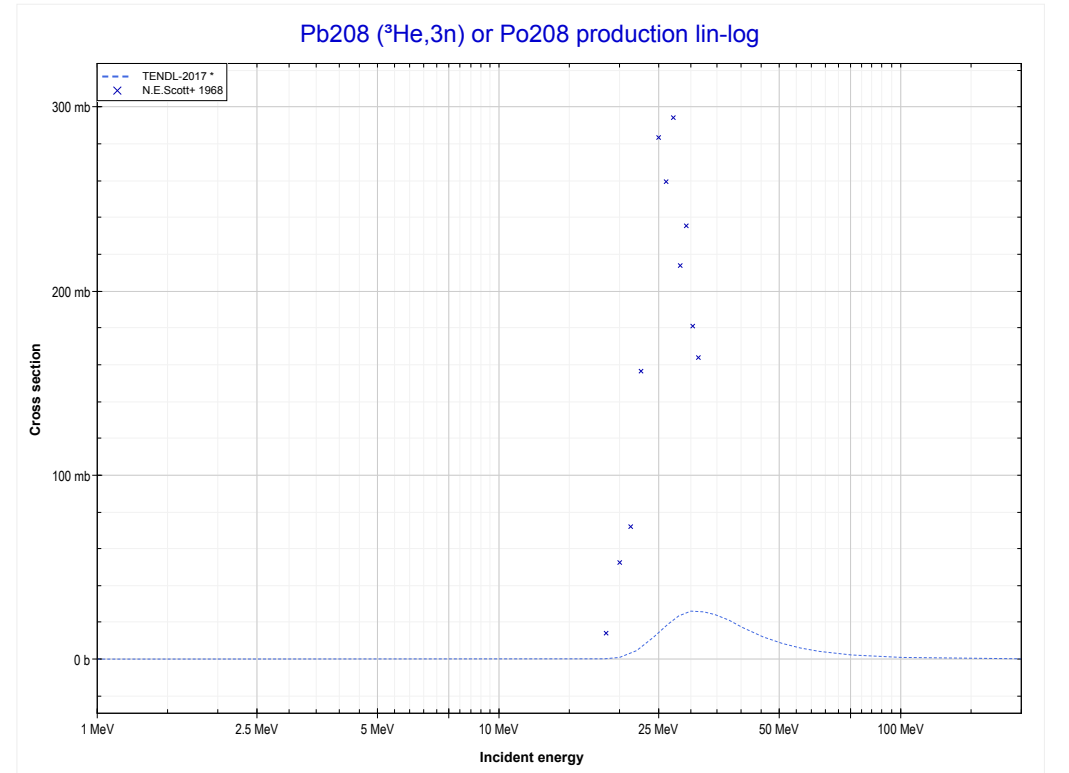
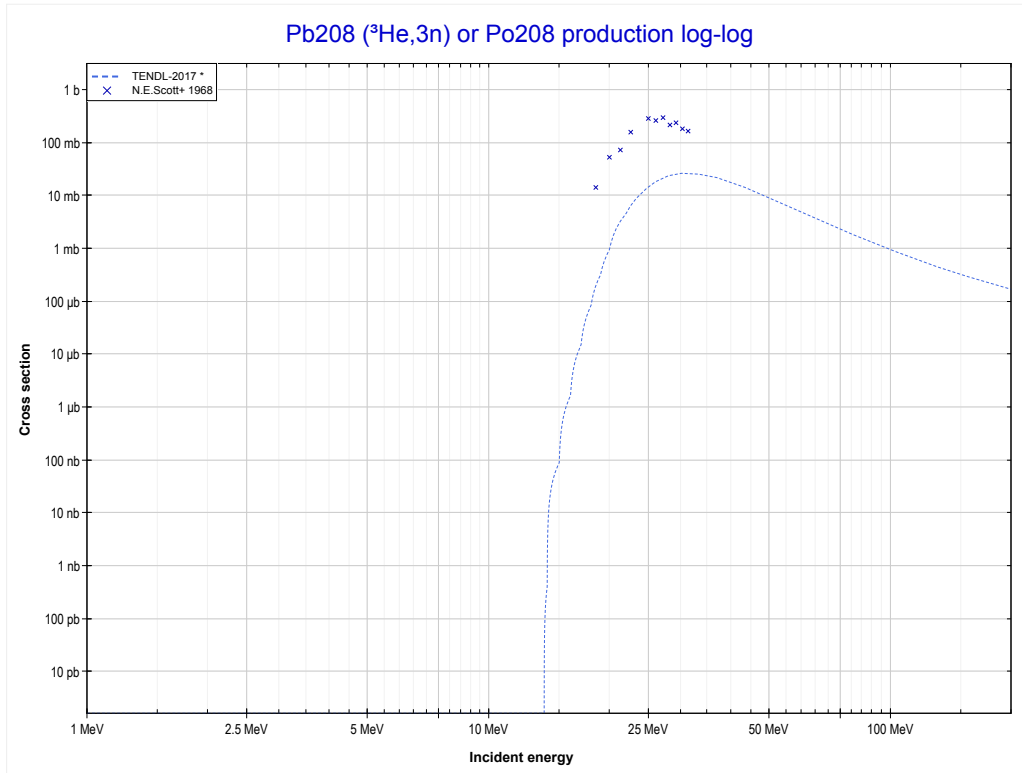
Reaction	Q-Value
Pb207($\text{He}3,4n$)Po206	-21617.55 keV

<< 73-Ta-181	82-Pb-208	83-Bi-209 >>
<< 82-Pb-207 MT37 (³ He,4n)	MT4 (³He,n) or MT5 (Po210 production)	MT17 (³ He,3n) >>



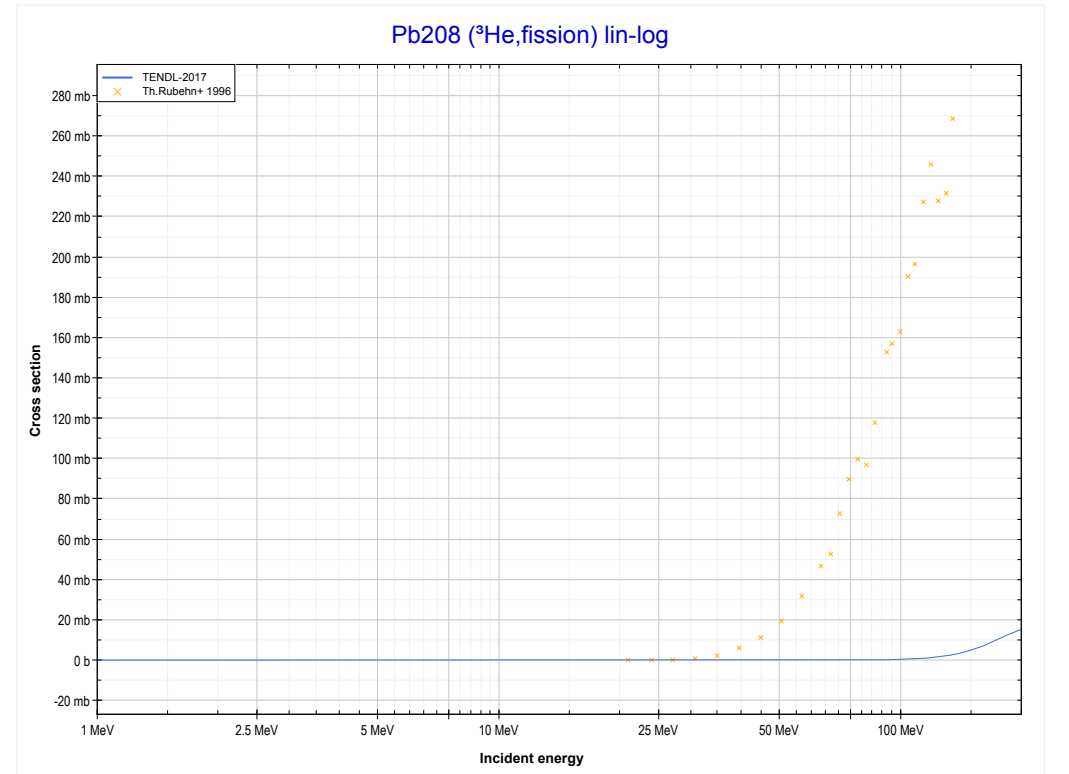
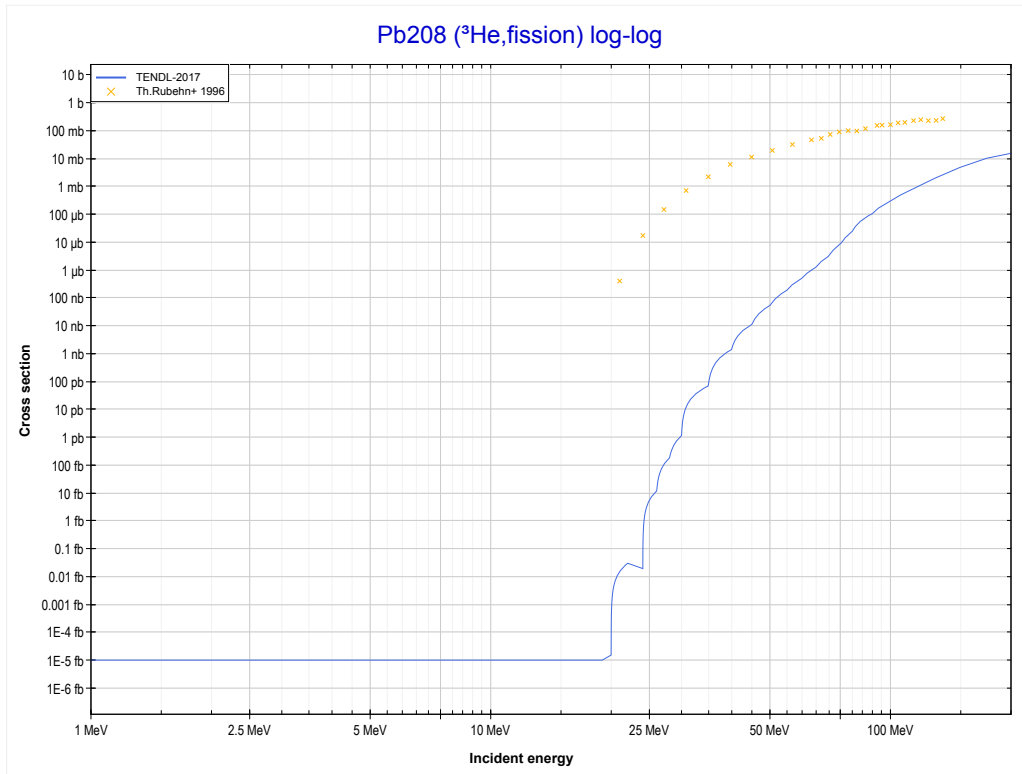
Reaction	Q-Value
Pb208(He3,n)Po210	1064.50 keV

<< 82-Pb-207	82-Pb-208	83-Bi-209 >>
<< MT4 (³ He,n)	MT17 (³He,3n) or MT5 (Po208 production)	MT18 (³ He,fission) >>

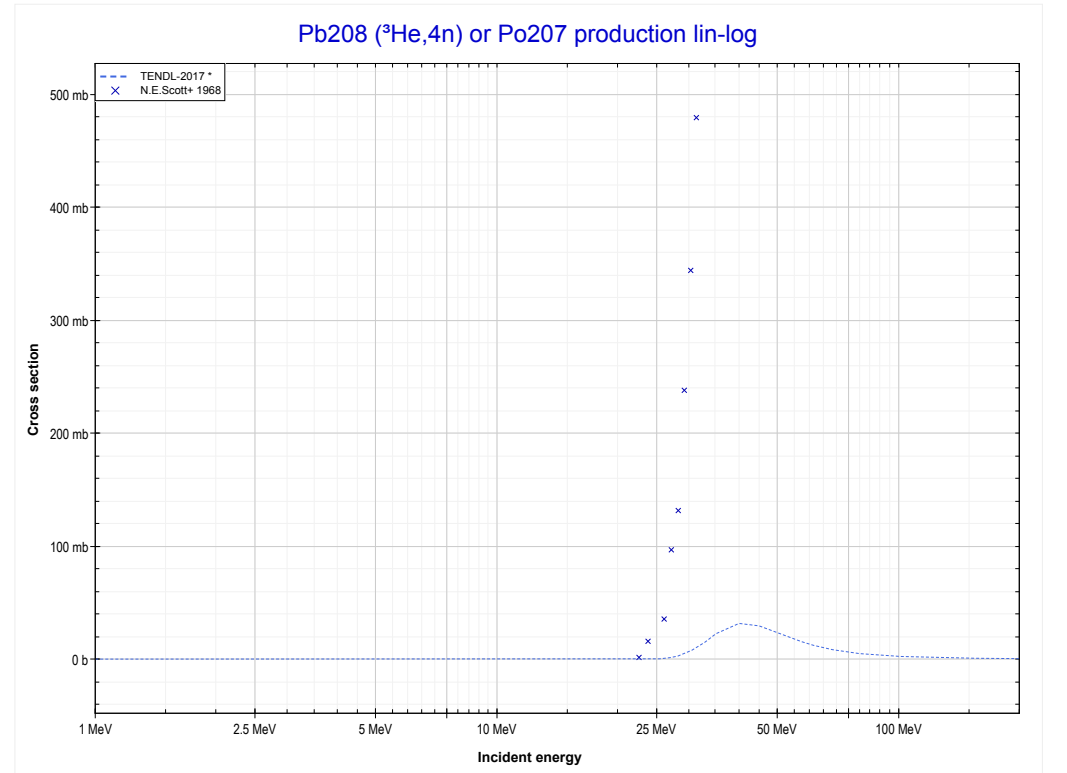
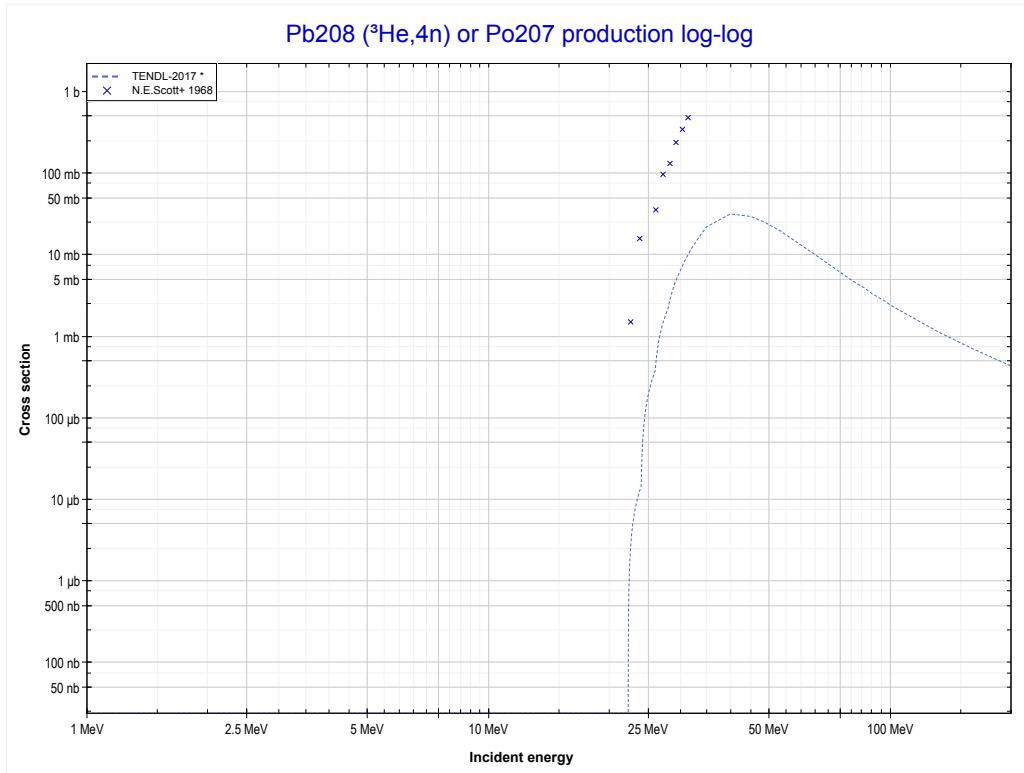


Reaction	Q-Value
Pb208(He3,3n)Po208	-13561.64 keV

<< 79-Au-197	82-Pb-208	83-Bi-209 >>
<< MT17 (³ He,3n)	MT18 (³He,fission)	MT37 (³ He,4n) >>

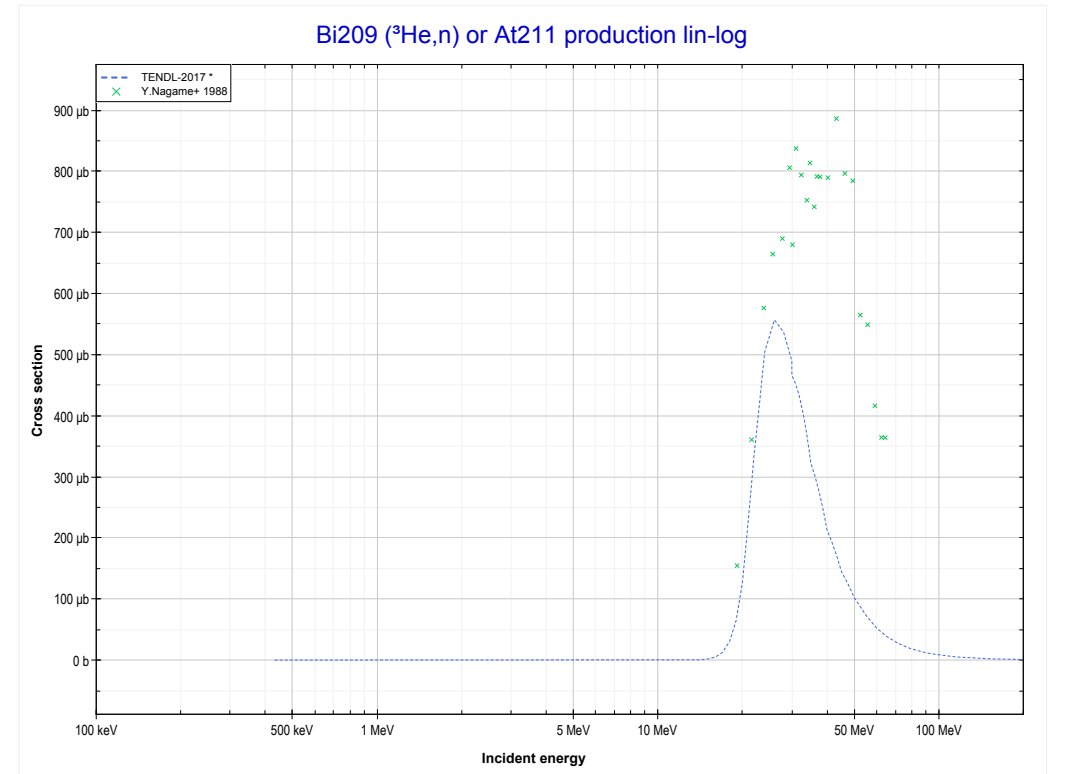
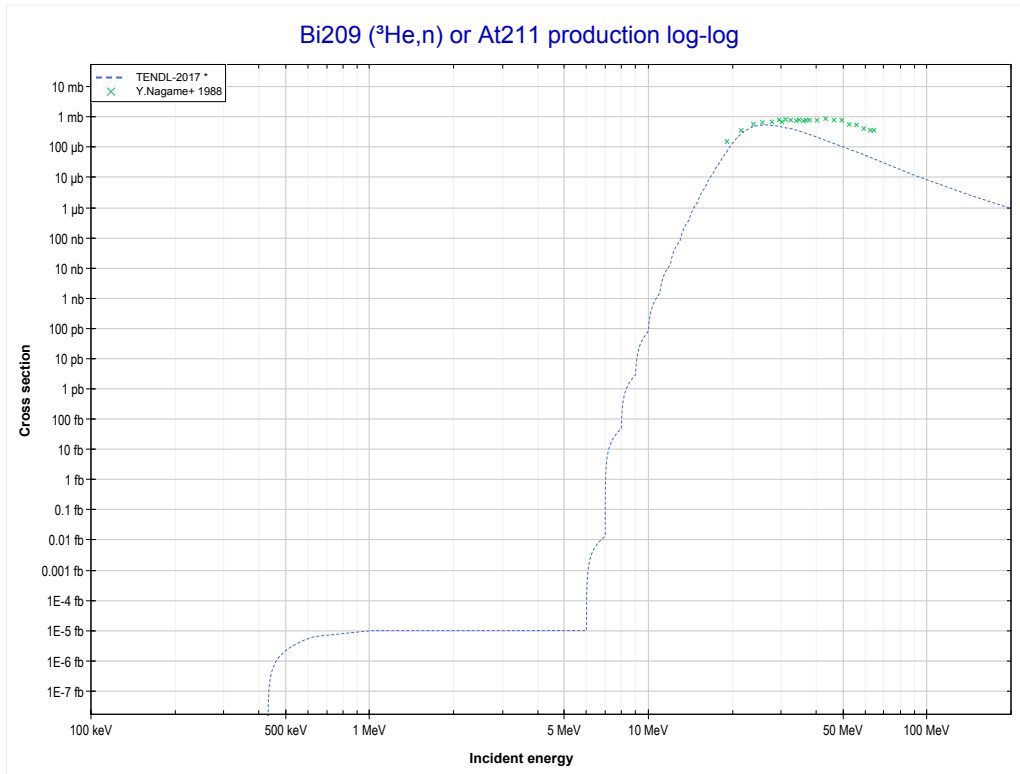


<< 82-Pb-207	82-Pb-208	83-Bi-209 >>
<< MT18 (³ He,fission)	MT37 (³He,4n) or MT5 (Po207 production)	83-Bi-209 MT4 (³ He,n) >>



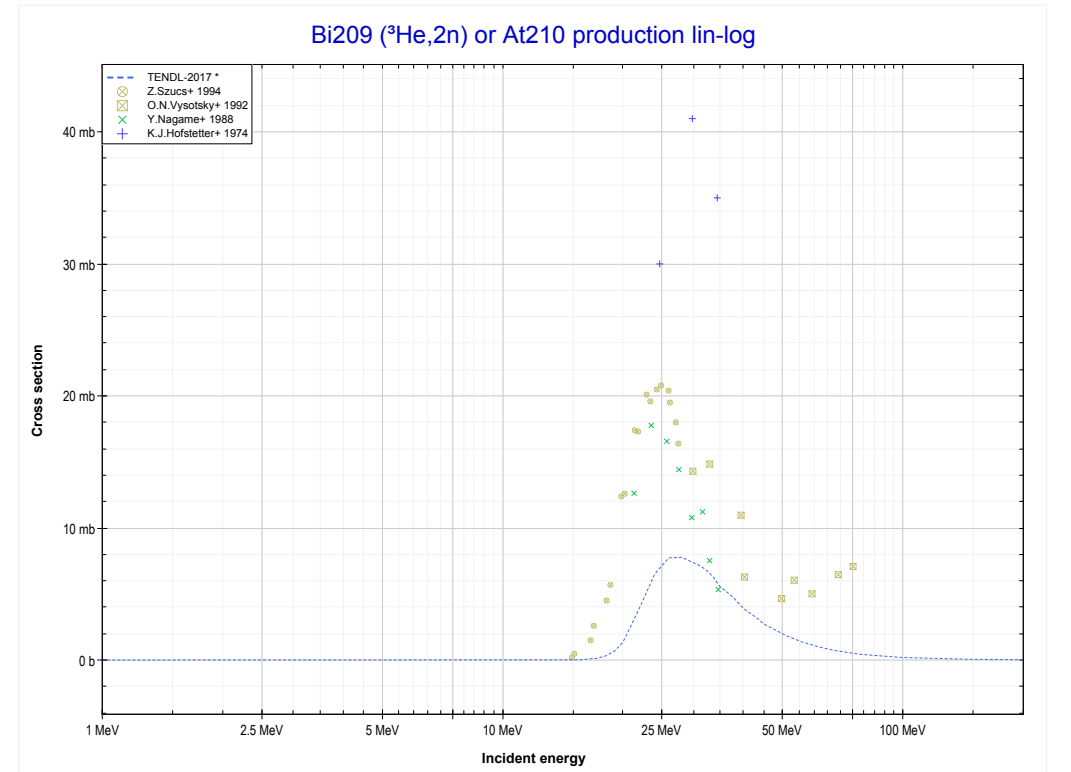
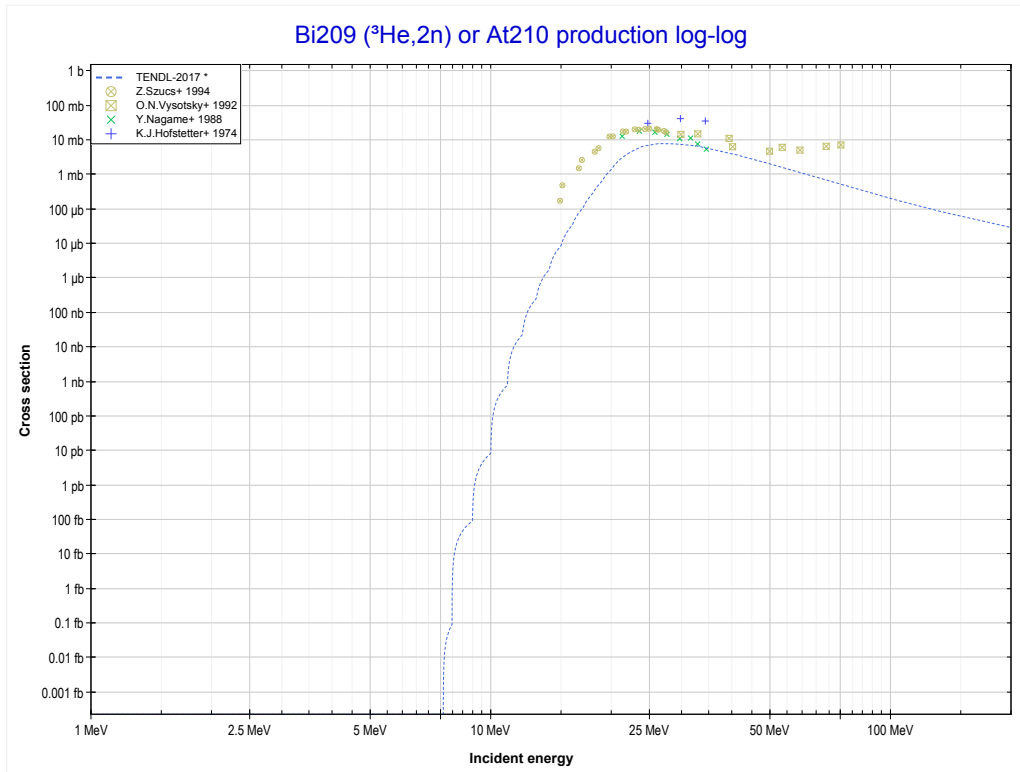
Reaction	Q-Value
Pb208(He3,4n)Po207	-21957.15 keV

<< 82-Pb-208	83-Bi-209	92-U-235 >>
<< 82-Pb-208 MT37 (³ He,4n)	MT4 (³He,n) or MT5 (At211 production)	MT16 (³ He,2n) >>



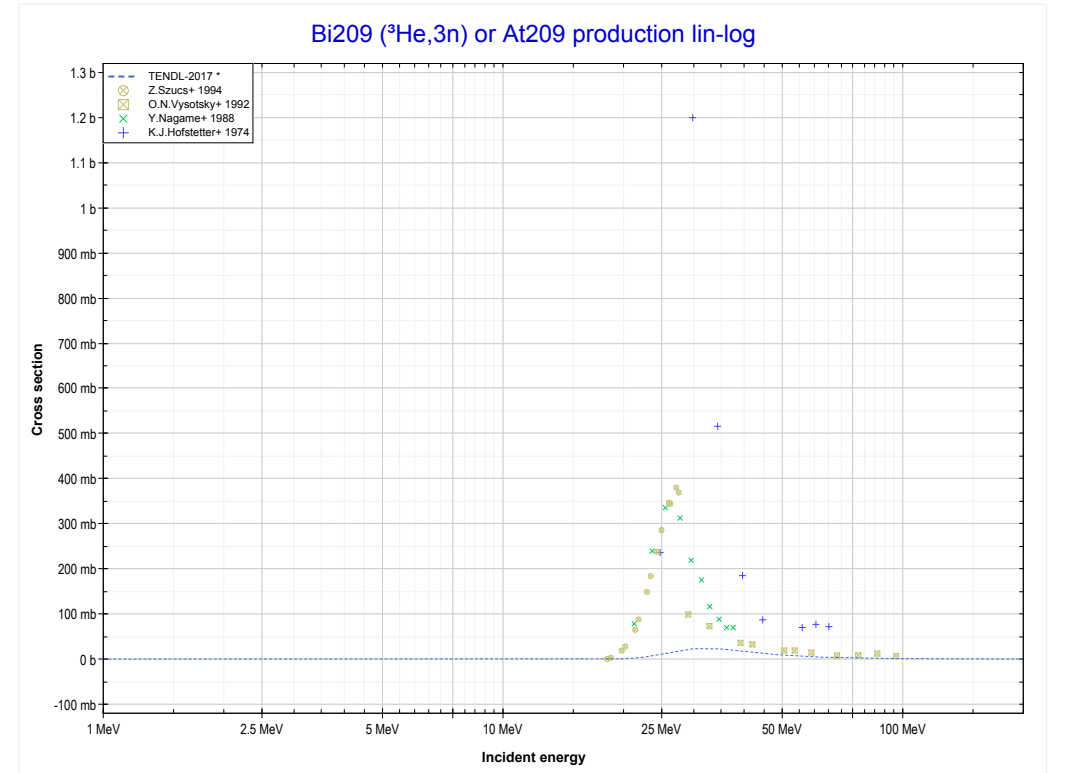
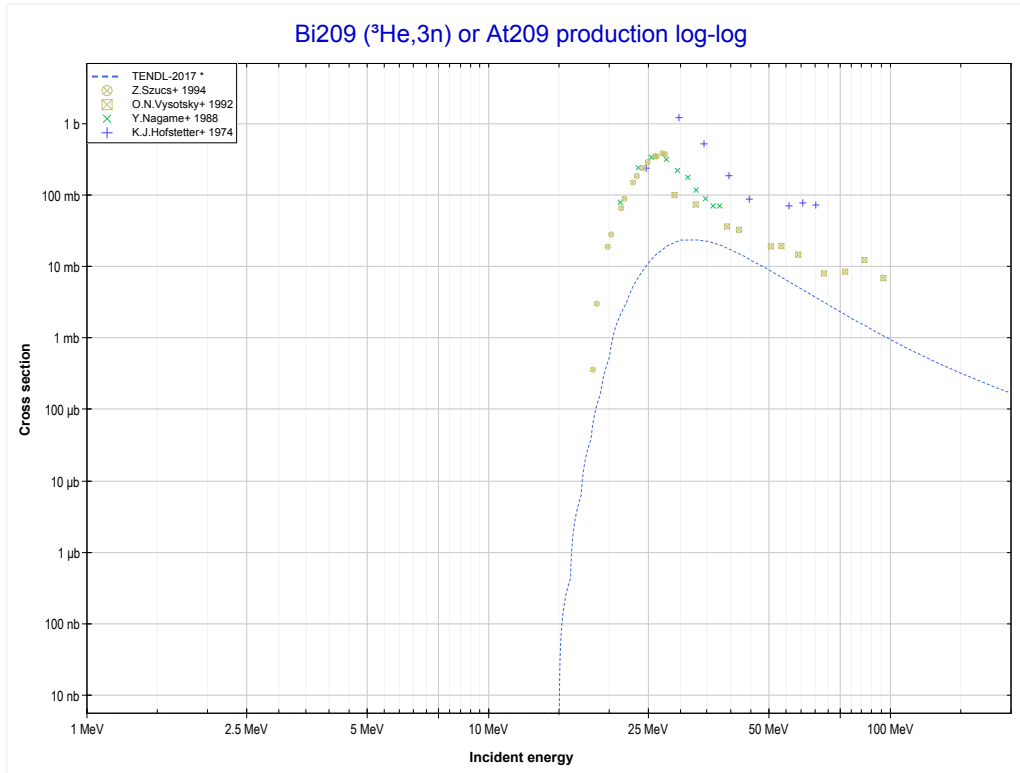
Reaction	Q-Value
Bi209(He3,n)At211	248.50 keV

<< 82-Pb-207	83-Bi-209	92-U-235 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (At210 production)	MT17 (³ He,3n) >>



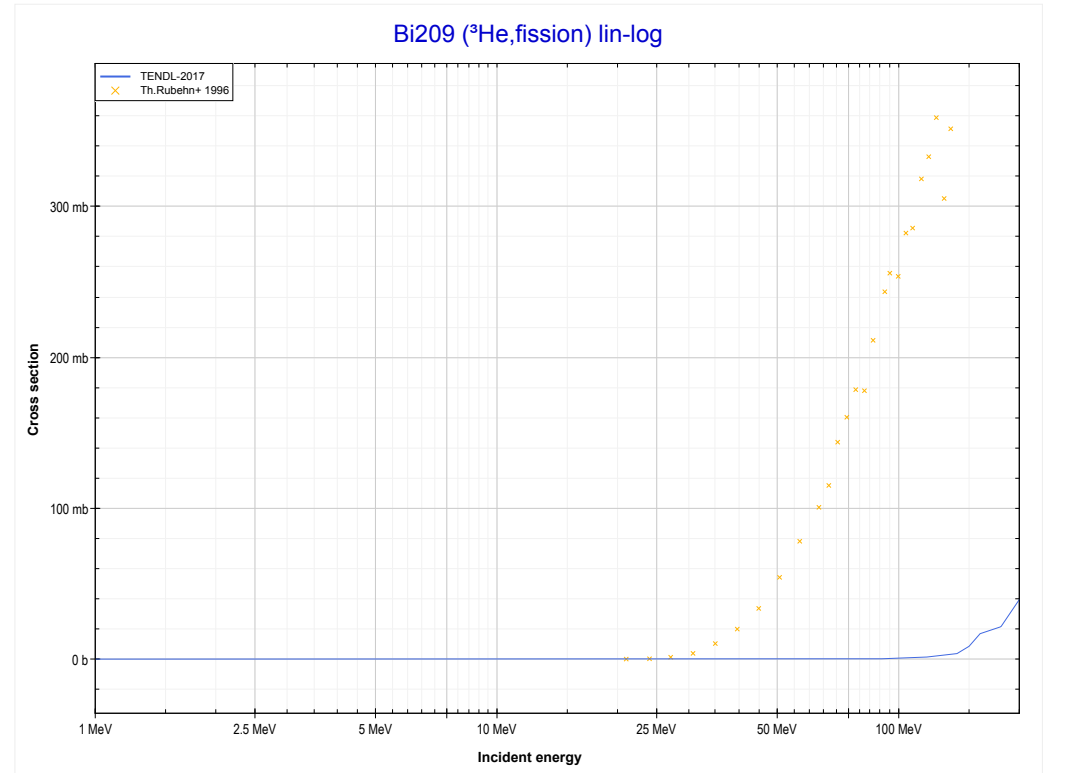
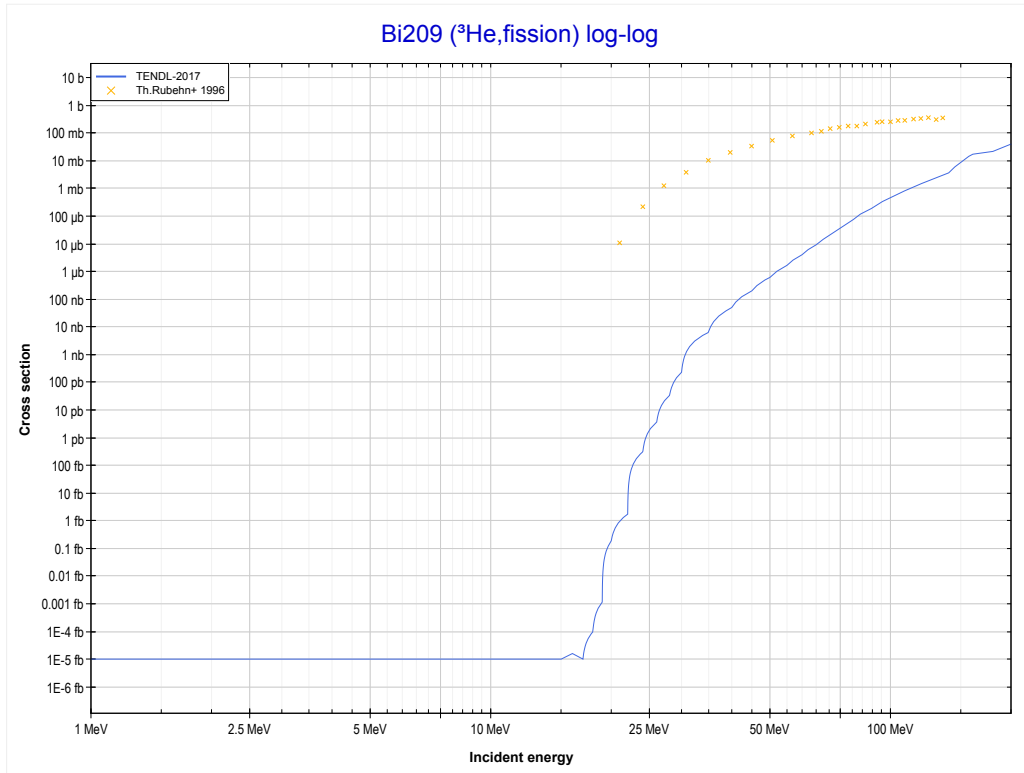
Reaction	Q-Value
Bi209(He3,2n)At210	-7497.62 keV

<< 82-Pb-208	83-Bi-209	90-Th-230 >>
<< MT16 (³ He,2n)	MT17 (³He,3n) or MT5 (At209 production)	MT18 (³ He,fission) >>

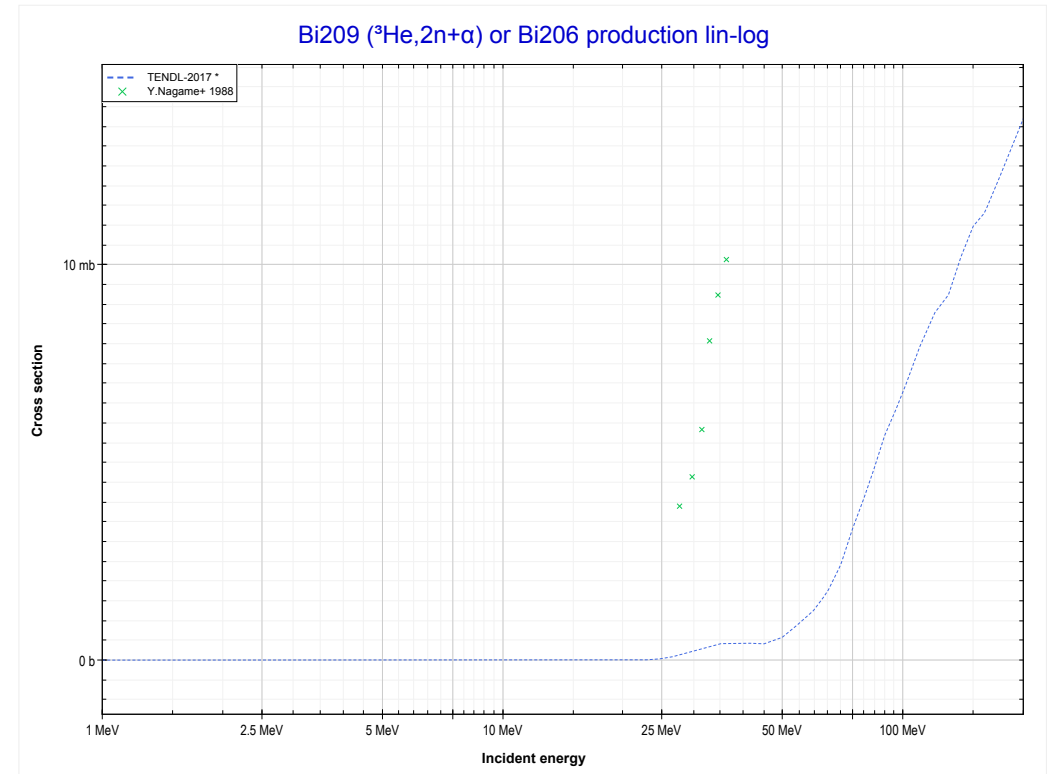
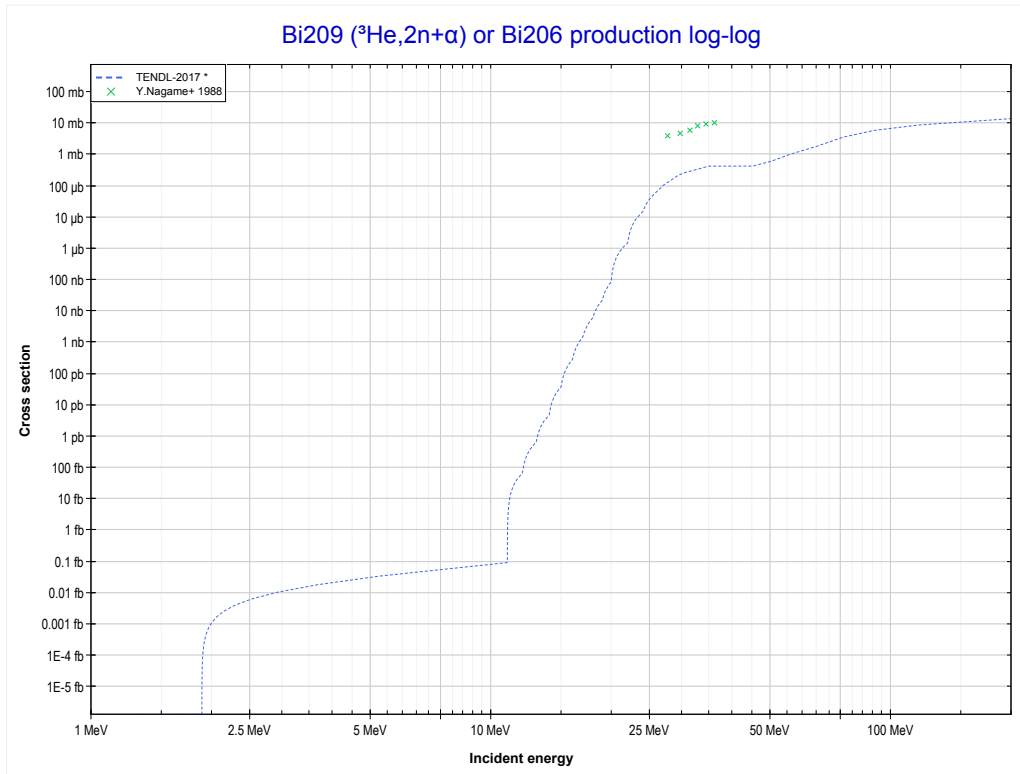


Reaction	Q-Value
Bi209(He3,3n)At209	-14658.94 keV

<< 82-Pb-208	83-Bi-209	92-U-238 >>
<< MT17 ($^3\text{He},3n$)	MT18 ($^3\text{He},\text{fission}$)	MT24 ($^3\text{He},2n+\alpha$) >>

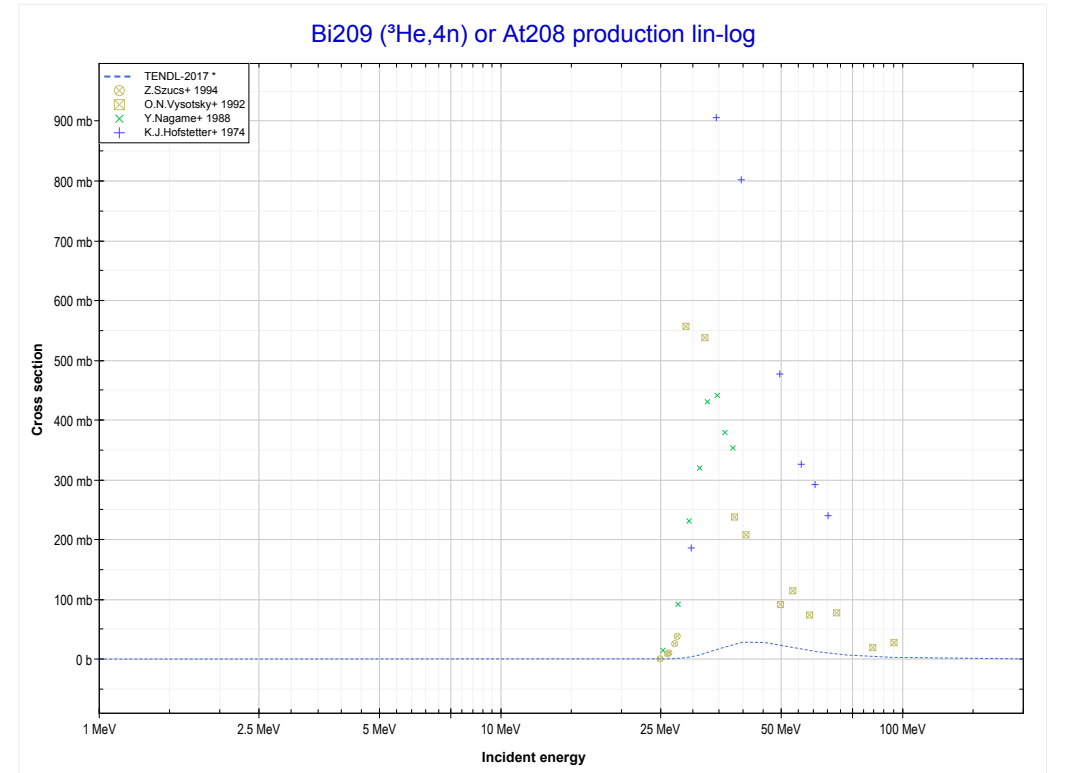
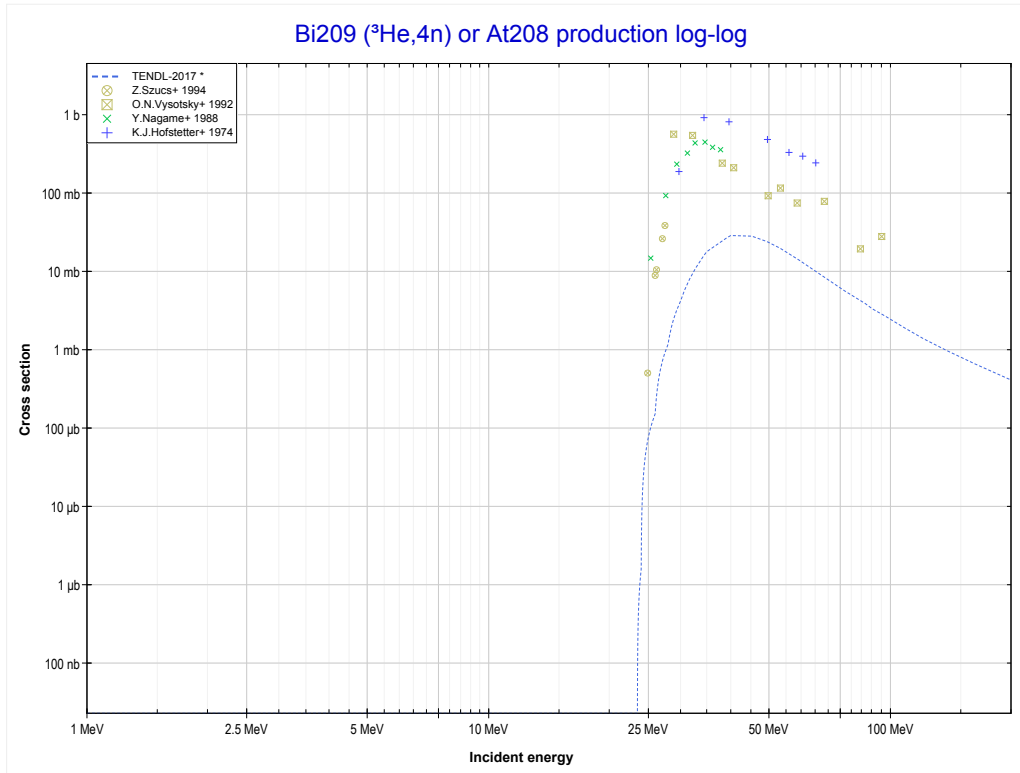


<< 73-Ta-181	83-Bi-209	
<< MT18 (³ He,fission)	MT24 (³He,2n+α) or MT5 (Bi206 production)	MT37 (³ He,4n) >>



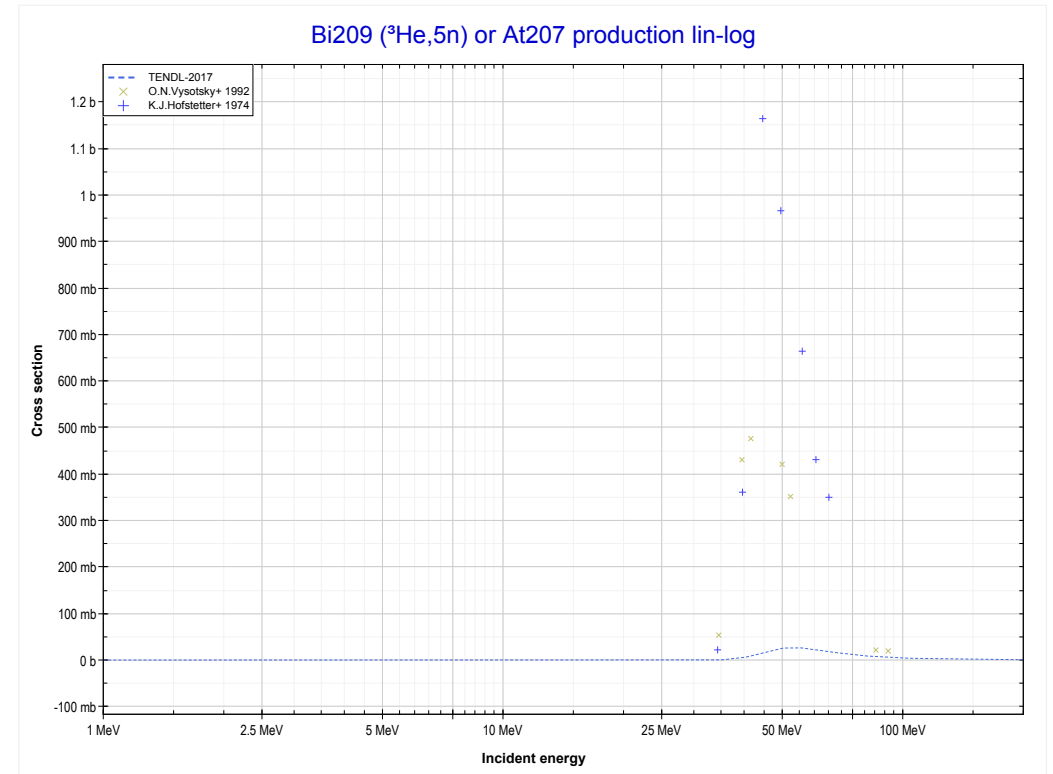
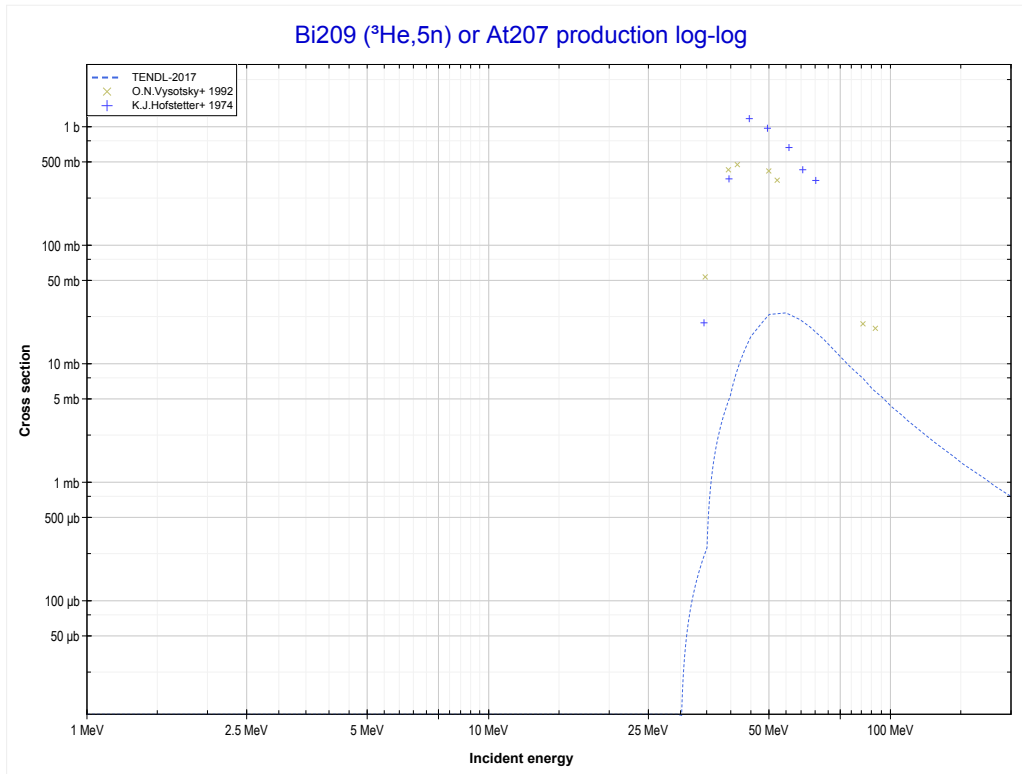
Reaction	Q-Value
Bi209(He3,2n+α)Bi206	-1866.53 keV
Bi209(He3,2t)Bi206	-13198.60 keV
Bi209(He3,n+d+t)Bi206	-19455.83 keV
Bi209(He3,2n+p+t)Bi206	-21680.40 keV
Bi209(He3,3n+He3)Bi206	-22444.15 keV
Bi209(He3,2n+2d)Bi206	-25713.06 keV
Bi209(He3,3n+p+d)Bi206	-27937.63 keV
Bi209(He3,4n+2p)Bi206	-30162.19 keV

<< 82-Pb-208	83-Bi-209	92-U-235 >>
<< MT24 ($^3\text{He},2n+\alpha$)	MT37 ($^3\text{He},4n$) or MT5 (At208 production)	MT152 ($^3\text{He},5n$) >>



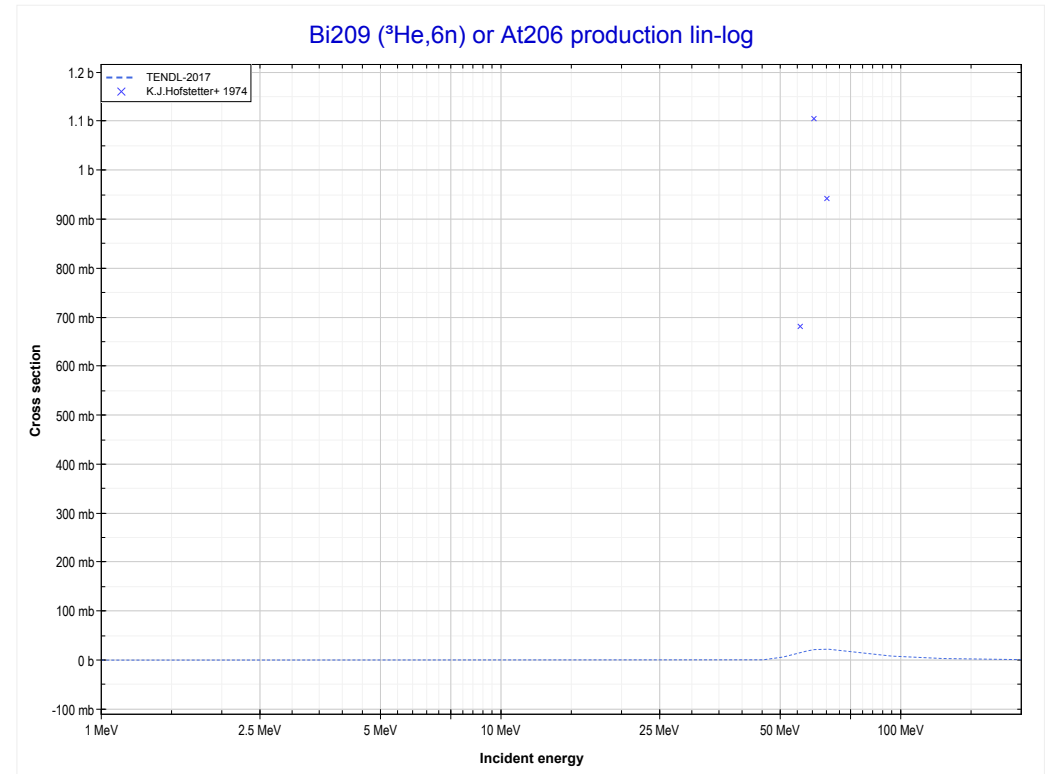
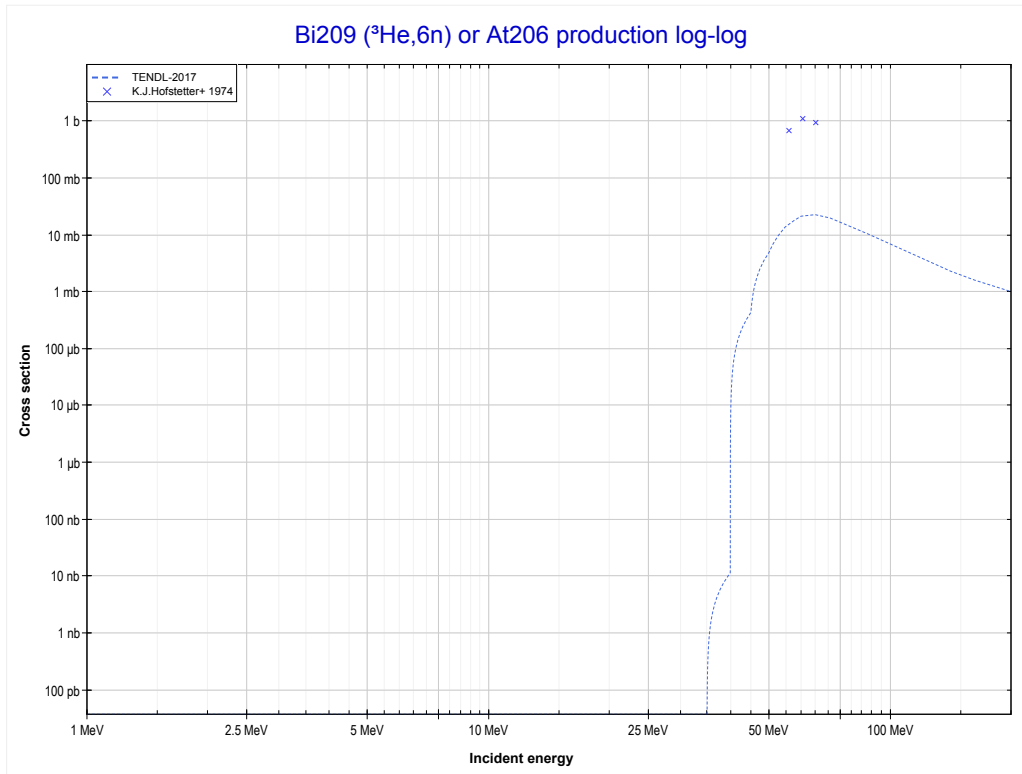
Reaction	Q-Value
Bi209($\text{He}3,4n$)At208	-23142.25 keV

<< 81-Tl-203	83-Bi-209	
<< MT37 (³ He,4n)	MT152 (³He,5n) or MT5 (At207 production)	MT153 (³ He,6n) >>



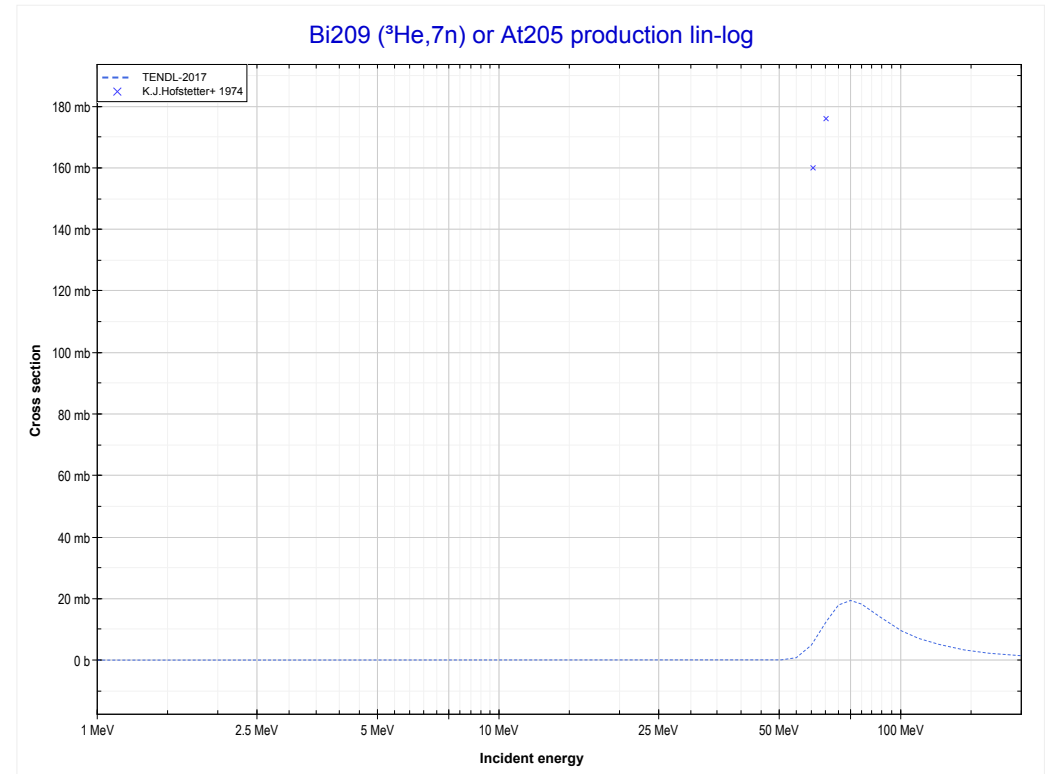
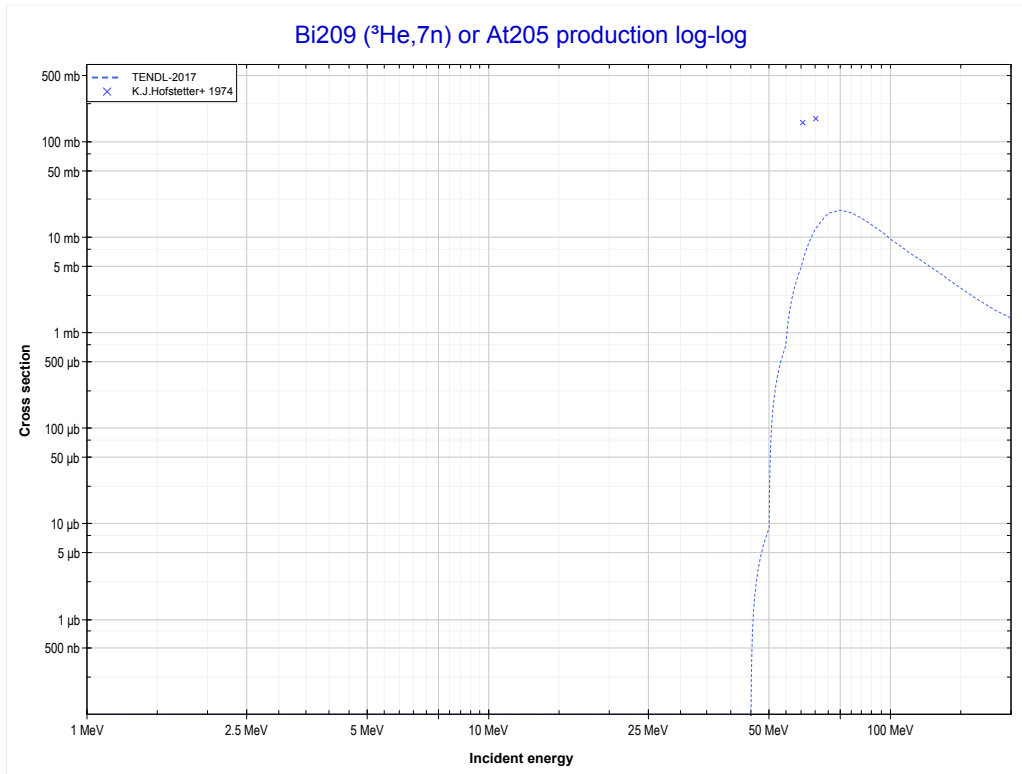
Reaction	Q-Value
Bi209(He3,5n)At207	-30456.57 keV

<< 81-Tl-203	83-Bi-209	
<< MT152 (³ He,5n)	MT153 (³He,6n) or MT5 (At206 production)	MT160 (³ He,7n) >>



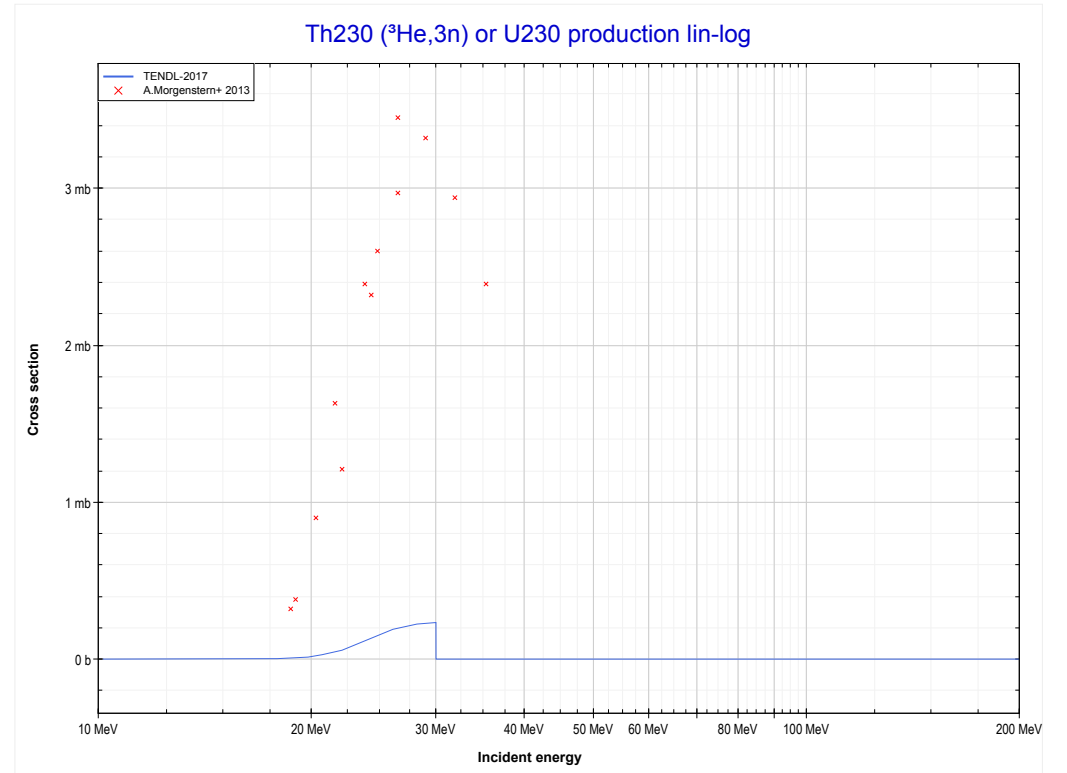
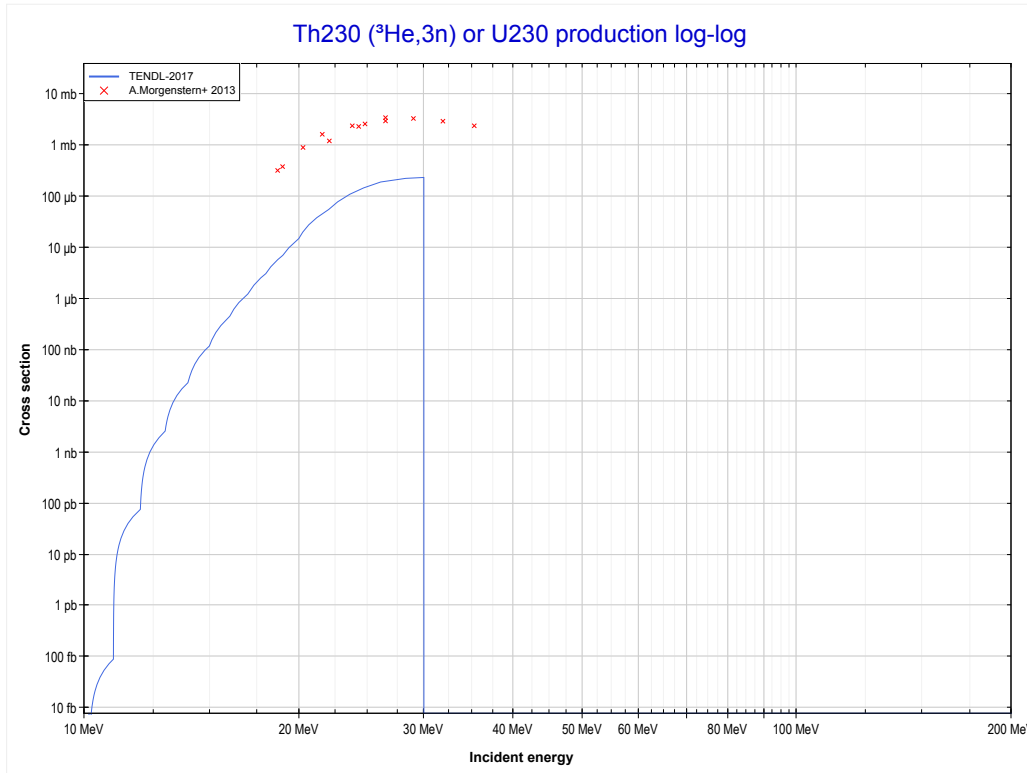
Reaction	Q-Value
Bi209(He3,6n)At206	-39325.89 keV

<< 73-Ta-181	83-Bi-209	
<< MT153 (³ He,6n)	MT160 (³He,7n) or MT5 (At205 production)	90-Th-230 MT17 (³ He,3n) >>



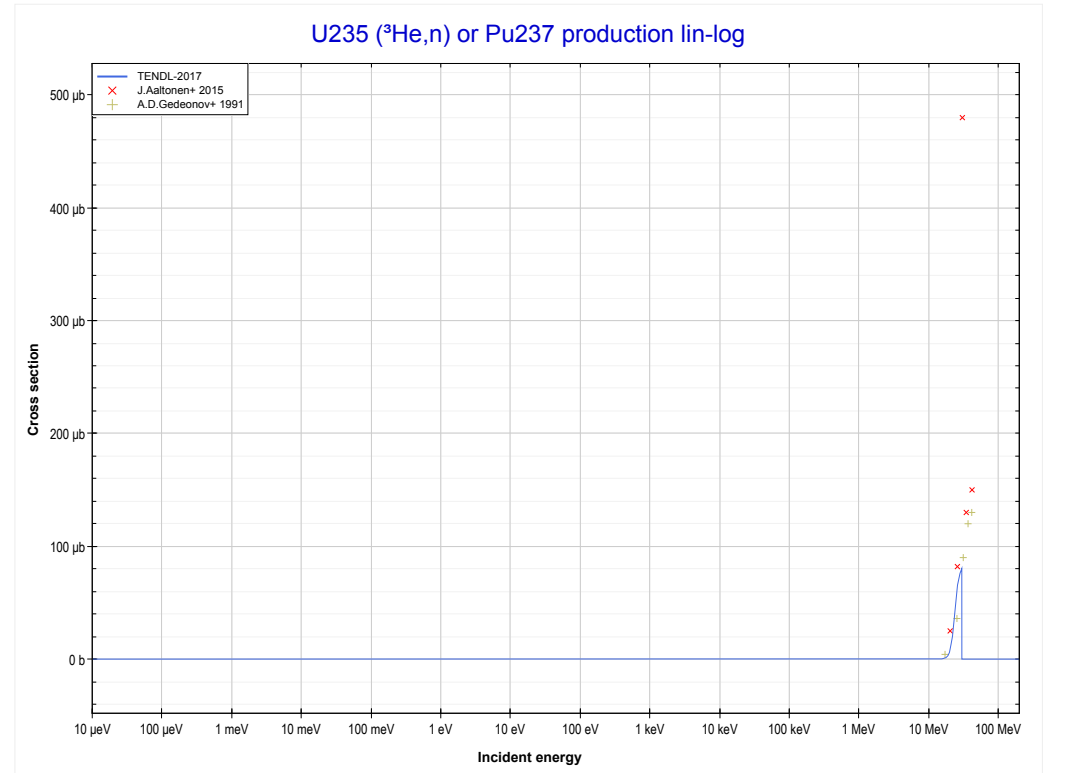
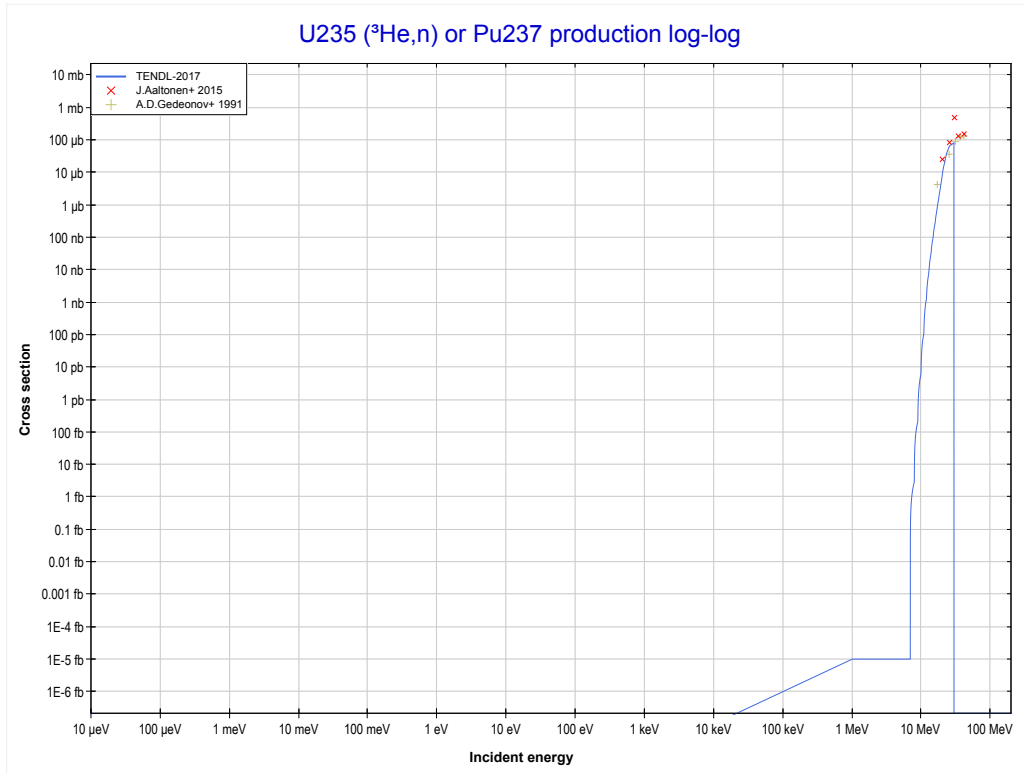
Reaction	Q-Value
Bi209(He3,7n)At205	-46856.20 keV

<< 83-Bi-209	90-Th-230	93-Np-237 >>
<< 83-Bi-209 MT160 (³ He,7n)	MT17 (³He,3n) or MT5 (U230 production)	92-U-235 MT4 (³ He,n) >>



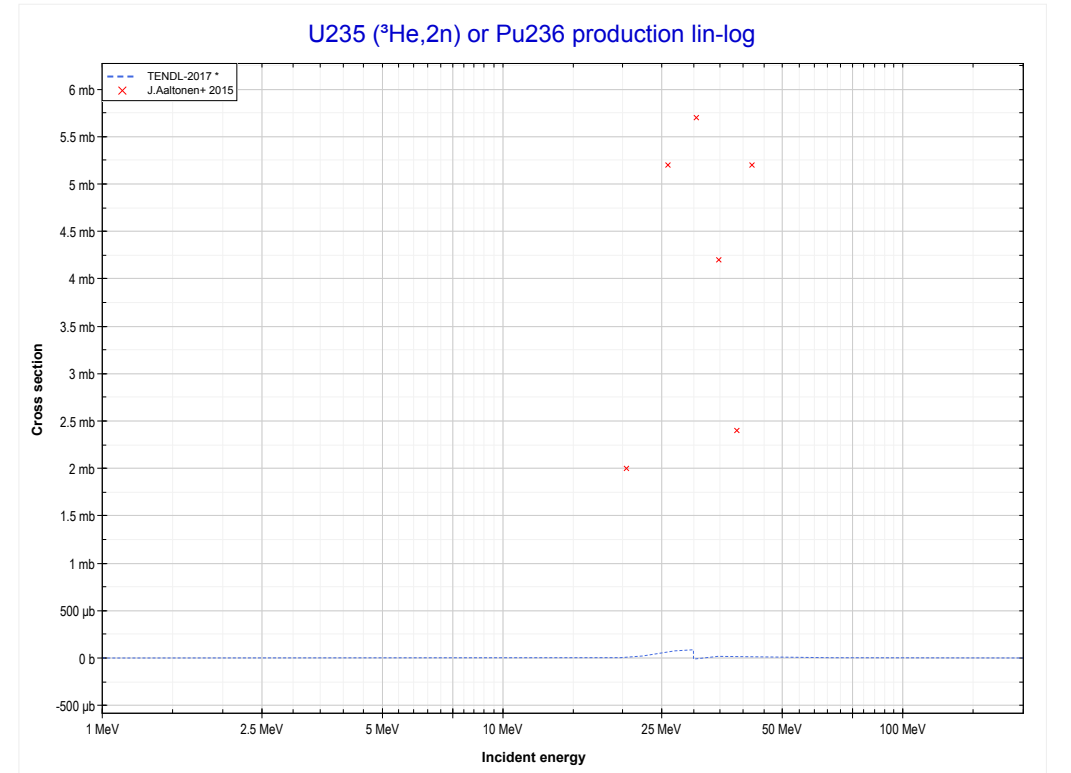
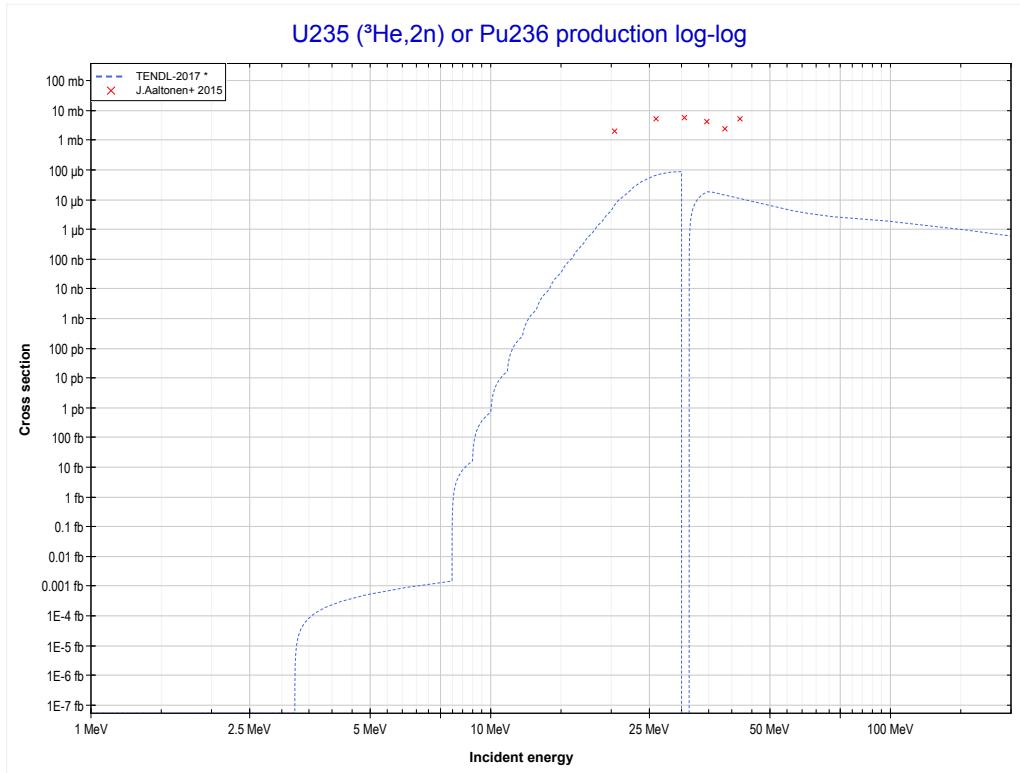
Reaction	Q-Value
Th230(He3,3n)U230	-10033.54 keV

<< 83-Bi-209	92-U-235	93-Np-237 >>
<< 90-Th-230 MT17 (³ He,3n)	MT4 (³He,n) or MT5 (Pu237 production)	MT16 (³ He,2n) >>



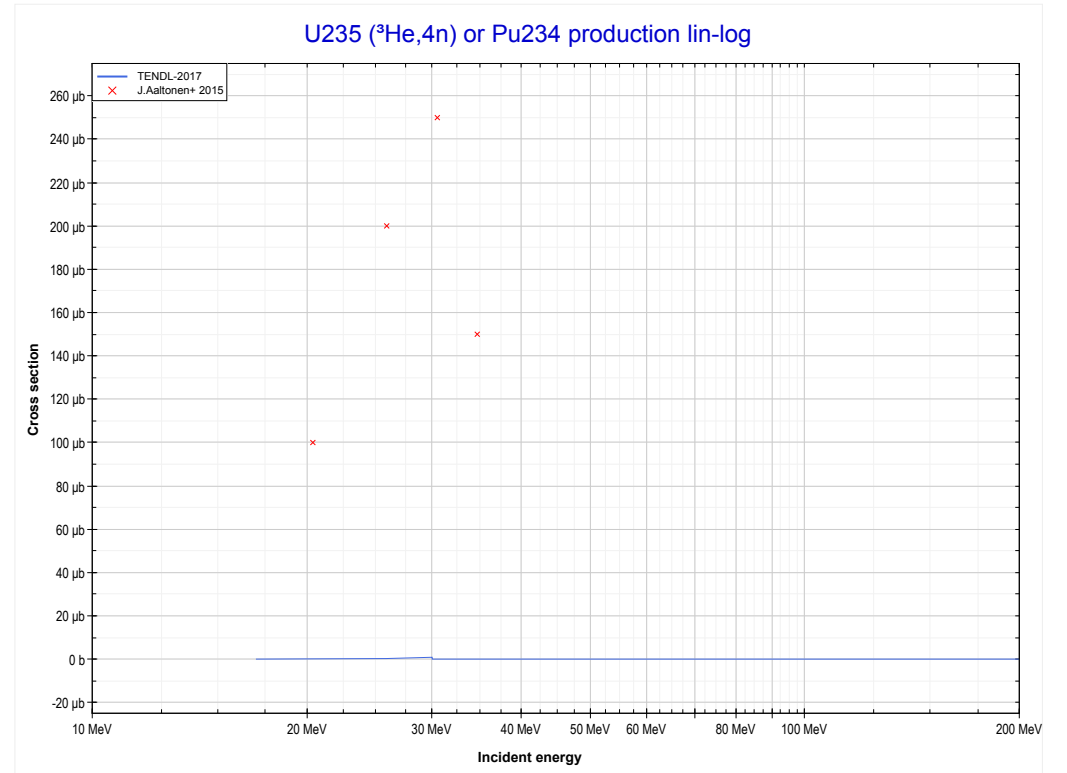
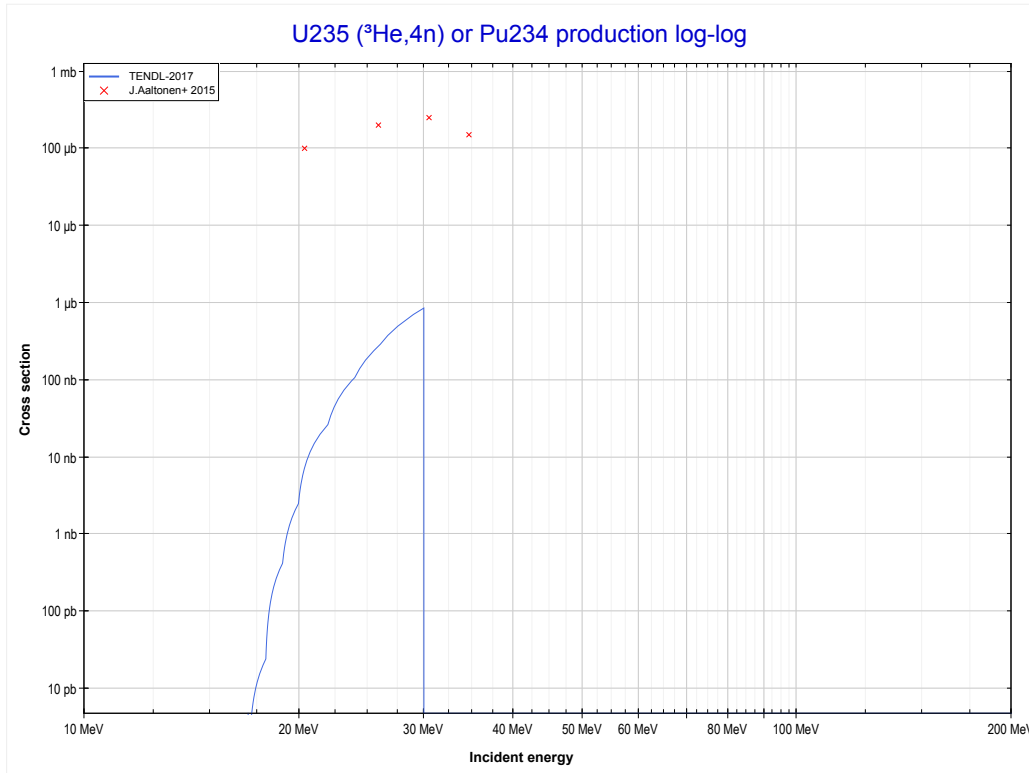
Reaction	Q-Value
U235(He3,n)Pu237	2687.10 keV

<< 83-Bi-209	92-U-235	92-U-236 >>
<< MT4 (³ He,n)	MT16 (³He,2n) or MT5 (Pu236 production)	MT37 (³ He,4n) >>



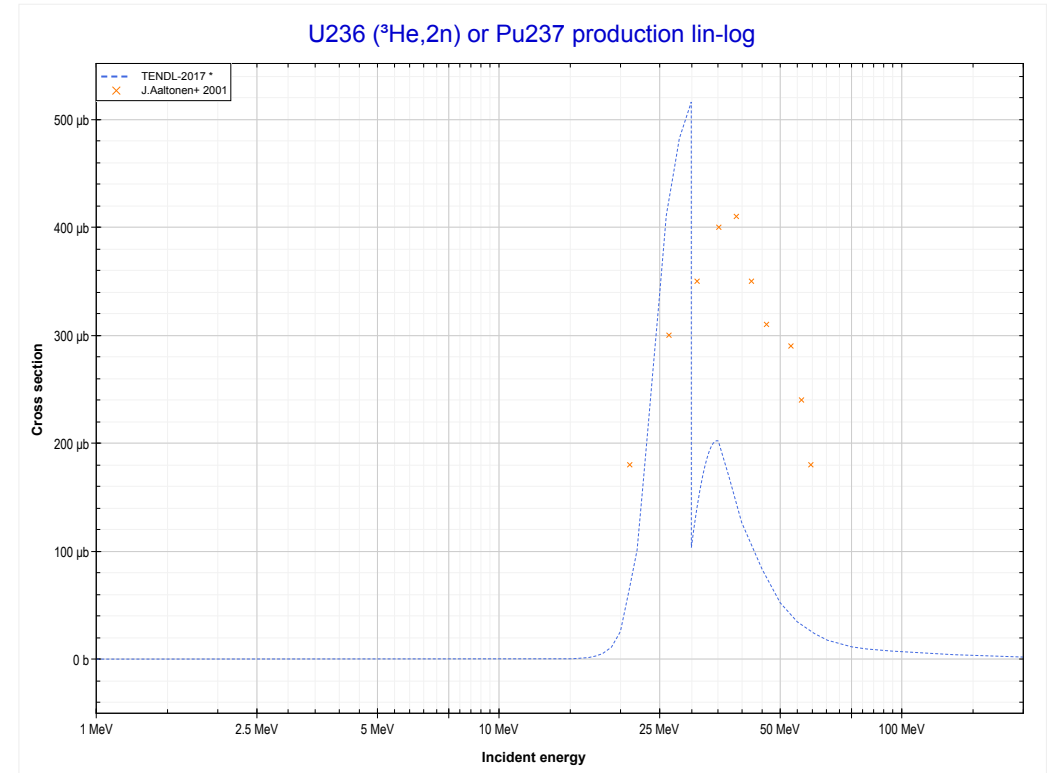
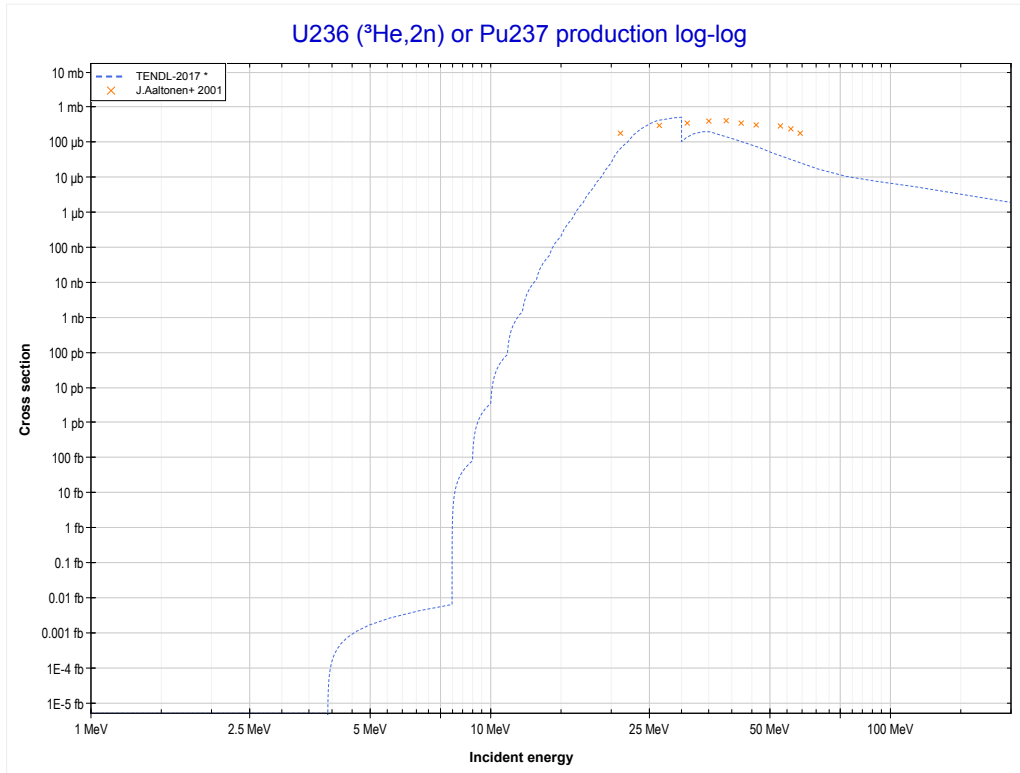
Reaction	Q-Value
U235(He3,2n)Pu236	-3193.62 keV

<< 83-Bi-209	92-U-235	
<< MT16 ($^3\text{He},2n$)	MT37 ($^3\text{He},4n$) or MT5 (Pu234 production)	92-U-236 MT16 ($^3\text{He},2n$) >>



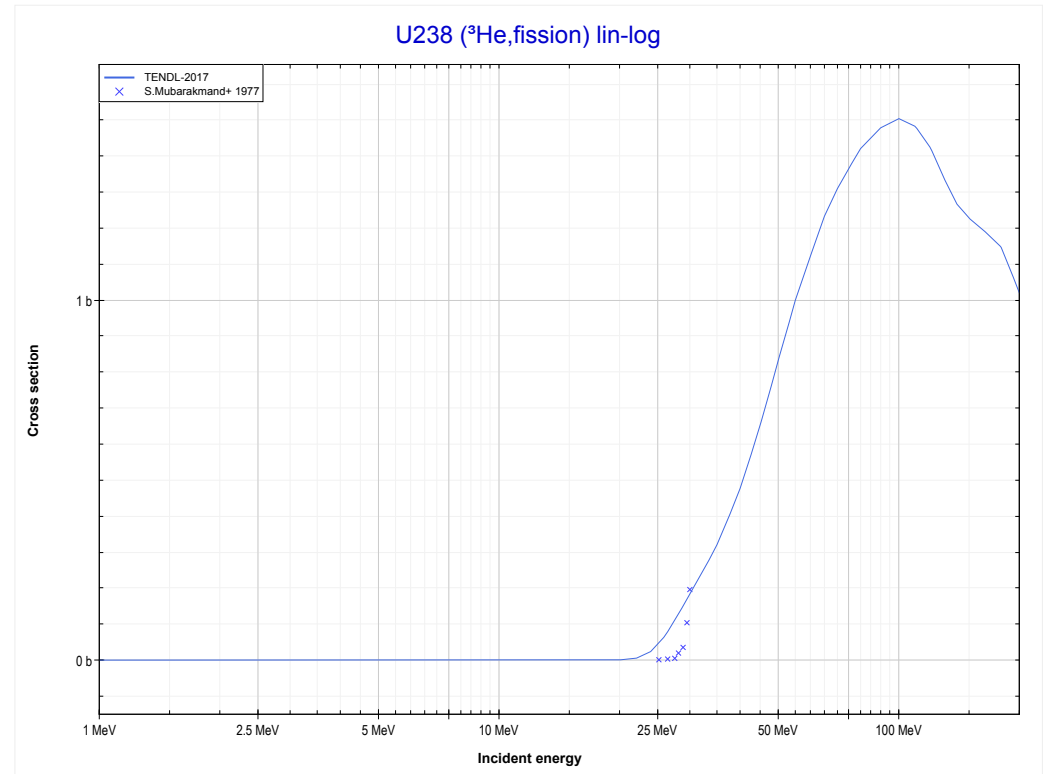
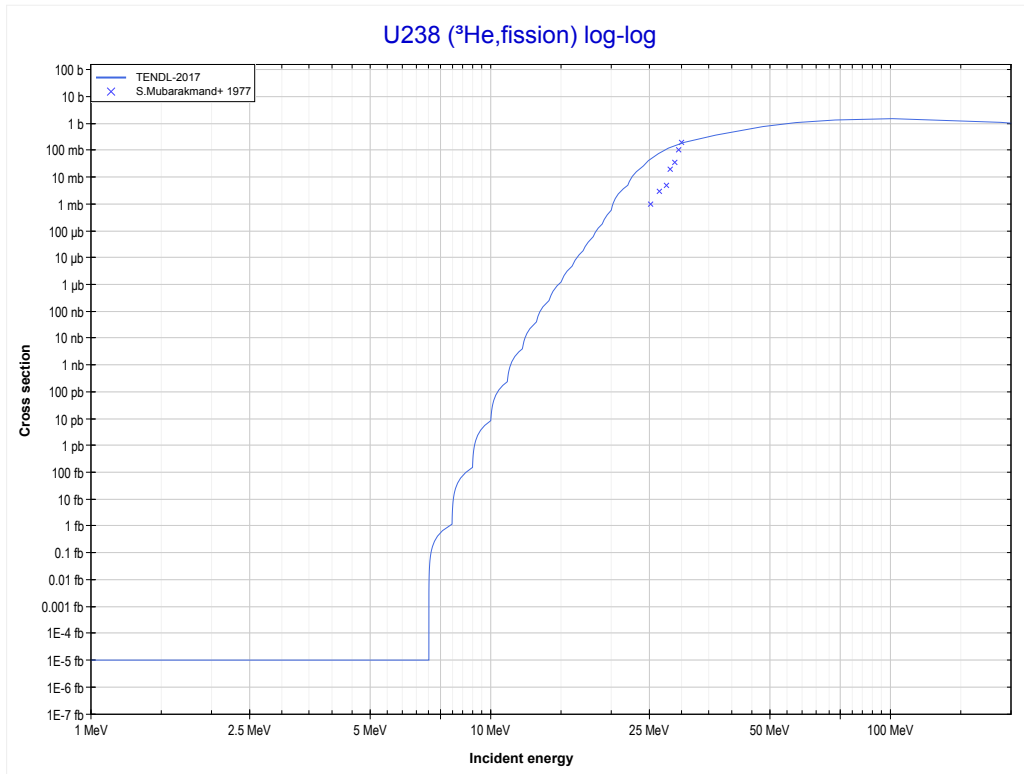
Reaction	Q-Value
U235(He3,4n)Pu234	-16783.35 keV

<< 92-U-235	92-U-236	
<< 92-U-235 MT37 (³ He,4n)	MT16 (³He,2n) or MT5 (Pu237 production)	92-U-238 MT18 (³ He,fission) >>

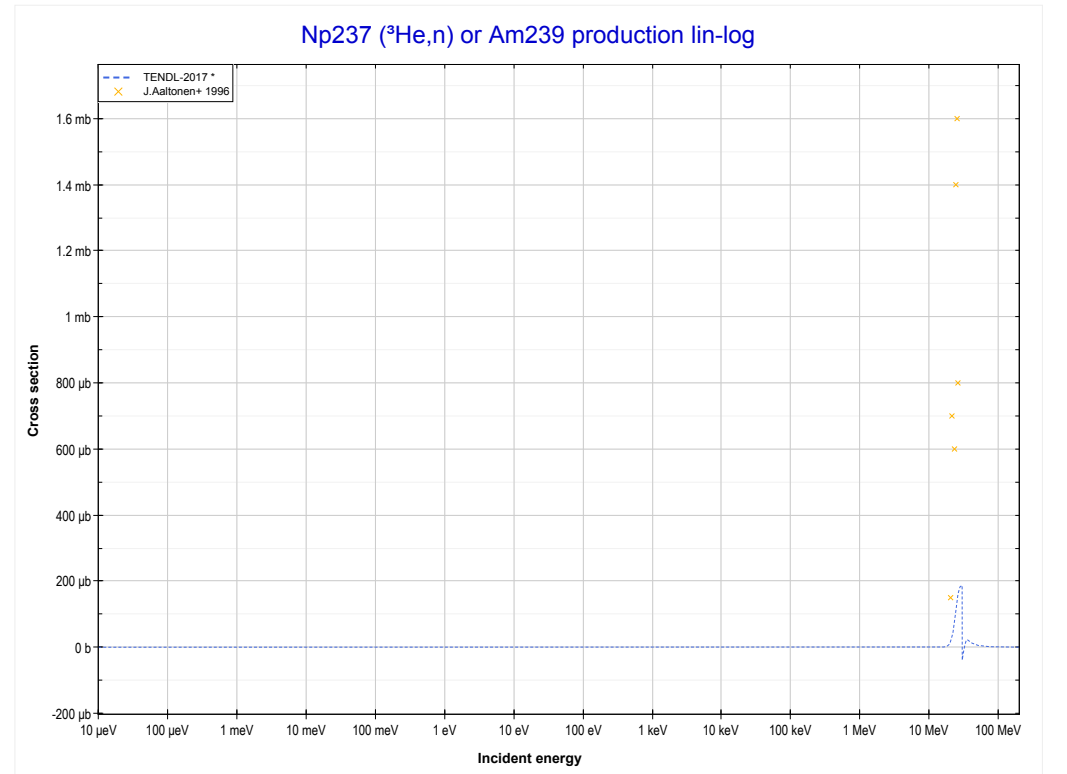
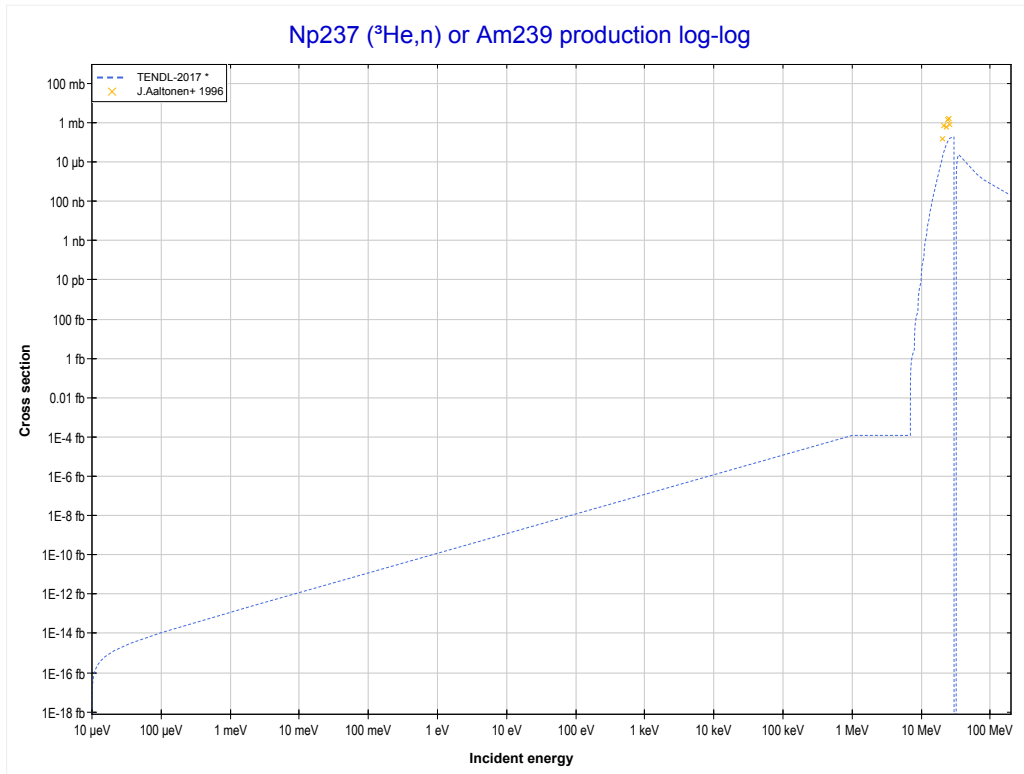


Reaction	Q-Value
U236(He3,2n)Pu237	-3858.42 keV

<< 83-Bi-209	92-U-238	
<< 92-U-236 MT16 ($^3\text{He},2n$)	MT18 ($^3\text{He},\text{fission}$)	93-Np-237 MT4 ($^3\text{He},n$) >>

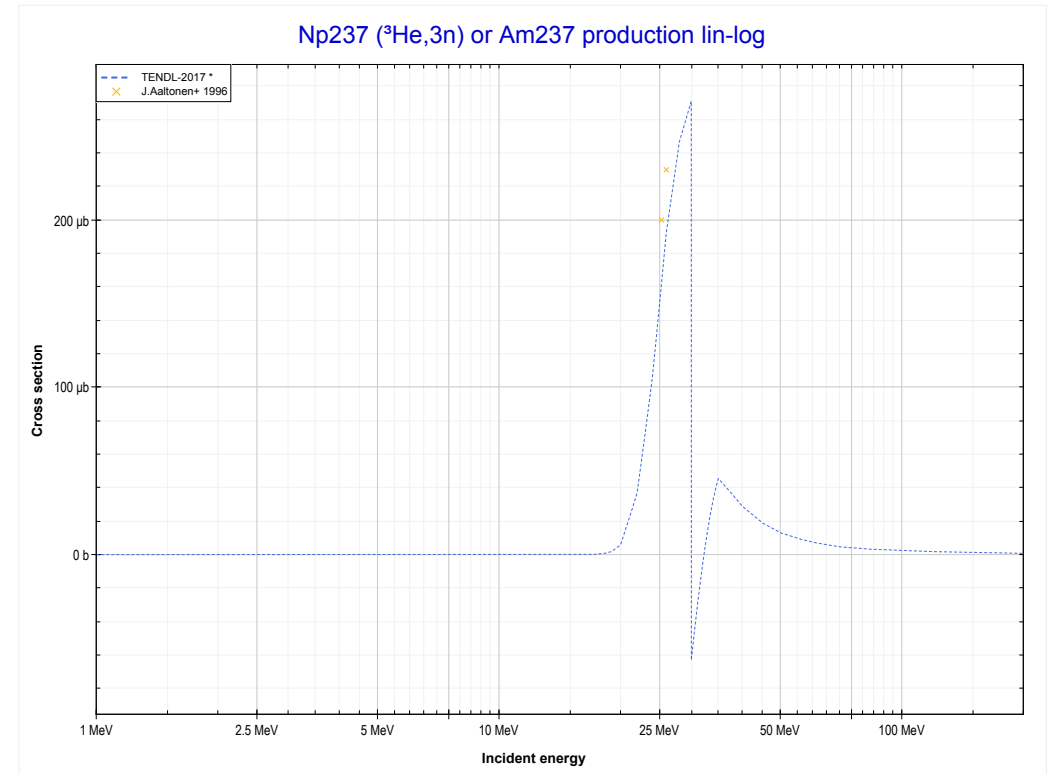
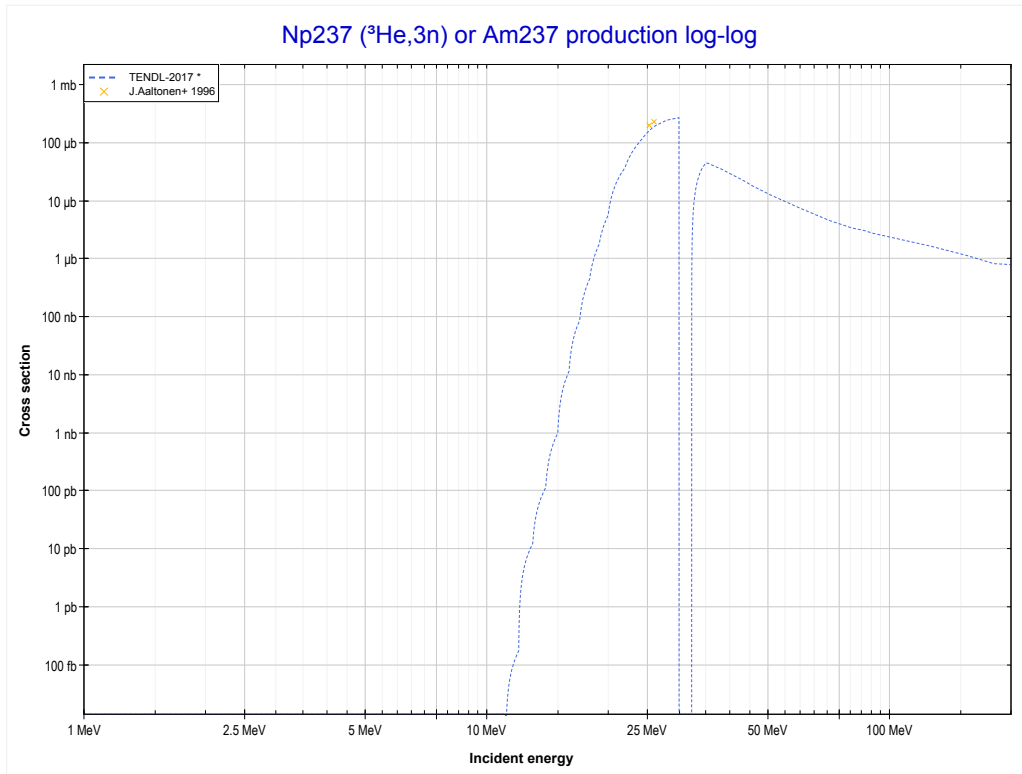


<< 92-U-235	93-Np-237	
<< 92-U-238 MT18 (³ He,fission)	MT4 (³He,n) or MT5 (Am239 production)	MT17 (³ He,3n) >>



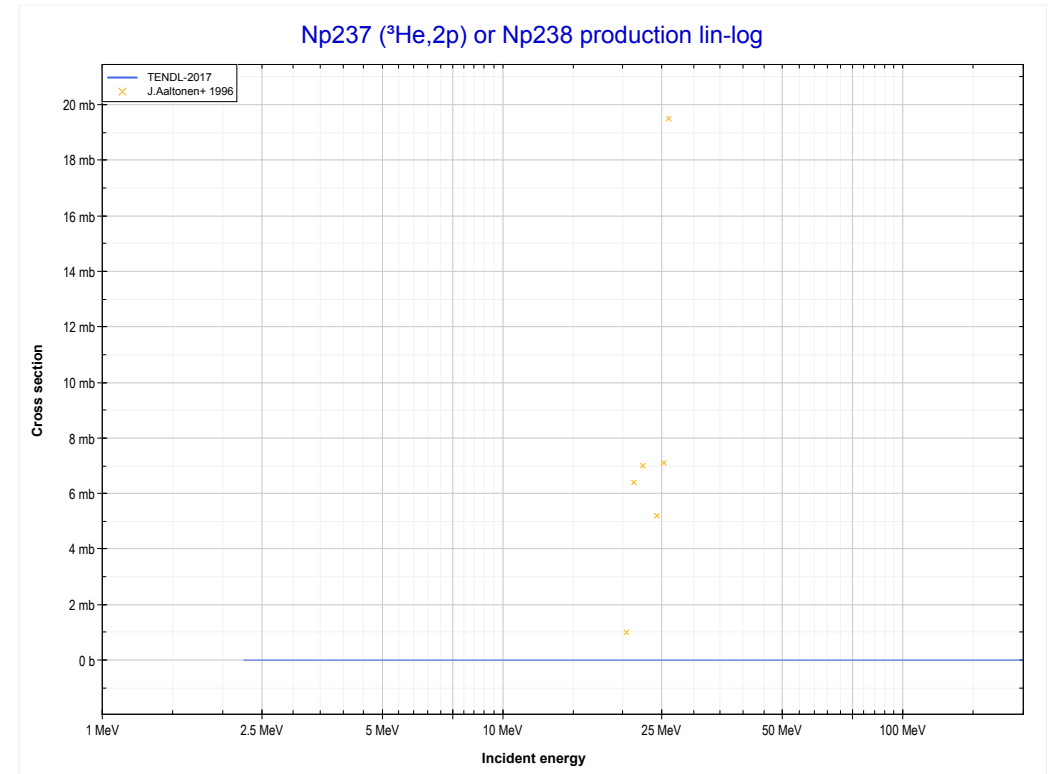
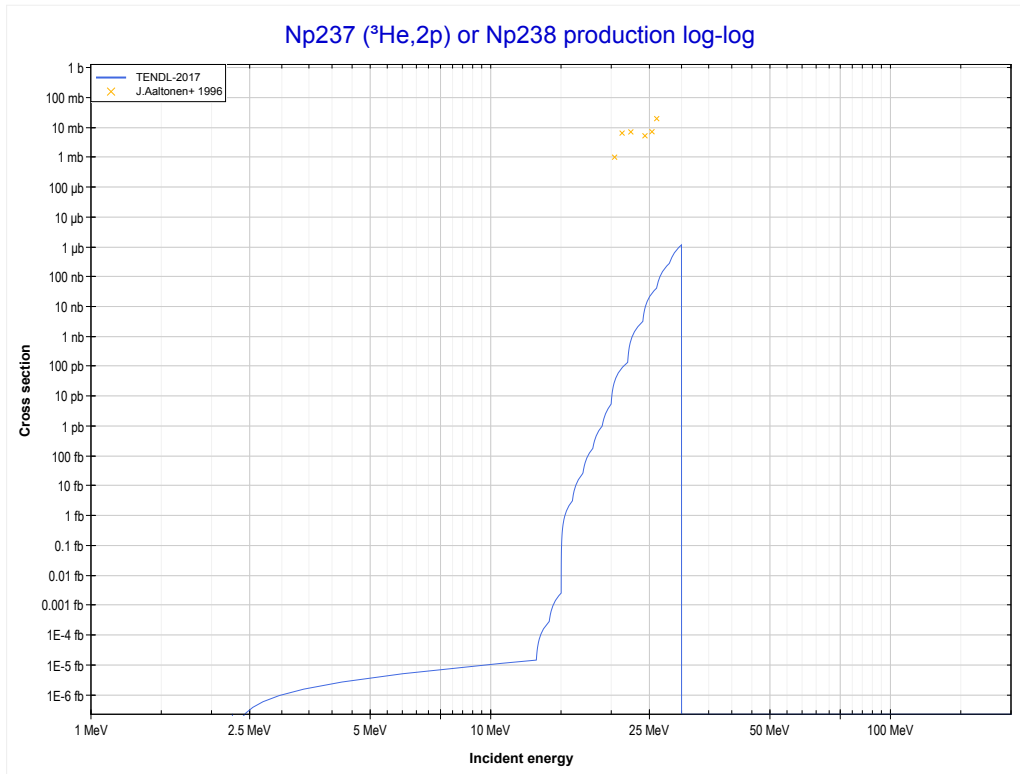
Reaction	Q-Value
Np237(He3,n)Am239	2341.20 keV

<< 90-Th-230	93-Np-237	
<< MT4 (³ He,n)	MT17 (³He,3n) or MT5 (Am237 production)	MT111 (³ He,2p) >>



Reaction	Q-Value
Np237(He3,3n)Am237	-10979.24 keV

<< 79-Au-197	93-Np-237	
<< MT17 ($^3\text{He},3n$)	MT111 ($^3\text{He},2p$) or MT5 (Np238 production)	



Reaction	Q-Value
Np237($\text{He}3,2p$)Np238	-2229.73 keV