Table 4: Radioactive progenitors considered in the calculation of cummulative cross sections and nuclear decay data used for these calculations.

nuclide	half-life [h]	pro-genitor	half-life [h]	branching ratio
HE-3	1.000E+10	H-3	1.080E+05	1.0
C-14	5.019E+07	B-14	4.472E-06	1.0
		BE-14	1.000E+00	1.0
F-18	1.830E+00	NE-18	4.667E-04	1.0
NE-20	1.000E+10	NA-20	1.239E-04	1.0
		MG-20	2.778E-05	1.0
		F-20	3.056E-03	1.0
		O-20	3.750E-03	1.0
		N-20	1.000E+00	1.0
		C-20	1.000E+00	1.0
NE-21	1.000E+10	NA-21	6.244E-03	1.0
		MG-21	3.389E-05	1.0
		F-21	1.156E-03	1.0
		O-21	9.444E-04	1.0
		N-21	1.000E+00	1.0
NE-22	1.000E+10	F-22	1.175E-03	1.0
		O-22	1.000E+00	1.0
		N-22	1.000E+00	1.0
		NA-22	2.278e+04	1.0
		MG-22	1.072e-03	1.0
NA-22	2.278e+04	MG-22	1.072e-03	1.0
NA-24	1.503e+01	NE-24	5.633e-02	1.0
MG-28	2.090E+01	NA-28	8.333E-06	1.0
AR-36	1.000E+20	K-36	1.000E+00	1.0
		CA-36	1.000E+00	1.0
		CL-36	2.628E+09	0.981
AR-38	1.000E+10	K-38	1.000E+00	1.0
		CA-38	1.000E+00	1.0
		CL-38	1.000E+00	1.0
		S-38	1.000E+00	1.0
		P-38	1.000E+00	1.0
		SI-38	1.000E+00	1.0
V-48	3.833e+02	CR-48	2.193e+01	1.0
CR-51	6.648E+02	MN-51	0.770E+00	1.0
		FE-51	7.500E-05	1.0
MN-53	3.241E+10	FE-53	1.000E+00	1.0
		CO-53	1.000E+00	1.0
FE-55	2.365E+04	CO-55	1.754E+00	1.0
		NI-55	5.250E-05	1.0
FE-59	1.068e+03	MN-59	1.278e-03	1.0
CO-56	1.891E+03	NI-56	1.464E+02	1.0

nuclide	half-life [h]	pro-genitor	half-life [h]	branching ratio
CO-57	6.523E+03	NI-57	3.600E+01	1.0
ZN-65	5.858E+03	GA-65	2.533E-01	1.0
		GE-65	8.583E-03	1.0
GA-67	7.824E+01	GE-67	3.117E-01	1.0
		AS-67	1.181E-02	1.0
GE-69	3.905E+01	AS-69	2.533E-01	1.0
		SE-69	7.611E-03	1.0
AS-71	6.480E+01	SE-71	7.900E-02	1.0
		BR-71	5.944E-03	1.0
		KR-71	2.694E-05	1.0
SE-75	2.875E+03	BR-75	1.620E+00	1.0
		KR-75	7.167E-02	1.0
		RB-75	4.778E-03	1.0
BR-77	5.712E+01	KR-77	1.240E+00	1.0
		RB-77	6.167E-02	1.0
		SR-77	2.500E-03	1.0
KR-78	1.000E+10	RB-78	1.000E+00	1.0
KR-79	3.504E+01	RB-79	3.833E-01	1.0
		SR-79	3.833E-02	1.0
KR-80	1.000E+10	BR-80	1.000E+00	0.916
		RB-80	1.000E+00	1.0
		SR-80	1.000E+00	1.0
		Y-80	1.000E+00	1.0
KR-81	1.800E+09	RB-81	1.000E+00	1.0
		SR-81	1.000E+00	1.0
		Y-81	1.000E+00	1.0
		ZR-81	1.000E+00	1.0
KR-82	1.000E+10	BR-82	1.000E+00	1.0
		RB-82	1.000E+00	1.0
		SR-82	1.000E+00	1.0
		Y-82	1.000E+00	1.0
		ZR-82	1.000E+00	1.0
KR-83	1.000E+10	BR-83	1.000E+00	1.0
		SE-83	1.000E+00	1.0
		AS-83	1.000E+00	1.0
		GE-83	1.000E+00	1.0
		GA-83	1.000E+00	1.0
		RB-83	1.000E+00	1.0
		SR-83	1.000E+00	1.0
		Y-83	1.000E+00	1.0
		ZR-83	1.000E+00	1.0

nuclide	half-life [h]	pro-genitor	half-life [h]	branching ratio
KR-84	1.000E+10	BR-84	1.000E+00	1.0
		SE-84	1.000E+00	1.0
		AS-84	1.000E+00	1.0
		GE-84	1.000E+00	1.0
		RB-84	1.000E+00	1.0
KR-85	9.426E+04	BR-85	4.783E-02	0.214
		SE-85	9.167E-03	0.214
		AS-85	5.694E-04	0.214
KR-86	1.000E+10	BR-86	1.000E+00	1.0
		SE-86	1.000E+00	1.0
		AS-86	1.000E+00	1.0
RB-83	2.069E+03	SR-83	3.240E+01	1.0
		Y-83	1.177E-01	1.0
		ZR-83	1.167E-02	1.0
SR-83	3.240E+01	Y-83	1.177E-01	1.0
		ZR-83	1.167E-02	1.0
SR-85	1.556E+03	Y-85	4.900E+00	1.0
		ZR-85	1.583E-01	1.0
		NB-85	3.833E-02	1.0
Y-87	8.040E+01	ZR-87	1.730E+00	1.0
		NB-87	5.330E-02	1.0
		MO-87	4.056E-03	1.0
Y-88	2.558E+03	ZR-88	2.002E+03	1.0
		NB-88	1.667E-01	1.0
		MO-88	1.366E-01	1.0
ZR-86	1.650E+01	NB-86	2.167E-02	1.0
ZR-88	2.002E+03	NB-88	1.667E-01	1.0
		MO-88	1.366E-01	1.0
ZR-89	7.848E+01	NB-89	1.500E+00	1.0
		MO-89	3.583E-02	1.0
ZR-95	1.537E+03	Y-95	1.716E-01	1.0
		SR-95	6.778E-03	1.0
		RB-95	1.056E-04	1.0
RU-103	9.420E+02	TC-103	1.505E-02	1.0
		MO-103	1.875E-02	1.0
		NB-103	4.166E-04	1.0
AG-105	9.840E+02	CD-105	0.925E+00	1.0
		IN-105	8.000E-02	1.0
		SN-105	8.600E-03	1.0
SN-113	2.762E+03	SB-113	1.112E-01	1.0
		TE-113	2.833E-02	1.0
		I-113	1.833E-03	1.0
		XE-113	7.778E-04	1.0

nuclide	half-life [h]	pro-genitor	half-life [h]	branching ratio
XE-127	8.738E+02	CS-127	6.250E+00	1.0
		BA-127	2.112E-01	1.0
		LA-127	6.333E-02	1.0
		CE-127	8.889E-03	1.0
BA-131	2.832E+02	LA-131	0.983E+00	1.0
		CE-131	1.667E-01	1.0
		PR-131	2.833E-02	1.0
		ND-131	6.667E-03	1.0
BA-133	9.198E+04	LA-133	0.111E+00	1.0
		CE-133	4.930E+00	1.0
		PR-133	0.823E-01	1.0
		ND-133	0.194E-01	1.0
CE-139	3.305E+03	PR-139	4.410E+00	1.0
		ND-139	5.500E+00	1.0
		PM-139	6.917E-02	1.0
		SM-139	4.283E-02	1.0
		EU-139	6.110E-03	1.0
EU-145	1.426E+02	GD-145	3.833E-01	1.0
		TB-145	8.056E-03	1.0
		HO-149	5.833E-03	0.158
		DY-149	7.667E-02	0.158
		TB-149	4.150E+00	0.158
		ER-153	1.556E-02	0.08374
		TM-153	4.444E-04	0.158
		YB-153	1.111E-03	0.158
EU-147	5.760E+02	GD-147	3.810E+01	1.0
		TB-147	1.600E+00	1.0
		DY-147	1.667E-02	1.0
		DY-151	2.783E-01	0.056
		HO-151	1.111E-02	0.21176
		ER-151	6.389E-03	0.21176
		YB-155	4.583E-04	0.17788
EU-149	2.234E+03	GD-149	2.256E+02	1.0
		TB-149	4.150E+00	0.842
		DY-149	7.667E-02	0.842
		HO-149	5.833E-03	0.842
		ER-153	1.556E-02	0.44626
		TM-153	4.444E-04	0.842
		YB-153	1.111E-03	0.842
GD-146	1.159E+03	TB-146	6.389E-03	1.0
		HO-150	2.444E-02	0.33
		DY-150	1.167E-01	0.33
GD-147	3.810E+01	TB-147	1.600E+00	1.0

nuclide	half-life [h]	pro-genitor	half-life [h]	branching ratio
		DY-147	1.667E-02	1.0
		DY-151	2.783E-01	0.056
		HO-151	1.111E-02	0.21176
		ER-151	6.389E-03	0.21176
		YB-155	4.583E-04	0.17788
GD-149	2.256E+02	TB-149	4.150E+00	0.842
		DY-149	7.667E-02	0.842
		HO-149	5.833E-03	0.842
		ER-153	1.556E-02	0.446
		TM-153	4.444E-04	0.842
		YB-153	1.111E-03	0.842
GD-151	2.880E+03	TB-151	1.760E+01	1.0
		DY-151	2.817E-01	0.944
		HO-151	1.111E-02	0.156
		ER-151	6.389E-03	0.156
		YB-155	4.583E-04	0.131
GD-153	5.832E+03	TB-153	5.616E+01	1.0
		DY-153	6.500E+00	1.0
		HO-153	0.155E+00	1.0
		ER-153	1.556E-02	0.47
TB-149	4.150E+00	DY-149	7.667E-02	1.0
		HO-149	5.833E-03	1.0
		ER-153	1.556E-02	0.47
		TM-153	4.444E-04	1.0
		YB-153	1.111E-03	1.0
TB-151	1.760E+01	DY-151	2.817E-01	0.944
		HO-151	1.111E-02	0.156
		ER-151	6.389E-03	0.156
		YB-155	4.583E-04	0.131
TB-153	5.616E+01	DY-153	6.500E+00	1.0
		HO-153	0.156E+00	1.0
		ER-153	1.556E-02	0.47
TM-165	3.006E+01	YB-165	0.165E+00	1.0
		LU-165	0.197E+00	1.0
		HF-165	2.083E-02	1.0
TM-167	2.218E+02	YB-167	2.917E-01	1.0
		LU-167	8.583E-01	1.0
		HF-167	3.417E-02	1.0
		TA-167	5.000E-02	1.0
YB-166	5.664E+01	LU-166	4.417E-02	1.0
		HF-166	1.128E-01	1.0
		TA-166	8.889E-03	1.0
		W-166	4.444E-03	1.0

nuclide	half-life [h]	pro-genitor	half-life [h]	branching ratio
YB-169	7.685E+02	LU-169	3.406E+01	1.0
		HF-169	5.417E-02	1.0
		TA-169	8.000E-02	1.0
LU-169	3.406E+01	HF-169	5.417E-02	1.0
		TA-169	8.000E-02	1.0
LU-170	4.800E+01	HF-170	1.600E+01	1.0
		TA-170	1.127E-01	1.0
		W-170	6.667E-02	1.0
		RE-170	2.222E-03	1.0
		OS-170	1.972E-03	1.0
LU-171	1.973E+02	HF-171	1.210E+01	1.0
		TA-171	3.883E-01	1.0
		W-171	1.500E-01	1.0
LU-173	1.200E+04	HF-173	2.390E+01	1.0
		TA-173	3.650E+00	1.0
		W-173	2.750E-01	1.0
HF-172	1.638E+04	TA-172	6.133E-01	1.0
		W-172	1.117E-01	1.0
		RE-172	1.528E-02	1.0
		OS-172	5.278E-03	1.0
		PT-176	1.667E-03	0.40
		IR-176	2.222E-03	1.0
		HG-180	8.333E-04	0.14
HF-173	2.390E+01	TA-173	3.650E+00	1.0
		W-173	2.750E-01	1.0
HF-175	1.680E+03	TA-175	1.050E+01	1.0
		W-175	5.667E-01	1.0
		RE-175	8.333E-02	1.0
		OS-175	2.333E-02	1.0
RE-181	2.000E+01	OS-181	0.110e+00	1.0
		IR-181	8.167E-02	1.0
		PT-181	1.417E-02	1.0
		AU-181	3.194E-03	0.990
		HG-181	1.000E-03	0.733
RE-183	1.680E+03	OS-183	1.300E+01	1.0
		IR-183	9.167E-01	1.0
		PT-183	0.100E+00	1.0
		AU-183	0.122E-01	1.0
		HG-183	2.444E-03	0.768
OS-182	2.160E+01	IR-182	0.250E+00	1.0
		PT-182	4.333E-02	1.0
		AU-182	6.139E-03	1.0
		HG-182	3.111E-03	0.848

nuclide	half-life [h]	pro-genitor	half-life [h]	branching ratio
OS-185	2.246E+03	IR-185	1.400E+01	1.0
		PT-185	1.182E+00	1.0
		AU-185	7.167E-02	1.0
		HG-185	1.389E-02	1.0
OS-191	3.696E+02	RE-191	1.633E-01	1.0
IR-185	1.400E+01	PT-185	1.182E+00	1.0
		AU-185	7.167E-02	1.0
		HG-185	1.389E-02	1.0
IR-187	1.050E+01	PT-187	2.350E+00	1.0
		AU-187	1.333E-01	1.0
		HG-187	3.667E-02	1.0
IR-189	3.168E+02	PT-189	1.090E+01	1.0
		AU-189	4.783E-01	1.0
		HG-189	1.267E-01	1.0
PT-188	2.448E+02	AU-188	1.473E-01	1.0
		HG-188	5.417E-02	1.0
PT-189	1.087E+01	AU-189	4.783E-01	1.0
		HG-189	1.267E-01	1.0
PT-191	6.960E+01	AU-191	3.180E+00	1.0
		HG-191	8.167E-01	1.0
AU-195	4.392E+03	HG-195	4.160E+01	1.0