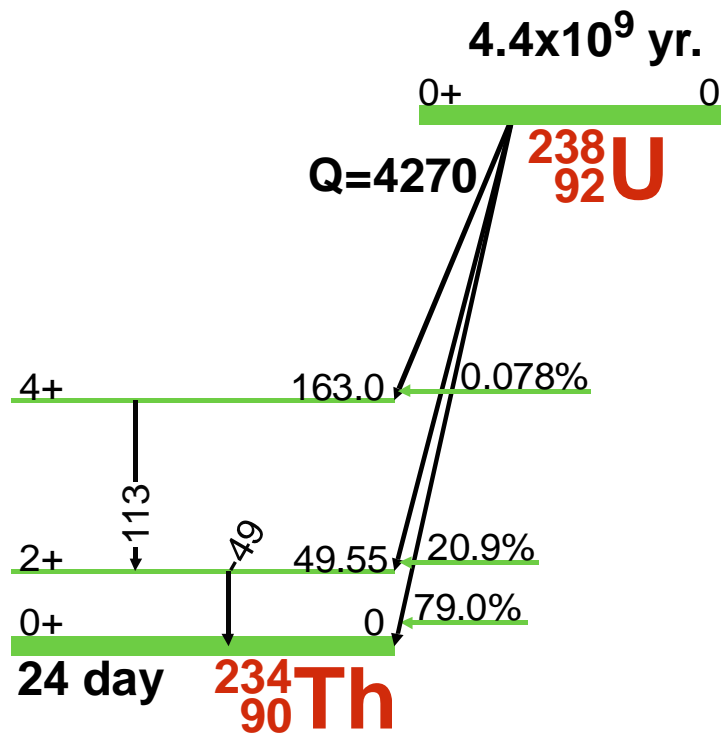
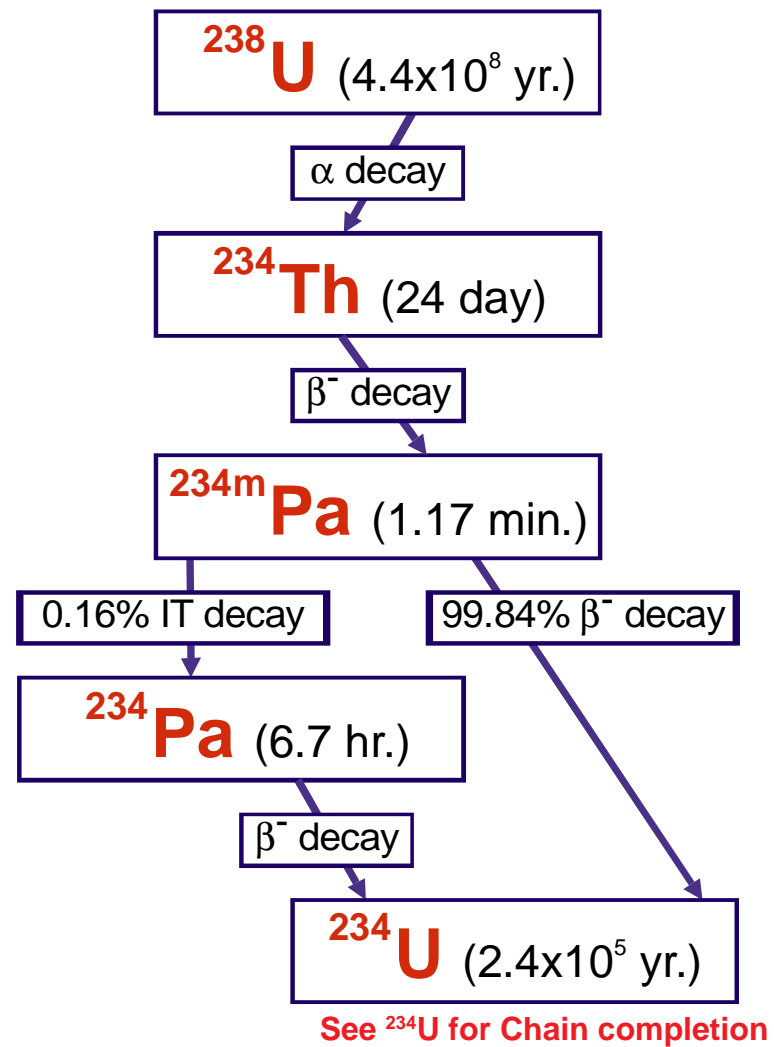


^{238}U (4.4×10^9 yr.) Decay Scheme **^{238}U Decay Chain**

GAMMA-RAY ENERGIES AND INTENSITIES (page 1 of 2)

Nuclide: ²³⁸U with Th & Pa DaughtersE_γ, σE_γ, I_γ, σI_γ - 1998 ENSDF DataHalf Life: 4.468(3) x 10⁹ yr.Detector: 4.55 cm² x 8 mm Ge (Li)

Method of Production: natural U

	E _γ (keV)	σE _γ	I _γ (rel)	I _γ (%)	σI _γ	S
²³⁸ U	49.55	0.06		0.064	0.008	4
²³⁴ Th	63.29	0.02		4.8	0.6	3
²³⁴ Th	92.38	0.01		2.81	0.26	4
²³⁴ Th	92.80	0.02		2.77	0.26	4
²³⁸ U	113.5	0.1		0.0102	0.0015	4
²³⁴ Pa	131.30	0.01	0.433	18.0	1.7	3
²³⁴ Pa	186.15	0.02	23.3	1.76	0.20	3
²³⁴ Pa D	226.50	0.03	2.83	4.2	0.5	4
²³⁴ Pa D	227.25	0.03		5.8	0.6	4
^{234m} Pa	258.26	0.1	3.6	0.0729	0.0004	4
^{234m} Pa D	387.6	0.8	0.06	0.0005		4
^{234m} Pa D	387.6	0.8		0.0010	0.0002	
²³⁴ Pa	568.9	0.2		3.6	0.5	4
²³⁴ Pa	569.5	0.1	2.16	8.2	1.1	3
^{234m} Pa	691.0	0.3	1.3	0.0078	0.0007	4
²³⁴ Pa	699.0	1.0	0.78	0.0008	0.0002	4
²³⁴ Pa	699.03	0.05		3.6	0.4	
^{234m} Pa	702.05	0.1	0.85	0.0071	0.0002	4
^{234m} Pa	705.90	0.10		0.0040	0.0005	4
²³⁴ Pa	705.9	0.1		2.27	0.24	
²³⁴ Pa	733.39	0.05	1.13	6.9	0.8	4
^{234m} Pa	739.95	0.10		0.0117	0.0003	4
^{234m} Pa	742.81	0.03	12.2	0.080	0.004	3
²³⁴ Pa	742.81	0.03		2.06	0.225	
²³⁴ Pa	755.0	.01		1.22	0.13	4
^{234m} Pa	766.36	0.02	40	0.294	0.012	2
^{234m} Pa	781.37	0.10	1.17	0.0078	0.0002	4
^{234m} Pa	786.27	0.03	7.17	0.0486	0.0019	3
^{234m} Pa	805.74	0.10	2.3	0.0043	0.0005	4
²³⁴ Pa	805.8	0.05		2.52	0.29	
^{234m} Pa	818.2	0.5	0.48	0.0010	0.0003	4
²³⁴ Pa	819.2	0.1		1.88	0.21	

	E _γ (keV)	σE _γ	I _γ (rel)	I _γ (%)	σI _γ	S
²³⁴ Pa	824.2	0.2		1.24	0.16	
²³⁴ Pa	825.1	0.2	0.9	1.88	0.21	4
^{234m} Pa	825.6	0.5		0.0014	0.0003	
²³⁴ Pa	831.5	0.1	1.5	4.1	0.4	4
^{234m} Pa	851.57	0.10	0.95	0.0062	0.0006	4
²³⁴ Pa	876.0	0.1	0.085	2.52	0.24	4
²³⁴ Pa	880.5	0.1		4.2	0.4	4
²³⁴ Pa	880.5	0.1		6.2	0.6	
^{234m} Pa	880.9	0.5	3.17	0.0038	0.0005	3
^{234m} Pa	883.24	0.04		0.0017	0.0005	4
^{234m} Pa	883.24	0.04		0.0018	0.0003	4
²³⁴ Pa	883.24	0.04	3	9.6	1.1	3
^{234m} Pa	887.28	0.10	1	0.0071	0.0001	4
²³⁴ Pa	898.67	0.05	1	3.2445	0.3764	4
^{234m} Pa	921.7	0.1	2.16	0.0127	0.0001	4
²³⁴ Pa D	925.0	0.1	4.3	7.8	0.9	3
²³⁴ Pa D	926.0	0.2		1.7	1.2	
^{234m} Pa	926.61	0.10		0.0012	0.0001	
²³⁴ Pa	926.72	0.15		7.2	1.2	
^{234m} Pa	936.3	1	0.13	0.0018	0.0005	4
^{234m} Pa	945.90	0.10	4.5	0.0099	0.0010	3
²³⁴ Pa	946.00	0.03		3.4	1.5	
²³⁴ Pa	980.3	0.1	0.67	1.75	0.17	4
²³⁴ Pa	980.3	0.1		2.68	0.26	
²³⁴ Pa	984.2	0.1	0.35	1.62	0.22	4
^{234m} Pa	996.1	2.0	1.02	0.0041	0.0007	4
^{234m} Pa	1001.7	0.1		0.838	0.10	1
²³⁴ Pa	1028.7	0.1	0.25	0.57	0.06	4
^{234m} Pa	1041.7	0.1	0.14	0.0012	0.0001	4
^{234m} Pa	1061.86	0.1	0.48	0.0023	0.0001	4
²³⁴ Pa	1083.2	0.1	0.15	0.50	0.06	4
^{234m} Pa	1125.7	0.5	0.3	0.0035	0.0006	4

NOTE: ²³⁴Pa - multiply I_γ(%) values by 0.0016 to account for branching from ^{234m}Pa

GAMMA-RAY ENERGIES AND INTENSITIES (page 2 of 2)

Nuclide: ²³⁸U with Th & Pa Daughters E_γ , σE_γ , I_γ , σI_γ - 1998 ENSDF DataHalf Life: 4.468(3) x 10⁹ yr.Detector: 4.55 cm² x 8 mm Ge (Li)

Method of Production: natural U

	E_γ (keV)	σE_γ	I_γ (rel)	I_γ (%)	σI_γ	S		E_γ (keV)	σE_γ	I_γ (rel)	I_γ (%)	σI_γ	S
²³⁴ Pa	1151.4	0.3	0.03	0.031	0.010	4	²³⁴ Pa	1668.4	0.1	0.18	0.76	0.09	3
^{234m} Pa	1193.77	0.03	1.65	0.0135	0.0001	3	²³⁴ Pa	1685.7	0.1	0.07	0.31	0.04	4
^{234m} Pa	1220.37	0.10	0.14	0.0009	0.0001	4	^{234m} Pa	1694.1	1.0	1.8	0.0005	0.0001	3
	1226.4	0.2	0.08		0.03	4	^{234m} Pa	1732.2	1.5		0.0018	0.0003	4
^{234m} Pa	1237.24	0.10	0.62	0.0053	0.0001	3	^{234m} Pa	1737.73	0.1		0.0211	0.0003	1
²³⁴ Pa	1292.8	0.1	0.07	0.46	0.05	4	^{234m} Pa	1759.81	0.10	0.2	0.0014	0.0007	3
²³⁴ Pa	1352.9	0.1	0.15	1.15	0.12	4	^{234m} Pa	1765.44	0.10	1	0.0087	0.0001	2
^{234m} Pa	1392.7	1.0		0.0034	0.0002	3	^{234m} Pa	1796.2	1	0.09	0.0003	0.0001	3
²³⁴ Pa	1393.9	0.1	0.48	2.06	0.22	3	^{234m} Pa	1809.04	0.10	0.45	0.0037	0.0001	2
²³⁴ Pa	1400.3	0.1	0.08	0.175	0.026	4	^{234m} Pa	1819.69	0.10		0.0009	0.0001	3
^{234m} Pa	1413.88	0.10	0.32	0.0023	0.0001	4	²³⁴ Pa	1819.8	0.3	0.1	0.0041	0.0011	3
²³⁴ Pa	1426.9	0.1	0.05	0.164	0.026	4	^{234m} Pa	1831.3	0.1	2.2	0.0172	0.0003	1
^{234m} Pa	1434.13	0.10	1.2	0.0097	0.0001	3	²³⁴ Pa	1849.8	0.2	0.01	0.0278	0.0067	4
²³⁴ Pa	1445.4	0.1	0.06	0.31	0.04	4	^{234m} Pa	1863.09	0.10	0.18	0.0012	0.0001	3
²³⁴ Pa	1452.7	0.1	0.12	0.80	0.09	4	^{234m} Pa	1867.68	0.10	1.2	0.0092	0.0001	1
^{234m} Pa	1510.2	0.1	1.6	0.0129	0.0002	2	^{234m} Pa	1874.85	0.10	1.2	0.0082	0.0001	1
^{234m} Pa	1527.27	0.10	0.28	0.0024	0.0001	3	^{234m} Pa	1893.5	0.1	0.35	0.0022	0.0001	2
^{234m} Pa	1550.0	1.0	0.2	0.0018	0.0002	4	^{234m} Pa	1911.17	0.10	0.77	0.0063	0.0001	1
^{234m} Pa	1553.74	0.10	1	0.0081	0.0001	3	^{234m} Pa	1926.5	1.0	0.08	0.0004	0.0001	3
^{234m} Pa	1570.67	0.10		0.0011	0.0001	4	^{234m} Pa	1937.01	0.10	0.35	0.0029	0.0001	1
^{234m} Pa	1593.88	0.10		0.0027	0.0001	4	^{234m} Pa	1970.0	1.5	0.045	0.0006	0.0001	3
^{234m} Pa	1667.6	1.0		0.0008	0.0002	4							

NOTE: ²³⁴Pa - multiply I_γ (%) values by 0.0016 to account for branching from ^{234m}Pa