^{238}U α decay

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 108, 681 (2007)	1-Jun-2006

Parent: ^{238}U: E=0.0; $J^\pi=0^+$; $T_{1/2}$=4.468×10^9 y *3*; Q(α)=4269.7 *29*; %α decay=100.0
Ag(t): (α)(ce 48γ)(t) $T_{1/2}$=0.37 ns *3* (1960Be25).

^{234}Th Levels

E(level)†	J^π†	$T_{1/2}$
0.0	0^+	
49.55 *6*	2^+	0.37 ns *3*
163.0 *1*	4^+	

† Adopted values.

α radiations

Eα†	E(level)	Iα‡@	HF#	Comments
4038 *5*	163.0	0.078 *12*	40	Iα: 0.23 *7* was measured by 1959Ko58. Eα: from E(level)=163.0 and Eα(to g.s.). The original measured value of 1961Ko11 is 4037 keV; adjustment as recommended by 1991Ry01 yields 4043.
4151 *5*	49.55	20.9 *27*	1.4	Iα: 23% 4 was measured by 1959Ko58. Eα(0)=4198 *3* and E(level)=49.55 *6* give Eα=4149 *3*.
4198 *3*	0.0	79.0 *27*	1.0	Iα: 77% 4 was measured by 1959Ko58.

† Energies of α's to 0.0 and 49.55-keV levels are from 1991Ry01, recommended from energies measured by 1957Ha08 (ic), 1961Ko11 (ic), 1960Vo05 (ic). Original energies of 1957Ha08, 1960Vo05 and 1961Ko11 were increased by 4.5, 3.3 and 6.0 keV, respectively, because of changes in calibration energies. Other measurements: 1947Al06, 1955Va20, 1957Bo98, 1957Cl17.
‡ α intensities per 100 ^{238}U α decays, deduced from γ-ray transition intensities. Iα's were measured by 1959Ko58. Although I(4198α) and I(4151α) of 1959Ko58 are in good agreement with the values given here, I(4038) is not.
# Hf(4198α)=1.0 yields $r_0(^{234}Th)$=1.535 *2*.
@ Absolute intensity per 100 decays.

$\gamma(^{234}$Th)

E_γ	I_γ†‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α#	Comments
49.55 *6*	0.064 *8*	49.55	2^+	0.0	0^+	E2	326.4	α(L)=239.6; α(M)=65.3 E_γ: from 1973Ta25 (semi). Other: 1956Al30 ((α)(ce)). Iγ=0.059% 2 was measured by 1990Ko40. Total I(ce)=23 *3* per 100 α decays (1952Du12,1952Za01,1956Al30). Mult.: α=359 *65* from Ice/Iγ and the measured half-life of 0.37 ns *3* for the 49.55-keV level rule out other multipolarities.
113.5 *1*	0.0102 *15*	163.0	4^+	49.55	2^+	[E2]	6.63	α(K)=0.237; α(L)=4.64; α(M)=1.28; α(N+..)=0.475 E_γ: from 1984Ro21.

† From 1984Ro21.
‡ Absolute intensity per 100 decays.
# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^{238}U α decay

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays