^{226}Ac ε decay

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Y. A. Akovali	NDS 77,433 (1996)	1-Feb-1996

Parent: ^{226}Ac: E=0.0; J^{π}=(1); $T_{1/2}$=29.37 h *12*; Q(ε)=640 *3*; %ε decay=17 *3*
%ε=17 *3*.

^{226}Ra Levels

E(level)	J^{π}
0.0	0^+
67.67 *1*	2^+
253.73 *1*	1^-

ε radiations

E(decay)	E(level)	Iε[†‡]	Log *ft*	Comments
(386 *3*)	253.73	11.3 *10*	6.7 *1*	εK=0.6988 *11*; εL=0.2208 *8*; εM+=0.0803 *4*
(572 *3*)	67.67	≈1.6	≈7.9	εK=0.7390; εL=0.1927 *3*; εM+=0.06833 *12*
(640 *3*)	0.0	4.1 *36*	7.7 *4*	εK=0.7467; εL=0.1873 *3*; εM+=0.06604 *9*

† Deduced from intensity balance at each level.
‡ Absolute intensity per 100 decays.

γ(^{226}Ra)

Iγ normalization: Normalization factor of 1.6 *3* to convert relative photon intensities to Iγ′s per 100 ε decays was obtained by requiring the normalization factor for converting Iγ′s per 100 ^{226}Ac decay in ε and β^- decays to be the same (Iγ′s for both decays were measured relative to each other): (0.17 *3*) × N(ε decay)=(0.83 *3*) × N(β^- decay)=0.269 *18*.
If Iγ′s normalized so that I(242γ of ^{226}Th)=0.866% [40], I(111γ of ^{226}Th)=3.29% [20], I(324γ of ^{222}Ra)=2.77% 8, then Iγ normalization=2.0 *4*, 1.6 *4*, 2.1 *4*, respectively.

X rays (Ra):

I(x ray) rel. ^{226}Ac(ε)+^{226}Th(α) 1974Va28	to I(253γ)=21.0 ^{226}Ac(ε) calculated	
15.5 16		Kα$_2$ x ray
23.8 24		Kα$_1$ x ray
9.1 9		Kβ$_1$′ x ray
2.6 3		Kβ$_2$′ x ray
51.0 31	47 16	total K x ray
		other measurement: 1967LoZZ.

E_γ[†]	I_γ[‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[&]	$I_{(\gamma+ce)}$[@]	Comments
67.6 *2*	0.4 *1*	67.67	2^+	0.0	0^+	E2	61.9	25.2 *63*	α(L)=45.2; α(M)=12.25; α(N+..)=4.40 Ice(L2)=10.2 *15* (1974Va28); Ice(L3)=4.8 *11* (1967LoZZ); L12:L3:M23=32 *6*:28 *5*:12.9 *5* (1967LoZZ).
185.60 *15*	17.5 *11*	253.73	1^-	67.67	2^+	E1	0.108	19.4 *12*	α(K)=0.0860; α(L)=0.0169; α(M)=0.00402;

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^{226}Ac ε decay (continued)

γ(^{226}Ra) (continued)

E_γ[†]	I_γ[‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[&]	$I_{(\gamma+ce)}$[@]	Comments
									α(N+..)=0.00139 Ice(K)=1.6 *3* (1974Va28), 1.36 *18* (1967LoZZ).
253.5 *2*	21.0 *15*	253.73	1⁻	0.0	0⁺	E1	0.0520	22.1 *16*	α(K)=0.0417; α(L)=0.00779; α(M)=0.00186; α(N+..)=0.00064 Ice(K)=1.0 *2* (1974Va28), 0.34 *17* (1967LoZZ).

† From 1974Va28. Other measurements: 1967LoZZ, 1957St33.
‡ From 1974Va28.
# From ce data of 1967LoZZ and 1974Va28. Ice′s have been normalized at 230γ of ^{226}Ac β^- decay so that α(K, 230γ)=0.0545 (E1 theory). Quoted Ice′s are in same relative units as the Iγ′s.
@ For absolute intensity per 100 decays, multiply by 0.27 *7*.
& 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.

^{226}Ac ε decay

Decay Scheme

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