

<sup>226</sup>Ac β<sup>-</sup> decay

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

Parent: <sup>226</sup>Ac: E=0.0; J<sup>π</sup>=(1); T<sub>1/2</sub>=29.37 h 12; Q(β<sup>-</sup>)=1117 5; %β<sup>-</sup> decay=83 3

<sup>226</sup>Th Levels

E(level)	J <sup>π</sup>	T <sub>1/2</sub>
0.0	0 <sup>+</sup>	30.57 min 10
72.20 4	2 <sup>+</sup>	
226.43 5	4 <sup>+</sup>	
230.37 5	1 <sup>-</sup>	
307.5 2	3 <sup>-</sup>	
805.2 4	(0 <sup>+</sup> )	
847.8 4	(2 <sup>+</sup> )	

β<sup>-</sup> radiations

%β<sup>-</sup>=83 3.

E(decay)†	E(level)	Iβ <sup>-</sup> ‡	Log ft	Comments
(269 5)	847.8	0.092 13	8.5	av Eβ=74.1 15
(312 5)	805.2	0.071 10	8.9	av Eβ=87.2 16
885 7	230.37	49 3	7.5	av Eβ=281.4 19
				Iβ <sup>-</sup> : 59 3 per 100 b- decay was measured by 1968Va17.
(1045 5)	72.20	≈10	≈8.5	av Eβ=339.6 19
1105 10	0.0	24 9	8.2	av Eβ=366.8 20
				I(1105β)=41 3 per 100 b- decays was measured by 1968Va17.

† From 1968Va17.

‡ Intensities per 100 decays of <sup>226</sup>Ac; deduced from I<sub>γ</sub>'s, except otherwise noted.

# Absolute intensity per 100 decays.

γ(<sup>226</sup>Th)

I<sub>γ</sub> normalization: Iβ<sup>-</sup> (to 230-keV level)=59 3 per 100 b- decays, as measured by 1968Va17, was used by the evaluator to obtain absolute photon intensities: (Ti(158γ)+Ti(230γ)-Ti(574γ)-Ti(617γ))N=(182.3 24)N=59 3 yields N=0.324 18 for converting relative intensities to per 100 b- decays. Normalizations of relative intensities measured by 1974Va28 such that I(111γ)=3.29% 20. I(242γ)=0.866% 40 from <sup>226</sup>Th α decay and I(324γ)=2.77% 8 from <sup>222</sup>Ra α decay yield N=0.31 4, 0.39 3 and 0.41 4, respectively.

E <sub>γ</sub> †	I <sub>γ</sub> ‡&	E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Mult. #	α <sup>a</sup>	Comments
72.23 10	2.1 5	72.20	2 <sup>+</sup>	0.0	0 <sup>+</sup>	E2	53.5	α(L)=38.9; α(M)=10.67; α(N+..)=3.94 Ice(L3)=32 3, L3/M=32 3/23 3 (1974Va28); L12:L3:M:N=117 20:102 15:93 15:24 5 (1967LoZZ).
(81.0 5)	0.0066 16	307.5	3 <sup>-</sup>	226.43	4 <sup>+</sup>	[E1]	0.208	E <sub>γ</sub> : from <sup>230</sup> U α decay; this transition was not observed in <sup>226</sup> Ac decay. I <sub>γ</sub> : calculated by the evaluator from intensity balance at the 307-keV level (β <sup>-</sup> feeding, if any, has been

Continued on next page (footnotes at end of table)

$^{226}\text{Ac} \beta^-$  decay (continued) $\gamma(^{226}\text{Th})$  (continued)

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>‡</sup> &	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. <sup>#</sup>	$\alpha^a$	Comments
(154.23 3)	0.0028 7	226.43	4 <sup>+</sup>	72.20	2 <sup>+</sup>	(E2)	1.83	neglected) and $I_\gamma(81\gamma)/I_\gamma(235\gamma)=4.8$ 11/117 8, as measured in $^{230}\text{U}$ decay. $\alpha(\text{K})=0.239$ ; $\alpha(\text{L})=1.16$ ; $\alpha(\text{M})=0.316$ ; $\alpha(\text{N+..})=0.117$ $E_\gamma, \text{Mult.}$ : from $^{230}\text{U}$ $\alpha$ decay; this transition was not observed in $^{226}\text{Ac}$ decay. $I_\gamma$ : obtained by the evaluator from intensity balance at the 226-keV level.
158.05 15	65 2	230.37	1 <sup>-</sup>	72.20	2 <sup>+</sup>	E1	0.167	$\alpha(\text{K})=0.131$ ; $\alpha(\text{L})=0.0273$ ; $\alpha(\text{M})=0.00656$ ; $\alpha(\text{N+..})=0.00233$
230.00 10	100	230.37	1 <sup>-</sup>	0.0	0 <sup>+</sup>	E1	0.0683	Ice(K)=7.4 15; K/L=7.4 15/1.6 4 (1974Va28). $\alpha(\text{K})=0.0543$ ; $\alpha(\text{L})=0.0106$ ; $\alpha(\text{M})=0.00255$ ; $\alpha(\text{N+..})=0.00090$
(235.3 1)	0.16 3	307.5	3 <sup>-</sup>	72.20	2 <sup>+</sup>	[E1]	0.0651	K/L=5.4/1.3 4 (1974Va28). $E_\gamma$ : from $^{230}\text{U}$ decay; this transition was not observed in the $^{226}\text{Ac}$ decay. $I_\gamma$ : calculated by the evaluator. See comment for $I_\gamma(81.0\gamma)$ .
540.4 <sup>@</sup> 3	0.18 3	847.8	(2 <sup>+</sup> )	307.5	3 <sup>-</sup>	[E1]	0.0109	
574.5 <sup>@</sup> 2	0.26 3	805.2	(0 <sup>+</sup> )	230.37	1 <sup>-</sup>	[E1]	0.0096	
617.4 <sup>@</sup> 4	0.16 3	847.8	(2 <sup>+</sup> )	230.37	1 <sup>-</sup>	[E1]	0.0084	

<sup>†</sup> From 1974Va28. Other measurements: 1968Va17, 1967LoZZ, 1957St33.

<sup>‡</sup> Relative photon intensity, measured by 1974Va28.

<sup>#</sup> From ce data of 1967LoZZ, 1974Va28. Ice's of 1974Va28 have been normalized at 230 $\gamma$  such that  $\alpha(\text{K})=0.054$  (E1 theory).

Multipolarities in square brackets are from the level scheme.

<sup>@</sup> Assignment to  $^{226}\text{Ac}$  decay was proposed by 1976Ku08.

& For absolute intensity per 100 decays, multiply by 0.269 18.

<sup>a</sup> Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on  $\gamma$ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

$^{226}\text{Ac} \beta^-$  decay

## Decay Scheme

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

## Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- - - - -→  $\gamma$  Decay (Uncertain)

