^{187}Pb α decay (15.2 s) 1981Mi12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 134, 149 (2016)	15-Apr-2015

Parent: ^{187}Pb: E=33 *13*; J^π=(3/2$^-$); $T_{1/2}$=15.2 s *3*; Q(α)=6393 *6*; %α decay=7.0 *20*

^{187}Pb-E: 3/2$^-$ g.s., 33 keV *13* below 13/2$^+$ state in ^{187}Pb from mass measurements (2005We11), or 3/2$^-$ level 2 keV *15* above a 13/2$^+$ ^{187}Pb g.s. from ^{191}Po α decay (2002An19), implying E(13/2$^+$) level in ^{183}Hg at 216 *16* or 185 *18*. The former is preferred by 2013Sa43 because the ^{183}Hg 13/2$^+$ level presumably must deexcite to the 9/2 *7*/2[514] level known from Adopted Levels, Gammas to lie 105 keV above the 7/2 *7*/2[514] level whose energy is estimated from systematics to be 120 *10* (2013Sa43); thus, E(13/2$^+$) in ^{183}Hg should exceed≈225 keV.

^{187}Pb-%α decay: From α-α correlation data of 1999An36.

Decay scheme based on αγ coincidence measurements on a mass separated source. Substantial ε decay branch could not be quantified by 1981Mi12 due to similar ^{187}Pb g.s.+isomer half-lives and unknown α branching ratios of the ^{187}Tl daughters.

For this decay, QxBR=450 *129*.

^{183}Hg Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[#]	Comments
0.0	1/2$^-$		No α branch observed to this level. 1981Mi12 estimate an upper limit of 1.5% of all parent α decays for such a branch; the implied lower limit for its hindrance factor (790 *240*) is surprisingly high compared with that for the branch to the 67-keV level (13 *4*) which has been postulated to be a member of the same rotational band.
67.43 *25*	3/2$^-$	≤16 ns	other E: 44 *19* from Q(α) and Eα if parent level energy is 33 *13* and 65 *19* if E(parent)=2 *15*.
275.47 *25*	(3/2$^-$)	≤16 ns	

[†] From least-squares fit to Eγ.
[‡] From Adopted Levels.
[#] Based on observation of prompt α-γ coin (FWHM=16 ns time distribution) (1981Mi12).

α radiations

Eα[†]	E(level)	Iα[†#]	HF[‡]
5993 *10*	275.47	40.3 *24*	2.6 *8*
6194 *10*	67.43	59.7 *24*	13 *4*

[†] From 1981Mi12. Intensities are given per 100 parent α decays, based on I(6194α):I(5993α)=21.5 *15*:14.5 *10* (1981Mi12).
[‡] If r_0=1.496 *15* (based on $r_0(^{182}Hg)$=1.50 *2*, $r_0(^{184}Hg)$=1.491 *14* in 1998Ak04), %α=7 *2*, Q(α)=6395 *7* and $T_{1/2}$=15.2 s *3* for ^{187}Pb parent.
[#] For absolute intensity per 100 decays, multiply by 0.07 *2*.

γ(^{183}Hg)

Eγ	Ei(level)	J_i^π	E_f	J_f^π	Mult.	α[†‡]	Comments
67.4 *3*	67.43	3/2$^-$	0.0	1/2$^-$	E2	32.1 *9*	α(L)=24.0 *7*; α(M)=6.26 *17* α(N)=1.55 *4*; α(O)=0.256 *7*; α(P)=0.000389 *9* Mult.: α(exp)=26 *4* from ratio of I(6197α) and I(6197α-67γ coin) (1981Mi12).
[x]187							Coincident with 5993α. Eγ is comparable to that expected for an otherwise unknown transition from 275 level to a known 5/2$^-$ 87 level, but no such branch from the 275 level was reported in the extensive (^{32}S,4nγ) E=159 MeV study by 1995La10.

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^{187}Pb α decay (15.2 s) 1981Mi12 (continued)

$\gamma(^{183}Hg)$ (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	$\alpha^{\dagger\ddagger}$	Comments
[x]195							Coincident with 5993α.
208.0 *3*	275.47	(3/2$^-$)	67.43	3/2$^-$	(M1)	0.991	α(K)=0.813 *12*; α(L)=0.1366 *20*; α(M)=0.0318 *5* α(N)=0.00797 *12*; α(O)=0.001509 *22*; α(P)=0.0001155 *17* Mult.: 0.87≤α(exp)≤5.3 from intensity balance at the 67 level. D,E2 from RUL.
275.5 *3*	275.47	(3/2$^-$)	0.0	1/2$^-$	(M1)	0.455	α(K)=0.374 *6*; α(L)=0.0625 *9*; α(M)=0.01454 *21* α(N)=0.00365 *6*; α(O)=0.000690 *10*; α(P)=5.29×10^{-5} *8* Mult.: M1 favored based on strength of 5993α-(K x ray) coin (1981Mi12).

† Additional information 1.
‡ 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.
[x] γ ray not placed in level scheme.

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Decay Scheme