^{188}Pb α decay   1993Wa03

		History	
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 111,275 (2010)	1-Oct-2009

Parent: ^{188}Pb: E=0.0; J$^\pi$=0$^+$; T$_{1/2}$=25.1 s 1; Q(α)=6109 3; %α decay=9.3 8

1993Wa03: mass-separated ^{188}Pb source from ^{155}Gd(^{40}Ar,^{7}n), E=240 MeV; PIPS-type α detectors (FWHM=23 keV At 5486), plastic scin (for ce), low-energy Ge detector (FWHM=0.67 At 122 keV); measured Eα, Iα, Eγ, α-X(t), α-ce(t).

The measured half-lives are T$_{1/2}$=23.6 s 45 (1972Ga27), 24.5 s 15 (1973Ho01), 26 s 2 (1974Le02), 22 s 2 (1984To09), 25.5 s 1 (1992Wa14). The weighted average of these values is 25.1 s 1. T$_{1/2}$(188PB)=24 s 2 was adopted by 1998Ak04 (unweighted average covering all measured values), and used for that calculation of r$_0$ (=1.491 14).

%α(^{188}Pb)=9.3 8 from 1999An22 is adopted here. 1998Ak04 adopted 8.5 13 from 1996Bi17. Previously, α branchings of 15% and 22% 7 were deduced by 1981To02 from x-ray/α and γ/α counts, respectively; %α=3-10 is listed in 1992Wa14.

Q(α)(^{188}Pb)=6109 3 (2003Au03, 2009AuZZ). Eα(to g.s.)=5983 4 (1991Ry01) gives Q(α)=6113 4.

^{184}Hg Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$	Comments
0.0	0$^+$		
367	2$^+$		
375	0$^+$	≤0.70 ns	T$_{1/2}$: limit from α-ce(t) (1993Wa03).

[†] From Eγ.
[‡] From Adopted Levels.

α radiations

Eα[†]	E(level)	Iα[‡@]	HF[#]	Comments
5614 10	375	≈1	≈2.1	Iα: ≈1 from I(5614α)/I(5983α)=(0.029 to 0.095)/(3 to 10), listed by 1994Wa13. However, they listed its hindrance (Rasmussen calculation) as 21 3; if that hindrance is correct, then Iα is an order of magnitude smaller than given here and comparable to that for ^{186}Pb α decay to the second 0$^+$ state In ^{182}Hg.
5633 10	367	0.095	23.9 22	Iα: measured by 1993WaZI. 5620α doublet coincident with 367γ and K x ray(Hg) (1993Wa03).
5983 4	0.0	99 1	1.0	Eα: recommended by 1991Ry01, based on measured energies of 5990 10 (1972Ga27), 5980 10 (1977De32), 5990 15 (1980Sc09), and 5980 5 (1984To09). Also observed by 2000By02 and 1998Ba88. the adopted Eα implies Q(α)=6113 4 cf. 6109 3 from 2009AuZZ.

[†] α energies to excited states were measured by 1993Wa03.
[‡] α intensity per 100 α decays.
[#] r$_0$(^{184}Hg)=1.494 4 is calculated by requiring the hindrance factor for the 5983α to be 1.0.
[@] For absolute intensity per 100 decays, multiply by 0.093 8.

<u>^{188}Pb α decay   **1993Wa03 (continued)**</u>

<u>$\gamma(^{184}$Hg)</u>

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[‡]	Comments
367	367	2^+	0.0	0^+	E2	0.0599	α(K)=0.0391 *6*; α(L)=0.01571 *23*; α(M)=0.00394 *6*; α(N+..)=0.001158 *17*
							α(N)=0.000981 *14*; α(O)=0.0001714 *25*; α(P)=5.12×10^{-6} *8*
							E_γ: from 1993Wa03.
375	375	0^+	0.0	0^+	E0		E_γ,Mult.: only ce observed. E_γ is rounded value from Adopted Gammas.

[†] From Adopted Gammas.

[‡] 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.

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Legend

<u>Decay Scheme</u>