

¹⁹⁶Po α decay 1985Va03,1989De18

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 1871 (2012)	15-Jun-2012

Parent: ¹⁹⁶Po: E=0.0; J ^{π} =0⁺; T_{1/2}=5.60 s 8; Q(α)=6658.0 24; % α decay=94 5
¹⁹⁶Po-T_{1/2}: 5.60 s 8 is weighted average of 5.5 s 5 (1967Si09), 5.8 s 2 (1985Va03), 5.8 s 2 (1993Wa04), 5.5 s 1 (1997Pu01).
 Others: 5.1 s +3I-14 (2005Uu02), 6.8 s 3 (1996Ta18). The datum from 1996Ta18 is a statistical outlier.
¹⁹⁶Po-% α decay: % α (¹⁹⁶Po)=94 5 from 1993Wa04. This is a little larger than expected on the basis of the calculated partial β decay half-life of 39.5 s (1997Mo25); the latter implies %(ϵ + β^+)=14.
 Others: 1967Si09, 1967Tr06, 1971Ho01, 1993Wa04, 1994Wa13, 1995De43, 1996Ta18, 1997Pu01, 2003Va16, 2005Uu02, 2005Uu03.
 1985Va03: sources from ²⁰Ne bombardments of tungsten foil (natural), E(²⁰Ne) \leq 225 MeV, on-line mass separation (LISOL); measured E α , I α (silicon surface-barrier detectors), parent T_{1/2}.
 1989De18: sources from ¹⁸²W(²⁰Ne,6n), E(²⁰Ne)<240 MeV, mass separation; measured E α , (α)(ce)(t); deduced mixing between π (2p-2h) intruder state (767 level) and ground state.
 1993Wa04: mass separated product (LISOL separator) from ²⁰Ne (E \leq 240 MeV) bombardment of ¹⁸²W target; measured E α , parent T_{1/2}. α branching determined from study of ²⁰⁰Rn α decay to ¹⁹⁶Po.
 1996Ta18: ¹⁹⁶Po from ²⁰⁰Rn α decay; measured E α (FWHM \approx 28 keV), T_{1/2}(¹⁹⁶Po).
 2009Ni11: calculated ¹⁹⁶Po α decay half-life using generalized density dependent cluster model with double folded Woods-Saxon potentials.
 2009Wa01: calculated α decay branching to g.s. and excited 0⁺ states within the framework of the generalized liquid drop model.

¹⁹²Pb Levels

E(level)	J ^{π} [†]	T _{1/2} [†]	Comments
0.0	0 ⁺	3.5 min 1	
767	0 ⁺	0.75 ns 10	E(level): based on E α . T _{1/2} : from (α)(ce)(t) (1989De18).
854?	2 ⁺		E(level): rounded-off value from Adopted Levels.

[†] From Adopted Levels.

α radiations

E α	E(level)	I α ^{#&}	HF ^{†‡}	Comments
5687 ^a CA	854?	\leq 0.0065	\geq 3.6	E α : deduced from E(level) and Q(α) (no peak visible in α spectrum from 1985Va03). HF: calculated by 1985Va03. I α : 1985Va03 obtained (but did not state) an upper limit for this intensity. Based on HF \geq 3.6 given in 1985Va03, I α \leq 0.0065. An upper limit of 0.024 is imposed by the requirement that HF \geq 1.0.
5769	767	0.022	2.74 16	E α : from 1985Va03. Authors do not state uncertainty; however, Δ E=6 keV is quoted in summary table II by 2003Va16. Also observed by 1989De18. coincident with Pb x-rays (2000Va34).
6521.9 [@] 21	0.0	99.978	1.0	E α =6521.9 21 implies Q(α)=6657.8 21 cf. 6658.0 24 from 2011AuZZ.

[†] Additional information 1.

[‡] r₀(¹⁹²Pb)=1.513 3 from Hf(to g.s.)=1.0. This assumes T_{1/2}=5.60 s 8 for ¹⁹⁶Po. See 1995De43 for discussion of hindrance for decay to 0⁺ 767 intruder state; these authors report Hf(to 767)=2.5 1 cf. 2.9 7 in 1985Va03 and 2.74 16 calculated here.

[#] Measured, but not stated, in 1985Va03. 1994Wa13 indicate I(6518 α):I(5769 α)=94:0.021.

[@] Weighted average of 6526 8 (1967Si09), 6518 5 (1967Tr06, after 0.7 keV increase recommended in 1991Ry01), 6522 8 (1971Ho01, after 1.3 keV increase recommended in 1991Ry01), 6521 5 (1985Va03), 6521 5 (1993Wa04), 6518 5 (1996Ta18);

Continued on next page (footnotes at end of table)

^{196}Po α decay 1985Va03,1989De18 (continued)

α radiations (continued)

$\Delta E_\alpha=1$ keV (statistical), ≤ 5 keV (systematic), 6533 6 (2005Uu03). 1991Ry01 recommended $E_\alpha=6520$ 3 based on the pre-1991 data above. Other E_α : 6520 (1977De32), 6520 30 (1997Pu01).

& For absolute intensity per 100 decays, multiply by 0.94 5.

^a Existence of this branch is questionable.

$\gamma(^{192}\text{Pb})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
769	767	0^+	0.0	0^+	E0	E_γ : rounded value from Adopted Gammas; conversion electrons observed in coincidence with 5769α (1989De18).

[†] From Adopted Gammas.

^{196}Po α decay 1985Va03,1989De18

Decay Scheme

