

^{191}Po α decay (93 ms) 2002An19,1999An36,1999An10

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 110, 999 (2009)	1-Nov-2008

Parent: ^{191}Po : $E=40$ 15; $J^\pi=(13/2^+)$; $T_{1/2}=93$ ms 3; $Q(\alpha)=7501$ 11; $\% \alpha$ decay=96 4

^{191}Po - $T_{1/2}$: From 2002An19. Others: 98 ms 8 (1999An10), 95 ms +130-60 (7364 α - $T_{1/2}$ and 110 ms +70-30 (6878 α -t) (2001Ke06).

^{191}Po - $\% \alpha$ decay: From 2007Va21.

Other: 2001Hu21, 2001Uu01.

2002An19: ^{191}Po from $^{142}\text{Nd}(^{52}\text{Cr},3n)$ (99.8% ^{142}Nd), $E=236$ 1 MeV; RITU separator for fusion-evaporation residue, position sensitive silicon strip detector, gas detector, HPGe detectors of Jurosphere array; Measured: $E\alpha$, $I\alpha$, α - γ coin, α - α coin, $E\gamma$.

1999An10, 1999An36: ^{191}Po from ^{36}Ar bombardment of 67.1% enriched ^{160}Dy , $E=175$ -193 MeV (5 energies); pulsed beam, gas-filled recoil separator (RITU), position sensitive Si detector, HPGe detector; measured excit, $E\alpha$, $I\alpha$, $E\gamma$, $I\gamma$, α - α correlations, $\alpha\gamma$ coin, α -x coin.

1997Ba25: ^{191}Po from $^{96}\text{Mo}(^{96}\text{Mo},N)$, $E=404$ MeV; 94.5% enriched ^{96}Mo target; recoil nuclei implanted in double-sided Si strip detector after identification using fragment mass analyzer and gas-filled parallel-grid avalanche counter; measured $E\alpha$, $\alpha(t)$, recoil- $\alpha(t)$.

Parent $T_{1/2}=93$ ms 3 from 7376 $\alpha(t)$ (2002An19).

 ^{187}Pb Levels

E(level) [†]	J^π	$T_{1/2}$	Comments
0.0	(13/2 ⁺)		J^π : possible configuration (ν $i_{13/2}$) $\otimes\pi(0p-0h)$ (1999An10).
472 1	(9/2 ⁺)		J^π : from 472 γ (E2) to (13/2 ⁺) and HF of the 6909 α decay (2002An19).
494 1	(13/2 ⁺)	<10 ns	J^π : from 494 γ (M1) to (13/2 ⁺), HF, and the J^π of the parent nucleus (2002An19). Possible configuration (ν $i_{13/2}$) $\otimes\pi(2p-2h)$.
573 15	(9/2 ⁺)		$T_{1/2}$: based on observation of 6888 α and 494 γ in prompt coincidence (1999An10).
594? 1			J^π : Based on the $J^\pi=(13/2^+)$ of 494 keV level and the (80 γ) (E2).

[†] From 2002An19.

 α radiations

$E\alpha$ ^{†‡}	E(level)	$I\alpha$ ^{‡@}	HF [#]	Comments
6790& 15	594?	0.5 3	76 48	
6815 15	573	10 2	4.5 12	
6888 5	494	38 8	2.2 6	$E\alpha$: Other: 6888 15 (1999An10), 6878 12 (2001Ke06).
6909 15	472	3.9 11	26 9	
7376 5	0.0	47.6 1	70 10	$E\alpha$: Other: 7378 10 (1999An10), 7364 20 (2001Ke06).

[†] 2002An19 searched for crossover α decay from ^{191}Po ($J^\pi=13/2^+$) to the ^{187}Pb ($J^\pi=3/2^-$), but did not find any evidence. An upperlimit of hindrance factor ≥ 80 20 is calculated for an expected crossover 7374 α .

[‡] From 2002An19.

[#] From $r_0=1.526$ 22, average of $r_0(^{186}\text{Pb})=1.54$ 2 and $r_0(^{188}\text{Pb})=1.511$ 8 (1998Ak04), $T_{1/2}=93$ ms 3 for 40 15 level of ^{191}Po , $Q(\alpha)(^{191}\text{Po})=7501$ 11, and $\% \alpha(^{191}\text{Po})=100$ from systematics. The calculated hindrance factor here is larger by a factor of ~ 2.9 than that reported in 2002An19, which is probably arises due to the difference of r_0 value used in this calculation.

[@] For absolute intensity per 100 decays, multiply by 0.96 4.

[&] Existence of this branch is questionable.

$$\underline{\underline{\gamma(^{187}\text{Pb})}}$$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	$\alpha^\dagger$	Comments
(80 15)	573	(9/2 ⁺)	494	(13/2 ⁺)	(E2)	≥ 10	Mult., α : From α , $\alpha \geq 10$ (2002An19).
472 1	472	(9/2 ⁺)	0.0	(13/2 ⁺)	(E2)		Mult.: from $\alpha(K)\text{exp} \leq 0.06$.
494 1	494	(13/2 ⁺)	0.0	(13/2 ⁺)	(M1)		Mult.: from $\alpha(K)\text{exp}$ 0.076 20.
594 [‡] 1	594?		0.0	(13/2 ⁺)			

[†] 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.

[‡] Placement of transition in the level scheme is uncertain.

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Legend

Decay Scheme

-----► γ Decay (Uncertain)

