

^{187}Bi α decay (0.370 ms) 2006An11,1999Ba45

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

Parent: ^{187}Bi : $E=112$ 11; $J^\pi=(1/2^+)$; $T_{1/2}=0.370$ ms 20; $Q(\alpha)=7779$ 4; $\% \alpha$ decay ≈ 100.0

^{187}Bi -E: From 2006An11, based on their measured $E\alpha$ to ^{183}Tl g.s. from this level and from ^{187}Bi g.s..

^{187}Bi - $T_{1/2}$: From 7721 α (t) (2006An11). others: 0.29 ms +9-5 (1999Ba45; 7721 α (t)) and 0.31 ms +19-9 (2003Ke08; 7714 α (t)). 0.8 ms 6 for $E\alpha=7583$ 10 (1984ScZQ) May have been wrongly assigned to $^{187\text{m}}\text{Bi}$ because that α was not seen by 2003Ke08 or 1999Ba45.

Additional information 1.

2006An11: ^{187}Bi source from $^{144}\text{Sm}(^{46}\text{Ti},\text{P2N})$ reaction at $E(^{46}\text{Ti})=224$ MeV 1 (production $\sigma=0.20$ μb 8); evaporation residues separated by SHIP velocity filter and implanted into position-sensitive Si detector; using 6 Si BOX detectors, 3 time of flight detectors, a veto detector and a four-fold segmented Clover Ge detector; measured $E\alpha$, $I\alpha$, (recoil)- γ coin, α - γ coin.

1999Ba45: source from $^{97}\text{Mo}(^{92}\text{Mo},\text{pn})$, $E=420$ MeV, 93% ^{97}Mo target; recoils identified using fragment mass analyzer and gas-filled parallel-grid avalanche counter, then implanted in double-sided Si strip detector; measured $E\alpha$, $I\alpha$, recoil- α (t).

Other: 1984ScZQ.

For discussion of competition between p and α decay see 2014Wa16 (generalized liquid drop model).

For this decay, $Q_{\text{xBR}}=7891$ 12.

 ^{183}Tl Levels

<u>E(level)</u>	<u>J^π</u>	<u>Comments</u>
0.0	(1/2 ⁺)	J^π : from Adopted Levels.

 α radiations

<u>$E\alpha$</u>	<u>E(level)</u>	<u>$I\alpha^\ddagger$</u>	<u>HF</u>	<u>Comments</u>
7721 8	0.0	≈ 100	$\approx 0.81^\dagger$	$E\alpha$: weighted average of 7721 15 (1999Ba45) and 7721 10 (2006An11). Other: 1984ScZQ report $E\alpha=7583$ 10 with $T_{1/2}=0.8$ ms 6; its absence in the 1999Ba45 and 2006An11 studies casts doubt on its assignment to this decay. The adopted $E\alpha$ implies $Q(\alpha)=7790$ 8 cf. 7789 14 from 2003Au03 and 7779 4 from 2012Wa38. Reduced α width $\delta_\alpha^2=43$ keV 3 (2006An11).

[†] If $r_0=1.493$ 7 (unweighted average of $r_0(^{182}\text{Hg})=1.50$ 2 (1998Ak04) and $r_0(^{184}\text{Pb})=1.486$ 10 (if $E\alpha=7911$ 13 and $\% \alpha=100$ for ^{188}Po)) and $Q(\alpha)=7778$ 5 (based on $E\alpha=7612$ 5 for g.s. to g.s. transition (2006An11)).

[‡] For absolute intensity per 100 decays, multiply by ≈ 1.0 .