

^{193}At α decay (28 ms) [2003Ke08](#)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Aug-2021

Parent: ^{193}At : $E=0$; $J^\pi=(1/2^+)$; $T_{1/2}=28$ ms $+5-4$; $Q(\alpha)=7572$ 7; $\% \alpha$ decay ≈ 100.0

^{193}At - $Q(\alpha)$: From [2021Wa16](#).

^{193}At - $E, J^\pi, T_{1/2}$: From ^{193}At Adopted Levels in the ENSDF database (March 2017 update), where values are taken from [2003Ke08](#). No new references since the 2017 evaluation.

^{193}At - $\% \alpha$ decay: $\% \alpha \approx 100$ for ^{193}At g.s. decay.

[2003Ke08](#): ^{193}At produced in $^{141}\text{Pr}(^{56}\text{Fe}, 4n\gamma)$ reaction, at $E=264-272$ MeV; recoil fragment mass separation; measurement using recoil-tagged α - α and α - γ coincidences, and considering α -decay links to levels in the daughter nuclides ^{189}Bi and ^{185}Tl . [2005Ke10](#), [2005Uu03](#) and [2007DoZW](#) are conference reports from the same group as [2003Ke08](#).

 ^{189}Bi Levels

<u>$E(\text{level})^\dagger$</u>	<u>$J^\pi^\dagger$</u>	<u>$T_{1/2}^\dagger$</u>	Comments
0.0	($9/2^-$)	688 ms 5	
99.6 5	($7/2^-$)		
184 8	($1/2^+$)	5.0 ms 1	$\% \alpha = 83$ 5 (2003Ke08); $\% \text{IT} = 17$ 5 (2003Ke08) $E(\text{level})$: average of values from ^{193}At α -decay: 187 9 (2003Ke08), 182 8 (1997Wa05). Others: 190 40 (1995Ba75), 220 30 (1993An19), 92 7 (1985Co06). J^π : hindrance factor of ≈ 1.2 suggests favored α decay with the same J^π values for this level and the ^{193}At g.s. parent. $T_{1/2}$: Other: 4.6 ms $+8-6$ (from $E\alpha=7295$, 2003Ke08).

† From Adopted Levels.

 α radiations

<u>$E\alpha$</u>	<u>$E(\text{level})$</u>	<u>$I\alpha^\ddagger$</u>	<u>$\text{HF}^\dagger$</u>	Comments
7235 5	184	100	≈ 1.3	HF: 0.69 13 (2003Ke08).

† The nuclear radius parameter $r_0(^{189}\text{Bi})=1.5519$ 62 is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides, evaluated in [2020Si16](#). Value from [2003Ke08](#) is given under comments.

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

 $\gamma(^{189}\text{Bi})$

<u>E_γ</u>	<u>$E_i(\text{level})$</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>$\alpha^\ddagger$</u>	<u>$I_{(\gamma+ce)}^\dagger$</u>	Comments
(84 8)	184	($1/2^+$)	99.6	($7/2^-$)	[E3]	55×10^1 27	17 5	E_γ : from level-energy difference. $I_{(\gamma+ce)}$: from $\% \text{IT} = 17$ 5 (2003Ke08). E3 branch of 17% 5 from the 187-keV isomer from 2003Ke08 .

† For absolute intensity per 100 decays, multiply by ≈ 1.0 .

‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

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Legend

Decay Scheme

-----► γ Decay (Uncertain)

