^{193}At α decay (27 ms) 2003Ke08

History

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

Parent: ^{193}At: E=39 *7*; J^{π}=(13/2$^+$); $T_{1/2}$=27 ms *+4–3*; Q(α)=7572 *7*; %α decay=24 *10*

^{193}At-Q(α): From 2021Wa16.

^{193}At-E,J^{π},$T_{1/2}$: 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. Energy of this state is given as 42 keV *9* in 2021Ko07 evaluation.

^{193}At-%α decay: %α=24 *10* for ^{193}At isomer decay(2003Ke08); 13/2$^+$ to 7/2$^-$, E3 transition of ≈34 keV in ^{193}At is expected to be 76% *10* (2003Ke08).

2003Ke08: ^{193}At produced in ^{141}Pr(^{56}Fe,4nγ) reaction, at E=264-272 MeV; recoil fragment mass separation; measurement using recoil-tagged $\alpha\alpha$ and $\alpha\gamma$ 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

E(level)[†]	J^{π}[‡]	$T_{1/2}$[‡]	Comments
0	(9/2$^-$)	658 ms *22*	
357.6 *5*	(13/2$^+$)	886 ns *32*	%IT=100 J^{π}: hindrance factor of 1.8 *9* suggests favored α decay with the same J^{π} values for this level and the 39-keV level in ^{193}At parent. $T_{1/2}$: other: ≈500 ns from $\alpha\gamma$(t) in ^{193}At, 27-ms, (13/2$^+$) α decay (2003Ke08).

† From Eγ value.
‡ From Adopted Levels.

α radiations

Eα	E(level)	Iα[‡]	HF[†]	Comments
7106 *5*	357.6	100	1.8 *9*	HF: 1.0 *4* (2003Ke08).

† The nuclear radius parameter r_0(^{189}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 0.24 *10*.

γ(^{189}Bi)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J^{π}_i	E$_f$	J^{π}_f	Mult.	α[‡]	I$_{(\gamma+ce)}$[†]	Comments
357.6 *5*	50.8 *4*	357.6	(13/2$^+$)	0	(9/2$^-$)	M2	0.969	100	α(K)=0.738; α(L)=0.175; α(M)=0.0429; α(N)=0.01105 E$_\gamma$: from 2003Ke08, seen in coin with α particles. I$_{(\gamma+ce)}$: from Iα=100 per 100 α decays. I$_\gamma$: from I(γ+ce) and α. Mult.: from the Adopted Gammas.

† For absolute intensity per 100 decays, multiply by 0.24 *10*.
‡ 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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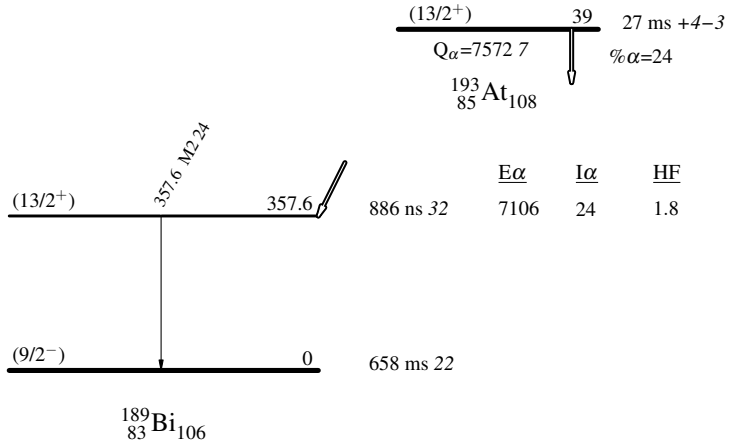
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



	Eα	Iα	HF
	7106	24	1.8