^{190}Bi α decay: high spin 2003An26,1988Hu03,1991Va04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. C. Batchelder and A. M. Hurst, M. S. Basunia	NDS 183, 1 (2022)	1-Mar-2022

Parent: ^{190}Bi: E=191 *65*; J^π=(10$^-$); $T_{1/2}$=6.2 s *1*; Q(α)=6862 *3*; %α decay=70 *9*

^{190}Bi-E,J^π,$T_{1/2}$: From 2020Si26. Other energies: 182 *57* (2020St11), 130 *40* (2017Au03).

^{190}Bi-%α decay: From 1991Va04.

Others: 1993An21, 2013Ny01, 2020St11.

1991Va04, 1988Hu03: mass separated samples. Measured Eα, Iα, $\alpha\gamma$ coin, Iγ, I(K x ray), I(L x ray), α(K)exp.

2003An26: ^{190}Bi was produced from ^{142}Nd(^{52}Cr,p3n), E=256 MeV, and a total of 10^6 α decays observed. Enriched (99.8%) $^{142}NdF_3$ target (thickness 290 μg/cm^2). Separated isotopes were implanted into a 16-strip positron-sensitive Si detector (PSDD), a 4-segment clover HPGe detector. Measured Eα, Iα, Eγ, α-γ-γ coincidences (sorted within a fixed interval of 0 to 5 μs). Deduce level scheme and α decay hindrance factors. Also ^{190}Bi was produced by ^{142}Nd(^{50}Cr,pn) reaction (enriched ^{52}Cr).

2013Ny01 observed ^{190}Bi as the daughter product of the ^{194}At -^{190}Bi α-α decay chain.

^{186}Tl Levels

E(level)†	J^π†	$T_{1/2}$	Comments
40 *39*	(7$^+$)	27.5 s *10*	Additional information 1.
129 *39*	(6$^+$,7$^+$,8$^+$)	<0.4 ns	$T_{1/2}$: From 1991Va04.
295 *39*			
321 *39*			
396 *39*			
414 *39*	(10$^-$)	3.32 s *11*	$T_{1/2}$: From Adopted Levels.
481 *39*			

† From Adopted Levels.

α radiations

Eα#	E(level)	Iα†&	HF‡	Comments
6392@ *10*	481	0.23@ *4*	335 *75*	Iα: 0.24 *4* (2003An26).
6454@ *5*	414	96.1@	1.4	Eα: Others: 6429 *5* (1988Hu03). Iα: 100 (1991Va04,2003An26). Eα: Weighted ave. of 6455 keV *5* (1988Hu03), 6456 keV *5* (1991Va04), 6456 keV *5* (2003An26), 6450 keV *5* (2013Ny01). Uncertainty lowest input value. Other: 6455 keV (1993An21).
6472@ *10*	396	0.39@ *7*	4.1×10^2 *10*	Iα: 0.041 *7* (2003An26).
6546@ *10*	321	0.044@ *8*	7.0×10^3 *16*	Iα: 0.046 *8* (2003An26).
6570@ *10*	295	0.037@ *8*	1.02×10^4 *27*	Iα: 0.039 *8* (2003An26).
6734 *5*	129	1.4 *2*	1.10×10^3 *22*	Eα: Other: 6734 *10* (2003An26). Iα: 1.5 *2* (1991Va04, 2003An26).
6819 *5*	40	1.7 *2*	3.7×10^3 *10*	Iα: 1.8 *2* from wt. ave. of 1.7 *2* (1991Va04) and 2.0 *3* (2003An26).

† From 1991Va04, normalized to ΣIα=100 by the evaluators listed in column and relative values from references in the column section.

‡ For $r_0(^{186}Tl)$=1.502 *7*, based on ^{184}Hg=1.4885 *32*, ^{186}Hg=1.4923 *55*, ^{186}Pb=1.5114 *26*, ^{188}Pb=1.5137 *13* (2020Si16).

From 1991Va04, except otherwise noted.

@ From 2003An26.

& For absolute intensity per 100 decays, multiply by 0.70 *9*.

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γ(^{186}Tl)

E_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α [#]	Comments
89.5 *4*	129	$(6^+,7^+,8^+)$	40	(7^+)	M1	11.76 *22*	α(K)=9.58 *18*; α(L)=1.67 *4*; α(M)=0.390 *8* α(N)=0.0985 *19*; α(O)=0.0191 *4*; α(P)=0.00180 *4* E_γ: Other: 89 *1* (2003An26). Mult.: From α(K)exp=10.3 *9* (2003An26). Other: α(K)exp=17 *8* (1991Va04).
255‡ *1*	295		40	(7^+)			
267‡	396		129	$(6^+,7^+,8^+)$			
281‡ *1*	321		40	(7^+)			
352‡	481		129	$(6^+,7^+,8^+)$			
356‡ *1*	396		40	(7^+)			
373.9	414	(10^-)	40	(7^+)	E3	0.250	α(K)=0.1009 *15*; α(L)=0.1107 *16*; α(M)=0.0292 *4* α(N)=0.00737 *11*; α(O)=0.001308 *19*; α(P)=6.72×10^{-5} *10* E_γ: Other: 374 (2003An26).
441‡ *1*	481		40	(7^+)			

† From 1991Va04, except otherwise noted.
‡ From 2003An26.
# Additional information 2.

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Legend

● Coincidence

Decay Scheme