

¹⁹⁵At α decay (143 ms) 2013Ny01,2003Ke04,1999Ta20

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 195,368 (2024)	1-Dec-2023

Parent: ¹⁹⁵At: E=29 7; J ^{π} =(7/2⁻); T_{1/2}=143 ms 3; Q(α)=7344 6; % α decay=88 4

¹⁹⁵At-E: From 2021Ko07 – NUBASE. Adopted E α =7221 4 and Q α ¹⁹⁵At=7344 6 (2021Wa16) yield the same value.

¹⁹⁵At-J ^{π} : From 2014Hu18 (evaluation).

¹⁹⁵At-T_{1/2}: From 2013Ny01. Other values: 147 ms 5 (2003Ke04, same lab of 2013Ny01), 146 ms +21-17 (1999Ta20, also 1996PuZZ from the same research group), 150 ms 30 and 140 ms 50 (1995Le15). T_{1/2} values measured much less precisely, mainly for decay chain identification purpose: 120 ms +25-20 and 130 ms +70-40 (2013Ka16), 130 ms +50-30 (2013Uu01).

¹⁹⁵At-Q(α): From 2021Wa16.

¹⁹⁵At-% α decay: From 2013Ny01, 2014Hu18 (and %IT=12 4 in 2013Ny01, 2014Hu18). Other: Calculated partial alpha and beta decay half-lives in 2019Mo01 yield estimates of % α \approx 94.9 and % ϵ +% β^+ \approx 5.1.

Other α measurements: 2013Uu01, 2013Ka16.

2013Ny01: measured half-life and E α , recoil- α correlated decay measurements at Jyväskylä cyclotron facility using RITU separator.

2003Ke04,2005Ke10: Production of ¹⁹⁵At by ¹⁴²Nd(⁵⁶Fe,p2n), E(lab)=255-268 MeV. The evaporation residues formed in the fusion reaction were separated using the RITU gas-filled mass separator and implanted into a position-sensitive Si strip detector. A multiwire proportional avalanche gas counter was used to discriminate α -ray particles from other signals in the Si detector. A Compton-suppressed, 40% relative efficiency, Ge detector was used for prompt α - γ coincidence measurements.

1999Ta20: ¹⁶⁹Tm(³⁶Ar, α 6n), E=215 MeV. RIKEN ring cyclotron. Recoil reaction products separated with the gas-filled recoil separator GARIS. Detection of recoil fragments and decay α rays using two-dimensional position-sensitive Si detector at the focal plane. Microchannel plate placed before this detector allows to distinguish evaporation residues from alpha particles. RDT method. Analyze correlated recoil-alpha1-alpha2 decay chains.

¹⁹¹Bi Levels

E(level)	J ^{π} †	T _{1/2} †	Comments
0.0	(9/2 ⁻)	12.4 s 3	
148.7 5	(7/2 ⁻)	<10 ns	T _{1/2} : from prompt coincidences (resolving time <10 ns) of the deexciting 148.7-keV γ -ray with the 7075-keV α ray feeding this level from the (7/2 ⁻) isomeric state in ¹⁹⁵ At (2003Ke04).

† From Adopted Levels.

α radiations

E α †	E(level)	I α †#	HF‡	Comments
7075 4	148.7	95.5 5	2.30 15	E α : Other: 7105 30 (1999Ta20). Reduced α width of 55 keV 3, $\Delta L=0$, and HF=1.17 6 estimated by authors of 2003Ke04 using the Rasmussen method.
7221 4	0.0	4.5 5	153 20	E α : Other E α =7248 6 (2013Ka16). Estimated reduced α width is 1.4 keV 2, $\Delta L=2$ (2003Ke04). Authors also estimate a HF=47 6 using the Rasmussen method.

† α -ray energy and relative intensity from 2003Ke04 (see also preliminary data in 1995Le15, 1999Ta20).

‡ A r_0 (¹⁹¹Bi)=1.548 10 is obtained is deduced from interpolation (or unweighted average) of the r_0 values for the neighboring even-Z, N=108 isotones: r_0 (¹⁹⁰Pb)=1.511 4, from 2020Si16, and r_0 (¹⁹²Po)=1.585 15.

For absolute intensity per 100 decays, multiply by 0.88 4.

^{195}At α decay (143 ms) 2013Ny01,2003Ke04,1999Ta20 (continued)

$\gamma(^{191}\text{Bi})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\dagger	Comments
148.7 5	148.7	(7/2 ⁻)	0.0	(9/2 ⁻)	(M1)	3.29 6	$\alpha(\text{K})=2.68\ 5$; $\alpha(\text{L})=0.468\ 8$; $\alpha(\text{M})=0.1100\ 19$ $\alpha(\text{N})=0.0282\ 5$; $\alpha(\text{O})=0.00575\ 10$; $\alpha(\text{P})=0.000685\ 12$ E_γ : From 2003Ke04. Mult.: From $\alpha_{\text{K}}(\text{exp})=3.3\ 3$ (2003Ke04).

† Additional information 1.

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Decay Scheme

