^{218}At α decay 2019Cu02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Shaofei Zhu and E. A. Mccutchan	NDS 175, 1 (2021)	1-May-2021

Parent: ^{218}At: E=0.0; J^π=(2$^-$,3$^-$); $T_{1/2}$=1.27 s *6*; Q(α)=6874 *3*; %α decay=99.95 *5*

^{218}At-J^π,$T_{1/2}$: From ^{218}At Adopted Levels (2019Si39).

^{218}At-Q(α): From 2021Wa16.

2019Cu02: ^{218}At produced at CERN-ISOLDE facility and separated with laser ionization and magnetic separator. Measured α, α-γ and half-life after ion implantation at the center of decay station with ^{218}At ions at 30-keV energy.

^{214}Bi Levels

E(level)	J^π[†]	Comments
0.0	1$^-$	
53.3 *3*	2$^-$	E(level): from Eγ.
62.68 *5*	(2$^-$,3$^-$)	E(level): from the Adopted Levels.
101 *5*	(3$^-$,4$^-$)	E(level): deduced from Eα=6654 *4* to this level and Eα=6693 *3* to 62.68-keV level. J^π: unfavored 6654α from ^{218}At g.s., which is suggested to be (3$^-$) from hfs (2019Ba22) and α decay (2019Cu02) measurements.

[†] From the Adopted Levels.

α radiations

Eα[‡]	E(level)	Iα[#@]	HF[†]	Comments
6654 *5*	101	6.9 *1*	20.2 *12*	Eα: weighted average of 6653 *5* (1963Wa29) and 6655 *7* (2019Cu02). Iα: other: 6.4 (1963Wa29).
6693 *3*	62.68	92.7 *5*	2.09 *11*	Eα: weighted average of 6693 *3* (1963Wa29) and 6694 *5* (2019Cu02). Iα: deduced from Iα(6760α)+Iα(6693α)=93.1 *1* with Iα(6760α) ≤ 0.9 (2019Cu02). Other: 90 (1963Wa29).
≈6760	0.0	≤0.9	≥348	other: Eα=6756 *5*; Iα=3.6 (1963Wa29). the observation of 6756α was a private communication. It was not observed in 1960Wa14 and 2019Cu02.

[†] r_0(^{214}Bi)=1.549 *6*, unweighted average of r_0(^{212}Pb)=1.54117 *28*, r_0(^{214}Pb)=1.5379 *2*, r_0(^{214}Po)=1.5606 *7*, r_0(^{216}Po)=1.5555 *1* (2020Si16).

[‡] Due to a change in calibration energy, the Eα values measured in 1963Wa29 were recommended to be reduced by 1 keV by 1991Ry01.

[#] From 2019Cu02.

[@] For absolute intensity per 100 decays, multiply by 0.9995 *5*.

γ(^{214}Bi)

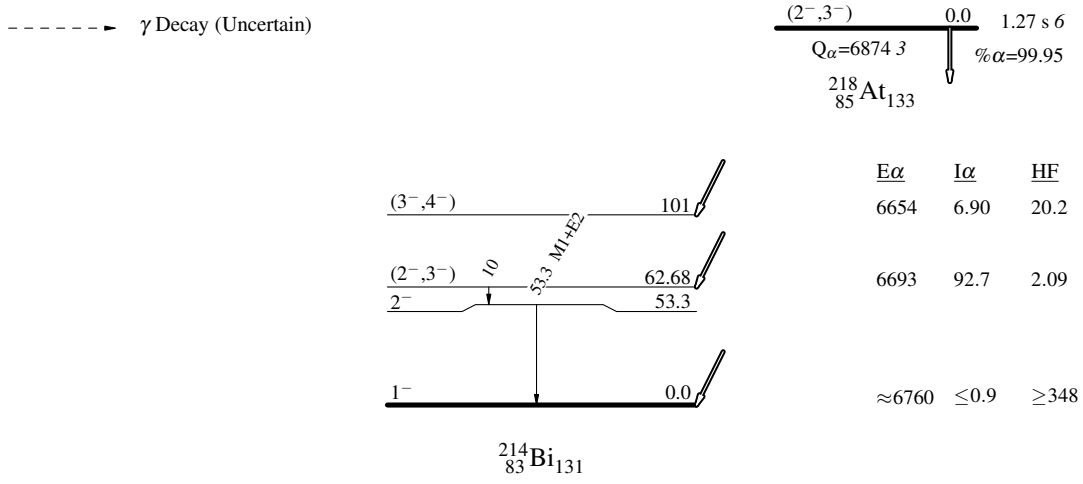
Eγ	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	δ	Comments
(10)	62.68	(2$^-$,3$^-$)	53.3	2$^-$			γ not observed, but expected to be the dominant decay path because the coincident relation between 6693α and the 53.3γ (2019Cu02).
53.3 *3*	53.3	2$^-$	0.0	1$^-$	M1+E2	0.038 *+26−18*	Eγ: from 2019Cu02. Mult.,δ: from the Adopted Gammas. α(tot)=8.6 *4* (2019Cu02).

^{218}At α decay 2019Cu02

Legend

- - - - - - ► γ Decay (Uncertain)

Decay Scheme



Eα	Iα	HF
6654	6.90	20.2
6693	92.7	2.09
≈6760	≤0.9	≥348