Adopted Levels, Gammas

History

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

Q(β^-)=941 *10*; S(n)=4871 *6*; S(p)=4015 *5*; Q(α)=8988 *4* 2021Wa16
S(2n)=10894 *4*; S(2p)=9839 *4* (2021Wa16).
α: Additional information 1.

^{214}At Levels

Cross Reference (XREF) Flags

A ^{218}Fr α decay (1.1 ms)
B ^{218}Fr α decay (21.9 ms)

E(level)†	Jπ	$T_{1/2}$	XREF	Comments
0.0	1^-	558 ns *10*	AB	%α=100 Only α decay has been observed. Jπ: favored α decay to 1^- state in ^{210}Bi, and the α fine structure populates only low-spin states in ^{210}Bi (1982Ew01,1999Sh03). Configuration=$((\pi\ h_{9/2})^{+3}(\nu\ g_{9/2})^{+3})$. $T_{1/2}$: from 1982Ew01.
59? *9*		265 ns *30*		%α<100 Only observed by 1982Ew01, but no evidence found by 1999Sh03. E(level): from Q_α with the assumption of E(α)=8877 *8* of this isomer and E(α)=8819 *4* of 558-ns g.s. both feeding the g.s. in ^{210}Bi; and the coincidence of 8877α with the 7875α from the 21.9-ms state of ^{218}Fr to the 78-keV level in ^{214}At (1982Ew01). $T_{1/2}$: from 1982Ew01. Jπ: possible $J^\pi=0^+,1^\pm,2^\pm,3^-$ on the basis of 59γ being M1, E1 or E2 with HF >4.0 for α-decay from this state to ^{210}Bi.
78.0 *10*	(0^-)		AB	Jπ: γ to 1^-, γ from $(1^-, 2^-)$, no ^{218}Fr α-decay from 1^-, α-decay from the 21.9-ms state of ^{218}Fr with HF≥3872. Configuration=$((\pi\ h_{9/2})^{+3}(\nu g_{9/2})^{+3})$.
145.1 *5*	$(2)^-$		AB	Jπ: M1 to 1^-; α-decay from 1^- state of ^{218}Fr with HF=75; α-decay from the 21.9-ms state of ^{218}Fr with HF≥2360. Configuration=$((\pi\ h_{9/2})^{+3}(\nu\ g_{9/2})^{+3})$.
187.0 *9*	$(3^-)^{\#}$		AB	Jπ: γ to 1^-, α-decay from the 21.9-ms state of ^{218}Fr with HF≥2402.
228.1 *12*	$(4^-)^{\#}$		B	Jπ: γ to $(2)^-$; no α-decay from the 1^- state of ^{218}Fr.
231‡ *7*	9^-	760 ns *15*	B	%α≤100 Jπ: favored α decay to 9^- state in ^{210}Bi; α from the 21.9-ms state of ^{218}Fr with HF≥388. $T_{1/2}$: from 1982Ew01. %α: only α decay observed, IT decay is possible but not observed.
277.9 *10*	$(7^-)^{\#}$		B	Jπ: γ to 9^-, no α from 1^-, α from the 21.9-ms state of ^{218}Fr with HF≥89.
302.1 *15*	$(6^-)^{\#}$		B	Jπ: γ to (4^-); α from the 21.9-ms state of ^{218}Fr with HF≥105.
304.0 *12*	$(1^-,2^-)$		A	Jπ: γ to 1^- and $(3)^-$; α from the 1.1-ms, 1^- state of ^{218}Fr with HF=7.
334.0 *14*			A	
343.0 *10*	$(8)^-$		B	Jπ: M1 to 9^-; α from the 21.9-ms state of ^{218}Fr with HF≥24.
412‡ *7*			B	
455‡ *8*			B	
495?‡ *6*			A	
504.1 *23*			B	
565.1 *23*			B	
631‡ *12*			B	
728.4 *15*	(8^-)		B	Jπ: γ to $(7)^-$; γ to 9^-; α from the 21.9-ms state of ^{218}Fr with HF≥5.9.

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Adopted Levels, Gammas (continued)

^{214}At Levels (continued)

E(level)†	XREF
790‡ *6*	B
864‡ *7*	B
883‡ *16*	B
975‡ *9*	B
1018‡ *7*	B
1138‡ *9*	B

† From least square fit to Eγ's by evaluator, unless otherwised noted as from Eα and Q_α.
‡ From Eα and Q(α).
# Configuration=$((\pi\ h_{9/2})^{+3}(\nu\ g_{9/2})^{+3})$; tentative spin assignment.

γ(^{214}At)

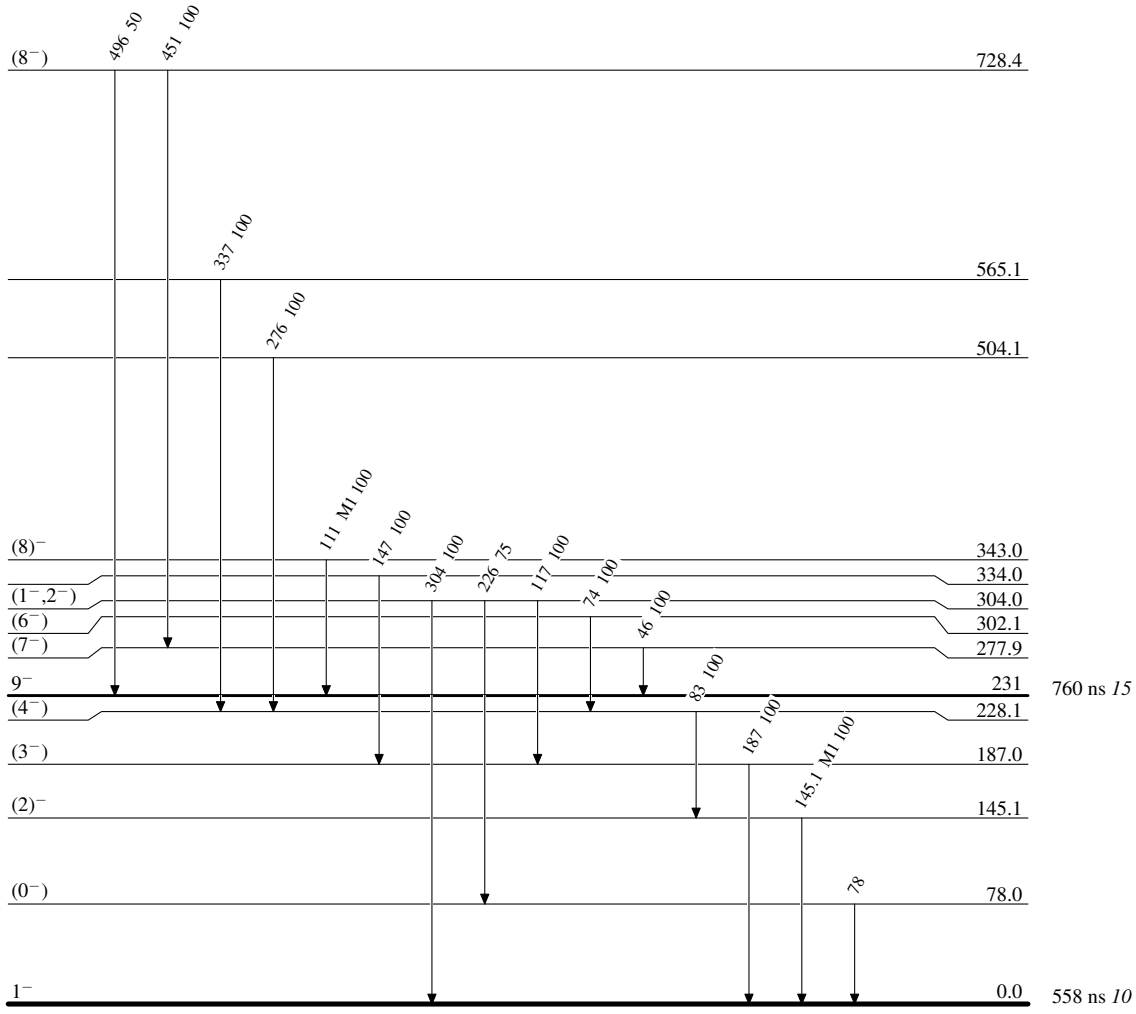
E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.†	α	Comments
78.0	(0^-)	78		0.0	1^-			
145.1	$(2)^-$	145.1 *5*	100	0.0	1^-	M1	4.19 *7*	α(K)=3.39 *6*; α(L)=0.608 *10*; α(M)=0.1438 *25*; α(N)=0.0373 *6*; α(O)=0.00798 *14* α(P)=0.001102 *19*
187.0	(3^-)	187 *1*	100	0.0	1^-			
228.1	(4^-)	83 *1*	100	145.1	$(2)^-$			
277.9	(7^-)	46 *1*	100	231	9^-			
302.1	(6^-)	74 *1*	100	228.1	(4^-)			
304.0	$(1^-,2^-)$	117 *1*	100	187.0	(3^-)			
		226 *2*	75	78.0	(0^-)			
		304 *4*	100	0.0	1^-			
334.0		147 *1*	100	187.0	(3^-)			
343.0	$(8)^-$	111 *1*	100	231	9^-	M1	8.98 *27*	α(K)=7.26 *21*; α(L)=1.31 *4*; α(M)=0.310 *9*; α(N)=0.0804 *24*; α(O)=0.0172 *5*; α(P)=0.00238 *7*
504.1		276 *2*	100	228.1	(4^-)			
565.1		337 *2*	100	228.1	(4^-)			
728.4	(8^-)	451 *2*	100	277.9	(7^-)			
		496 *2*	50	231	9^-			

† From ^{218}Fr α decay (1999Sh03).

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{214}_{85}At_{129}$