^{218}Fr α decay (1.1 ms) 1999Sh03

History

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

Parent: ^{218}Fr: E=0.0; $J^\pi=1^-$; $T_{1/2}$=1.1 ms *+5−4*; Q(α)=8013.7 *14*; %α decay=100.0

^{218}Fr-Q(α): from 2021Wa16.

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

1999Sh03: Radioactivity of ^{218}Fr produced from ^{222}Ac decay (following Th(p,X)^{222}Ac); ISOCELE Mass and chemical separation of source. Measured Eα, Eγ, $\alpha\gamma$-, $\gamma\gamma$-coin; deduced levels J^π, α-branching.

Other measurements: 1964Mc21 and 1982Ew01.

α: Additional information 1.

^{214}At Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	1^-	558 ns *10*	$T_{1/2}$: from Adopted Levels.
78.0 *10*	(0^-)		
145.1 *5*	$(2)^-$		
187.0 *9*	(3^-)		
304.0 *12*	$(1^-,2^-)$		
334.0 *14*			
495? *6*			E(level): from Eα and Q(α). Marked as a tentative level in 1999Sh03.

[†] From a least squares fit to Eγ's by evaluators, except the 495 keV level.

[‡] From the Adopted Levels.

α radiations

Eα	E(level)	Iα[†#]	HF[‡]	Comments
7381 *6*	495?	1.0 *5*	9 *7*	Eα: from 1999Sh03; other: 7362 *10* (1964Mc21) adjusted to 7384 *10* (1996FiZX). Iα: from 1999Sh03; other:<0.5 (1964Mc21).
7531 *8*	334.0	0.5 *2*	61 *37*	Eα: from 1999Sh03; other: 7520 *15* (1964Mc21) adjusted to 7542 *15* (1996FiZX). Iα: from 1999Sh03; other: 1 (1964Mc21).
7569 *5*	304.0	5 *1*	8 *4*	Eα: from 1999Sh03; other: 7550 *10* (1964Mc21) adjusted to 7572 *5* (1996FiZX). Iα: from 1999Sh03; other: 5 (1964Mc21).
7726 *7*	145.1	1.5 *5*	77 *44*	Eα: from 1999Sh03; other: 7710 *10* (1964Mc21) adjusted to 7732 *10* (1996FiZX). Iα: from 1999Sh03; other:< 0.5 (1964Mc21).
7866.6 *14*	0.0	92 *2*	3.4 *16*	Eα: weighted average of 7866 *2* (1999Sh03), 7867 *2* (1973BoXL,1982Bo04), 7868 *5* (1982Ew01) and 7870 *20* (1972Es03). Other: 7.87 MeV *1* (1972Es03), 7.85 MeV *2* (1968Ha14), 7845 *10* (1964Mc21), 7.85 MeV *4* (1958To25) and 7.85 MeV *5* (1951Me10). Suggested adjustments to the original measured values (1991Ry01): −0.3 keV (1982Bo04), −0.8 keV (1972Es03) and +22 keV (1964Mc21). Iα: from 1999Sh03; other: 93 (1964Mc21,1982Ew01).

[†] α intensity per 100 α decays.

[‡] $r_0(^{214}At)$=1.5615 *28*, unweighted average of $r_0(^{212}Po)$=1.5658 *59*, $r_0(^{214}Po)$=1.5606 *7*, $r_0(^{214}Rn)$=1.5655 *13*, $r_0(^{216}Rn)$=1.5539 *57* (2020Si16).

[#] Absolute intensity per 100 decays.

^{218}Fr α decay (1.1 ms) 1999Sh03 (continued)

$\gamma(^{214}At)$

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α	Comments
78		78.0	(0^-)	0.0	1^-			
117 *1*	4	304.0	$(1^-,2^-)$	187.0	(3^-)			
145.1 *5*	3	145.1	$(2)^-$	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* Mult.: from the ratio of the IK-x ray to Iγ; measured value not explicitly given (1999Sh03).
147 *1*	3	334.0		187.0	(3^-)			
187 *1*	5	187.0	(3^-)	0.0	1^-			
226 *2*	3	304.0	$(1^-,2^-)$	78.0	(0^-)			
304 *4*	4	304.0	$(1^-,2^-)$	0.0	1^-			

† From 1999Sh03.

^{218}Fr α decay (1.1 ms) 1999Sh03

Decay Scheme

Intensities: Relative I_γ