

^{218}Fr α decay (1.1 ms) 1999Sh03

Type	Author	History	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; $Q(\alpha)=8013.7$ 14; % α decay=100.0

^{218}Fr -Q(α): from 2021Wa16.

^{218}Fr -J $^\pi$, $T_{1/2}$: 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 E α , E γ , $\alpha\gamma$ -, $\gamma\gamma$ -coin; deduced levels J^π , α -branching.

Other measurements: 1964Mc21 and 1982Ew01.

α : Additional information 1.

 ^{214}At Levels

E(level) [†]	J $^\pi$ [‡]	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 E α and Q(α). Marked as a tentative level in 1999Sh03.

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

[‡] From the Adopted Levels.

 α radiations

E α	E(level)	I α ^{†#}	HF [‡]	Comments
7381 6	495?	1.0 5	9 7	E α : from 1999Sh03; other: 7362 10 (1964Mc21) adjusted to 7384 10 (1996FiZX). I α : from 1999Sh03; other:<0.5 (1964Mc21).
7531 8	334.0	0.5 2	61 37	E α : from 1999Sh03; other: 7520 15 (1964Mc21) adjusted to 7542 15 (1996FiZX). I α : from 1999Sh03; other: 1 (1964Mc21).
7569 5	304.0	5 1	8 4	E α : from 1999Sh03; other: 7550 10 (1964Mc21) adjusted to 7572 5 (1996FiZX). I α : from 1999Sh03; other: 5 (1964Mc21).
7726 7	145.1	1.5 5	77 44	E α : from 1999Sh03; other: 7710 10 (1964Mc21) adjusted to 7732 10 (1996FiZX). I α : from 1999Sh03; other:< 0.5 (1964Mc21).
7866.6 14	0.0	92 2	3.4 16	E α : 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). I α : from 1999Sh03; other: 93 (1964Mc21,1982Ew01).

[†] α intensity per 100 α decays.

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

Absolute intensity per 100 decays.

^{218}Fr α decay (1.1 ms) 1999Sh03 (continued) $\gamma(^{214}\text{At})$

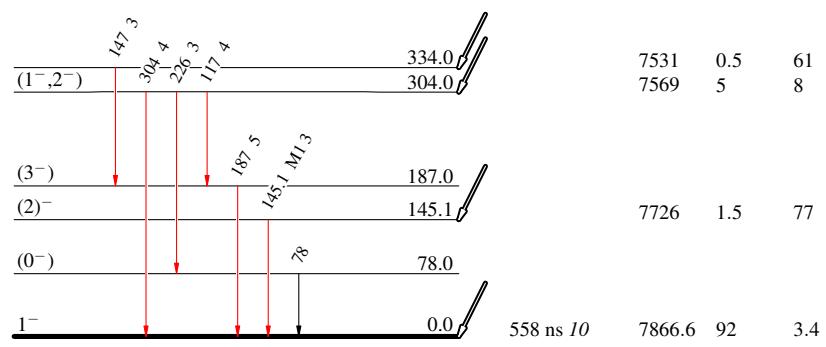
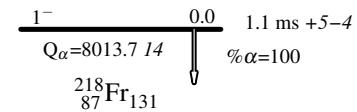
E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α	Comments
78		78.0	(0 ⁻)	0.0	1 ⁻			
117 1	4	304.0	(1 ⁻ ,2 ⁻)	187.0	(3 ⁻)			
145.1 5	3	145.1	(2) ⁻	0.0	1 ⁻	M1	4.19 7	$\alpha(K)=3.39$ 6; $\alpha(L)=0.608$ 10; $\alpha(M)=0.1438$ 25; $\alpha(N)=0.0373$ 6; $\alpha(O)=0.00798$ 14 $\alpha(P)=0.001102$ 19 Mult.: from the ratio of the IK-x ray to $I\gamma$; 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) 1999Sh03Decay Scheme

Legend

Intensities: Relative I_γ

- $I_\gamma < 2\% \times I_{\gamma}^{\max}$
- $I_\gamma < 10\% \times I_{\gamma}^{\max}$
- $I_\gamma > 10\% \times I_{\gamma}^{\max}$

 $^{214}_{85}\text{At}_{129}$