

^{222}Ac α decay (64 s) 1972Es03

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, M. S. Basunia, Murray Martin et al. ,		NDS 160, 405 (2019)	30-Oct-2019

Parent: ^{222}Ac : $E=0+x$; $T_{1/2}=64$ s 3; $Q(\alpha)=7137.4$ 20; $\% \alpha$ decay=94 6

^{222}Ac -E: $x=9$ keV 20, deduced from $E\alpha=7008.6$ 20 and 7000 20 from the α decays of the 5.0-s and 64-s activities of ^{222}Ac , respectively, both α transitions populating the g.s. of ^{218}Fr . 2017Au03 give 200 keV 150 from systematic trend.

^{222}Ac - $T_{1/2}$: Weighted average of 66 s 3 (1972Es03), 62 s 5 (1973Mo07), 60 s 4 (1982Bo04).

^{222}Ac - J^π : On the basis of measured production cross-section ratio, 1972Es03 suggested that the 64-s isomeric state has higher spin than the spin of 4.9-s g.s.

^{222}Ac - $Q(\alpha)$: From 2017Wa10.

^{222}Ac - $\% \alpha$ decay: $\%IT \leq 10$, $\% \epsilon + \% \beta^+ \geq 0.7 \leq 2$ (1972Es03). $\%IT$ was deduced by 1972Es03 from ratio of $I\alpha$ values of 4.9-s ^{222}Ac and 64-s ^{222}Ac . $\% \epsilon + \% \beta^+$ was deduced by 1972Es03 from the intensities of α rays from ^{218}Rn , ^{214}Po and 64-s ^{222}Ac .

1972Es03: measured $E\alpha$, $I\alpha$, branching ratio.

 ^{218}Fr Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	1^-	1.1 ms +5-4	$J^\pi, T_{1/2}$: from the Adopted Levels.
31 28			
112 28			
163 28			
193 28			
255 28			
295 28			
550 28			

 α radiations

$E\alpha^\dagger$	E(level)	$I\alpha^\ddagger@$	HF#
6460 20	550	2 1	15 8
6710 20	295	8 4	40 21
6750 20	255	15 5	30 11
6810 20	193	27 10	29 12
6840 20	163	10 5	101 53
6890 20	112	15 5	105 38
6970 20	31	8 3	3.9×10^2 16
7000 20	0.0	15 5	2.7×10^2 10

† From 1972Es03. No adjustment to the energies has been applied.

‡ α intensity per 100 α decays of 64-s ^{222}Ac .

The nuclear radius parameter $r_0(^{218}\text{Fr})=1.5497$ 30 is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides.

@ For absolute intensity per 100 decays, multiply by 0.94 6.