

^{222}Ac α decay (4.9 s) [1982Bo04](#),[1972Es03](#),[1964Mc21](#)

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 : $E=0.0$; $J^\pi=1^-$; $T_{1/2}=4.9$ s 5; $Q(\alpha)=7137.4$ 20; $\% \alpha$ decay=99 1

^{222}Ac - J^π : From ^{222}Ac Adopted Levels in the ENSDF database (March 2011 update).

^{222}Ac - $T_{1/2}$: Weighted average of 5 s 1 ([1972Es03](#)), 4.2 s 5 ([1958To25](#)) and 5.5 s 5 ([1952Me13](#)). Value is 5.0 s 5 in ^{222}Ac Adopted Levels in the ENSDF database.

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

^{222}Ac - $\% \alpha$ decay: $\% \alpha=99$ 1. Possible ε branching was estimated by [1966Wa23](#) as 1-2% from $I\alpha(7.13\text{-MeV } \alpha)$ of ^{218}Rn shown in ^{222}Ac α spectrum by [1964Mc21](#). Theoretical partial $T_{1/2}>100$ s for ^{222}Ac $\varepsilon+\beta^+$ decay ([2019Mo01](#)) gives $(\% \varepsilon+\% \beta^+)<5$.

[1982Bo04](#): measured $E\alpha$.

[1972Es03](#): measured $E\alpha$, $I\alpha$, half-life of decays of ^{222}Ac and ^{218}Fr . Deduced hindrance factors.

[1964Mc21](#): measured $E\alpha$, $I\alpha$.

Other: [1991Ga28](#): $\alpha\alpha$ correlations from successive α decays.

 ^{218}Fr Levels

E(level)	J^π	$T_{1/2}$	Comments
0 46 11	1^-	1.1 ms +5-4	$J^\pi, T_{1/2}$: from the Adopted Levels.

 α radiations

$E\alpha$	E(level)	$I\alpha^\dagger\#$	HF ‡	Comments
6963 10	46	6 1	35 7	$E\alpha$: from 1964Mc21 . Original energy has been increased by 11 keV, as recommended by 1991Ry01 .
7008.6 20	0	94 1	3.2 4	$E\alpha$: recommended by 1991Ry01 from energies measured by 1982Bo04 , 1972Es03 and 1964Mc21 . The original energies were changed because of changes in calibration energies used. The original energies and the changes (+ for increased energies, and - for decreased $E\alpha$) are 7013 2 (-4.4) (1982Bo04), 7010 20 (+1.4) (1972Es03), 6998 (-1.6) (1964Mc21). Others: 1988Hu08 , 1968Ha14 , 1958To25 , 1951Me10 .

† α intensity per 100 α decays. These $I\alpha$ data are the values recommended by [1991Ry01](#) from $I\alpha$ measured by [1964Mc21](#).

‡ 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 0.99 1.