^{213}Fr α decay 2005Ku06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Chen # and F. G. Kondev	NDS 126, 373 (2015)	30-Sep-2013

Parent: ^{213}Fr: E=0.0; $J^{\pi}=9/2^{-}$; $T_{1/2}=34.6$ s *3*; Q(α)=6904.8 *12*; %α decay=99.45 *3*

^{213}Fr-J^{π},$T_{1/2}$: From Adopted Levels of ^{213}Fr.

^{213}Fr-Additional information 1.

^{213}Fr-Q(α): From 2012Wa38.

^{213}Fr-%α decay: From weighted average of electron capture branching ratios: 0.0057 *3* from 1967Va20 and 0.0052 *3* from 1964Gr04. %ε=0.9 *1* from 1974Ho27 is much higher probably due to an unnoticed escape of Rn activity in cases where it is not trapped by implantation.

2005Ku06: Francium isotopes were produced by ^{209}Bi(^{12}C,xn) with the ^{12}C beam produced from the UNILAC at GSI. Evaporation residues were separated by the velocity filter SHIP and implanted into a position sensitive 16-strip PIPS Si detectors (FWHM≈22 keV at 8 MeV). γ-rays were detected with a Ge-Clover detector (4.5(3)% absolute efficiency at 1.3 MeV). Measured Eγ, Iγ, Eα, Iα, $\alpha\gamma$-coin, $\gamma\gamma$-coin. Deduced level, α-branchings, hindrance factors.

Others:

1982Bo04: Francium isotopes were produced at the LBL Bevatron. α particles were detected by silicon surface-barrier detectors. Measured Eα, α(t). Deduced levels, $T_{1/2}$.

1974Ho27: Francium isotopes were produced in the ISOLDE facility. α particles were detected by a silicon surface barrier detector (FWHM=20 keV). Measured Eα, Iα, α(t). Deduced levels, $T_{1/2}$, α-branchings.

1967Va20: Francium isotopes were produced at the Berkeley heavy-ion linear acceleration (HILAC). α particles were detected by a Si(Au) surface barrier detectors. Measured Eα, Iα, α(t). Deduced levels, $T_{1/2}$, α-branchings.

1964Gr04: Francium isotopes were produced at the Berkeley heavy-ion linear acceleration (hilac). α particles were detected by an ionization chamber. Measured Eα, Iα, α(t). Deduced levels, $T_{1/2}$, α-branchings.

Others: 2012No08, 1980Li22.

^{209}At Levels

E(level)†	J^{π}‡
0.0	$9/2^{-}$
408.2 *2*	$7/2^{-}$
577.1 *2*	$11/2^{-}$

† From a least-squares fit to Eγ.

‡ From Adopted Levels.

α radiations

Eα†	E(level)	Iα‡@	HF#	Comments
6211 *5*	577.1	0.10 *3*	6.4 *20*	
6378 *5*	408.2	0.12 *3*	27 *7*	
6775 *2*	0.0	99.78 *17*	1.33 *5*	Eα: weighted average of 6775 *4* (2005Ku06), 6775 *2* (1982Bo04), 6779 *5* (1974Ho27), 6773 *5* (1967Va20) and 6770 *10* (1964Gr04).

† From 2005Ku06, unless otherwise noted.

‡ Relative intensities normalized to 100 for the total α intensity, values extracted indirectly from $\alpha\gamma$-coin data (2005Ku06).

r_0=1.445 *11*, unweighted average of r_0(^{208}Po)=1.4343 *34* and r_0(^{210}Rn)=1.4552 *21* deduced using HF=1.0.

@ For absolute intensity per 100 decays, multiply by 0.9945 *3*.

^{213}Fr α decay 2005Ku06 (continued)

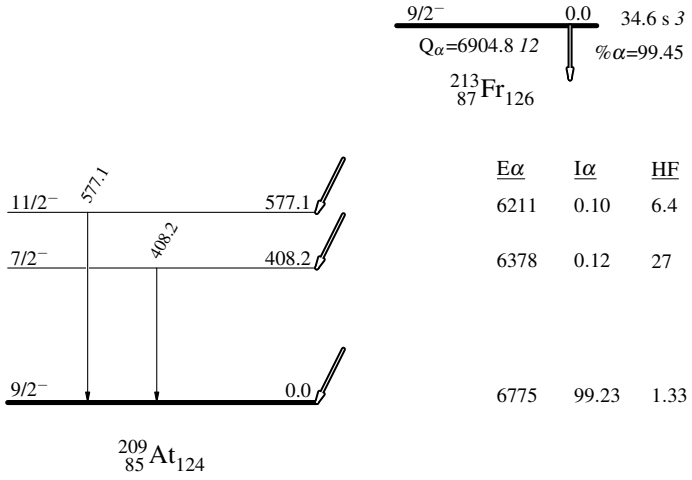
$\gamma(^{209}At)$

E_γ †	E_i(level)	J_i^π	E_f	J_f^π
408.2 *2*	408.2	7/2$^-$	0.0	9/2$^-$
577.1 *2*	577.1	11/2$^-$	0.0	9/2$^-$

† From 2005Ku06.

^{213}Fr α decay 2005Ku06

Decay Scheme



Eα	Iα	HF
6211	0.10	6.4
6378	0.12	27
6775	99.23	1.33