^{213}Rn α decay 2000He17,2001Ku07,1970Va13

History

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

Parent: ^{213}Rn: E=0.0; J^π=(9/2$^+$); $T_{1/2}$=19.5 ms *1*; Q(α)=8244 *3*; %α decay=100.0

^{213}Rn-Q(α): From Eα=8089 keV *3* determined in the present evaluation.

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

^{213}Rn-Additional information 1.

2000He17: ^{213}Rn was produced by the ^{208}Pb(^{12}C,X) reaction with E=100 MeV ^{12}C beam from the UNILAC accelerator. α-particles were detected by a position sensitive 16-strip pips detector and γ-rays were detected by two planar Ge detectors. Measured Eα, σ(E$_\alpha$), $\alpha\gamma$-coin, α(t). Deduced levels, t, Q, α-branchings.

2001Ku07: ^{213}Rn activity was produced from ^{22}Ne beam on ^{208}Pb target with E=92 MeV beam from the JYFL K130 heavy ion cyclotron. Evaporation residues are implanted into a position sensitive pips Si detector. Measured Eα, σ(E$_\alpha$), α(t). Deduced levels, t, Q, α-branchings.

1970Va13: ^{213}Rn activity was produced by bombarding the targets of ^{208}Pb, ^{206}Pb and ^{209}Bi by various beams of Ne,F,O,N and C from the Berkeley heavy-ion linear accelerator (HILAC). α-particles were detected by silicon surface-barrier detectors. Measured Eα, σ(E$_\alpha$), α(t). Deduce levels, t, Q, α-branching.

Others: 2005Li17, 2003Ni10, 1974Ho27, 1983Fa03, 1970TaZS, 1966Ro12, 1962Gr20.

^{209}Po Levels

E(level)†	J^π‡
0.0	1/2$^-$
545.00 *10*	5/2$^-$
854.00 *20*	3/2$^-$

† From a least-squares fit to Eγ.
‡ From Adopted Levels.

α radiations

Eα	E(level)	Iα‡	HF†	Comments
7252 *4*	854.00	1.04 *12*	21 *5*	Eα: weighted average of 7252 *10* from 2000He17 and 7252 *4* from 2001Ku07. Iα: weighted average of 1.1 *1* from 2000He17 and 0.8 *2* from 2001Ku07.
7554 *4*	545.00	0.71 *10*	302 *65*	Eα: weighted average of 7550 *15* from 1970Va13, 7550 *15* from 2000He17 and 7555 *4* from 2001Ku07. Iα: weighted average 0.67 *7* of from 2000He17 and 1.0 *2* from 2001Ku07.
8089 *3*	0.0	98.2 *2*	87 *14*	Eα: weighted average of 8085 *10* from 1970Va13, 8090 *8* from 1974Ho27, 8088 *10* from 2000He17, and 8090 *3* from 2001Ku07. Other: 8064 *41* from 2005Li17. Iα: weighted average of 98.2 *2* from 2000He17 and 98.2 *12* from 2001Ku07.

† Using r_0=1.48 *5*, unweighted average of r_0=1.4343 *24* for ^{208}Po and 1.532 *6* for ^{210}Po, deduced from HF=1.
‡ Absolute intensity per 100 decays.

γ(^{209}Po)

E$_\gamma$†	I$_\gamma$‡	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	α#	Comments
545.0 *1*	0.69 *10*	545.00	5/2$^-$	0.0	1/2$^-$	E2	0.0262	α(K)=0.0186 *3*; α(L)=0.00575 *8*; α(M)=0.001437 *21* α(N)=0.000369 *6*; α(O)=7.40×10^{-5} *11*; α(P)=8.25×10^{-6} *12* E$_\gamma$: Other: Eγ=540.3 keV *4* from $\alpha\gamma$-coin by 2000He17, but

Continued on next page (footnotes at end of table)

^{213}Rn α decay 2000He17,2001Ku07,1970Va13 (continued)

$\gamma(^{209}Po)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α [#]	Comments
								the energy is inconsistent with Eγ=545.0 keV *1* from Adopted Gammas.
854.0 *2*	1.01 *12*	854.00	3/2$^-$	0.0	1/2$^-$	M1	0.0313	α(K)=0.0256 *4*; α(L)=0.00435 *6*; α(M)=0.001021 *15* α(N)=0.000263 *4*; α(O)=5.50×10^{-5} *8*; α(P)=7.13×10^{-6} *10*

† From Adopted Gammas.
‡ From Iα and α.
# Additional information 2.

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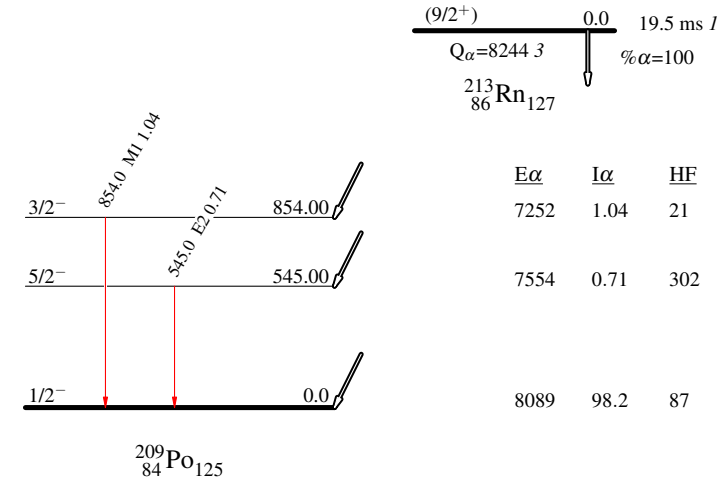
Decay Scheme

Intensities: Relative $I_{(\gamma+ce)}$

Legend

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



Eα	Iα	HF
7252	1.04	21
7554	0.71	302
8089	98.2	87