^{211}Ra α decay 2003He06,1967Va22

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Lalkovski	NDS 112, 707 (2011)	1-Aug-2010

Parent: ^{211}Ra: E=0.0; $J^\pi=5/2^{(-)}$; $T_{1/2}$=13 s *2*; Q(α)=7043 *4*; %α decay>93.0

^{211}Ra-$T_{1/2}$ and J^π are from 2004Br45. Q(α) is from 2003Au03.

^{211}Ra-%α decay: From 2004Br45 based on the assumption that log *ft*>5.9 for ε decay to the daughter (^{211}Fr) ground state that leads to I($\varepsilon+\beta^+$ to g.s.)<7%.

2003He06: Source produced using ^{204}Pb(^{12}C,5n) reaction. Projectile: E(^{12}C)=78-110 MeV, beam intensity 100-200 pnA. Target: enriched to 99.73% ^{204}Pb, 0.45 mg/cm^2 thick, evaporated on carbon layers of 0.04 mg/cm^2 (upstream) and covered with 0.005 mg/cm^2 carbon (downstream), mounted on a rotating wheel (50 Hz repetition frequency) and synchronized with the beam time macro structure. Detectors: velocity filter SHIP, position sensitive 16-strip detector (PIPS) with a typical resolution of 20-24 keV. HPGE detector located behind PIPS. Measured: Eα, Iα; Eα-Eγ correlations. Maximum cross section is 13 mb at 83 MeV. See also 2001HeZY.

1967Va22: Source produced using ^{197}Au(^{19}F,5n) and ^{206}Pb(^{12}C,7n) reactions. Projectiles: E(^{19}F)=197 MeV and E(^{12}C)=125 MeV. Targets: ^{197}Au, 2.5 mg/cm^2 thick and enriched to 97.22% ^{206}Pb, 0.3 mg/cm^2 thick. Detectors: Si (Au) surface barrier detectors. Measured: Eα, Iα, $T_{1/2}$.

^{207}Rn Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	$5/2^-$	9.25 min *17*	J^π,$T_{1/2}$: From Adopted Levels.
120.03 *9*	$3/2^-$		
267? *9*			E(level): From Eα=6909 keV *4* and 6647 keV *5*, corrected for recoil term.
282.97 *9*	$(1/2^-,3/2^-)$		
596.1 *3*			
601.6 *3*			
665.00 *10*	$9/2^-$		J^π: From Adopted Levels.

[†] From a least-squares fit to Eγ.

[‡] From 2003He06, unless otherwise specified.

α radiations

Eα[‡]	E(level)	Iα[‡#]	HF[†]	Comments
6255 *5*	665.00	0.0006	445	
6315 *10*	601.6	0.0004	1243	
6320 *10*	596.1	0.00007	7491	
6627 *5*	282.97	0.0008	12330	
6647[@] *5*	267?			
6788 *5*	120.03	0.01	4178	
6909 *4*	0.0	99	1.2	Eα: Weighted average of 6907 keV *5* (2003He06) and 6910 keV *5* (1967Va22). Eα=6910 keV *5* is recommended by 1991Ry01. Other: 6890 keV *20* (1968Lo15).

[†] r_0(^{207}Rn)=1.478 *12*, unweighted average from values for neighboring even-even ^{208}Rn (r_0=1.466 *8*) and ^{206}Rn (r_0=1.4905 *29*) nuclei, deduced by forcing Hf(Eα)=1.0.

[‡] From 2003He06, unless otherwise specified.

[#] For absolute intensity per 100 decays, multiply by >0.93.

[@] Existence of this branch is questionable.

^{211}Ra α decay 2003He06,1967Va22 (continued)

γ(^{207}Rn)

E_γ ‡	I_γ #@	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ	α †	Comments
120.0 *1*	0.0013	120.03	3/2⁻	0.0	5/2⁻	M1+E2	0.66 *13*	6.6 *4*	α(K)=4.5 *5*; α(L)=1.58 *12*; α(M)=0.40 *4*; α(N+..)=0.129 *12* α(N)=0.104 *10*; α(O)=0.0218 *18*; α(P)=0.00281 *16* Mult.: α(K)exp=4.5 *5* from K x ray/Iγ and ω_K=0.967 (2003He06). δ: From α(K)exp.
162.9 *1*		282.97	(1/2⁻,3/2⁻)	120.03	3/2⁻				
283.0 *1*		282.97	(1/2⁻,3/2⁻)	0.0	5/2⁻				
596.1 *3*		596.1		0.0	5/2⁻				
601.6 *3*		601.6		0.0	5/2⁻				
665.0 *1*	0.00059	665.00	9/2⁻	0.0	5/2⁻	[E2]		0.0185	α(K)=0.01354 *19*; α(L)=0.00375 *6*; α(M)=0.000932 *13*; α(N+..)=0.000301 *5* α(N)=0.000243 *4*; α(O)=5.15×10⁻⁵ *8*; α(P)=6.87×10⁻⁶ *10*

† Additional information 1.
‡ From 2003He06.
# From Iα (2003He06) and theoretical α values.
@ For absolute intensity per 100 decays, multiply by >0.93.

^{211}Ra α decay 2003He06,1967Va22

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays