Adopted Levels, Gammas

History

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

Q(β^-)=−5790 *20*; S(n)=7591 *17*; S(p)=3495 *18*; Q(α)=6251.1 *17* 2012Wa38
Note: Current evaluation has used the following Q record −5.79E+3 6 7.59×10^3 *3* 3500 *30* 6251.1 *16* 2003Au03.

^{207}Rn Levels

Cross Reference (XREF) Flags

A ^{207}Rn IT decay
B ^{211}Ra α decay
C ^{196}Pt(^{16}O,5nγ)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
0	5/2$^-$	9.25 min *17*	ABC	%α=21 *3*; %ε+%β^+=79 *3* μ=+0.816 *9* Q=+0.220 *22* %α: From 1971Ho01. Other: 21% *7* (1971Go35). The value reported by 1971Ho01 (23% *2*) using %α(^{207}At)=10% has been adjusted by the evaluator to correspond to the revised adopted value of %α(^{207}At)=8.6% *10*. The value given by 1971Go35 (23% *7*) has been similarly adjusted. Jπ: From hyperfine structure (1987Bo29). Favored α decay (HF=1.15) to ^{203}Po g.s. (J^π=5/2$^-$); shell model. $T_{1/2}$: From 1971Ho01. Others: 11.0 min *10* (1954Bu66), 10 min *2* (1957St10), 10 min *1* (1971Go35). μ: From 1987Bo29 using collinear fast beam laser spectroscopy technique. Q: As quoted in 2005St24; collinear fast beam laser spectroscopy technique. No polarization correction is included. Eα(g.s. to g.s.)=6131 keV *4*, weighted average of 6135 keV *3* (1967Va20), 6126 keV *3* (1971Go35) and 6129.4 keV *25* (1993Wa04). Other: 6130 keV (1974Ho27). Eα=6131 keV *4* is recommended by 1991Ry01. configuration: $((\pi\ h_{9/2})^{+4}_{0+}(\nu\ f_{5/2})^{-1})$.
120.03 *9*	3/2$^-$		B	Jπ: 120.0γ M1+E2 to 5/2$^-$; non-population of this level in decay of the 9/2$^-$ state at 665.1 keV argues against J^π=5/2$^-$ or 7/2$^-$ assignment. configuration: $((\pi\ h_{9/2})^{+4}_{0+}(\nu\ p_{3/2})^{-1})$. The assignment is tentative.
267? *9*			B	E(level): From ^{211}Ra α decay. The existence of this level is tentative.
282.97 *9*	(1/2$^-$,3/2$^-$)		B	Jπ: 162.9γ to 3/2$^-$; 283.0γ to 5/2$^-$; non-population of this level in decay of the 9/2$^-$ state at 665.1 keV argues against J^π=5/2 or 7/2$^-$ assignment; shell model predictions.
596.1 *3*			B	
601.6 *3*			B	
665.10 *10*	9/2$^-$		ABC	Jπ: 665.1γ E2 to 5/2$^-$.
899.1 *10*	13/2$^+$	184.5 μs *9*	A C	%IT=100 μ=−0.903 *3* Jπ: 234γ M2 to 9/2$^-$; analogy to ^{205}Po. $T_{1/2}$: From 234ce(K)(t) in 2006Ha17 (^{207}Rn IT decay). Other: 181 μs *18* from 665.1γ(t) in 1974Re06 (^{207}Rn IT decay). μ: From 1981Ma28 using time dependent perturbed angular distribution technique. configuration: $((\pi\ h_{9/2})^{+4}_{0+}(\nu\ i_{13/2})^{-1})$.
1397.1 *10*	(13/2$^-$)		C	Jπ: 732γ (E2) to 9/2$^-$.
1482.1 *15*	(17/2$^+$)		C	Jπ: 583γ (E2) to 13/2$^+$.
1633.1 *15*	(15/2)		C	
1683.1 *15*	(17/2$^-$)		C	Jπ: 286γ (E2) to (13/2$^-$).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{207}Rn Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
1739.1 *18*	(19/2)	C	
1904.1 *18*	(21/2$^+$)	C	J$^{\pi}$: 422γ (E2) to (17/2$^+$).
2192.1 *20*	(23/2)	C	
2324.1 *20*	(25/2)	C	
2359.1 *20*	(23/2)	C	
2385.1 *20*	(23/2)	C	
2614.1 *23*	(29/2)	C	
2778.1 *23*	(27/2)	C	
2841.1 *25*	(33/2)	C	
2902.1 *23*	(27/2)	C	
3013 *3*	(37/2)	C	

[†] From a least-squares fit to Eγ, unless otherwise specified.
[‡] From 2003Lu08 based on deduced transition multipolarities using $\gamma\gamma(\theta)$(DCO), unless otherwise specified.

$\gamma(^{207}Rn)$

E$_i$(level)	J$_i^{\pi}$	E$_{\gamma}$[‡]	I$_{\gamma}$[‡]	E$_f$	J$_f^{\pi}$	Mult.[‡]	δ	α[†]	Comments
120.03	3/2$^-$	120.0[#] *1*	100[#]	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 (2003He06).
282.97	(1/2$^-$,3/2$^-$)	162.9 *1*		120.03	3/2$^-$				E$_{\gamma}$: From ^{211}Ra α decay (2003He06).
		283.0 *1*		0	5/2$^-$				E$_{\gamma}$: From ^{211}Ra α decay (2003He06).
596.1		596.1[#] *3*	100[#]	0	5/2$^-$				
601.6		601.6[#] *3*	100[#]	0	5/2$^-$				
665.10	9/2$^-$	665.1[#] *1*	100[#]	0	5/2$^-$	E2		0.0185	α(K)=0.01354 *19*; α(L)=0.00374 *6*; α(M)=0.000932 *13*; α(N+..)=0.000301 *5* α(N)=0.000242 *4*; α(O)=5.15×10^{-5} *8*; α(P)=6.87×10^{-6} *10* Mult.: Anisotropy of 20% *15* was measured for 665.1γ in ^{207}Rn IT decay (1974Re06), thus suggesting mult=Q. The balance of the level scheme in 1974Re06 requires mult.=E2.
899.1	13/2$^+$	234 *1*	100	665.10	9/2$^-$	M2		4.94 *10*	α(K)=3.55 *7*; α(L)=1.042 *23*; α(M)=0.264 *6*; α(N+..)=0.0870 *19* α(N)=0.0697 *15*; α(O)=0.0151 *4*; α(P)=0.00214 *5* B(M2)(W.u.)=0.00115 *4* E$_{\gamma}$,I$_{\gamma}$: From ^{207}Rn IT decay. Mult.: α(K)exp=3.6 *9* from K x ray/Iγ in ^{207}Rn IT decay (1974Re06).
1397.1	(13/2$^-$)	732 *1*	100	665.10	9/2$^-$	(E2)		0.01513	α(K)=0.01129 *16*; α(L)=0.00290 *5*; α(M)=0.000716 *11*; α(N+..)=0.000231 *4*

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

$\gamma(^{207}Rn)$ (continued)

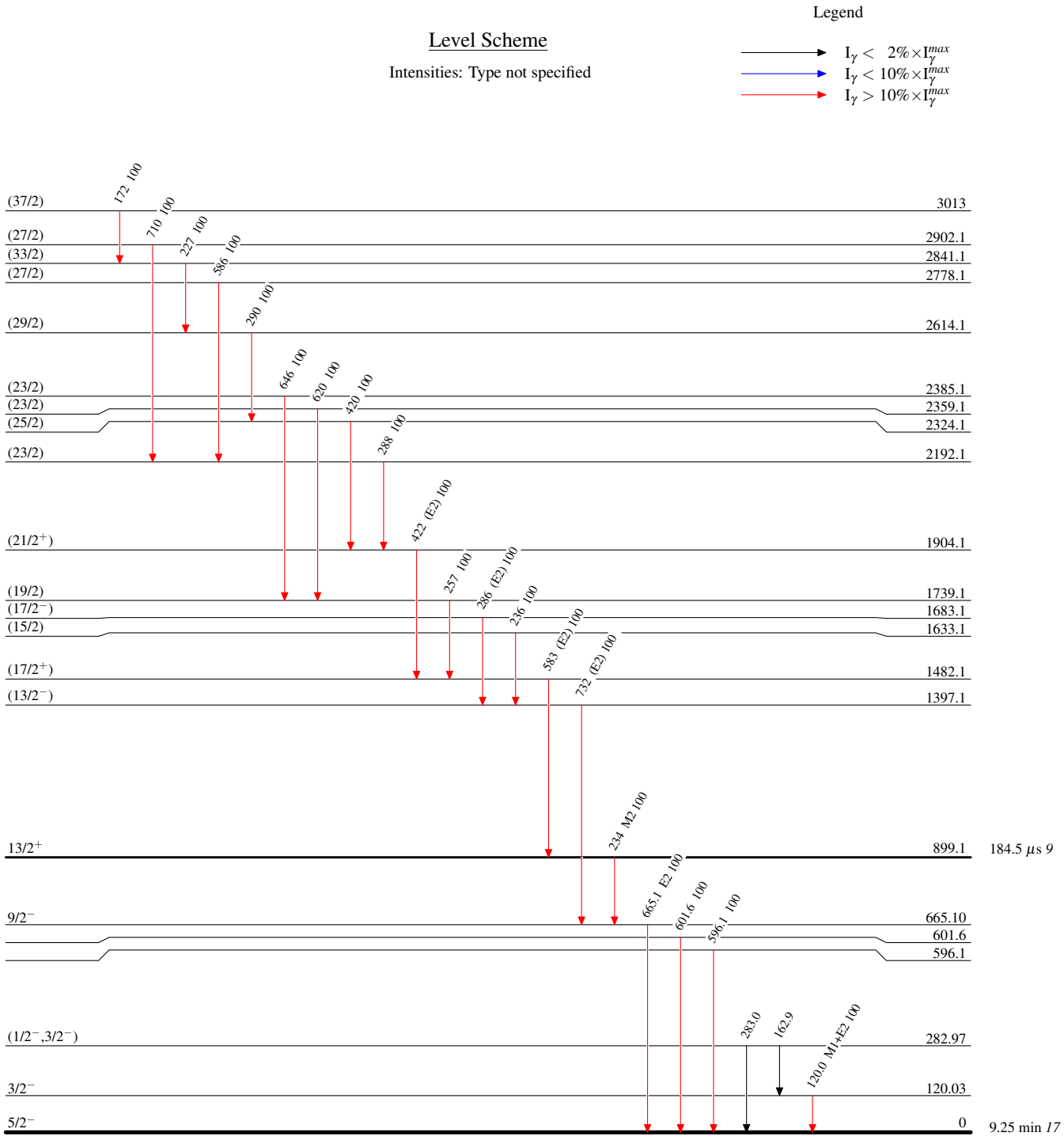
E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[‡]	α[†]	Comments
								α(N)=0.000186 *3*; α(O)=3.97×10^{-5} *6*; α(P)=5.35×10^{-6} *8*
1482.1	(17/2$^+$)	583 *1*	100	899.1	13/2$^+$	(E2)	0.0247	α(K)=0.0174 *3*; α(L)=0.00543 *8*; α(M)=0.001365 *21*; α(N+..)=0.000440 *7* α(N)=0.000355 *6*; α(O)=7.50×10^{-5} *12*; α(P)=9.84×10^{-6} *15*
1633.1	(15/2)	236 *1*	100	1397.1	(13/2$^-$)			
1683.1	(17/2$^-$)	286 *1*	100	1397.1	(13/2$^-$)	(E2)	0.160 *3*	α(K)=0.0764 *13*; α(L)=0.0617 *12*; α(M)=0.0162 *4*; α(N+..)=0.00520 *11* α(N)=0.00423 *9*; α(O)=0.000870 *17*; α(P)=0.0001037 *20*
1739.1	(19/2)	257 *1*	100	1482.1	(17/2$^+$)			E$_\gamma$: 257γ was in coincidence with all γ-rays above the 1904 keV level, but the connecting transitions were not observed in ^{196}Pt(^{16}O,5nγ) (2003Lu08).
1904.1	(21/2$^+$)	422 *1*	100	1482.1	(17/2$^+$)	(E2)	0.0535 *9*	α(K)=0.0334 *5*; α(L)=0.01500 *25*; α(M)=0.00386 *7*; α(N+..)=0.001240 *21* α(N)=0.001005 *17*; α(O)=0.000209 *4*; α(P)=2.63×10^{-5} *5*
2192.1	(23/2)	288 *1*	100	1904.1	(21/2$^+$)			
2324.1	(25/2)	420 *1*	100	1904.1	(21/2$^+$)			
2359.1	(23/2)	620 *1*	100	1739.1	(19/2)			
2385.1	(23/2)	646 *1*	100	1739.1	(19/2)			
2614.1	(29/2)	290 *1*	100	2324.1	(25/2)			
2778.1	(27/2)	586 *1*	100	2192.1	(23/2)			
2841.1	(33/2)	227 *1*	100	2614.1	(29/2)			
2902.1	(27/2)	710 *1*	100	2192.1	(23/2)			
3013	(37/2)	172 *1*	100	2841.1	(33/2)			

† Additional information 1.
‡ From ^{196}Pt(^{16}O,5nγ) (2003Lu08), unless otherwise specified.
# From ^{211}Ra α decay (2003He06).

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified



$^{207}_{86}Rn_{121}$