Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, M. S. Basunia, Murray Martin et al. ,	NDS 160, 405 (2019)	30-Oct-2019

Q(β^-)=−1842 *5*; S(n)=6512 *4*; S(p)=6466 *5*; Q(α)=7262.5 *19* 2017Wa10
S(2n)=11178 *6*, S(2p)=11143.0 *27* (2017Wa10).
Additional information 1.
Isotopic assignment: 1948St42.
2019An10: measured mass excess=5089 keV *54* as compared to 5217.2 keV *23* in 2017Wa10. Note that negative sign in 2019An10 is a misprint.
Theory references: consult NSR database (www.nndc.bnl.gov/nsr/) for 42 primary references for calculations of half-lives of radioactive decay modes, and 20 for nuclear structure.

^{218}Rn Levels

Cross Reference (XREF) Flags

A ^{222}Ra α decay (33.6 s)
B ^{232}Th(^{136}Xe,Xγ)

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	XREF	Comments
0.0[#]	0$^+$	33.75 ms *15*	AB	%α=100 Evaluated rms charge radius=5.6540 fm *187* (2013An02). Evaluated charge radius relative to ^{212}Rn: $\delta\langle r^2\rangle(^{218}Rn,^{212}Rn)$=+0.7000 fm^2 *3* (2013An02). T$_{1/2}$: From 2012Su11, delayed $\alpha\alpha$-coin method. Others: 39 ms *2* (1971Er02), 35 ms *1* (1963Di05), 30 ms *3* (1961Ru06), 19 ms (1948St42).
324.320[#] *18*	2$^+$	<80 ps	AB	J$^\pi$: E2 324γ to 0$^+$. T$_{1/2}$: from (α)(324γ)(t) in ^{222}Ra α decay (1960Be25).
653.18[#] *18*	(4$^+$)		AB	J$^\pi$: 329γ to 2$^+$, rotational band assignment in (^{136}Xe,Xγ).
796.911 *21*	(3$^-$)		A	J$^\pi$: (E1) 473γ to 2$^+$; γ to (4$^+$).
840.172[@] *18*	(3$^-$)		AB	
1014.3[#] *3*	(6$^+$)		B	
1026.1[@] *4*	(5$^-$)		B	
1327.9[@] *4*	(7$^-$)		B	
1392.9[#] *4*	(8$^+$)		B	
1694.3[@] *5*	(9$^-$)		B	
1775.2[#] *4*	(10$^+$)		B	
2070.9[@] *7*	(11$^-$)		B	
2168.9[#] *7*	(12$^+$)		B	
2457.9[@] *9*	(13$^-$)		B	
2576.6[#] *8*	(14$^+$)		B	
2853.0?[@] *10*	(15$^-$)		B	
3002.0[#] *10*	(16$^+$)		B	
3265.2?[@] *11*	(17$^-$)		B	
3437.5[#] *11*	(18$^+$)		B	
3683.2?[@] *13*	(19$^-$)		B	
3859.4[#] *12*	(20$^+$)		B	
4287.0[#] *13*	(22$^+$)		B	

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Adopted Levels, Gammas (continued)

^{218}Rn Levels (continued)

E(level)[†]	Jπ[‡]	XREF
4725.0[#] *14*	(24+)	B
5167.8?[#] *15*	(26+)	B

[†] From a least-squares fit to Eγ, by evaluators.
[‡] From probable band assignments (g.s. band and an octupole band) for levels above the first 2+ state.
[#] Band(A): g.s. band.
[@] Band(B): Octupole band. For 7− member, D_0/Q_0=0.000097 fm^{-1} *8*, from the γ-ray branching ratio and rotational model, where D_0 and Q_0 are intrinsic electric dipole moment and quadrupole moment, respectively.

γ(^{218}Rn)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.	α[@]	Comments
324.320	2+	324.31[‡] *2*	100	0.0	0+	E2	0.1097	B(E2)(W.u.)>23 Mult.: from ce data in ^{222}Ra α decay.
653.18	(4+)	328.9[‡] *2*	100	324.320	2+	[E2]	0.1053	
796.911	(3−)	144.4[#] *5*	2.8[#] *5*	653.18	(4+)	[E1]	0.190 *4*	
		472.59[#] *1*	100[#] *3*	324.320	2+	(E1)		Mult.: from ce data in ^{222}Ra α decay.
840.172	(3−)	515.83[#] *3*	51[#] *3*	324.320	2+			
		840.18[#] *2*	100[#] *4*	0.0	0+	[E3]		
1014.3	(6+)	361.1 *2*	100	653.18	(4+)			
1026.1	(5−)	186.3[&] *5*		840.172	(3−)			
		372.7 *5*		653.18	(4+)			
1327.9	(7−)	302.0 *5*	100 *15*	1026.1	(5−)			
		313.4 *5*	52 *12*	1014.3	(6+)			
1392.9	(8+)	378.6 *2*	100	1014.3	(6+)			
1694.3	(9−)	301.4[&] *5*		1392.9	(8+)			
		366.4 *5*		1327.9	(7−)			
1775.2	(10+)	382.3 *2*	100	1392.9	(8+)			
2070.9	(11−)	376.6 *5*	100	1694.3	(9−)			
2168.9	(12+)	393.7 *5*	100	1775.2	(10+)			
2457.9	(13−)	387.0 *5*	100	2070.9	(11−)			
2576.6	(14+)	407.7 *5*	100	2168.9	(12+)			
2853.0?	(15−)	395.1[&] *5*		2457.9	(13−)			
3002.0	(16+)	425.4 *5*	100	2576.6	(14+)			
3265.2?	(17−)	412.2[&] *5*		2853.0?	(15−)			
3437.5	(18+)	435.5 *5*	100	3002.0	(16+)			
3683.2?	(19−)	418.0[&] *5*		3265.2?	(17−)			
3859.4	(20+)	421.9 *5*	100	3437.5	(18+)			
4287.0	(22+)	427.6 *5*	100	3859.4	(20+)			
4725.0	(24+)	438.0 *5*	100	4287.0	(22+)			
5167.8?	(26+)	442.8[&] *5*		4725.0	(24+)			

[†] From ^{232}Th(^{136}Xe,Xγ), except where noted.
[‡] From ^{222}Rn α decay.
[#] From ^{222}Rn α decay only.
[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation

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Adopted Levels, Gammas (continued)

$\gamma(^{218}Rn)$ (continued)

based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
& Placement of transition in the level scheme is uncertain.

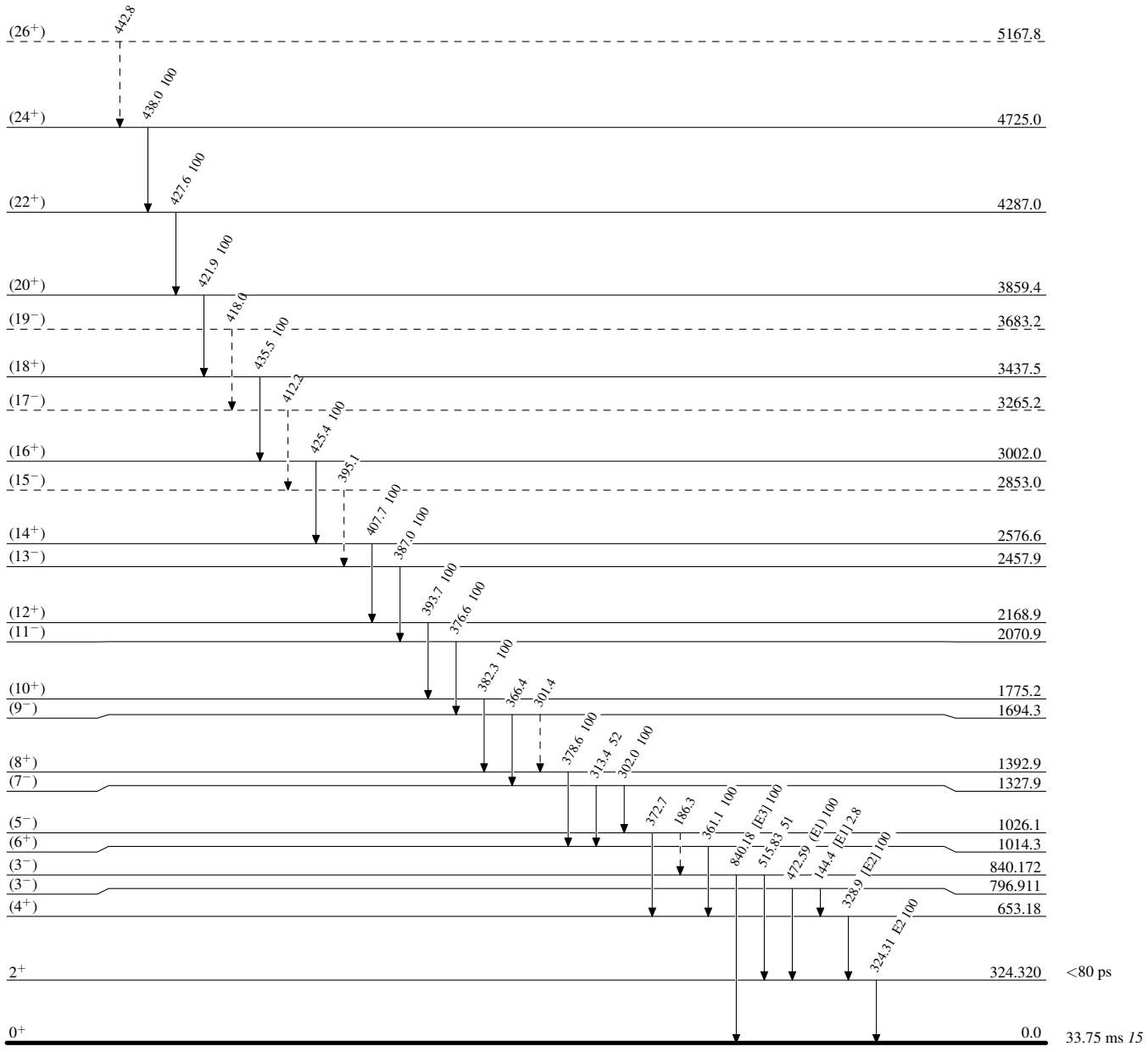
Adopted Levels, Gammas

Legend

Level Scheme

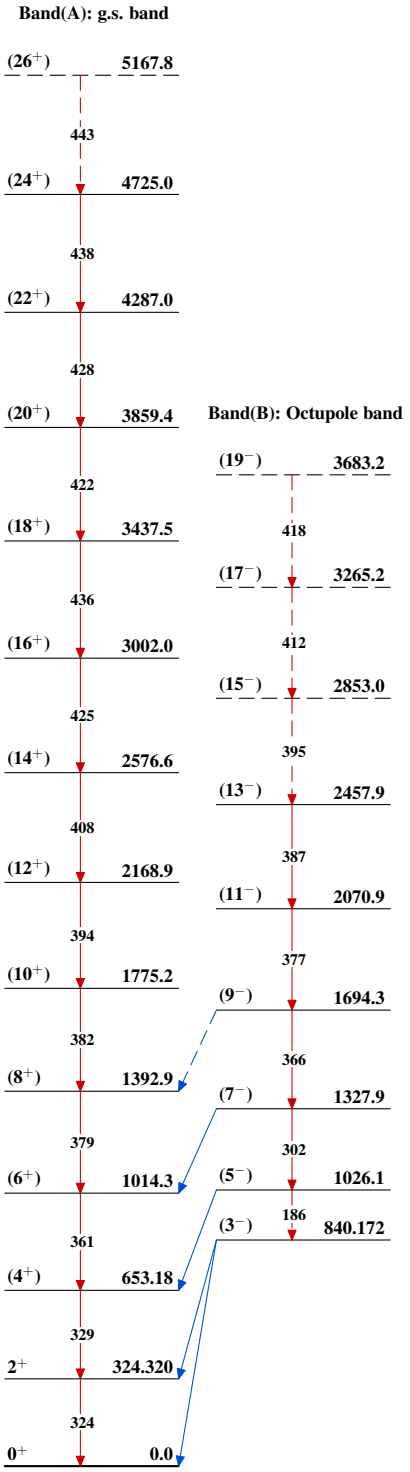
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{218}_{86}Rn_{132}$

Adopted Levels, Gammas



$^{218}_{86}Rn_{132}$