

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 177, 509, 2021	4-Jul-2021

$Q(\beta^-) = -7060.9$; $S(n) = 7981.18$; $S(p) = 2878.28$; $Q(\alpha) = 6629.921$ [2021Wa16](#)

 ^{203}Rn LevelsCross Reference (XREF) Flags

A ^{207}Ra α decay (1.2 s)
B ^{207}Ra α decay (59 ms)
C (HL,xny)

E(level) [†]	J^π	$T_{1/2}$	XREF	Comments
0.0	$3/2^-$	44.2 s 16	A	$\% \alpha = 66.9$; $\% \varepsilon + \% \beta^+ = 34.9$ $\% \alpha$: From 1978HoZZ . Other: $\% \alpha = 45.8$ (1971Ho01). The $\% \varepsilon + \% \beta^+$ branch was not measured directly. J^π : Favored α decay to ^{199}Po ($J^\pi = 3/2^-$, 2014Se07); systematics in neighboring N=117 isotones (^{201}Po , ^{199}Pb), where J was directly measured; shell model predictions. $T_{1/2}$: Weighted average of 45 s 2 (1971Ho01), 45 s 5 (1967Va17) and 42 s 3 (1996Ta18). Others: ≈ 50 s (1995Uu01). $E\alpha = 6499$ keV 2, weighted average of 6497 keV 5 (1967Va17), 6499.3 keV 25 (1993Wa04), 6499 keV 2 (1996Ta18) and 6499 keV 10 (1995Uu01). configuration: $\nu(p_{3/2}^{-1})$.
362 [±] 4	$13/2^+$	26.9 s 5	BC	$\% \alpha = 75.10$; $\% \varepsilon + \% \beta^+ = 25.10$ $\mu = -0.955518$ Additional information 1. $\% \alpha$: From 1987He10 . Other: $\% \alpha \approx 100$ (1971Ho01). The $\% \varepsilon + \% \beta^+$ branch was not measured directly. E(level): From 2021Ko07 . J^π : From 1987Bo29 ; favored α decay to $^{199\text{m}}\text{Po}$ ($J^\pi = 13/2^+$, 2014Se07 , 2017Al34); systematics in neighboring N=117 isotones; μ . $T_{1/2}$: Weighted average of 28 s 2 (1971Ho01), 28 s 2 (1967Va17), 26.7 s 5 (1996Ta18) and 28 s 2 (1996Le09). $E\alpha = 6550$ keV 1, weighted average of 6547 keV 3 (1967Va17), 6550 keV 10 (1987He10), 6549.0 keV 25 (1993Wa04), 6552 keV 3 (1995Le04), 6548 keV 3 (1996Le09) and 6551 keV 1 (1996Ta18). μ : Recommended in 2019StZV , based on $\mu = -0.94$ (1987Bo29) using the collinear fast-beam laser spectroscopy technique. configuration: $\nu(i_{13/2}^{-1})$.
860 [±] 4	$17/2^+$		C	J^π : 498.1 γ E2 to $13/2^+$.
1444 [±] 4	$21/2^+$		C	J^π : 584.3 γ E2 to $17/2^+$.
1495 [#] 4	$(21/2^+)$		C	J^π : 635.3 γ (E2) to $17/2^+$.
1938 [#] 4	$(25/2^+)$		C	J^π : 494.0 γ E2 to $21/2^+$.
2055 [@] 4			C	
2098 [±] 4	$25/2^+$		C	J^π : 653.2 γ E2 to $21/2^+$.
2192 [@] 4			C	
2249 [#] 4	$(29/2^+)$		C	J^π : 310.8 γ E2 to $(25/2^+)$.
2425 [@] 4			C	
2513 [#] 4	$(33/2^+)$		C	J^π : 263.6 γ (E2) to $(29/2^+)$.
2771 [±] 4	$(27/2^+)$		C	J^π : 673.1 γ M1(+E2) to $25/2^+$.
2909.1? 6			C	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{203}Rn Levels (continued)

E(level) [†]	J ^π	XREF	Comments
3111 [#] 4	(37/2 ⁺)	C	J ^π : 598.5γ (E2) to (33/2 ⁺).
3319 [‡] 5		C	
3686 [#] 4	(41/2 ⁺)	C	J ^π : 574.6γ (E2) to (37/2 ⁺).
4116 [#] 4		C	
4720.8 [?] #		C	

[†] From a least-squares fit to Eγ, unless otherwise stated.

[‡] Seq.(A): $\nu(i_{13/2}^{-1})$ structure.

[#] Seq.(B): $\pi(f_{7/2}^{+2}) \otimes \nu(i_{13/2}^{-1})$ or $\nu(f_{5/2}^{-2}, i_{13/2}^{-1})$ structure.

@ Seq.(C): Side structure.

 $\gamma(^{203}\text{Rn})$

E _i (level)	J _i ^π	E _γ [†]	I _γ [†]	E _f	J _f ^π	Mult. [†]	Comments
860	17/2 ⁺	498.1 1	100	362	13/2 ⁺	E2	Mult.: pol=+0.2 1; A ₂ =+0.8 5.
1444	21/2 ⁺	584.3 1	100	860	17/2 ⁺	E2	Mult.: pol=+0.2 1; A ₂ =+0.4 1.
1495	(21/2 ⁺)	635.3 1	100	860	17/2 ⁺	(E2)	Mult.: A ₂ =+0.4 1.
1938	(25/2 ⁺)	443.2 2	100 19	1495	(21/2 ⁺)	(E2)	Mult.: A ₂ =+0.7 1. Note, that the value is somewhat larger than that expected for a pure E2 transition.
		494.0 1	86 14	1444	21/2 ⁺	E2	Mult.: pol=+0.2 2; A ₂ =+0.3 2.
2055		116.2 5	100	1938	(25/2 ⁺)	D[+Q]	Mult.: A ₂ =-0.4 1.
2098	25/2 ⁺	653.2 1	100	1444	21/2 ⁺	E2	Mult.: pol>0; A ₂ =+0.4 1.
2192		137.4 5	100	2055		D[+Q]	Mult.: A ₂ =-0.6 2.
2249	(29/2 ⁺)	310.8 1	100	1938	(25/2 ⁺)	(E2)	Mult.: A ₂ =+0.7 1. Note, that the value is somewhat larger than that expected for a pure E2 transition.
2425		232.9 1	100	2192			
2513	(33/2 ⁺)	263.6 5	100	2249	(29/2 ⁺)	(E2)	Mult.: A ₂ =+0.6 3.
2771	(27/2 ⁺)	673.1 5	100	2098	25/2 ⁺	M1(+E2)	Mult.: A ₂ =-0.5 4.
2909.1 [?]		810.5 [‡]	100	2098	25/2 ⁺		
3111	(37/2 ⁺)	598.5 1	100	2513	(33/2 ⁺)	(E2)	Mult.: A ₂ =+1.2 4. Note, that the value is somewhat larger than that expected for a pure E2 transition.
3319		548.6	100	2771	(27/2 ⁺)		
3686	(41/2 ⁺)	574.9 1	100	3111	(37/2 ⁺)	(E2)	Mult.: A ₂ =+0.9 4. Note, that the value is somewhat larger than that expected for a pure E2 transition.
4116		429.3 2	100	3686	(41/2 ⁺)		
4720.8 [?]		604.2 [‡] 5	100	4116			

[†] From (HI,xnγ). Mult. are based on the angular distribution and polarization data in (HI,xnγ) (2001Ne11).

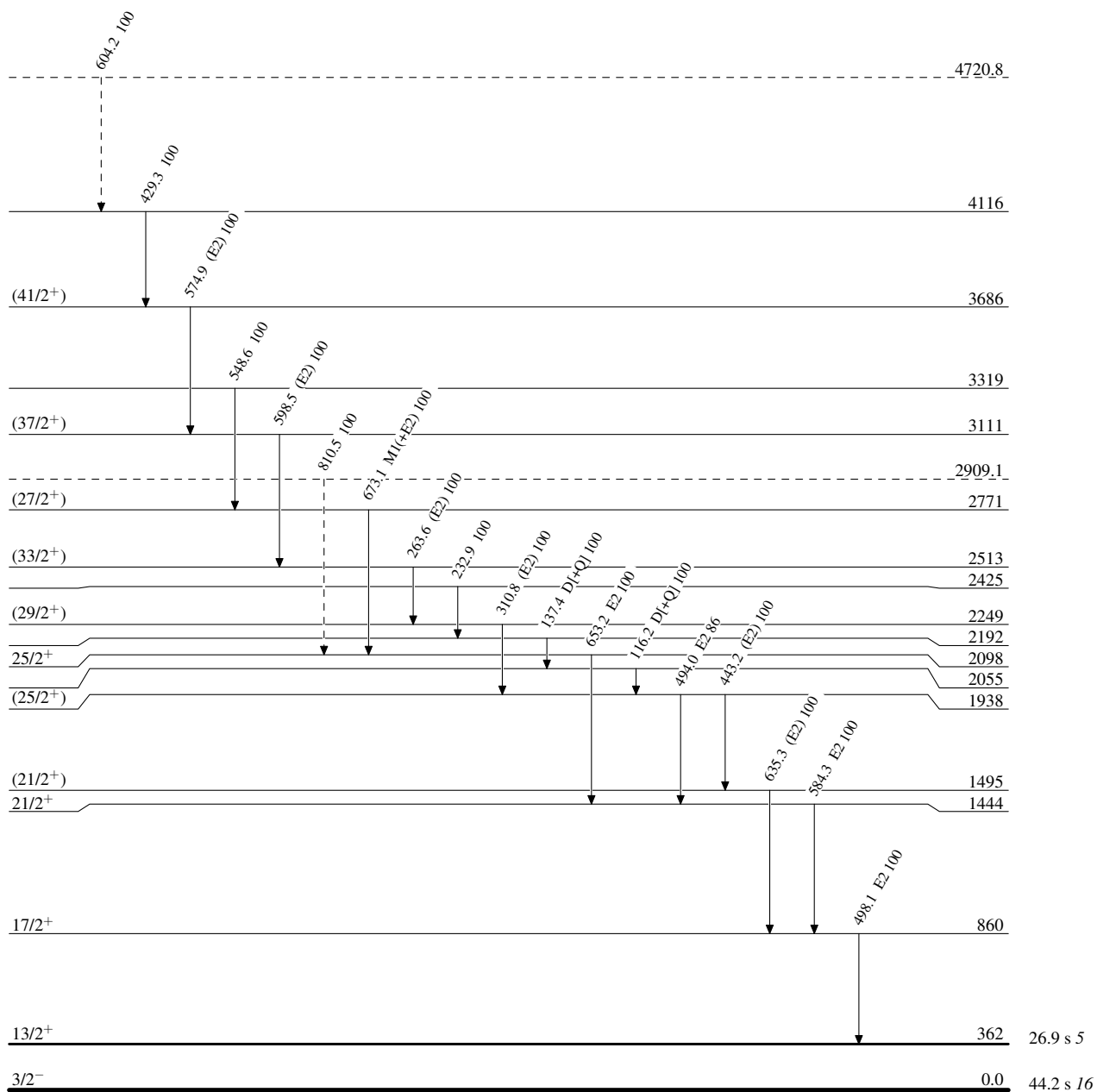
[‡] Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{203}_{86}\text{Rn}_{117}$

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