(HI,xnγ)   2001Ne11,1994Fr11

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

2001Ne11: Two experiments: one using ^{168}Er(^{40}Ar,5nγ) reaction at 188 MeV; gammasphere spectrometer with 101 Compton-suppressed HPGe detectors in conjunction with the Argonne Fragment Mass Analyzer; Measured: γ-γ-γ coin, recoil-γ-γ coin, Eγ, Iγ. The second experiment using the ^{174}Yb(^{34}S,5nγ) reaction at 167 MeV; yrast Ball array comprised of 18 Compton-suppressed HPGe detectors and three Compton-suppressed segmented clover detectors; Measured: γ-γ coin, Eγ, Iγ.

1994Fr11: Two experiments: one using ^{181}Ta(^{27}Al,5nγ) reaction at E=132 and 150 MeV; Target: natural Ta of thickness 200-300 μg/cm^2; Detectors: 6% efficient HPGe detectors in conjunction with Fragment Mass Analyzer; Measured: recoil-γ coin, Eγ, Iγ. The second experiment using ^{192}Pt(^{16}O,5nγ) reaction at E=110 MeV; Target: 1 mg/cm^2 enriched to 57% in ^{192}Pt; ten Compton-suppressed HPGe detectors in conjunction with a Fragment Mass Analyzer; Measured: recoil-γ coin, recoil-γ-γ coin, Eγ, Iγ.

^{203}Rn Levels

E(level)[†]	J^π	T$_{1/2}$	Comments
362[‡] 4	(13/2$^+$)	26.9 s 5	Additional information 1. E(level),T$_{1/2}$: From Adopted Levels.
860.10[‡] 10	(17/2$^+$)		
1444.43[‡] 14	(21/2$^+$)		
1495.37[#] 14	(21/2$^+$)		
1938.46[#] 16	(25/2$^+$)		
2054.7[@] 6			
2097.63[‡] 17	(25/2$^+$)		
2192.1[@] 8			
2249.26[#] 19	(29/2$^+$)		
2425.0[@] 8			
2512.9[#] 6	(33/2$^+$)		
2770.7[‡] 6	(27/2$^+$)		
2909.1? 6			
3111.4[#] 6	(37/2$^+$)		
3319.3[‡] 8			
3686.3[#] 6	(41/2$^+$)		
4115.6[#] 6			
4720.8?[#] 8			

[†] From a least-squares fit to Eγ.
[‡] Seq.(A): configuration=$ν$(i$^{-1}_{13/2}$).
[#] Seq.(B): configuration=$π$(f$^{+2}_{7/2}$)⊗$ν$(i$^{-1}_{13/2}$) or $ν$(f$^{-2}_{5/2}$,i$^{-1}_{13/2}$).
[@] Seq.(C): Side structure.

γ(^{203}Rn)

E$_γ$[†]	I$_γ$[†]	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.[‡]	Comments
116.2 5	36 9	2054.7		1938.46	(25/2$^+$)	D[+Q]	Mult.: A$_2$=−0.4 1.
137.4 5	16 7	2192.1		2054.7		D[+Q]	Mult.: A$_2$=−0.6 2.
232.9 1	5 2	2425.0		2192.1			
263.6 5	10 2	2512.9	(33/2$^+$)	2249.26	(29/2$^+$)	E2	Mult.: A$_2$=+0.6 3.

Continued on next page (footnotes at end of table)

(HI,xnγ)   2001Ne11,1994Fr11 (continued)

$γ(^{203}Rn)$ (continued)

$E_γ^†$	$I_γ^†$	E_i(level)	$J_i^π$	E_f	$J_f^π$	Mult.‡	Comments
310.8 1	19 3	2249.26	$(29/2^+)$	1938.46	$(25/2^+)$	(E2)	Mult.: A_2=+0.7 1. Note, that the value is somewhat large than that expected for a pure E2 transition. $E_γ,I_γ$: Other: $E_γ$=310.6 keV 2, $I_γ$=15 2 (1994Fr11).
^{x}368.0$^\#$ 2	7$^\#$ 1						
429.3 2		4115.6		3686.3	$(41/2^+)$		
443.2 2	21 4	1938.46	$(25/2^+)$	1495.37	$(21/2^+)$	(E2)	Mult.: A_2=+0.7 1. Note, that the value is somewhat large than that expected for a pure E2 transition. $E_γ,I_γ$: Other: $E_γ$=442.9 keV 2, $I_γ$=18 4 (1994Fr11).
494.0 1	18 3	1938.46	$(25/2^+)$	1444.43	$(21/2^+)$	E2	Mult.: pol=+0.2 2; A_2=+0.3 2.
498.1 1	100 8	860.10	$(17/2^+)$	362	$(13/2^+)$	E2	Mult.: pol=+0.2 1; A_2=+0.8 5. $E_γ,I_γ$: Other: $E_γ$=498.0 keV 1, $I_γ$=100 8 (1994Fr11).
548.6 5		3319.3		2770.7	$(27/2^+)$		
574.9 1	5 2	3686.3	$(41/2^+)$	3111.4	$(37/2^+)$	E2	Mult.: A_2=+0.9 4. Note, that the value is somewhat large than that expected for a pure E2 transition.
584.3 1	78 6	1444.43	$(21/2^+)$	860.10	$(17/2^+)$	E2	Mult.: pol=+0.2 1; A_2=+0.4 1. $E_γ,I_γ$: Other: $E_γ$=584.2 keV 1, $I_γ$=56 6 (1994Fr11).
598.5 1	7 2	3111.4	$(37/2^+)$	2512.9	$(33/2^+)$	(E2)	Mult.: A_2=+1.2 4. Note, that the value is somewhat large than that expected for a pure E2 transition. $E_γ,I_γ$: Other: $E_γ$=598.0 keV 2, $I_γ$=42 7 (1994Fr11). $I_γ$ differs significantly from that reported by 2001Ne11.
604.2$^@$ 5		4720.8?		4115.6			
635.3 1	23 3	1495.37	$(21/2^+)$	860.10	$(17/2^+)$	(E2)	Mult.: A_2=+0.4 1. $E_γ,I_γ$: Other: $E_γ$=635.4 keV 2, $I_γ$=30 5 (1994Fr11).
653.2 1	24 4	2097.63	$(25/2^+)$	1444.43	$(21/2^+)$	E2	Mult.: pol>0; A_2=+0.4 1. $E_γ,I_γ$: Other: $E_γ$=653.3 keV 2; $I_γ$=76 6 (1994Fr11).
^{x}663.5$^\#$ 3	16$^\#$ 6						
673.1 5	9 2	2770.7	$(27/2^+)$	2097.63	$(25/2^+)$	M1(+E2)	Mult.: A_2=−0.5 4. $E_γ,I_γ$: Other: $E_γ$=672.9 keV 6, $I_γ$=14 5 (1994Fr11).
810.5$^@$ 5	15 3	2909.1?		2097.63	$(25/2^+)$		

† From 2001Ne11, unless otherwise stated.
‡ Based on the angular distribution and polarization data in 2001Ne11.
$^\#$ From 1994Fr11. γ-ray not reported by 2001Ne11.
$^@$ Placement of transition in the level scheme is uncertain.
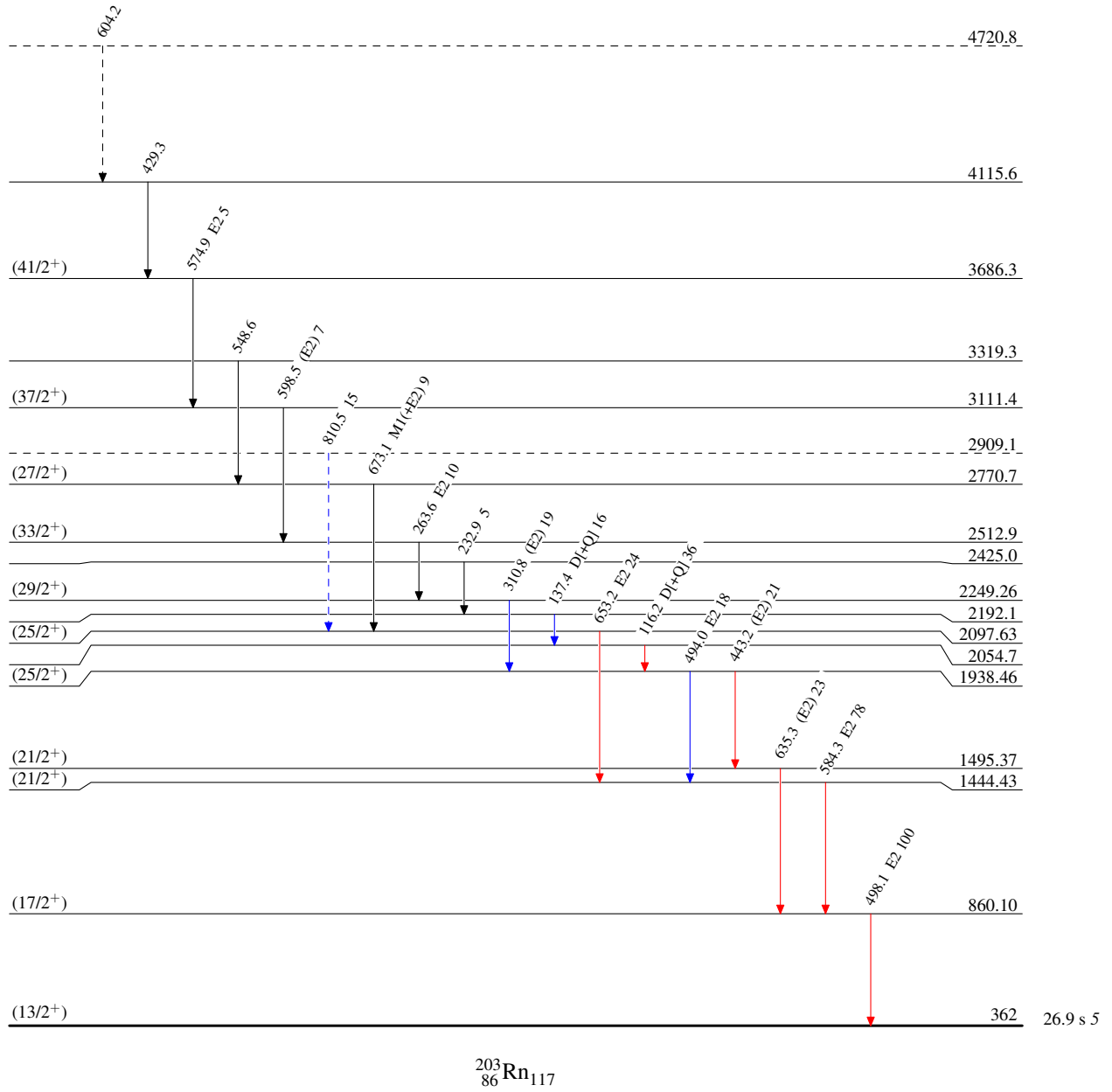^{x} γ ray not placed in level scheme.

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Legend

Level Scheme

Intensities: Relative I$_\gamma$

I$_\gamma$ < 2%×I$_\gamma^{max}$
I$_\gamma$ < 10%×I$_\gamma^{max}$
I$_\gamma$ > 10%×I$_\gamma^{max}$
γ Decay (Uncertain)

$^{203}_{86}$Rn$_{117}$

(HI,xnγ)   **2001Ne11,1994Fr11**

Seq.(B): Configuration=
$\pi(\mathbf{f}^{+2}_{7/2})$
$\otimes\nu(\mathbf{i}^{-1}_{13/2})$ **or**
$\nu(\mathbf{f}^{-2}_{5/2},$
$\mathbf{i}^{-1}_{13/2})$

- - - - - - - - - - **4720.8**

604

4115.6

429

(41/2⁺) **3686.3**

575

(37/2⁺) **3111.4**

Seq.(A): Configuration=
$\nu(\mathbf{i}^{-1}_{13/2})$

3319.3

549

598

(27/2⁺) **2770.7**

Seq.(C): Side structure

(33/2⁺) **2512.9**

2425.0

673

264

(29/2⁺) **2249.26**

233

2192.1

311

137

2054.7

(25/2⁺) **2097.63**

(25/2⁺) **1938.46**

653

443

(21/2⁺) **1444.43**

(21/2⁺) **1495.37**

584

(17/2⁺) **860.10**

498

(13/2⁺) **362**

$^{203}_{86}\text{Rn}_{117}$