

⁶²Ni(¹⁶O,p2n γ), ⁵⁸Ni(²⁴Mg, α 3p γ) 1985Lu02,1989Ma27,1981Kr10

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh		NDS 114, 841 (2013)	30-Jun-2013

Includes: ⁶⁶Zn(¹²C,p2n γ) (1985Lu02); ⁵⁴Fe(²⁸Si, α 3p γ) (1985We10); ⁵⁴Fe(²⁴Mg,3p γ) (1998Sk01).
 1985Lu02 (also 1986LiZQ): ⁶²Ni(¹⁶O,p2n) E=45-65 MeV, ⁶⁶Zn(¹²C,p2n) E=35-55 MeV. Measured E γ , I γ , $\gamma\gamma$, T_{1/2} (by DSAM) using three Ge(Li) detectors (resolution 1.8-2.1 keV at 1.33 MeV). Four bands proposed: 5/2⁺ to 33/2⁺; 3/2⁻ to 31/2⁻; 5/2⁻ to 33/2⁻; 3/2⁺ to 23/2⁺.
 1989Ma27: ⁵⁸Ni(²⁴Mg, α 3p γ) E=110 MeV. Measured γ , $\gamma\gamma$ using TESSA array of 15 Ge detectors. Four bands proposed: 5/2⁺ to 45/2⁺; 3/2⁻ to 47/2⁻; 5/2⁻ to 49/2⁻; 3/2⁺ to 19/2⁺.
 1981Kr10: ⁶²Ni(¹⁶O,p2n) E=45-70 MeV. Measured γ , $\gamma\gamma$, T_{1/2}. Four bands proposed: 5/2⁺ to 25/2⁺; 3/2⁻ to 23/2⁻; 5/2⁻ to 25/2⁻; 3/2⁺ to 15/2⁺.
 1985We10: ⁵⁴Fe(²⁸Si, α 3p γ), E=128 MeV, measured γ , $\gamma\gamma$. Three bands proposed: 5/2⁺ to 29/2⁺; 3/2⁻ to 31/2⁻; 5/2⁻ to 33/2⁻.
 1998Sk01: ⁵⁴Fe(²⁴Mg,3p γ) E=75,80 MeV. Measured T_{1/2} by recoil-distance Doppler shift (RDDS) analyzed by differential decay curve method.
 1988Cr03: calculations of continuum feeding times in ⁶²Ni(¹⁶O,p2n) E=60 MeV.

⁷⁵Br Levels

E(level) [†]	J π [#]	T _{1/2} [‡]	Comments
0.0 ^d	3/2 ⁻		
119.50 ^c 3	(5/2 ⁻)		
132.57 ^a 12	(5/2) ⁺		
154.51 ^b 22	(3/2) ⁺		
220.81 ^a 11	(9/2) ⁺	39 ns 4	T _{1/2} : from 1981Kr10 by a centroid shift analysis of $\gamma\gamma$ data.
373.92 ^b 12	(7/2) ⁺	57 ps 5	
518.051 ^d 19	(7/2 ⁻)	7.1& ps 5	T _{1/2} : 10.2 ps 7 (1985Lu02).
773.63 ^c 4	(9/2 ⁻)	4.0 ps 4	
783.72 ^a 19	(13/2 ⁺)	4.7 ps 4	
939.72 ^b 15	(11/2 ⁺)	4.6 ps 9	
1149.86 ^d 5	(11/2 ⁻)	2.29& ps 7	T _{1/2} : 2.7 ps 5 (1985Lu02).
1516.22 ^c 10	(13/2 ⁻)	0.9 ps 3	
1613.96 ^a 21	(17/2 ⁺)	0.83 ps 14	
1791.6 ^b 3	(15/2 ⁺)		
1896.87 ^d 10	(15/2 ⁻)	0.76& ps 7	T _{1/2} : 1.2 ps 6 (1985Lu02).
2356.21 ^c 11	(17/2 ⁻)	0.83 ps 21	
2659.30 ^a 24	(21/2 ⁺)	0.33 ps 4	
2755.93 ^d 12	(19/2 ⁻)	0.55& ps 14	T _{1/2} : 0.83 ps 21 (1985Lu02).
2864.1 ^b 5	(19/2 ⁺)		
2946.0? 21			Level considered suspect, no 1332 γ reported in (³⁰ Si,p2n γ) (1999So10).
3274.13 ^c 13	(21/2 ⁻)	0.51 ps 7	
3778.24 ^d 24	(23/2 ⁻)	0.37 ps 8	
3868.7 ^a 4	(25/2 ⁺)	0.16 ps 2	
4016.9? 8			Level considered suspect, no 1152.8 γ reported in (³⁰ Si,p2n γ) (1999So10).
4201.3 21			
4348.7 ^c 9	(25/2 ⁻)	0.30 ps 3	
4967.7 ^d 5	(27/2 ⁻)	0.18 ps 3	
5188.9 ^a 7	(29/2 ⁺)	0.23 ps 10	
5601.3 ^c 9	(29/2 ⁻)	0.14 @ ps 7	
6231.8 ^d 11	(31/2 ⁻)	0.21 @ ps 11	
6624.8 ^a 9	(33/2 ⁺)		

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⁶²Ni(¹⁶O,p2n γ),⁵⁸Ni(²⁴Mg, α 3p γ) **1985Lu02,1989Ma27,1981Kr10 (continued)**

⁷⁵Br Levels (continued)

E(level) [†]	J π [#]	Comments
6932.9 ^c 11	(33/2 ⁻)	
7635.8 ^d 15	(35/2 ⁻)	
8272.9 ^a 14	(37/2 ⁺)	
8327.9 ^c 15	(37/2 ⁻)	
9204.8 ^d 18	(39/2 ⁻)	
9876.9 ^c 18	(41/2 ⁻)	
10148.9 ^a 17	(41/2 ⁺)	
10899.8 ^d 21	(43/2 ⁻)	
11645.9 ^c 21	(45/2 ⁻)	
12205.9 ^a 20	(45/2 ⁺)	Level considered suspect since it is not confirmed in (³⁰ Si,p2n γ) (1999So10), where 45/2 ⁺ member of this band is reported at 12106 decaying through 1956 γ .
12787.8 ^d 23	(47/2 ⁻)	
13671.9 ^c 23	(49/2 ⁻)	

[†] Levels higher than 6933 are reported by 1989Ma27 only.

[‡] From recoil-distance Doppler-shift method (1985Lu02), unless otherwise stated.

[#] From Adopted Levels.

@ Not corrected for cascade and side feeding.

& From 1998Sk01, recoil-distance Doppler shift method analyzed by differential decay curve method.

^a Band(A): 5/2⁺ band.

^b Band(B): 3/2⁺ band.

^c Band(C): 5/2⁻ band.

^d Band(D): 3/2⁻ band.

γ (⁷⁵Br)

E γ [†]	I γ [†]	E _i (level)	J π _i	E _f	J π _f	Comments
88.23 [‡] 7	57	220.81	(9/2) ⁺	132.57	(5/2) ⁺	
119.50 [‡] 5	52	119.50	(5/2 ⁻)	0.0	3/2 ⁻	Mult.: D(+Q) from intensity balance at 199 level in coincidence spectrum with 631 γ .
132.5 [‡] 2	167	132.57	(5/2) ⁺	0.0	3/2 ⁻	
153.12 [‡] 5	17	373.92	(7/2 ⁺)	220.81	(9/2) ⁺	
154.5 [‡] 3	1.3	154.51	(3/2) ⁺	0.0	3/2 ⁻	E γ : from 1981Kr10.
156.0 [‡] 3	1.5	939.72	(11/2 ⁺)	783.72	(13/2 ⁺)	E γ : from 1981Kr10.
219.4 [‡] 3	0.8	373.92	(7/2 ⁺)	154.51	(3/2) ⁺	
241.3 [‡] 3	2.7	373.92	(7/2 ⁺)	132.57	(5/2) ⁺	
255.57 13	2.3 8	773.63	(9/2 ⁻)	518.051	(7/2 ⁻)	
297.5 2	4.5 6	518.051	(7/2 ⁻)	220.81	(9/2) ⁺	
366 [#]		1516.22	(13/2 ⁻)	1149.86	(11/2 ⁻)	
376.23 13	1.8 10	1149.86	(11/2 ⁻)	773.63	(9/2 ⁻)	
398.54 3	8.0 8	518.051	(7/2 ⁻)	119.50	(5/2 ⁻)	
459 [#]		2356.21	(17/2 ⁻)	1896.87	(15/2 ⁻)	
518 [#]		3274.13	(21/2 ⁻)	2755.93	(19/2 ⁻)	
518.05 2	43.0 11	518.051	(7/2 ⁻)	0.0	3/2 ⁻	
552.61 16	6.9 8	773.63	(9/2 ⁻)	220.81	(9/2) ⁺	
562.93 16	100.0 14	783.72	(13/2 ⁺)	220.81	(9/2) ⁺	

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$^{62}\text{Ni}(^{16}\text{O,p}2n\gamma), ^{58}\text{Ni}(^{24}\text{Mg},\alpha 3p\gamma)$ **1985Lu02,1989Ma27,1981Kr10 (continued)** $\gamma(^{75}\text{Br})$ (continued)

E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments	
565.79	14	10.9	6	939.72	(11/2 ⁺)	373.92 (7/2 ⁺)	
631.80	4	46.4	14	1149.86	(11/2 ⁻)	518.051 (7/2 ⁻)	
654.13	2	45.0	16	773.63	(9/2 ⁻)	119.50 (5/2 ⁻)	
718.90	13	8.6	9	939.72	(11/2 ⁺)	220.81 (9/2 ⁺)	
742.59	9	39.2	14	1516.22	(13/2 ⁻)	773.63 (9/2 ⁻)	
747.01	7	39.0	17	1896.87	(15/2 ⁻)	1149.86 (11/2 ⁻)	
830.23	7	83.0	21	1613.96	(17/2 ⁺)	783.72 (13/2 ⁺)	
839.99	5	29.9	11	2356.21	(17/2 ⁻)	1516.22 (13/2 ⁻)	
851.82	23	12.7	9	1791.6	(15/2 ⁺)	939.72 (11/2 ⁺)	
859.05	9	26.8	10	2755.93	(19/2 ⁻)	1896.87 (15/2 ⁻)	
917.91	7	16.4	10	3274.13	(21/2 ⁻)	2356.21 (17/2 ⁻)	
1008.1	7	5	2	1791.6	(15/2 ⁺)	783.72 (13/2 ⁺)	
1022.3	2	18.6	11	3778.24	(23/2 ⁻)	2755.93 (19/2 ⁻)	
1045.33	12	53.9	12	2659.30	(21/2 ⁺)	1613.96 (17/2 ⁺)	
1072.5	4	8.0	11	2864.1	(19/2 ⁺)	1791.6 (15/2 ⁺)	
1074.6	8	13.7	9	4348.7	(25/2 ⁻)	3274.13 (21/2 ⁻)	
1152.8 [@]	6	<6		4016.9?		2864.1 (19/2 ⁺)	
1189.5	4	12.2	10	4967.7	(27/2 ⁻)	3778.24 (23/2 ⁻)	
1209.4	3	31.7	7	3868.7	(25/2 ⁺)	2659.30 (21/2 ⁺)	
1252.6	4	10.7	8	5601.3	(29/2 ⁻)	4348.7 (25/2 ⁻)	
1264	1	8.8	11	6231.8	(31/2 ⁻)	4967.7 (27/2 ⁻)	E_γ : 1269.0 γ (1999So10) from this band member.
1320.2	5	16.4	10	5188.9	(29/2 ⁺)	3868.7 (25/2 ⁺)	
1331.5	5	4.8	5	6932.9	(33/2 ⁻)	5601.3 (29/2 ⁻)	E_γ : 1336.3 γ (1999So10) from this band member.
1332 ^{#@}	2			2946.0?		1613.96 (17/2 ⁺)	
1395 [#]	1			8327.9	(37/2 ⁻)	6932.9 (33/2 ⁻)	
1404 [#]	1			7635.8	(35/2 ⁻)	6231.8 (31/2 ⁻)	
1435.9	6	10	2	6624.8	(33/2 ⁺)	5188.9 (29/2 ⁺)	
1542 [#]	2			4201.3		2659.30 (21/2 ⁺)	E_γ : also observed by 1985Lu02 but unplaced.
1549 [#]	1			9876.9	(41/2 ⁻)	8327.9 (37/2 ⁻)	
1569 [#]	1			9204.8	(39/2 ⁻)	7635.8 (35/2 ⁻)	
^x 1616 [#]							E_γ : also reported by 1985Lu02.
1648 [#]	1			8272.9	(37/2 ⁺)	6624.8 (33/2 ⁺)	
1695 [#]	1			10899.8	(43/2 ⁻)	9204.8 (39/2 ⁻)	
^x 1719 [#]							
^x 1755 [#]							
1769 [#]	1			11645.9	(45/2 ⁻)	9876.9 (41/2 ⁻)	E_γ : 1772.5 γ (1999So10) from this band member.
1876 [#]	1			10148.9	(41/2 ⁺)	8272.9 (37/2 ⁺)	
1888 [#]	1			12787.8	(47/2 ⁻)	10899.8 (43/2 ⁻)	
2026 [#]	1			13671.9	(49/2 ⁻)	11645.9 (45/2 ⁻)	
2057 [#]	1			12205.9?	(45/2 ⁺)	10148.9 (41/2 ⁺)	

[†] From 1985Lu02, unless otherwise stated. I_γ 's from 1985Lu02 are for ($^{16}\text{O,p}2n\gamma$) $E=60$ MeV at $\theta=55^\circ$. The authors do not give intensities for $E_\gamma<250$.

[‡] From 1981Kr10 at $E=65$ MeV in ($^{16}\text{O,p}2n\gamma$), normalized to 100 for 562.9 γ .

[#] From 1989Ma27. The authors do not give intensities. Also, uncertainties on energies are not given for several transitions.

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

^x γ ray not placed in level scheme.

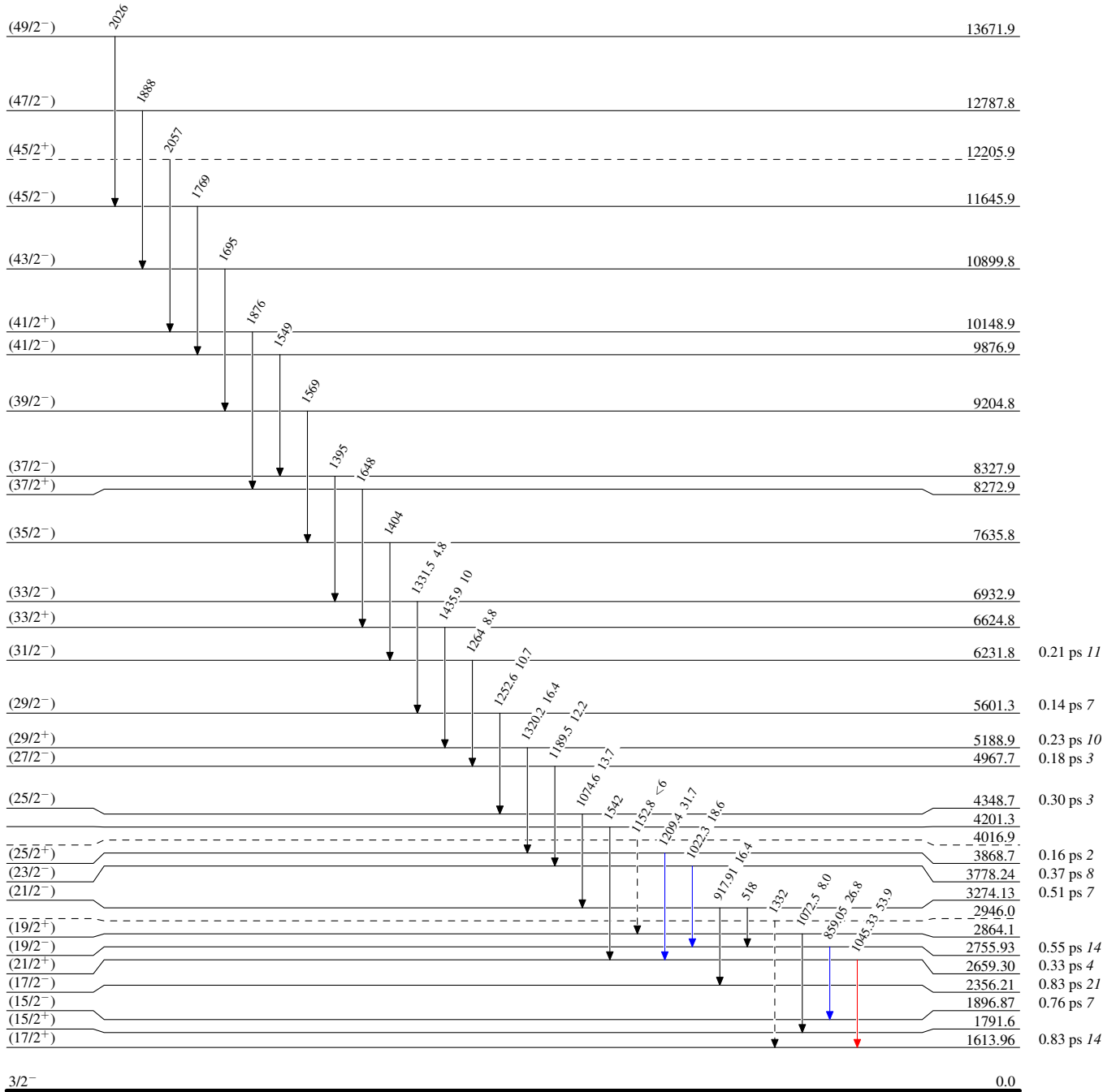
⁶²Ni(¹⁶O,p2nγ),⁵⁸Ni(²⁴Mg,α3pγ) 1985Lu02,1989Ma27,1981Kr10

Legend

Level Scheme

Intensities: Relative I_γ

- ▶ I_γ < 2% × I_γ^{max}
- ▶ I_γ < 10% × I_γ^{max}
- ▶ I_γ > 10% × I_γ^{max}
- - -▶ γ Decay (Uncertain)



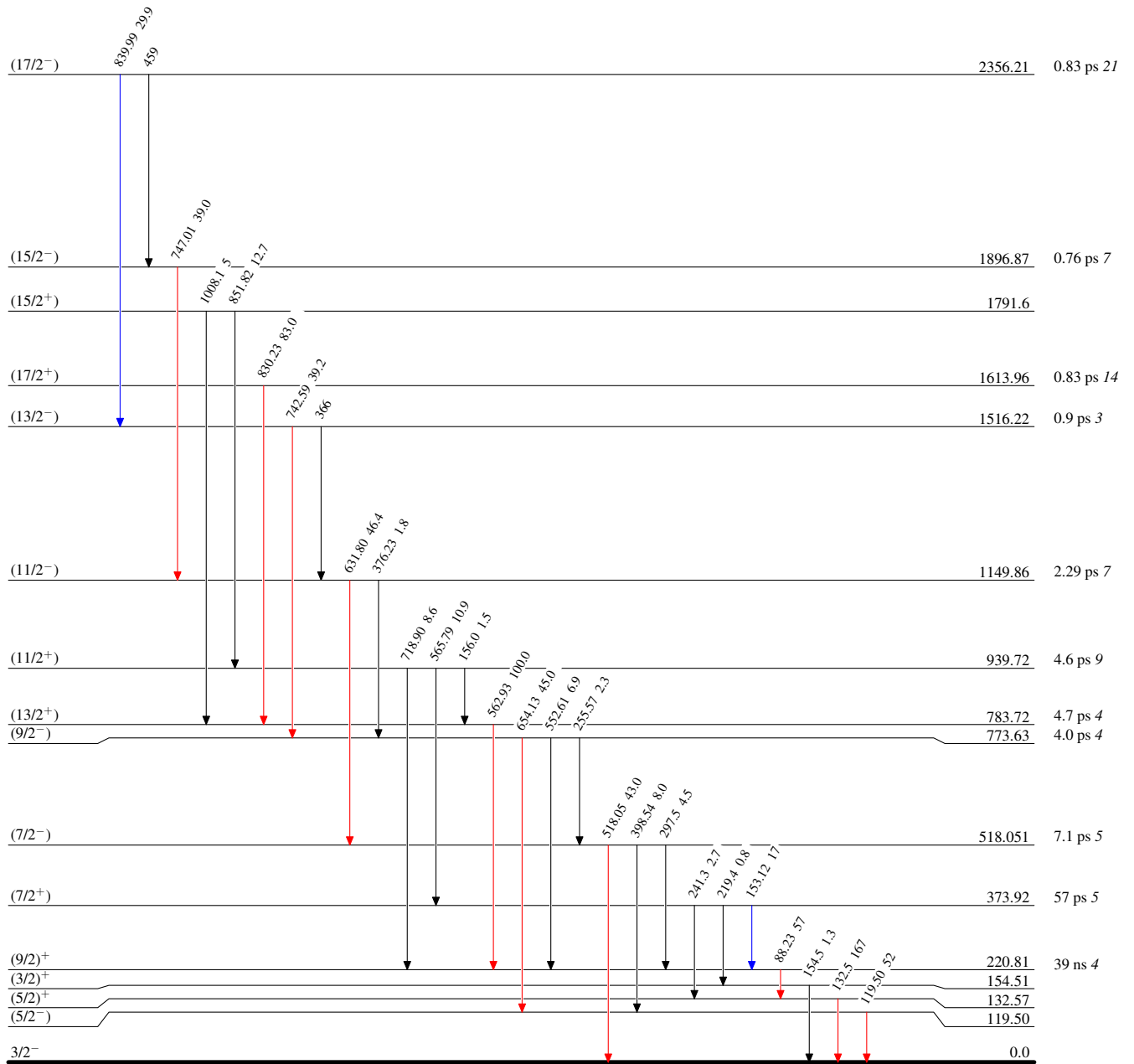
$^{62}\text{Ni}(^{16}\text{O,p}2n\gamma), ^{58}\text{Ni}(^{24}\text{Mg},\alpha 3p\gamma)$ 1985Lu02,1989Ma27,1981Kr10

Level Scheme (continued)

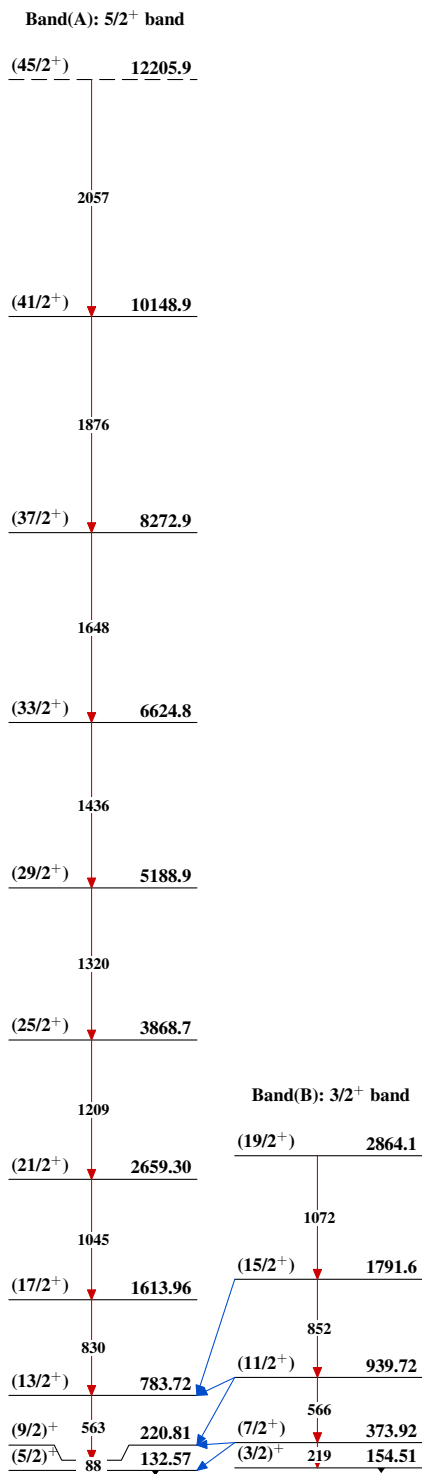
Intensities: Relative I_γ

Legend

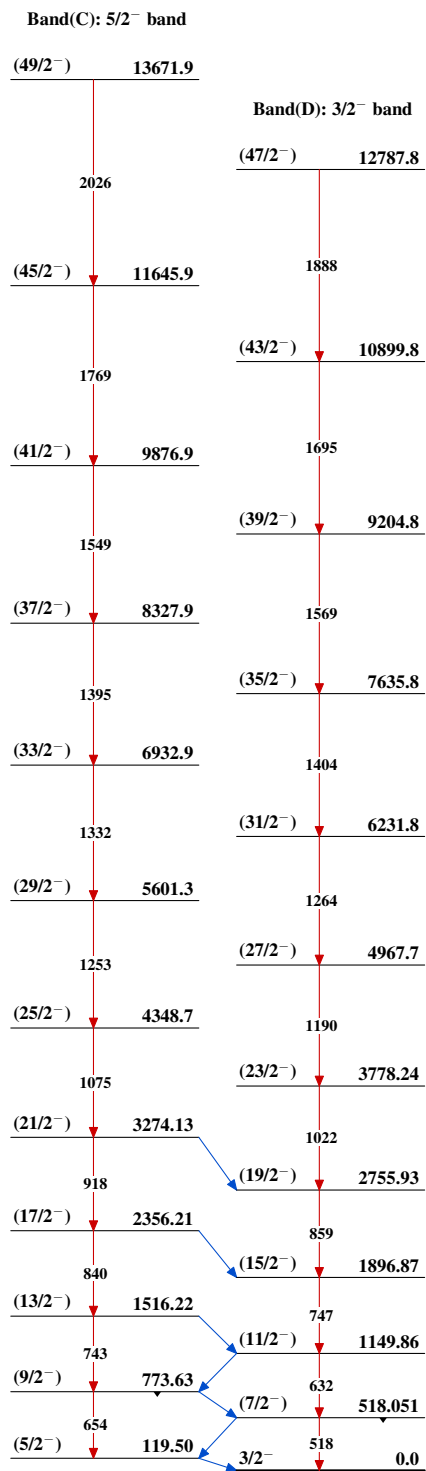
- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$

 $^{75}_{35}\text{Br}_{40}$

$^{62}\text{Ni}(^{16}\text{O},\text{p}2\text{n}\gamma)$, $^{58}\text{Ni}(^{24}\text{Mg},\alpha 3\text{p}\gamma)$ 1985Lu02,1989Ma27,1981Kr10



$^{75}_{35}\text{Br}_{40}$

$^{62}\text{Ni}(^{16}\text{O,p}2n\gamma), ^{58}\text{Ni}(^{24}\text{Mg},\alpha 3p\gamma)$ 1985Lu02,1989Ma27,1981Kr10 (continued) $^{75}_{35}\text{Br}_{40}$