

²⁴Mg(⁵⁸Ni,2pn γ) **1990Ch07**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 135, 193 (2016)	31-May-2016

1990Ch07: E=190 MeV. Measured E γ , I γ , $\gamma\gamma$, recoil- $\gamma\gamma$ coin.

⁷⁹Sr Levels

E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]
0.0 [@]	3/2 ⁻	982.98 [@] 24	11/2 ⁻	2729.1 [@] 4	19/2 ⁻	5479.9 ^{&} 9	(29/2 ⁺)
159.44 [#] 21	5/2 ⁻	1179.7 ^{&} 4	13/2 ⁺	3129.4 ^{&} 5	(21/2 ⁺)	5671.3 [#] 8	(29/2 ⁻)
177.1 ^{&} 3	5/2 ⁺	1339.8 [#] 3	13/2 ⁻	3215.6 [#] 4	(21/2 ⁻)	6734.8 ^{&} 12	(33/2 ⁺)
329.8 ^a 4	7/2 ⁺	1730.0 ^a 4	(15/2 ⁺)	3832.2 [@] 5	(23/2 ⁻)	7139.6 [#] 11	(33/2 ⁻)
381.42 [@] 18	7/2 ⁻	1774.2 [@] 3	15/2 ⁻	3873.7 ^a 7	(23/2 ⁺)	8175.2 ^{&} 14	(37/2 ⁺)
499.2 ^{&} 4	9/2 ⁺	2065.2 ^{&} 5	(17/2 ⁺)	4304.7 ^{&} 7	(25/2 ⁺)		
649.63 [#] 22	9/2 ⁻	2202.9 [#] 4	17/2 ⁻	4368.2 [#] 7	(25/2 ⁻)		
914.5 ^a 4	11/2 ⁺	2729.0 ^a 5	(19/2 ⁺)	5086.0 [@] 7	(27/2 ⁻)		

[†] From least-squares fit to E γ data.

[‡] From 1990Ch07 based on band structures and decay pattern.

Band(A): ν 3/2[301], α =+1/2.

@ Band(a): ν 3/2[301], α =-1/2.

& Band(B): ν 5/2[422], α =+1/2.

^a Band(b): ν 5/2[422], α =-1/2.

γ (⁷⁹Sr)

E γ	I γ [†]	E _i (level)	J π _i	E _f	J π _f	Comments
152.87 29	89 4	329.8	7/2 ⁺	177.1	5/2 ⁺	
159.45 29	100 5	159.44	5/2 ⁻	0.0	3/2 ⁻	
169.43 28	65 4	499.2	9/2 ⁺	329.8	7/2 ⁺	
177.05 28		177.1	5/2 ⁺	0.0	3/2 ⁻	
222.01 26	55 5	381.42	7/2 ⁻	159.44	5/2 ⁻	
265.21 25	11 2	1179.7	13/2 ⁺	914.5	11/2 ⁺	
268.25 24	31 3	649.63	9/2 ⁻	381.42	7/2 ⁻	
322.07 25	15 2	499.2	9/2 ⁺	177.1	5/2 ⁺	Branching ratio: I γ (322)/I γ (169)=19 2/81 2.
333.39 22	18 4	982.98	11/2 ⁻	649.63	9/2 ⁻	
335.15 22	3 1	2065.2	(17/2 ⁺)	1730.0	(15/2 ⁺)	
356.87 22	12 4	1339.8	13/2 ⁻	982.98	11/2 ⁻	
381.41 21	11 2	381.42	7/2 ⁻	0.0	3/2 ⁻	Branching ratio: I γ (381)/I γ (222)=17 1/83 1.
400.35 23	3 1	3129.4	(21/2 ⁺)	2729.0	(19/2 ⁺)	
415.32 20	21 3	914.5	11/2 ⁺	499.2	9/2 ⁺	
428.89 34	7 3	2202.9	17/2 ⁻	1774.2	15/2 ⁻	
434.53 20	9 3	1774.2	15/2 ⁻	1339.8	13/2 ⁻	
486.50 23	2 1	3215.6	(21/2 ⁻)	2729.1	19/2 ⁻	
490.17 20	22 3	649.63	9/2 ⁻	159.44	5/2 ⁻	Branching ratio: I γ (490)/I γ (268)=42 1/58 1.
526.24 21	4 2	2729.1	19/2 ⁻	2202.9	17/2 ⁻	
535.85 [#] 27	2 2	4368.2	(25/2 ⁻)	3832.2	(23/2 ⁻)	
550.28 20	7 1	1730.0	(15/2 ⁺)	1179.7	13/2 ⁺	
584.75 20	12 2	914.5	11/2 ⁺	329.8	7/2 ⁺	Branching ratio: I γ (585)/I γ (415)=36 2/64 2.
601.54 21	21 5	982.98	11/2 ⁻	381.42	7/2 ⁻	Branching ratio: I γ (601)/I γ (333)=54 3/46 3.
616.63 27	2 1	3832.2	(23/2 ⁻)	3215.6	(21/2 ⁻)	

Continued on next page (footnotes at end of table)

$^{24}\text{Mg}(^{58}\text{Ni}, 2\text{pn}\gamma)$ **1990Ch07 (continued)** $\gamma(^{79}\text{Sr})$ (continued)

E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
663.70 23	5 2	2729.0	(19/2 ⁺)	2065.2	(17/2 ⁺)	
680.53 22	34 3	1179.7	13/2 ⁺	499.2	9/2 ⁺	Branching ratio: $I_\gamma(680)/I_\gamma(265)=76$ 2/24 2.
690.11 23	23 3	1339.8	13/2 ⁻	649.63	9/2 ⁻	Branching ratio: $I_\gamma(690)/I_\gamma(357)=66$ 3/34 3.
744.2 [#] 3	1 1	3873.7	(23/2 ⁺)	3129.4	(21/2 ⁺)	
791.13 26	21 5	1774.2	15/2 ⁻	982.98	11/2 ⁻	Branching ratio: $I_\gamma(791)/I_\gamma(434)=70$ 4/30 4.
815.49 28	11 2	1730.0	(15/2 ⁺)	914.5	11/2 ⁺	Branching ratio: $I_\gamma(815)/I_\gamma(550)=61$ 3/39 3.
862.97 30	21 4	2202.9	17/2 ⁻	1339.8	13/2 ⁻	Branching ratio: $I_\gamma(863)/I_\gamma(429)=75$ 5/26 5.
885.43 31	25 4	2065.2	(17/2 ⁺)	1179.7	13/2 ⁺	Branching ratio: $I_\gamma(885)/I_\gamma(335)=89$ 4/11 4.
954.86 34	14 4	2729.1	19/2 ⁻	1774.2	15/2 ⁻	Branching ratio: $I_\gamma(955)/I_\gamma(526)=78$ 4/22 4.
999.05 37	9 3	2729.0	(19/2 ⁺)	1730.0	(15/2 ⁺)	Branching ratio: $I_\gamma(999)/I_\gamma(664)=43$ 4/36 4.
1012.8 4	15 4	3215.6	(21/2 ⁻)	2202.9	17/2 ⁻	Branching ratio: $I_\gamma(1013)/I_\gamma(486)=88$ 4/12 4.
1064.5 4	18 3	3129.4	(21/2 ⁺)	2065.2	(17/2 ⁺)	Branching ratio: $I_\gamma(1064)/I_\gamma(400)=86$ 5/14 5.
1103.1 4	9 3	3832.2	(23/2 ⁻)	2729.1	19/2 ⁻	Branching ratio: $I_\gamma(1103)/I_\gamma(617)=82$ 5/18 5.
1144.7 5	5 2	3873.7	(23/2 ⁺)	2729.0	(19/2 ⁺)	Branching ratio: $I_\gamma(1145)/I_\gamma(744)=83$ 7/17 7.
1152.6 5	7 3	4368.2	(25/2 ⁻)	3215.6	(21/2 ⁻)	Branching ratio: $I_\gamma(1153)/I_\gamma(536)=88$ 6/22 6.
1175.2 [‡] 5	19 [‡] 3	4304.7	(25/2 ⁺)	3129.4	(21/2 ⁺)	
1175.2 [‡] 5	19 [‡] 3	5479.9	(29/2 ⁺)	4304.7	(25/2 ⁺)	
1253.7 5	6 3	5086.0	(27/2 ⁻)	3832.2	(23/2 ⁻)	
1254.9 8	6 2	6734.8	(33/2 ⁺)	5479.9	(29/2 ⁺)	
1303.1 5	5 3	5671.3	(29/2 ⁻)	4368.2	(25/2 ⁻)	
1440.4 [#] 6	3 1	8175.2	(37/2 ⁺)	6734.8	(33/2 ⁺)	
1468.2 7	2 1	7139.6	(33/2 ⁻)	5671.3	(29/2 ⁻)	

[†] From 1990Ch07. Values are from total projection of recoil- $\gamma\gamma$ coin spectra and sums of gated spectra from $\gamma\gamma$ data.

[‡] Multiply placed with undivided intensity.

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

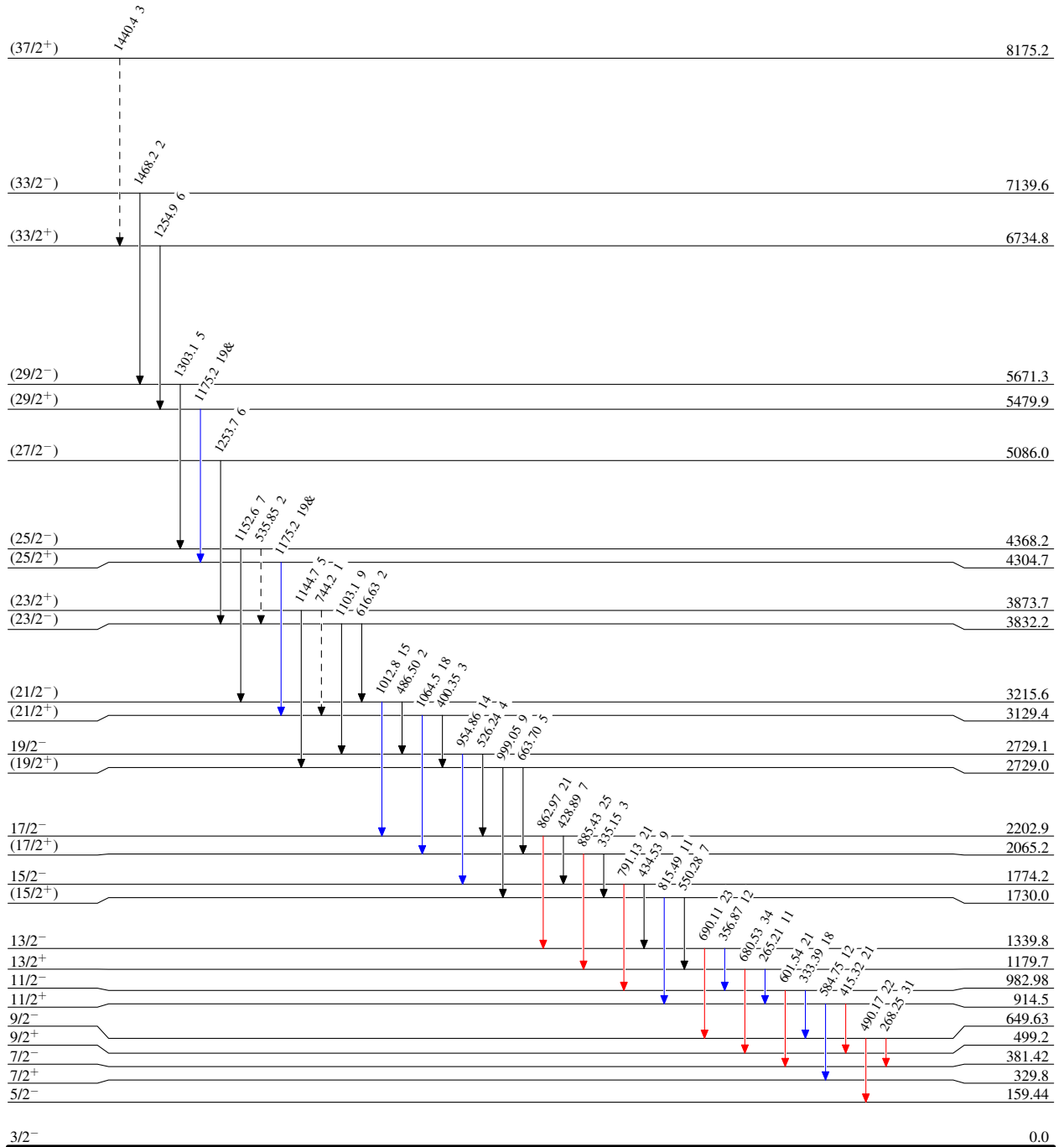
²⁴Mg(⁵⁸Ni,2pn γ) 1990Ch07

Level Scheme

Intensities: Relative I γ
& Multiply placed: undivided intensity given

Legend

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



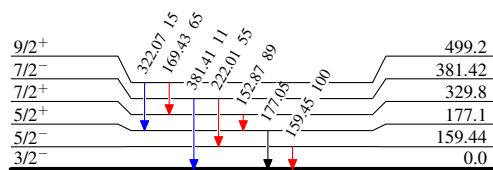
$^{24}\text{Mg}(^{58}\text{Ni}, 2\text{pn}\gamma)$ 1990Ch07

Level Scheme (continued)

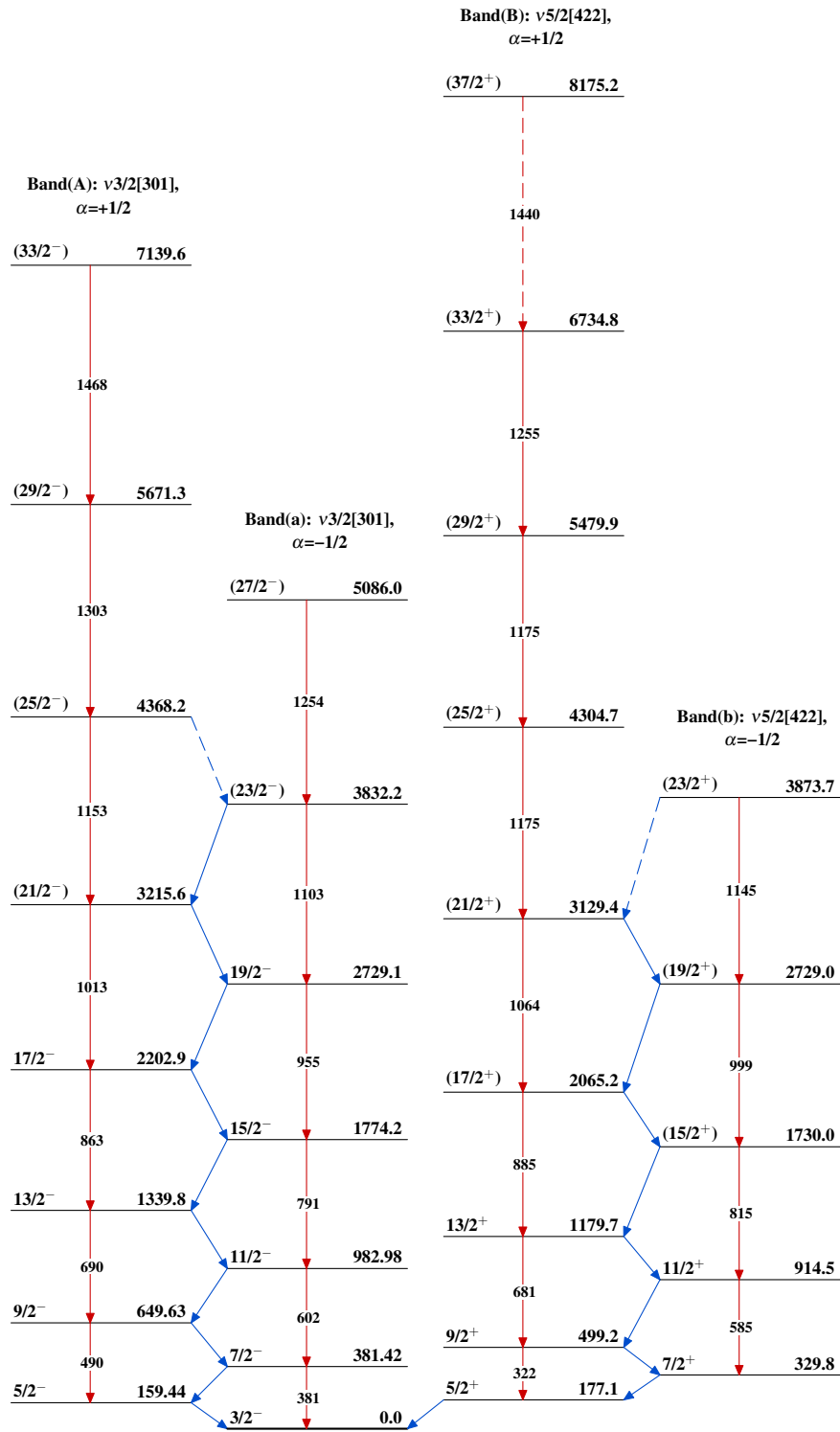
Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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

 $^{79}\text{Sr}_{41}$

$^{24}\text{Mg}(^{58}\text{Ni}, 2\text{pn}\gamma)$ 1990Ch07



$^{79}\text{Sr}_{41}$