^{170}Er(n,γ) E=thermal 1971Al01,1984MuZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan	NDS 151, 334 (2018)	30-Jun-2018

σ_n=8.9 *3* (2006MuZX) (cf. 5.8 *3* (1984MuZX), 8.0 *6* (2007Yu02)).
% abundance (^{170}Er)=14.9 *3*.
The level scheme and all data are from 1971Al01, except as noted.
2007ChZX: Evaluation of (n,γ) E=thermal data, including new cross section data using elemental targets; Ge detector; observed only 4 transitions.
1971Al01: E=thermal; erbium targets enriched to 96.06% in ^{170}Er; measured Eγ, Iγ for primary and secondary transitions (3-crystal Ge(Li) pair spect for Eγ>2100 keV, anti-Compton spectrometer for Eγ<1435 keV).

^{171}Er Levels

E(level)[†]	J$^\pi$[‡]	Comments
0.0[#]	5/2$^-$	
79.1[#] *1*	(7/2$^-$)	
198.0[@] *6*	1/2$^-$	
255.8[@] *9*	(3/2$^-$)	
278.8[@] *8*	(5/2$^-$)	
707.0[&] *8*	(1/2$^-$)	
736.2?[&] *16*	(3/2$^-$)	
794.2[&] *7*	(5/2$^-$)	
904.5[a] *7*	(3/2$^-$)	
1220.1 *6*	(3/2$^-$)	
1263.9 *12*	1/2,3/2	
1334.2 *12*	1/2,3/2	
1373.4 *12*	1/2,3/2	
1496.1 *10*	1/2,3/2	
1519.6 *17*	1/2,3/2	
1627.0 *12*	1/2,3/2	
1722.9 *17*	1/2,3/2	
1756.5 *16*	1/2,3/2	
1796.9? *16*	(1/2,3/2)	
1962.0 *12*	1/2,3/2	
1976.4 *12*	1/2,3/2	
2036.8 *21*	1/2,3/2	
2053.0 *12*	1/2,3/2	
2064.1 *12*	1/2,3/2	
2087.3 *12*	1/2,3/2	
2104.1 *8*	1/2,3/2	
(5681.6 *6*)	1/2$^+$	E(level): others: S(n)=5681.5 *5*, given by 1971Al01 and 5681.6 *4* adopted by 2017Wa10. J$^\pi$: s-wave capture by even-even nucleus.

[†] From least-squares fit to Eγ.
[‡] Adopted values, except where noted.
[#] Band(A): 5/2[512] band.
[@] Band(B): 1/2[521] band.
[&] Band(C): 1/2[510] band (+ 5/2[512] γ vibration).
[a] Band(D): 3/2[512] band.

^{170}Er(n,γ) E=thermal 1971Al01,1984MuZY (continued)

$\gamma(^{171}Er)$

Iγ normalization: deduced from σ_n=5.8 *3* (1984MuZY), and normalization of 1971Al01 (based on σ_n=9 *2*). Negligible uncertainty introduced by new cross section, but 27%−100% uncertainty introduced by uncertainty in Iγ (25% for normalizing transition (5426.3γ), 10%−100% for relative Iγ).

E$_\gamma$	I$_\gamma$[†][b]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
(79.1[#] *1*)		79.1	(7/2$^-$)	0.0	5/2$^-$	
177.8 *15*	0.49	255.8	(3/2$^-$)	79.1	(7/2$^-$)	
197.9 *10*	31.8	198.0	1/2$^-$	0.0	5/2$^-$	
279.1 *10*	3.3 *3*	278.8	(5/2$^-$)	0.0	5/2$^-$	
359.0[d] *15*	1.5	1263.9	1/2,3/2	904.5	(3/2$^-$)	
[x]501.7 *15*	3.1					
538.2 *15*	0.78	736.2?	(3/2$^-$)	198.0	1/2$^-$	
556.1 *15*	1.3	1263.9	1/2,3/2	707.0	(1/2$^-$)	
[x]562.8 *15*	2.0					
[x]663.4 *10*	1.3					
706.9[c] *10*	3.7[c]	707.0	(1/2$^-$)	0.0	5/2$^-$	E$_\gamma$: other: 706.3 *4* (2007ChZX), placed from 905 level only.
706.9[c] *10*	3.7[c]	904.5	(3/2$^-$)	198.0	1/2$^-$	E$_\gamma$: other: 706.3 *4* (2007ChZX), presumably for a doublet, but not so indicated by 2007ChZX. I$_\gamma$: other: 9 *5* per 100 n captures (2007ChZX).
715.2 *10*	0.97	794.2	(5/2$^-$)	79.1	(7/2$^-$)	
794.0 *15*	0.93	794.2	(5/2$^-$)	0.0	5/2$^-$	
[x]870.5[d] *15*	0.60					
[x]894.0[d] *15*	0.30					
904.0 *10*	4.5	904.5	(3/2$^-$)	0.0	5/2$^-$	
941.5[@] *10*	1.2	1220.1	(3/2$^-$)	278.8	(5/2$^-$)	
1021.7 *15*	0.71	1220.1	(3/2$^-$)	198.0	1/2$^-$	
1140.3 *15*	0.58	1220.1	(3/2$^-$)	79.1	(7/2$^-$)	
1175.4 *15*	0.66	1373.4	1/2,3/2	198.0	1/2$^-$	
1220.3 *10*	0.80	1220.1	(3/2$^-$)	0.0	5/2$^-$	
[x]1235.0 *10*	1.1					
1297.8 *15*	0.84	1496.1	1/2,3/2	198.0	1/2$^-$	E$_\gamma$: other: 1297.96 *15* (2007ChZX). I$_\gamma$: other: 38 *6* per 100 n captures (2007ChZX).
[x]1434.9[d] *15*	0.55					
2104 *1*	1.5	2104.1	1/2,3/2	0.0	5/2$^-$	
[x]2407[‡] *2*	0.53[‡]					
[x]2420[‡] *2*	0.49[‡]					
[x]2448[‡] *1*	0.50[‡]					
[x]2468[‡] *1*	0.31[‡]					
[x]2515[‡] *2*	0.49[‡]					
[x]2523[‡] *2*	0.42[‡]					
[x]2545[‡] *2*	0.40[‡]					
[x]2564[‡&] *2*	0.53[‡]					
[x]2596[‡] *1*	0.63[‡]					
[x]2627[‡] *1*	0.21[‡]					
[x]2645[‡] *1*	0.35[‡]					
[x]2655[‡] *2*	0.21[‡]					
[x]2747[‡] *2*	0.30[‡]					
[x]2761[‡] *2*	0.30[‡]					
[x]2797[‡] *1*	0.31[‡]					

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^{170}Er(n,γ) E=thermal 1971Al01,1984MuZY (continued)

$\gamma(^{171}Er)$ (continued)

E_γ	I_γ †[b]	E_i(level)	J_i^π	E_f	J_f^π	Comments
x2818‡ 2	0.51‡					
x2825‡ 2	0.26‡					
x2837‡ 2	0.26‡					
x2854‡ 2	0.32‡					
x2871‡ 2	0.26‡					
x2887‡ 2	0.26‡					
x2898‡ 2	0.25‡					
x2913‡ 2	0.25‡					
x2940‡[a] 2	‡					
x2957‡ 2	0.37‡					
x3018‡ 2	0.33‡					
x3036‡ 1	0.60‡					
x3063‡ 2	0.33‡					
x3078‡ 1	0.57‡					
x3085‡ 2	0.42‡					
x3099‡ 1	0.53‡					
x3128‡ 2	0.42‡					
x3135‡ 2	0.54‡					
x3164‡ 1	0.52‡					
x3188‡ 2	0.32‡					
x3201‡ 2	0.55‡					
x3213‡ 2	0.33‡					
x3244‡ 2	0.33‡					
x3279‡ 2	0.20‡					
x3299‡ 1	0.32‡					
x3340‡ 2	0.22‡					
x3350‡ 2	0.16‡					
x3399‡ 2	0.24‡					
x3404‡ 2	0.34‡					
x3443‡ 2	0.30‡					
x3449‡ 2	0.30‡					
x3464.0‡ 15	0.25‡					
x3489.0‡ 20	0.16‡					
x3521.0‡[a] 25	0.50‡					
x3548.0‡ 10	0.80‡					
3577.4 10	2.4	(5681.6)	$1/2^+$	2104.1	1/2,3/2	
3594.3 10	0.42	(5681.6)	$1/2^+$	2087.3	1/2,3/2	E_γ: other: 3592.0 6 (2007ChZX). I_γ: other: 9 5 per 100 n captures (2007ChZX).
3617.5 10	0.40	(5681.6)	$1/2^+$	2064.1	1/2,3/2	
3628.6 10	0.83	(5681.6)	$1/2^+$	2053.0	1/2,3/2	
3644.8[a] 20	0.43	(5681.6)	$1/2^+$	2036.8	1/2,3/2	
3705.2 10	0.60	(5681.6)	$1/2^+$	1976.4	1/2,3/2	
3719.6 10	0.44	(5681.6)	$1/2^+$	1962.0	1/2,3/2	
3884.7[d] 15	0.28	(5681.6)	$1/2^+$	1796.9?	(1/2,3/2)	
3925.1 15	0.23	(5681.6)	$1/2^+$	1756.5	1/2,3/2	
3958.7 15	0.10	(5681.6)	$1/2^+$	1722.9	1/2,3/2	
4054.6 10	1.0	(5681.6)	$1/2^+$	1627.0	1/2,3/2	

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^{170}Er(n,γ) E=thermal 1971Al01,1984MuZY (continued)

$\gamma(^{171}Er)$ (continued)

E_γ	I_γ †*b*	E_i(level)	J_i^π	E_f	J_f^π	Comments
4162.0 *15*	0.40	(5681.6)	$1/2^+$	1519.6	1/2,3/2	E_γ: other: 4162.6 *3* (2007ChZX). I_γ: other: 27 *5* per 100 n captures (2007ChZX).
4185.4 *10*	1.4	(5681.6)	$1/2^+$	1496.1	1/2,3/2	
4308.2 *15*	0.13	(5681.6)	$1/2^+$	1373.4	1/2,3/2	
4347.4 *10*	0.13	(5681.6)	$1/2^+$	1334.2	1/2,3/2	
4417.0 *15*	0.30	(5681.6)	$1/2^+$	1263.9	1/2,3/2	
4461.6 *10*	3.1	(5681.6)	$1/2^+$	1220.1	$(3/2^-)$	
4777.1 *10*	0.76	(5681.6)	$1/2^+$	904.5	$(3/2^-)$	
4975.0 *15*	0.09	(5681.6)	$1/2^+$	707.0	$(1/2^-)$	
5426.3 *10*	0.40 *10*	(5681.6)	$1/2^+$	255.8	$(3/2^-)$	
5483.1 *15*	0.07	(5681.6)	$1/2^+$	198.0	$1/2^-$	

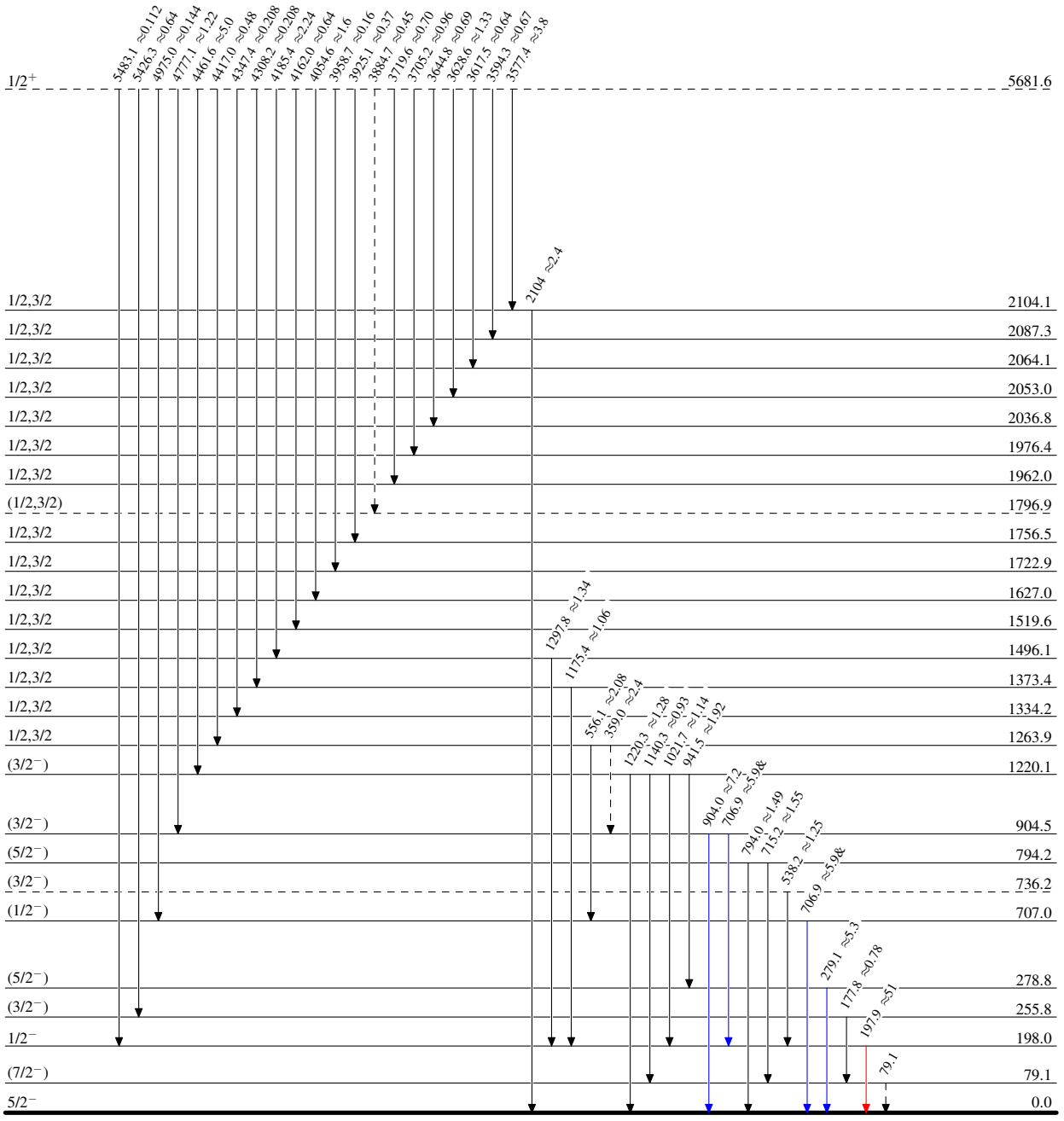
† Relative values. See 1971Al01 for preliminary normalization and calibration of intensity scales for primary and secondary γ rays. Uncertainties range from ≈ 10% for intense peaks to ≈ 100% for weak peaks, except where noted. See comment with normalization to obtain absolute intensities.
‡ Isotope assignment uncertain; Iγ is upper limit because of contributions from other Er isotopes.
# Adopted value.
@ Could also be attributed to ^{158}Gd and/or ^{168}Er.
& Possible doublet.
a Doublet.
b For intensity per 100 neutron captures, multiply by ≈1.6.
c Multiply placed with undivided intensity.
d Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

^{170}Er(n,γ) E=thermal 1971Al01,1984MuZY

Level Scheme

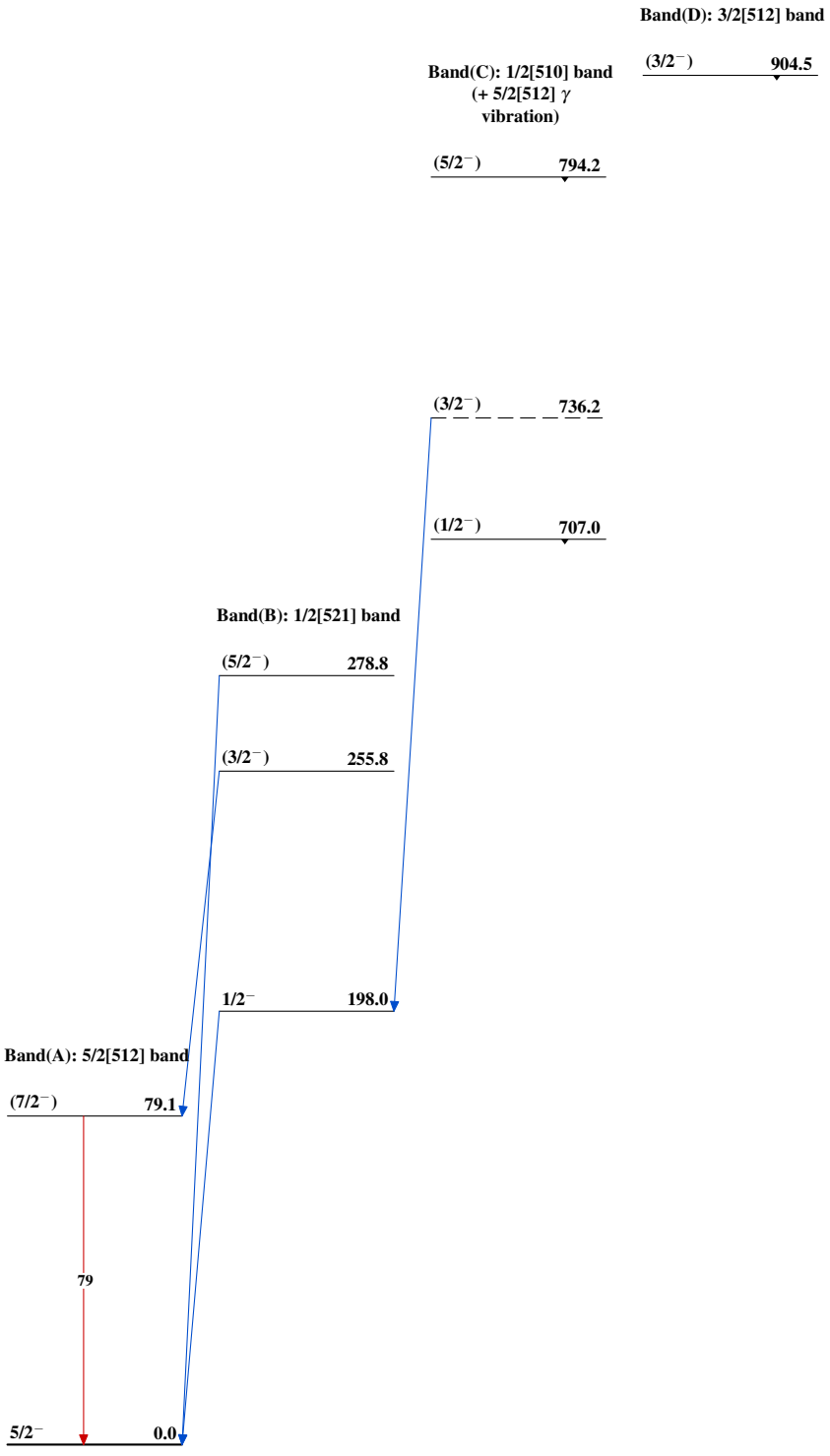
Intensities: Iγ per 100 neutron captures
& Multiply placed: undivided intensity given

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{171}_{68}Er_{103}$

^{170}Er(n,γ) E=thermal 1971Al01,1984MuZY



$^{171}_{68}Er_{103}$