^{148}Nd(α,2nγ) E=26 MeV 1975Th07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni	NDS 114, 435 (2013)	1-Apr-2013

See also 1977Su05 for (α,4n) data.

Authors concentrated on a search for bands other than the g.s. band. They report as new the levels in the negative-parity band from $J^\pi=7^-$ up to (13^-). Other details of the decay scheme given were taken from earlier works which are freely referenced.

γ-ray studies were made with a 14-cm^3 Ge(Li) detector with 1.9-keV resolution at 1332 keV. γ ray, $\gamma(\theta)$, $\gamma\gamma$, and conversion electron studies were made. $\gamma(\theta)$ measurements were made at 15° intervals between 0° and 90° to the beam direction. To obtain a 0° reading the beam was stopped in these measurements at the target with a natural Pb backing. $\gamma\gamma$ data were accumulated with a 25-ns resolving time. Random coincidences were shown to be negligible. Conversion electron studies were done with a 7-gap orange electron spectrometer (resolution≈1% of $\beta\times\rho$). Experimental conversion coefficients were normalized to give the correct coefficients for the known E2 transitions in the g.s. band. γ-ray intensities used in this process were determined from the A_0 terms of the angular distribution.

^{150}Sm Levels

E(level)	J$^\pi$[#]	T$_{1/2}$	E(level)	J$^\pi$[#]	E(level)	J$^\pi$[#]
0.0[†]	0^+	stable	1278.6[†] *3*	6^+	2432.6[†] *4*	10^+
333.90[†] *20*	2^+		1357.5[‡] *3*	5^-	2743.8[‡] *4*	11^-
740.4 *10*	0^+		1449.3 *4*	4^+	3047.8[†] *4*	12^+
773.2[†] *3*	4^+		1764.4[‡] *3*	7^-	3292.8[‡] *6*	(13^-)
1046.1 *4*	2^+		1836.7[†] *3*	8^+		
1071.4[‡] *4*	3^-		2231.9[‡] *3*	9^-		

[†] Band(A): Member of g.s. band.
[‡] Band(B): $K^\pi=0^-$ octupole band.
[#] From Adopted Levels below 7^- level and from $\gamma(\theta)$ and conversion electron data from 7^- level and up.

γ(^{150}Sm)

B(E1)(W.u.): the authors observe ratios of interband E1 to intraband E2 transition strengths which give consistent E1 hindrance factors of $1.\times10^4$ to $1.\times10^5$ in Weisskopf single particle estimates. Adopting the nuclear deformation for ^{150}Sm of $\beta_2=0.19$ given by (1965St22), the authors conclude that the E2 transitions are enhanced, and thus the E1 hindrance factors are probably of the order $1.\times10^6$ to $1.\times10^7$.

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	Comments
311.2 *2*	3.1 *2*	2743.8	11^-	2432.6	10^+	E1	α(K)exp=0.014 *3*
333.9 *2*	100	333.90	2^+	0.0	0^+	E2[#]	
395.2 *2*	10.8 *6*	2231.9	9^-	1836.7	8^+	E1	α(K)exp=0.0086 *20*
406.5	≤9.1[@]	740.4	0^+	333.90	2^+		
407.0	≤9.1[@]	1764.4	7^-	1357.5	5^-		
439.3 *2*	83 *4*	773.2	4^+	333.90	2^+	E2[#]	
467.5 *2*	1.9 *1*	2231.9	9^-	1764.4	7^-	E2	α(K)exp=0.015 *3*
485.8 *1*	13.1 *7*	1764.4	7^-	1278.6	6^+	E1	α(K)exp=0.0055 *20*
505.4 *1*	58 *3*	1278.6	6^+	773.2	4^+	E2[#]	
511.9 *5*	6 *1*	2743.8	11^-	2231.9	9^-	E2	α(K)exp=0.010 *4*
549.0 *5*	1.6 *1*	3292.8	(13^-)	2743.8	11^-	E2[#]	
558.1 *1*	31 *2*	1836.7	8^+	1278.6	6^+	E2[#]	

Continued on next page (footnotes at end of table)

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$\gamma(^{150}Sm)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
584.3 *2*	9.0 *5*	1357.5	5^-	773.2	4^+	E1	Mult.: established by (1969Re11).
595.9 *2*	11.3 *6*	2432.6	10^+	1836.7	8^+	E2[#]	
615.2 *2*	2.2 *2*	3047.8	12^+	2432.6	10^+	E2[#]	
676.1 *3*	1.9 *2*	1449.3	4^+	773.2	4^+		
712.2 *3*	2.3 *2*	1046.1	2^+	333.90	2^+		
737.5 *3*	4.2 *5*	1071.4	3^-	333.90	2^+	E1[#]	

[†] Normalized to 100 for the 2^+ to g.s. transition.
[‡] Assigned from $\gamma(\theta)$ and α(K)exp normalized to the known E2 transitions in the g.s. band.
[#] From adopted gammas.
[@] Iγ=9.1 *5* for the 406.5=407.0 γ pair. The authors conclude, on the basis of an isotropic $\gamma(\theta)$, that most of the intensity belongs with the 0^+ to 2^+ placement (740.4 level).

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Level Scheme

Intensities: Type not specified

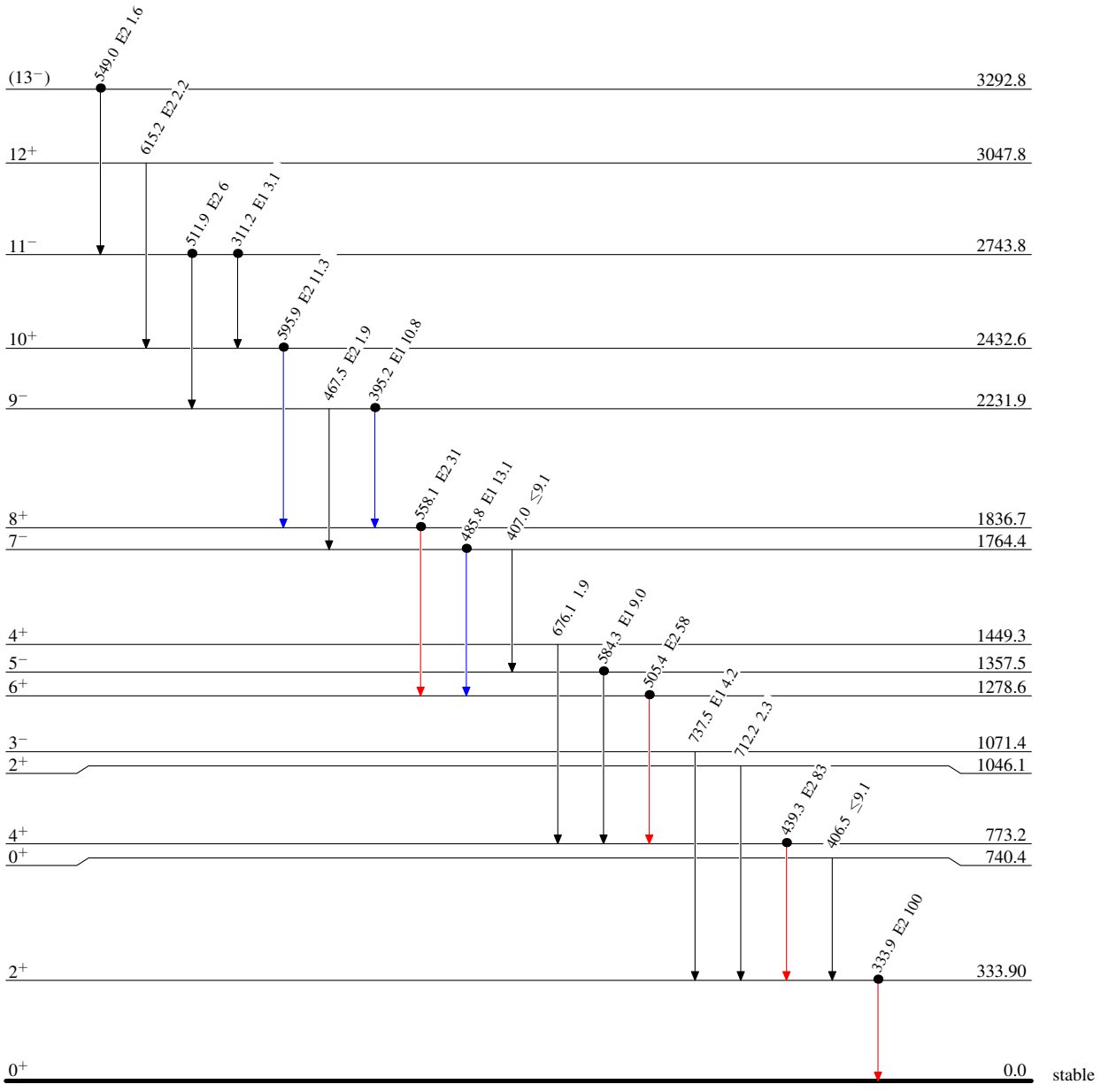
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

Coincidence



$^{150}_{62}Sm_{88}$

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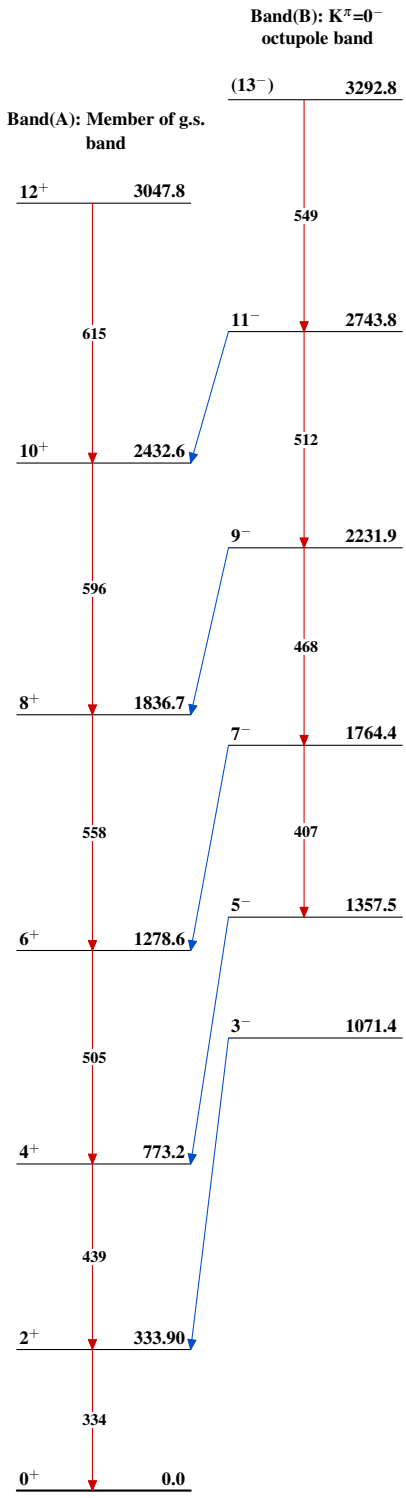

$^{150}_{62}Sm_{88}$