

¹⁵²Sm(p,2n γ) E=12-22 MeV **1983Bo23**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 110, 1 (2009)	20-Nov-2008

1983Bo23: measured γ , $\gamma\gamma$, $\gamma(\theta)$ and excitation functions.

¹⁵¹Eu Levels

γ -ray placements are from 'Adopted Levels, gammas'. In a few cases the placements suggested by 1983Bo23 differ.

E(level)	J π^\dagger	E(level)	J π^\dagger	E(level)	J π^\dagger	E(level)	J π^\dagger
0.0	5/2 ⁺	353.8 3	5/2 ⁻ ,7/2 ⁻	600.6 4		956.7 5	19/2 ⁻
21.542 3	7/2 ⁺	415.6 3	(7/2 ⁺)	611.2 4	13/2 ⁻	973.3 4	(15/2 ⁺)
196.1 3	11/2 ⁻	499.8 2	(7/2 ⁺)	697.0 4		1040.6 4	17/2 ⁻
196.5 3	(3/2 ⁺)	502.0 4	15/2 ⁻	698.1 4	(11/2 ⁻)	1093.5 4	
243.3 3	7/2 ⁻	503.2 3	9/2 ⁺	714.6 3	(9/2 ⁺)	1112.9 4	15/2 ⁺
260.5 2	5/2 ⁺	511.1 2	(11/2 ⁺)	718.7 5	(7/2 ⁺ ,9/2 ⁺)	1220.7 5	(17/2 ⁺)
307.3 2	(7/2 ⁺)	522.1 5		734.7 4		1462.6 \ddagger 1	19/2 ⁺
307.9 2	(9/2 ⁺)	546.2 5	(5/2 ⁺)	752.4 3	13/2 ⁺	1502.5 6	(23/2 ⁻)
332.3 3	3/2 ⁺ ,5/2 ⁺	580.0 5		790.0 4	(7/2,11/2)	1563.6 5	21/2 ⁻
336.3 5		587.1 5		881.4 5	(11/2 ⁻)	1996.1 3	(23/2 ⁺)
349.6 4	9/2 ⁻	600.5 3		945.4 4			

\dagger From 'Adopted Levels'.

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$\gamma(^{151}\text{Eu})$

E γ	I γ^\dagger	E _i (level)	J π_i	E _f	J π_f	Comments
21.542 3		21.542	7/2 ⁺	0.0	5/2 ⁺	E γ : from 'adopted gammas'.
109.2 3	4.6	611.2	13/2 ⁻	502.0	15/2 ⁻	
139.8 3	21	336.3		196.5	(3/2 ⁺)	
153.6 3	39	349.6	9/2 ⁻	196.1	11/2 ⁻	
174.7 3	59	196.1	11/2 ⁻	21.542	7/2 ⁺	
192.8 3	6.3	499.8	(7/2 ⁺)	307.3	(7/2 ⁺)	
196.5 3	70	196.5	(3/2 ⁺)	0.0	5/2 ⁺	
203.2 3	4.1	511.1	(11/2 ⁺)	307.9	(9/2 ⁺)	
211.4 3	2.9	714.6	(9/2 ⁺)	503.2	9/2 ⁺	
238.9 3	20	260.5	5/2 ⁺	21.542	7/2 ⁺	
241.4 3	2.4	752.4	13/2 ⁺	511.1	(11/2 ⁺)	
243.3 3	50	243.3	7/2 ⁻	0.0	5/2 ⁺	
260.5 3	6.5	260.5	5/2 ⁺	0.0	5/2 ⁺	I γ : out of total I γ =7.6, I γ =1.1 is assigned (by evaluator) to a 260 γ from 503 level, based on results from Coul. ex.
261.6 3	9.8	611.2	13/2 ⁻	349.6	9/2 ⁻	
286.3 3	59	307.9	(9/2 ⁺)	21.542	7/2 ⁺	
302.9 3	4.1	546.2	(5/2 ⁺)	243.3	7/2 ⁻	
306.0 3	42.8	502.0	15/2 ⁻	196.1	11/2 ⁻	
307.5 3	102	307.3	(7/2 ⁺)	0.0	5/2 ⁺	
325.6 3	12.5	522.1		196.5	(3/2 ⁺)	
332.3 3	27	332.3	3/2 ⁺ ,5/2 ⁺	0.0	5/2 ⁺	
340.1 3	7.3	600.6		260.5	5/2 ⁺	
343.8 3	7.7	587.1		243.3	7/2 ⁻	I γ : from adopted branchings, I γ ≈0.9 is expected to from the decay of 697.0 level.
348.6 3	4.4	698.1	(11/2 ⁻)	349.6	9/2 ⁻	

Continued on next page (footnotes at end of table)

$^{152}\text{Sm}(p,2n\gamma) E=12-22 \text{ MeV}$ **1983Bo23** (continued) $\gamma(^{151}\text{Eu})$ (continued)

E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
353.8 3	28	353.8	$5/2^-, 7/2^-$	0.0	$5/2^+$	
^x 380.4 3	5.5					
383.9 3	4.9	580.0		196.5	$(3/2)^+$	
389.7 3	6.8	697.0		307.3	$(7/2)^+$	
394.1 3	12.9	415.6	$(7/2^+)$	21.542	$7/2^+$	
407.4 3	5.2	714.6	$(9/2^+)$	307.3	$(7/2)^+$	
415.1 3	16.2	611.2	$13/2^-$	196.1	$11/2^-$	I_γ : based on $I_\gamma(416\gamma)/I_\gamma(394\gamma)=0.72$ 20 in 'adopted gammas' from decay of 416 level, $I_\gamma \approx 9$ should be associated with 416 level.
427.4 3	4.1	734.7		307.3	$(7/2)^+$	
429.3 3	5.9	1040.6	$17/2^-$	611.2	$13/2^-$	
444.4 3	11.0	752.4	$13/2^+$	307.9	$(9/2)^+$	
455.0 3	7.0	956.7	$19/2^-$	502.0	$15/2^-$	
462.2 3	6.3	973.3	$(15/2)^+$	511.1	$(11/2)^+$	
468.3 3	2.2	1220.7	$(17/2^+)$	752.4	$13/2^+$	
475.4 3	5.9	718.7	$(7/2^+, 9/2^+)$	243.3	$7/2^-$	
482.1 3	8.0	790.0	$(7/2, 11/2)$	307.9	$(9/2)^+$	
489.4 3	27.0	511.1	$(11/2)^+$	21.542	$7/2^+$	
499.6 3	13	499.8	$(7/2^+)$	0.0	$5/2^+$	
501.9 3	12.1	698.1	$(11/2^-)$	196.1	$11/2^-$	Additional information 1.
501.9 3	12.1	1112.9	$15/2^+$	611.2	$13/2^-$	
503.2 3	14.3	503.2	$9/2^+$	0.0	$5/2^+$	
^x 518.4 3	3.1					
522.8 3	6.0	1563.6	$21/2^-$	1040.6	$17/2^-$	
531.8 3	2.2	881.4	$(11/2^-)$	349.6	$9/2^-$	
533.5 3	2.0	1996.1	$(23/2^+)$	1462.6	$19/2^+$	Deexcites a 1507 level (1983Bo23).
538.4 3	3.3	1040.6	$17/2^-$	502.0	$15/2^-$	
545.8 3	7.9	1502.5	$(23/2)^-$	956.7	$19/2^-$	
^x 554.9 3	2.5					
579.0 3	5.8	600.5		21.542	$7/2^+$	
582.4 3	1.8	1093.5		511.1	$(11/2)^+$	
600 [‡] 1		1112.9	$15/2^+$	511.1	$(11/2)^+$	
610		1112.9	$15/2^+$	502.0	$15/2^-$	Complex line deexciting a 1564 level (1983Bo23).
610		1563.6	$21/2^-$	956.7	$19/2^-$	Complex line.
638.1 3	4.2	945.4		307.9	$(9/2)^+$	

[†] At 15 MeV.

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

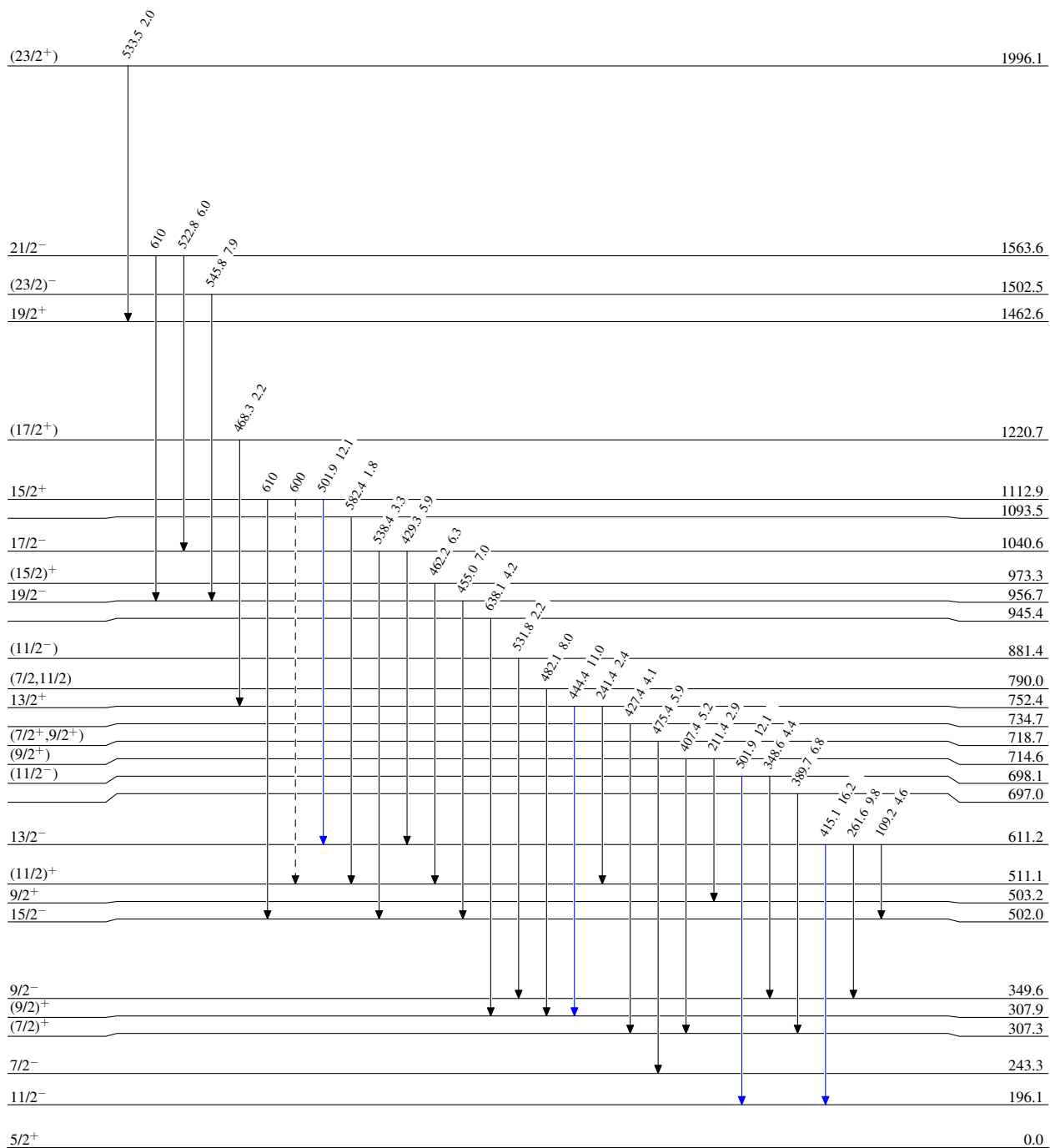
^x γ ray not placed in level scheme.

$^{152}\text{Sm}(p,2n\gamma) E=12-22 \text{ MeV}$ 1983Bo23

Legend

Level Scheme
Intensities: Relative I_γ

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



$^{151}_{63}\text{Eu}_{88}$

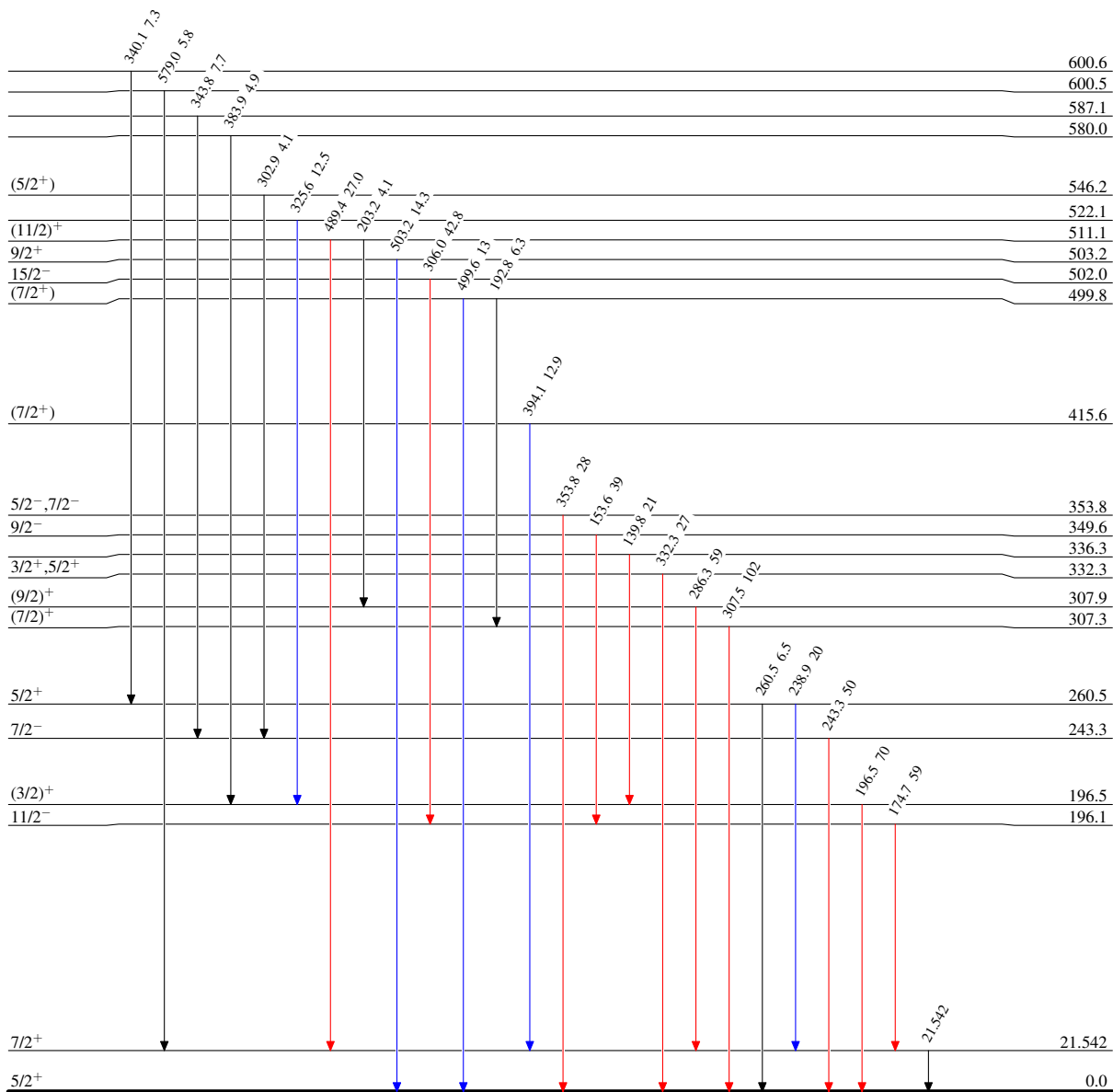
$^{152}\text{Sm}(p,2n\gamma) E=12-22 \text{ MeV}$ 1983Bo23

Level Scheme (continued)

Intensities: Relative I_γ

Legend

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



$^{151}_{63}\text{Eu}_{88}$