

$^{144}\text{Sm}(^{40}\text{Ar},3n\gamma)$  1997Va17

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 106, 367 (2005)	31-Aug-2005

E=175 MeV; unbacked target; fragment mass analyzer;  $\gamma$  detector array (10 Compton-suppressed Ge spectrometers); measured fragment- $\gamma$ - $\gamma$  coin,  $\gamma\gamma$  coin, fragment- $\gamma$  coin,  $E\gamma$ . E=180 MeV;  $\gamma$  detector array (12 Compton suppressed Ge detectors with multiplicity filter of 50 BGO detectors); measured  $E\gamma$  (>35 keV),  $I\gamma$ ,  $\gamma\gamma$  coin, DCO ratios (90°, 35° or 145°).

 $^{181}\text{Hg}$  Levels

E(level) <sup>†</sup>	J $\pi$ <sup>‡</sup>	Comments
0.0 <sup>#</sup>	1/2 <sup>-</sup>	
0.0+x <sup>&amp;</sup>	(7/2 <sup>-</sup> )	
0.0+y	(13/2 <sup>+</sup> )	Probably the oblate deformed $i_{13/2}$ isomeric state known in $A \geq 185$ odd-A Hg isotopes.
75.2+y <sup>b</sup> 13	(11/2 <sup>+</sup> )	
80.5 <sup>#</sup> 10	5/2 <sup>-</sup>	
90.7+x <sup>@</sup> 13	(9/2 <sup>-</sup> )	
248.4+x <sup>&amp;</sup> 10	(11/2 <sup>-</sup> )	
263.9 <sup>#</sup> 15	9/2 <sup>-</sup>	
315.7+y <sup>b</sup> 8	(15/2 <sup>+</sup> )	
400.1+x <sup>@</sup> 13	(13/2 <sup>-</sup> )	
416.8+y <sup>a</sup> 8	(17/2 <sup>+</sup> )	
535.2 <sup>#</sup> 18	13/2 <sup>-</sup>	
575.7+x <sup>&amp;</sup> 13	(15/2 <sup>-</sup> )	
656.3+y <sup>b</sup> 10	(19/2 <sup>+</sup> )	
766.3+x <sup>@</sup> 14	(17/2 <sup>-</sup> )	
794.2+y <sup>a</sup> 11	(21/2 <sup>+</sup> )	
889.7 <sup>#</sup> 20	17/2 <sup>-</sup>	
979.5+x <sup>&amp;</sup> 15	(19/2 <sup>-</sup> )	
1083.9+y <sup>b</sup> 12	(23/2 <sup>+</sup> )	
1198.6+x <sup>@</sup> 17	(21/2 <sup>-</sup> )	
1238.2+y <sup>a</sup> 15	(25/2 <sup>+</sup> )	
1325.3 <sup>#</sup> 23	21/2 <sup>-</sup>	
1453.6+x <sup>&amp;</sup> 18	(23/2 <sup>-</sup> )	
1587.9+y <sup>b</sup> 16	(27/2 <sup>+</sup> )	
1691.1+x <sup>@</sup> 20	(25/2 <sup>-</sup> )	
1749.4+y <sup>a</sup> 18	(29/2 <sup>+</sup> )	
1835.9 <sup>#</sup> 25	25/2 <sup>-</sup>	
1987.0+x <sup>&amp;</sup> 21	(27/2 <sup>-</sup> )	
2161.0+y <sup>b</sup> 19	(31/2 <sup>+</sup> )	
2240.6+x <sup>@</sup> 22	(29/2 <sup>-</sup> )	
2323.2+y <sup>a</sup> 21	(33/2 <sup>+</sup> )	
2411 <sup>#</sup> 3	29/2 <sup>-</sup>	
2786.0+y <sup>b</sup> 21	(35/2 <sup>+</sup> )	
2952.7+y <sup>a</sup> 23	(37/2 <sup>+</sup> )	

<sup>†</sup> From least-squares adjustment of  $E\gamma$ , allowing  $\Delta E_\gamma = 1$  keV for all transitions.

<sup>‡</sup> Authors' values, based on unenumerated DCO ratios, level systematics for heavier Hg isotopes and deduced band structure.

$^{144}\text{Sm}(^{40}\text{Ar},3n\gamma)$  1997Va17 (continued) $^{181}\text{Hg}$  Levels (continued)

- # Band(A): 1/2[521] band,  $\alpha=+1/2$ . The unfavored-signature partner of this band was not observed; large signature splitting is expected for the 1/2[521] orbital. Decoupled band built on prolate strongly deformed g.s.
- @ Band(B): 5/2[512] band,  $\alpha=+1/2$ . No signature splitting and very gradual alignment (as for 5/2[512] bands in N=101 isotones, where bandheads lie at 100-150 keV); B(M1)/B(E2) for  $\Delta J=1$  and  $\Delta J=2$  inband transitions from levels in this band indicate assignment of 5/2[512] orbital rather than the 7/2[514] orbital known in heavier Hg isotopes.
- & Band(b): 5/2[512] band,  $\alpha=-1/2$ . No signature splitting and very gradual alignment (as for 5/2[512] bands in N=101 isotones, where bandheads lie at 100-150 keV); B(M1)/B(E2) for  $\Delta J=1$  and  $\Delta J=2$  inband transitions from levels in this band indicate assignment of 5/2[512] orbital rather than the 7/2[514] orbital known in heavier Hg isotopes.
- <sup>a</sup> Band(C): 7/2[633] band,  $\alpha=+1/2$ . Probably analogous to mixed ( $\nu i_{13/2}$ ) bands in  $^{183}\text{Hg}$ ,  $^{185}\text{Hg}$  and  $^{187}\text{Hg}$  except that, here, the 7/2[633] rather than the 9/2[624] orbital is the predominant one. Prolate deformed structure.
- <sup>b</sup> Band(c): 7/2[633] band,  $\alpha=-1/2$ . Probably analogous to mixed ( $\nu i_{13/2}$ ) bands in  $^{183}\text{Hg}$ ,  $^{185}\text{Hg}$  and  $^{187}\text{Hg}$  except that, here, the 7/2[633] rather than the 9/2[624] orbital is the predominant one. Prolate deformed structure.

 $\gamma(^{181}\text{Hg})$ 

$E_\gamma$ †	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Comments
80.5	80.5	5/2 <sup>-</sup>	0.0	1/2 <sup>-</sup>	Includes contribution from Hg K $\beta$ x ray.
101.1	416.8+y	(17/2 <sup>+</sup> )	315.7+y	(15/2 <sup>+</sup> )	
137.9	794.2+y	(21/2 <sup>+</sup> )	656.3+y	(19/2 <sup>+</sup> )	
151.7	400.1+x	(13/2 <sup>-</sup> )	248.4+x	(11/2 <sup>-</sup> )	
157.7	248.4+x	(11/2 <sup>-</sup> )	90.7+x	(9/2 <sup>-</sup> )	
175.6	575.7+x	(15/2 <sup>-</sup> )	400.1+x	(13/2 <sup>-</sup> )	
183.4	263.9	9/2 <sup>-</sup>	80.5	5/2 <sup>-</sup>	
190.6	766.3+x	(17/2 <sup>-</sup> )	575.7+x	(15/2 <sup>-</sup> )	
213.2	979.5+x	(19/2 <sup>-</sup> )	766.3+x	(17/2 <sup>-</sup> )	
239.5	656.3+y	(19/2 <sup>+</sup> )	416.8+y	(17/2 <sup>+</sup> )	
240.5	315.7+y	(15/2 <sup>+</sup> )	75.2+y	(11/2 <sup>+</sup> )	
248.4‡	248.4+x	(11/2 <sup>-</sup> )	0.0+x	(7/2 <sup>-</sup> )	
271.3	535.2	13/2 <sup>-</sup>	263.9	9/2 <sup>-</sup>	
289.7	1083.9+y	(23/2 <sup>+</sup> )	794.2+y	(21/2 <sup>+</sup> )	
309.4‡	400.1+x	(13/2 <sup>-</sup> )	90.7+x	(9/2 <sup>-</sup> )	
315.7	315.7+y	(15/2 <sup>+</sup> )	0.0+y	(13/2 <sup>+</sup> )	
327.3‡	575.7+x	(15/2 <sup>-</sup> )	248.4+x	(11/2 <sup>-</sup> )	
340.6‡	656.3+y	(19/2 <sup>+</sup> )	315.7+y	(15/2 <sup>+</sup> )	
354.5	889.7	17/2 <sup>-</sup>	535.2	13/2 <sup>-</sup>	
366.2‡	766.3+x	(17/2 <sup>-</sup> )	400.1+x	(13/2 <sup>-</sup> )	
377.4‡	794.2+y	(21/2 <sup>+</sup> )	416.8+y	(17/2 <sup>+</sup> )	
403.8‡	979.5+x	(19/2 <sup>-</sup> )	575.7+x	(15/2 <sup>-</sup> )	
416.8‡	416.8+y	(17/2 <sup>+</sup> )	0.0+y	(13/2 <sup>+</sup> )	
427.6‡	1083.9+y	(23/2 <sup>+</sup> )	656.3+y	(19/2 <sup>+</sup> )	
432.3	1198.6+x	(21/2 <sup>-</sup> )	766.3+x	(17/2 <sup>-</sup> )	
435.6	1325.3	21/2 <sup>-</sup>	889.7	17/2 <sup>-</sup>	
444.0	1238.2+y	(25/2 <sup>+</sup> )	794.2+y	(21/2 <sup>+</sup> )	
474.1	1453.6+x	(23/2 <sup>-</sup> )	979.5+x	(19/2 <sup>-</sup> )	
492.5	1691.1+x	(25/2 <sup>-</sup> )	1198.6+x	(21/2 <sup>-</sup> )	
504.0	1587.9+y	(27/2 <sup>+</sup> )	1083.9+y	(23/2 <sup>+</sup> )	
510.6	1835.9	25/2 <sup>-</sup>	1325.3	21/2 <sup>-</sup>	
511.2	1749.4+y	(29/2 <sup>+</sup> )	1238.2+y	(25/2 <sup>+</sup> )	
533.4	1987.0+x	(27/2 <sup>-</sup> )	1453.6+x	(23/2 <sup>-</sup> )	
549.5	2240.6+x	(29/2 <sup>-</sup> )	1691.1+x	(25/2 <sup>-</sup> )	
573.1	2161.0+y	(31/2 <sup>+</sup> )	1587.9+y	(27/2 <sup>+</sup> )	
573.8	2323.2+y	(33/2 <sup>+</sup> )	1749.4+y	(29/2 <sup>+</sup> )	

Continued on next page (footnotes at end of table)

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 $^{144}\text{Sm}(^{40}\text{Ar},3n\gamma)$  **1997Va17 (continued)**

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 $\gamma(^{181}\text{Hg})$  (continued)

$E_\gamma$ †	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$
575.2	2411	29/2 <sup>-</sup>	1835.9	25/2 <sup>-</sup>
625.0 <sup>#</sup>	2786.0+y?	(35/2 <sup>+</sup> )	2161.0+y	(31/2 <sup>+</sup> )
629.5 <sup>#</sup>	2952.7+y?	(37/2 <sup>+</sup> )	2323.2+y	(33/2 <sup>+</sup> )

† Uncertainties unstated by authors.

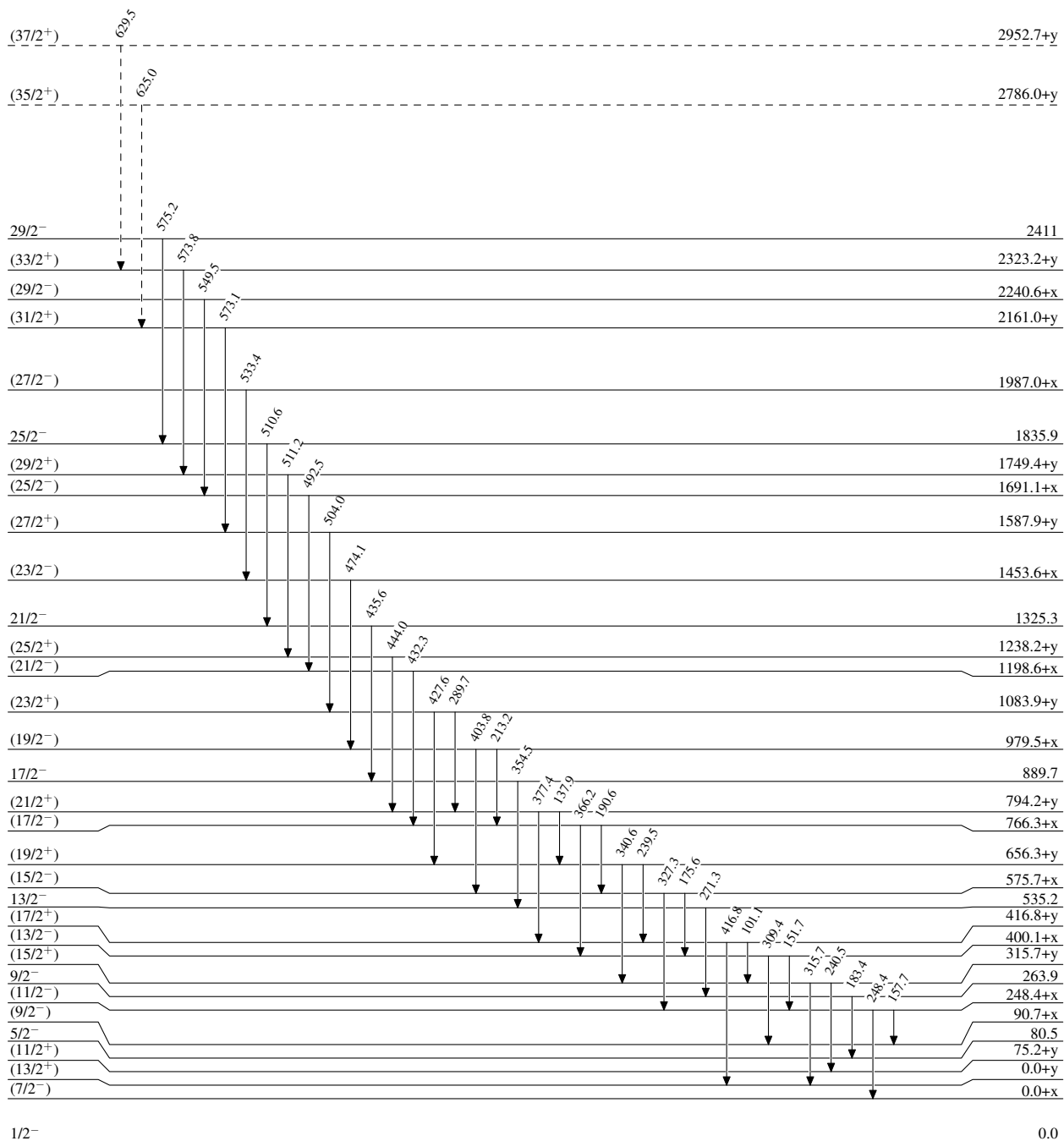
‡ Based on width of transition drawn in the level scheme, this is the strongest of the  $\gamma$ 's deexciting the parent level.

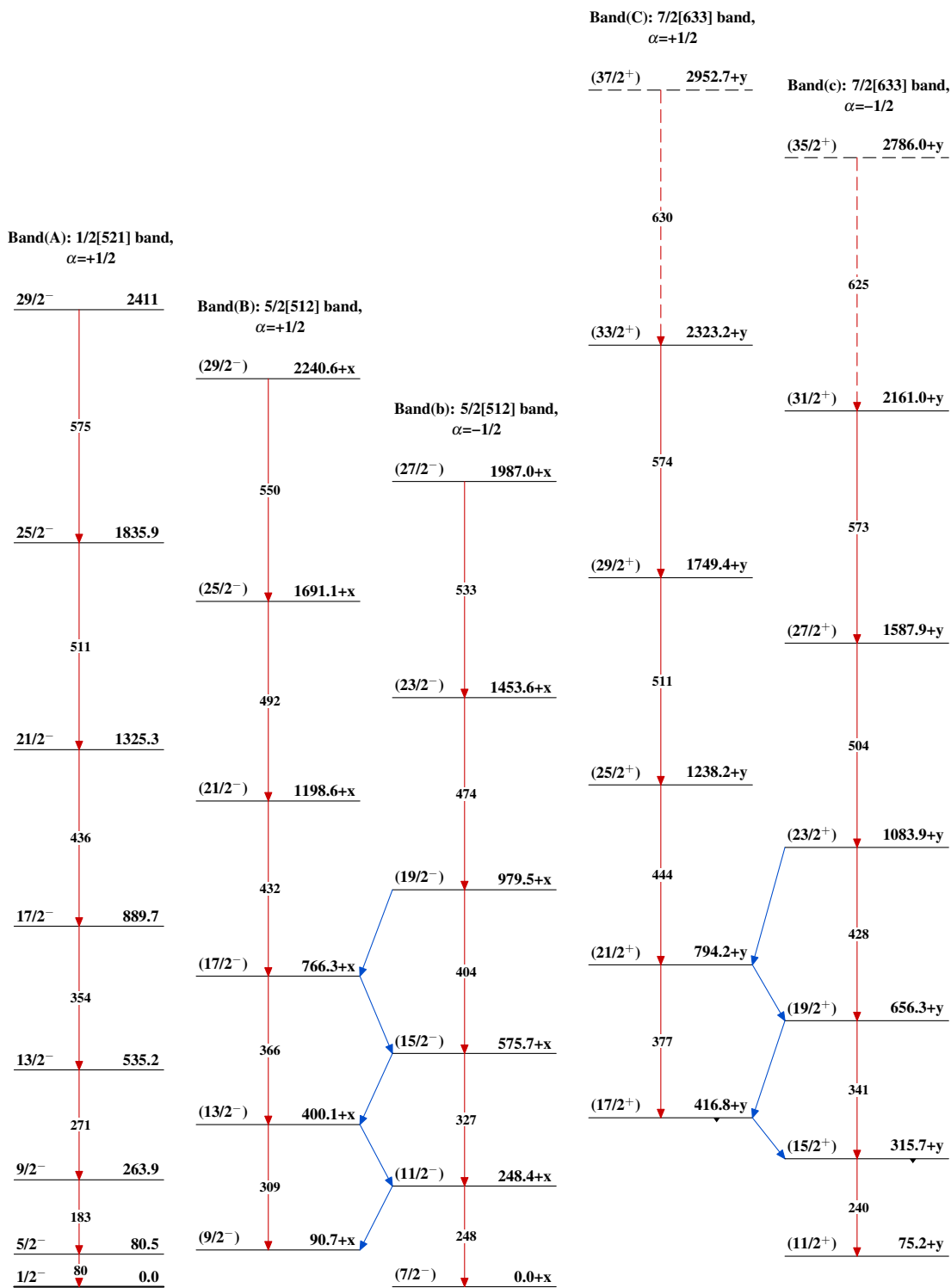
# Placement of transition in the level scheme is uncertain.

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Legend

## Level Scheme

-----►  $\gamma$  Decay (Uncertain) $^{181}_{80}\text{Hg}_{101}$

$^{144}\text{Sm}(^{40}\text{Ar},3n\gamma)$  1997Va17 $^{181}_{80}\text{Hg}_{101}$