

$^{174}\text{Yb(d,t)}$  1977Ta13

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	V. S. Shirley	NDS 75,377 (1995)	1-Oct-1993

E(d)=14 MeV,  $\theta=16^\circ-120^\circ$  (4 angles used); enriched Yb oxide targets (95.8%); measured E(level) (100-centimeter broad-range mag spect), differential cross sections, angular distributions; analyzed level structure, incorporating earlier analysis by 1966Bu16. Other: 1969Ga02.

$^{173}\text{Yb Levels}$

E(level)	$J^\pi$ <sup>†</sup>	L <sup>‡</sup>	S <sup>#</sup>	Comments
0.0 <sup>&amp;</sup>	5/2 <sup>-</sup>	3	0.047	
78.2 <sup>&amp;</sup> 7	7/2 <sup>-</sup>	3	0.633	
179.2 <sup>&amp;</sup> 7	9/2 <sup>-</sup>	5	0.189	
302.1 <sup>&amp;</sup> 7	11/2 <sup>-</sup>	5	0.098	
400.4 <sup>b</sup> 7	1/2 <sup>-</sup>	1	0.373	
412.0 <sup>a</sup> 9	9/2 <sup>+</sup>	4	0.422	
462.5 <sup>b</sup> 7	3/2 <sup>-</sup>	1	0.024	
482.0 <sup>b</sup> 7	5/2 <sup>-</sup>	3	0.129	
602.9 <sup>a</sup> 7	(13/2) <sup>+</sup>	6	1.380	
626.2 <sup>b</sup> 7	7/2 <sup>-</sup>	3	0.233	
637.7 <sup>c</sup> 10	7/2 <sup>-</sup>			
659.4 <sup>b</sup> 8	9/2 <sup>-</sup>			
749.1 <sup>c</sup> 8	(9/2 <sup>-</sup> )			
882.7 <sup>b</sup> 7	(11/2 <sup>-</sup> )			
1032.2 <sup>@d</sup> 18	(1/2 <sup>-</sup> )			
1074.2 <sup>d</sup> 8	(3/2 <sup>-</sup> )	1	0.025	
1121.6 <sup>d</sup> 8	(5/2 <sup>-</sup> )	3	0.062	
1172.1 <sup>g</sup> 7	(9/2 <sup>-</sup> )	5	0.523	
1219.7 <sup>@d</sup> 9	(7/2 <sup>-</sup> )			
1232.2 <sup>e</sup> 7	(3/2 <sup>-</sup> )	1	0.386	
1287.5 <sup>e</sup> 10	(5/2 <sup>-</sup> )			
1306.0 <sup>@d</sup> 15	(9/2 <sup>-</sup> )			
1329.9 12				
1339.9 <sup>f</sup> 12	(3/2 <sup>-</sup> )			
1362.2 <sup>e</sup> 7	(7/2 <sup>-</sup> )	(3)	0.357	L: a second, but less probable fit gives L=2.
1406.1 <sup>f</sup> 9	(5/2 <sup>-</sup> )			
1443.6 7	(7/2 <sup>+</sup> ,9/2 <sup>+</sup> )	(4)	0.452	L: a second, but less probable fit gives L=3. S: for $J^\pi=7/2^+$ ; S=0.371 for $J^\pi=9/2^+$ .
1460.8 <sup>de</sup> 11	(9/2 <sup>-</sup> ),(11/2 <sup>-</sup> )			Possible doublet; 11/2 <sup>-</sup> 1/2[510] and 9/2 <sup>-</sup> 3/2[521] assignments equally plausible.
1492.9 <sup>f</sup> 8	(7/2 <sup>-</sup> )			See comment with 1494.4 level in (d,p).
1506.8 12				See comment with 1494.4 level in (d,p).
1520.6 10				
1531.4 10		2,3,4		S=0.031 for $J^\pi=3/2^+$ ; S=0.023 for $J^\pi=5/2^+$ , S=0.067 for $J^\pi=5/2^-$ , S=0.055 for $J^\pi=7/2^-$ , S=0.267 for $J^\pi=7/2^+$ , and S=0.173 for $J^\pi=9/2^+$ .
1578.2 <sup>@e</sup> 23	(11/2 <sup>-</sup> )			
1586.9 <sup>j</sup> 9	(13/2 <sup>+</sup> )	5,6		S=1.470 for $J^\pi=13/2^+$ ; S=0.853 for 9/2 <sup>-</sup> , S=0.543 for $J^\pi=11/2^-$ , and S=2.262 for $J^\pi=11/2^+$ .
1607.3 <sup>fh</sup> 8	(5/2 <sup>+</sup> ),(9/2 <sup>-</sup> )	(2)	0.106	Possible doublet (?); earlier data are consistent with 9/2 <sup>-</sup> 3/2[512], and newer data with 5/2 <sup>+</sup> 3/2[651]; energy fits are excellent for both. L: a second, but less probable fit gives L=3.

Continued on next page (footnotes at end of table)

$^{174}\text{Yb}(\text{d,t})$  **1977Ta13 (continued)** $^{173}\text{Yb}$  Levels (continued)

E(level)	$J^{\pi\dagger}$	$L^{\ddagger}$	S <sup>#</sup>	Comments
1629.2 8				S: for $J^{\pi}=3/2^{+}$ ; S=0.064 for $J^{\pi}=5/2^{+}$ .
1639.9 10		4,5,6		S=0.070 for $J^{\pi}=7/2^{+}$ ; S=0.038 for $J^{\pi}=9/2^{+}$ , S=0.277 for $J^{\pi}=9/2^{-}$ , S=0.176 for $J^{\pi}=11/2^{-}$ , S=0.706 for $J^{\pi}=11/2^{+}$ , and S=0.453 for $J^{\pi}=13/2^{+}$ .
1665.6 9	$1/2^{-}, 3/2^{-}$	(1)	0.021	L: a second, but less probable fit gives L=2. S: for $J^{\pi}=1/2^{-}$ ; S=0.019 for $J^{\pi}=3/2^{-}$ .
1708.6 11	$(5/2^{-}, 7/2^{-})$			
1721.3 <sup>h</sup> 9	$(9/2^{+})$	(4)	0.316	L: a second, but less probable fit gives L=3. S: for $J^{\pi}=9/2^{+}$ ; S=0.383 for $J^{\pi}=7/2^{+}$ .
1735.8 8	$(1/2^{-}, 3/2, 5/2^{+})$	(2)	0.712	L: a second, but less probable fit gives L=1 (the opposite is true in (d,p)). S: for $J^{\pi}=3/2^{+}$ ; S=0.169 for $J^{\pi}=5/2^{+}$ .
1746.1 <sup>f</sup> 11	$(11/2^{-})$			
1759.8 <sup>@</sup> 12	$(^{-})$			
1776.3 8	$3/2^{+}, 5/2, 7/2^{-}$	2,3		S=0.131 for $J^{\pi}=3/2^{+}$ ; S=0.154 for $J^{\pi}=5/2^{+}$ , S=0.261 for $J^{\pi}=5/2^{-}$ , and S=0.199 for $J^{\pi}=7/2^{-}$ .
1814.0 11				
1829.0 8		4,5,6		S=0.101 for $J^{\pi}=7/2^{+}$ ; S=0.084 for $J^{\pi}=9/2^{+}$ , S=0.594 for $J^{\pi}=9/2^{-}$ , S=0.379 for $J^{\pi}=11/2^{-}$ , S=1.637 for $J^{\pi}=11/2^{+}$ , and S=0.122 for $J^{\pi}=13/2^{+}$ .
1866.7 <sup>i</sup> 8	$(7/2)^{-}$	3	1.663	S: for $J^{\pi}=7/2^{-}$ ; S=2.172 for $J^{\pi}=5/2^{-}$ .
1894.2 8	$(3/2^{+}, 5/2^{+})$	(2)	0.432	L: a second, but less probable fit gives L=3. S: for $J^{\pi}=3/2^{+}$ ; S=0.344 for $J^{\pi}=5/2^{+}$ .
1922.5 8	$(3/2^{+}, 5/2^{+})$	(2)	0.328	L: a second, but less probable fit gives L=3. S: for $J^{\pi}=3/2^{+}$ ; S=0.261 for $J^{\pi}=5/2^{+}$ .
1932.6 9	$(1/2^{-}, 3/2^{-})$	(1)	0.115	L: a second, but less probable fit gives L=2. S: for $J^{\pi}=1/2^{-}$ ; S=0.104 for $J^{\pi}=3/2^{-}$ .
1944.1 10	$3/2^{+}, 5/2, 7/2^{-}$	2,3		S=0.174 for $J^{\pi}=3/2^{+}$ ; S=0.137 for $J^{\pi}=5/2^{+}$ , S=0.234 for $J^{\pi}=5/2^{-}$ , and S=0.180 for $J^{\pi}=7/2^{-}$ .
1980.3 8				
1987.2 8				
2006.2 11				
2016.9 8				
2030.4 18				
2043.8 9				
2051.5 10				
2077.1 16				
2086.1 13				
2107.0 9				
2130.7 10				
2136.3 10				
2162.5 10				
2176.9 9				
2199.8 10				
2212.4 12				
2231.5 11				
2245.0 8				
2255.5 10				
2267.6 12				
2277.9 12				
2312.9 9				
2331.9 9				

<sup>†</sup> From consistency of level energies, angular distributions, spectroscopic factors, and relative and absolute cross sections for (d,p) and (d,t) with systematic properties of odd-mass Yb nuclei (1966Bu16,1977Ta13); see  $^{173}\text{Yb}$  Adopted Levels for evaluator's

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 $^{174}\text{Yb}(\text{d,t})$  **1977Ta13 (continued)**

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 $^{173}\text{Yb}$  Levels (continued)

assignments.

‡ DWBA analysis of angular distributions.

# Relative spectroscopic factor.

@ Not observed in (d,t); level was added from (d,p) data to make  $J^\pi$  summary and rotational-band analysis complete.

& 5/2[512] band member.

<sup>a</sup> 7/2[633] band member.

<sup>b</sup> 1/2[521] band member.

<sup>c</sup> 7/2[514] band member.

<sup>d</sup> 1/2[510] band member.

<sup>e</sup> 3/2[521] band member.

<sup>f</sup> 3/2[512] band member.

<sup>g</sup> 5/2[523] band member.

<sup>h</sup> 3/2[651] band member.

<sup>i</sup> 7/2[503] band member.

<sup>j</sup> 5/2[642] band member (tentative assignment).