$^{174}$**Yb(d,p),**$^{176}$**Yb(d,t)**     **1979Ta04**

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | M. Shamsuzzoha Basunia | NDS 102, 719 (2004) | 1-Jun-2004 |

14-MeV deuteron beam. Enriched targets: 95.8% $^{174}$Yb, 96.2 $^{176}$Yb. Measured p and t spectra. Magnetic spectrograph, FWHM=5-10 keV. Measured angular distributions in the range of 20° to 120° in 10° steps. Also measured distributions of scattered d, for normalization purposes.

Others: 1966Bu16, 1969Ga02, 1970Wh05.

### $^{175}$Yb Levels

| E(level)$^{†}$ | J$^{\pi ‡}$ | L$^{#}$ | C$^2$S$^{@}$ | Comments |
|---|---|---|---|---|
| 0.0$^{\&}$ *11* | 7/2$^-$ | | | |
| 104.1$^{\&}$ *7* | (9/2)$^-$ | 5 | 0.472 | |
| 231.8$^{\&}$ *13* | (11/2$^-$) | | | |
| 266.8$^{a}$ *9* | (9/2$^+$) | | | |
| 385.5$^{a}$ *17* | (11/2$^+$) | | | |
| 522.2$^{a}$ *10* | (13/2)$^+$ | 6$^{g}$ | 0.434 | |
| 557.0$^{b}$ *7* | (3/2)$^-$ | 1 | 0.042 | L=1, C$^2$S=0.226 for (d,p). |
| 603.3$^{b}$ *7* | (5/2)$^-$ | 3$^{g}$ | 0.060 | L=3, C$^2$S=0.398 for (d,p). |
| 639.2$^{c}$ *11* | (5/2)$^-$ | 3 | 0.038 | |
| 698.0$^{b}$ *8* | (7/2)$^-$ | 3$^{h}$ | 0.045 | C$^2$S: from (d,p). |
| 729.4$^{c}$ *7* | (7/2)$^-$ | 3 | 0.726 | L=3, C$^2$S=0.055 for (d,p). |
| 781.3$^{b}$ *14* | | | | |
| 811.2$^{d}$ *7* | (3/2)$^-$ | 1$^{h}$ | 0.054 | C$^2$S: from (d,p). |
| 844.1$^{c}$ *14* | | | | |
| 872.3$^{d}$ *7* | (5/2)$^-$ | 3 | 0.064 | L=3, C$^2$S=0.258 for (d,p). |
| 919.1$^{e}$ *13* | (1/2)$^-$ | 1 | 0.282 | |
| 957.4$^{d}$ *8* | (7/2)$^-$ | 3$^{h}$ | 0.051 | C$^2$S: from (d,p). |
| 983.0$^{c}$ *15* | | | | |
| 991.1$^{e}$ *13* | (3/2)$^-$ | 1 | 0.020 | |
| 1008.2 *12* | | 2,3 | 0.033,0.129 | C$^2$S: for 5/2$^+$ and 5/2$^-$, respectively. |
| 1021.5 *23* | | | | |
| 1035.0 *21* | | | | |
| 1062.2 *10* | | | | |
| 1073.3$^{i}$ *17* | | | | Possible 9/2$^-$,3/2[512] state. |
| 1097.3 *9* | | 3 | 0.077,0.059 | |
| 1117.6 *13* | | | | |
| 1156.5$^{i}$ *16* | | | | |
| 1174.8$^{e}$ *9* | (7/2)$^-$ | 3 | 0.164 | |
| 1195.2 *15* | | | | |
| 1204.2 *13* | | | | Possible 9/2$^-$,1/2[521] state. |
| 1210.3$^{i}$ *14* | | | | Possible 11/2$^-$,3/2[512] state. |
| 1222.9$^{i}$ *14* | | | | |
| 1262.0 *15* | | | | |
| 1290.0 *12* | | | | |
| 1308.4 *10* | | | | |
| 1346.4 *11* | (13/2$^+$) | (6)$^{g}$ | 0.979 | Possible 13/2$^+$,7/2[633] state (1966Bu16). |
| 1355.9$^{f}$ *8* | (1/2$^+$) | (0)$^{hj}$ | 0.793 | C$^2$S: from (d,p). |
| 1367.4$^{f}$ *8* | (5/2$^+$) | (2)$^{hj}$ | 0.488 | C$^2$S: from (d,p). l value not shown in Table 1, but stated in the text p 687, 2nd col. |
| 1424.9 *8* | 7/2$^+$,9/2$^+$ | 4$^{h}$ | 1.51,1.21 | C$^2$S: from (d,p). |

Continued on next page (footnotes at end of table)

## $^{174}$Yb(d,p),$^{176}$Yb(d,t)    1979Ta04 (continued)

### $^{175}$Yb Levels (continued)

| E(level)[†] | J$^{\pi}$[‡] | L[#] | C$^2$S[@] | Comments |
|---|---|---|---|---|
| 1461.1[f] 9 | 3/2$^+$,5/2$^+$ | 2[h] | 0.202,0.135 | C$^2$S: from (d,p). Possible doublet. |
| 1497.4 12 | | | | |
| 1517.1 13 | 7/2$^+$,9/2$^+$ | | | |
| 1536.0 14 | | | | |
| 1549.5 16 | 3/2$^+$,5/2$^+$ | | | |
| 1566.6 19 | | | | |
| 1581.4 26 | | | | |
| 1604.2 14 | | | | |
| 1620.6 12 | 1/2$^-$,3/2$^-$ | | | |
| 1628.2 11 | 1/2$^-$,3/2$^-$ | 1 | 0.098,0.089 | |
| 1636.4 14 | | | | |
| 1642.2 15 | | | | |
| 1650.4 14 | | | | |
| 1671.5 15 | | | | |
| 1685.8 10 | 1/2$^-$,3/2$^-$ | 1 | 0.017,0.016 | |
| 1743.4 12 | | | | |
| 1749.7 11 | | | | |
| 1754.3 16 | | | | |
| 1775.5 17 | 5/2$^-$,7/2$^-$ | 3 | 0.203,0.154 | |
| 1802.2 18 | | | | |
| 1808.7 18 | | | | |
| 1815.2 16 | | | | |
| 1822.9[i] 16 | | | | |
| 1833.9 16 | | | | |
| 1842.0 12 | | | | |
| 1851.8 16 | | | | |
| 1861.1 15 | | | | |
| 1870.8 12 | | | | |
| 1876.5 15 | | | | |
| 1881.6 15 | | | | |
| 1902.4 12 | | | | |
| 1911.6 15 | | | | |
| 1918.9 14 | | | | |
| 1932.5 17 | | | | |
| 1948.9 15 | | | | |
| 1960.9[i] 12 | | | | |
| 1966.0 12 | | | | |
| 1979.1 10 | | | | |
| 1989.9 14 | | | | |
| 1997.6 13 | | | | |
| 2023.8 10 | | | | |
| 2040.4 11 | | | | |
| 2053.9[i] 11 | | | | |
| 2091.9 12 | | | | |
| 2108.2 9 | | | | |
| 2119.4 15 | | | | |
| 2131.7 12 | | | | |
| 2142.6 10 | | | | |
| 2162.6 20 | | | | |
| 2181.7 9 | | | | |
| 2195.8 11 | | | | |
| 2209.1 17 | | | | |
| 2215.8 14 | | | | |
| 2220.5 17 | | | | |
| 2234.2 11 | 3/2$^+$,5/2$^+$ | 2[h] | 0.173,0.115 | C$^2$S: from (d,p). |
| 2251.4 10 | | | | |

## ${}^{174}$Yb(d,p),${}^{176}$Yb(d,t)    1979Ta04 (continued)

### ${}^{175}$Yb Levels (continued)

| E(level)[†] | J$^\pi$[‡] | L[#] | C$^2$S[@] | Comments |
|---|---|---|---|---|
| 2279.5 _12_ | | | | |
| 2284.5 _12_ | 5/2$^-$,7/2$^-$ | 3$^h$ | 0.128,0.096 | C$^2$S: from (d,p). L=3 for 2284 _2301_01 doublet. |
| 2300.7 _10_ | 3/2$^+$,5/2$^+$ | 2 | 0.062,0.053 | |
| 2317.6 _9_ | | 2,4$^{gh}$ | | |
| 2331.2 _12_ | 3/2$^+$,5/2$^+$ | 2 | 0.139,0.118 | |
| 2349.1 _12_ | | | | |
| 2366.5 _15_ | | | | |
| 2385.9 _11_ | | | | |
| 2398.9 _10_ | 3/2$^+$,5/2$^+$ | 2 | 0.051,0.043 | |
| 2415.9 _16_ | | | | |
| 2431.1 _15_ | | | | |
| 2438.4 _12_ | 3/2$^+$,5/2$^+$ | 2 | 0.076,0.064 | |
| 2450.9 _16_ | | | | |
| 2458.4$^i$ _15_ | | | | |
| 2471.0 _10_ | | | | |
| 2491.4 _14_ | 3/2$^+$,5/2$^+$ | 2 | 0.240,0.203 | C$^2$S: for 2491 _2507_07 doublet. |
| 2506.7 _23_ | | | | |
| 2515.0 _13_ | | | | |
| 2523.5$^i$ _18_ | | | | |
| 2533.5 _12_ | | | | |
| 2541.6 _11_ | 3/2$^+$,5/2$^+$ | 2 | 0.047,0.039 | |
| 2552.1 _13_ | | | | |
| 2571.6 _16_ | | | | |
| 2583.3 _16_ | | | | |
| 2599.8 _14_ | | | | |
| 2613.5 _14_ | | | | |
| 2630.1 _11_ | | 2,3$^g$ | 0.110,0.116 | C$^2$S: for J$^\pi$=5/2$^+$ and J$^\pi$=7/2$^-$, respectively. |
| 2646.4 _22_ | | | | |
| 2662.2 _14_ | | | | |
| 2677.7 _15_ | | | | |
| 2693.2 _14_ | | | | |
| 2712.3 _13_ | | | | |
| 2737.1 _14_ | | | | |

[†] Authors' weighted average from (d,p) and (d,t) (1979Ta04).

[‡] Spin and parity, and Nilsson orbital assignments are mainly based on the comparison of experimental cross-sections with values calculated using the DWBA approximation and Nilsson's model, measured L-value transfers, energy systematics of Nilsson orbitals in neighboring odd-A Yb nuclei, and rotational structure. (1966Bu16,1979Ta04).

[#] From comparison of measured angular distribution with DWBA calculations. Values are for (d,t), except as noted.

[@] Values for (d,t): d$\sigma$/d$\Omega$(exp)/n d$\sigma$/d$\Omega$(DWBA), with N=3.33, values for (d,p), given in comments, are for N=1.53. When two values are given, they correspond to the two possible J$^\pi$ assignments.

[&] 7/2(514) band.

[a] 9/2(624) band.

[b] 1/2(510) band.

[c] 5/2(512) band.

[d] 3/2(512) band.

[e] 1/2(521) band.

[f] 1/2(651) band.

[g] Fit of angular distribution with a single L transfer is poor.

[h] From (d,p).

<u>$^{174}$Yb(d,p),$^{176}$Yb(d,t)</u>     **1979Ta04 (continued)**

<u>$^{175}$Yb Levels (continued)</u>

$^{i}$ May contain contribution from a contaminant.
$^{j}$ Unresolved doublet in angular distribution measurements suggests L=2 member is dominant.

<u>$^{174}$Yb(d,p),$^{176}$Yb(d,t)</u>     **1979Ta04 (continued)**