^{173}Yb(d,t) 1972On01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 75,199 (1995)	31-May-1995

$J^{\pi}(^{173}Yb$ g.s.)=5/2$^-$[512].

E=12 MeV. Enriched (95%) target. FWHM≈7 keV. Measured cross sections at θ(lab)=60° and 120°. DWBA calculations.

Others:

1967Bu21: E=12 MeV. FWHM≈11 keV. Measured cross sections at 60° and 90°. Levels reported up to 2228 keV. DWBA calculations.

1976TaZZ: E=14 MeV. Enriched target. Measured cross sections at 60°, 90°, 120° for 30 levels below 2010 keV. Uncertainties are 25% on absolute cross sections and≈20% on relative values.

1982BuZK: E=15 MeV. Measured $\sigma(\theta)$ for 20 angles between θ=6° to 70°. Results of this study are not yet available.

Cross section data (1972On01)

Level	dσ/dΩ (μb/sr) at 120 °	Level	dσ/dΩ (μb/sr) at 120 °
0	1.3 3	2295	6.4 6
79	70 2	2317	6.8 7
261	56 2	2328	3.7 5
543	8.6 6	2346	4.7 6
917	0.6 2	2360	4.7 7
1043	0.3 2	2410	3.3 4
1117	25 2	2456	3.3 4
1172	78 2	2476	1.9 11
1198	3.1 4	2545	7.5 9
1222	5.7 6	2552	3.9 8
1262	23 1	2560	5.5 8
1286	18 1	2582	5.1 35
1330	6.3 6	2586	7 6
1352	9.7 10	2595	42 21
1375	17 2	2622	9 1
1465	18 1	2647	5.6 6
1475	3.6 5	2665	8.4 9
1496?	6.2 6	2674	13 1
1509	8.2 11	2686	4.2 6
1541	7.5 12	2697	21 1
1549	17 2	2718	4.6 7
1559	8.1 16	2731	5.1 6
1578?	1.7 3	2741	8.5 9
1608	72 2	2766	2.2 4
1636	3.3 3	2777	3.2 28
1661	52 7	2780	11 5
1668	18 4	2787	14 7
1700	14 1	2791	34 9
1720	2.9 6	2809	8.0 11
1748	9.4 9	2817	10 2
1757	5.7 9	2831	15 2
1779	6.1 6	2861	4.7 6
1804	22 11	2879	9.1 9
1811	6 3	2887	2.8 7
1823	2.2 4	2909	4.6 7
1862	5.5 6	2918	4.3 6
1887	2.6 4	2936	8.2 14
1918	2.4 10	2960	6.4 7
1927	11 2	2997	5.5 7
1956	1.8 4	3014	4.2 6
1967	6.5 7	3067	8.5 11
2009	10 1	3072	4.9 12
2047	9.1 7	3081	3.5 12
2075	3.2 6	3085	8.9 14

2101	3.1 8	3101	8.4 19
2111	7.7 19	3107	8.7 17
2119	0.7 6	3120	8.7 13
2181	7.9 8	3127	4.9 9
2193	2.2 4	3138	8.1 8
2215	1.6 4	3146	4.2 7
2226	2.9 6		
2272	3.6 5		

Cross sections at 60 ° are given by 1972On01 for levels up to 2552 keV. Cross sections at 60 ° and 90 ° are also given by 1967Bu21 for levels up to 2228 keV.

$\sigma(^3He,\alpha)(50°)/\sigma(d,t)$ (120 °) (1972On01)

Level	Experimental	Predicted
79	0.055 6	0.046
261	0.055 6	0.075
543	0.12 3	0.093
1172	0.049 7	0.016
1262	0.095	0.095
1330	0.60 26	1.2
1352	1.2 4	1.8
1375	0.15 6	0.018
1541	3.3 7 a)	2.3
1559	3.0 7 a)	2.6
1661	0.30 7 a)	0.98
1668	0.85 25 a)	1.2
1700	0.41 12	0.083
1748	0.27 7	1.0
1804	1.3 7 a)	0.27
1811	4.6 25	2.7
1823	1.8 9	3.3
1862	0.29 14 a)	1.1
1927	0.20 6	0.53
1967	2.4 5	3.2
2009	0.19 6	0.037
2047	0.36 6	0.17
2111	0.36 10	0.25
2181	0.35 7	1.0
2346	1.8 4	2.2
2545	2.1 4	4.5
2697	0.75 11 a)	0.55
2741	2.4 4	6.0
2787	4.4 23	2.8
2817	1.3 4 a)	0.91

a): total intensity of the multiplet in ($^3He,\alpha$) is assigned to this level

Cross section data at 90 ° (1976TaZZ)

Level	dσ/dΩ (μb/sr)	Level	dσ/dΩ (μb/sr)
78.5 7	84	1542.2 14	18
258.8 8	72	1550.0 9	44
539.4 11	11	1608.9 8	129
1118.7 17	43	1637.7 21	13
1173.8 16	136	1661.8 10	76
1222.9 11	12	1670.2 12	63
1262.7 8	37	1701.5 10	35
1285.8 9	29	1749.2 9	19
1330.1 15	10	1757.2 9	13
1353.2 10	16	1779.3 13	16
1375.4 8	33	1803.9 8	32
1465.2 9	35	1810.6 12	22

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   1476.7 15         11       1926.9 9        26
   1495.0 13         11       1966.1 11       18
   1509.2 13         13       2008.5 11       23

   1976TaZZ give relative cross sections at 60 ° and 120 °
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^{172}Yb Levels

The quasiparticle configurations given here are components deduced from a comparison of experimental and theoretical cross sections (1972On01). Other configurations may contribute which are not expected to be populated in this reaction.

E(level)[†]	J$^{\pi}$[‡]	σ(experimental)/σ(predicted) (1972On01)[#]	Comments
0[@]	0$^+$	6.5	
79[@]	2$^+$	0.93	
261[@]	4$^+$	1.1	
543[@]	6$^+$	2.9	
917[@]	8$^+$		σ(exp)=0.6 μb/sr is somewhat higher than σ(predicted)=0.
1043[&]	0$^+$		
1117[&]	2$^+$		
1172[a]	3$^+$	0.49	
1198			
1222[b]	3$^-$	1.8	
1262[a]	4$^+$	0.51	
1286[&]	4$^+$		
1330[b]	4$^-$	1.3	
1352[b]	(5$^-$)	1.3	
1375[a]	5$^+$	0.57	
1415?			E(level): reported by 1967Bu21 only.
1465[c]	2$^+$		
1475			
1496?			E(level): probably a contaminant due to ^{174}Yb.
1509[a]	6$^+$	0.9	
1541[b]	6$^-$,7$^-$	1.2	J$^{\pi}$: 6$^-$ or 7$^-$ member.
1549[c]	3$^+$		
1559[b]	6$^-$,7$^-$	2.6	J$^{\pi}$: 6$^-$ or 7$^-$ member.
1578?			E(level): probably a contaminant due to ^{174}Yb.
1608[d]	2$^+$	0.70	
1636			
1661[e]	3$^+$	2.3	
1668[f]	(7$^-$)	2.2	
1700[d]	3$^+$	0.30	
1720			
1748[e]	4$^+$	0.8	
1757			
1779			
1804[d]	4$^+$	0.9	
1811[f]	(8$^-$)	0.7	
1823[b]	(8$^-$)	3.1	

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^{173}Yb(d,t) 1972On01 (continued)

^{172}Yb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	σ(experimental)/σ(predicted) (1972On01)[#]
1862[e]	(5)$^+$	1.0
1887		
1918		
1927[d]	5$^+$	0.8
1956		
1967[f]	(9$^-$)	1.3
2009[g]	1$^+$	0.65
2047[g]	(2)$^+$	0.51
2075[d]	(6$^+$)	0.8
2101		
2111[g]	(3$^+$)	0.25
2119		
2181[h]	(6$^-$)	1.2
2193[g]	(4$^+$)	0.08
2215		
2226		
2272		
2295		
2317		
2328		
2346[h]	(7$^-$)	0.63
2360		
2410		
2456		
2476		
2545[h]	(8$^-$)	1.6
2552		
2560		
2582		
2586		
2595[ik]	(4$^+$)	1.4
2622		
2647		
2665		
2674		
2686		
2697[i]	(5$^+$)	0.82
2718		
2731		
2741[h]	(9$^-$)	4.2
2766		
2777		
2780		
2787[j]	(8$^+$)	0.8
2791		
2809		
2817[i]	(6$^+$)	0.63
2831		
2861		
2879		
2887		
2909		
2918		
2936		

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^{173}Yb(d,t) 1972On01 (continued)

^{172}Yb Levels (continued)

E(level)[†]	E(level)[†]	E(level)[†]
2960	3072	3107
2997	3081	3120
3014	3085	3127
3067	3101	3138
		3146

† From 1972On01. Groups above 2230 are reported only by 1972On01. The uncertainties are not quoted by 1972On01 but are expected to be about 2 keV for well resolved and strong groups and 5 keV for others.

‡ From Adopted Levels. Many values are deduced from σ(experimental), σ(predicted) and $\sigma(^3He,\alpha)/\sigma(d,t)$ ratios.

Ratio deduced (evaluator) from cross sections given by 1972On01. Due to large uncertainties in σ(predicted), agreement between experimental and predicted cross sections is valid mainly for strongly populated levels.

@ Band(A): $K^\pi=0^+$ g.s. band. the g.s. band is populated through Configuration=((ν 5/2(512))(ν 5/2(512))).

& Band(B): $K^\pi=0^+$ band. the contributing configurations are: Configuration=((ν 1/2(521))(ν 1/2(521))) + Configuration=((ν 5/2(512))(ν 5/2(512))).

a Band(C): $K^\pi=3^+$ band. contributing Configuration=((ν 5/2(512))(ν 1/2(521))). See Adopted Levels for other configurations.

b Band(D): $K^\pi=1^-$ octupole band. dominant (almost pure) Configuration=((ν 7/2(633))(ν 5/2(512))). J=1 and 2 members of this band are not seen in (d,t), consistent with the predicted low cross sections.

c Band(E): $K^\pi=2^+$ γ band.

d Band(F): $K^\pi=2^+$ band. dominant Configuration=((ν 5/2(512))(ν 1/2(521))).

e Band(G): $K^\pi=3^+$ band. dominant Configuration=((ν 11/2(505))(ν 5/2(512))).

f Band(H): $K^\pi=6^-$ band. main Configuration=((ν 5/2(512))(ν 7/2(633))).

g Band(I): $K^\pi=(1^+)$ band. probable Configuration=((ν 5/2(512))(ν 3/2(521))).

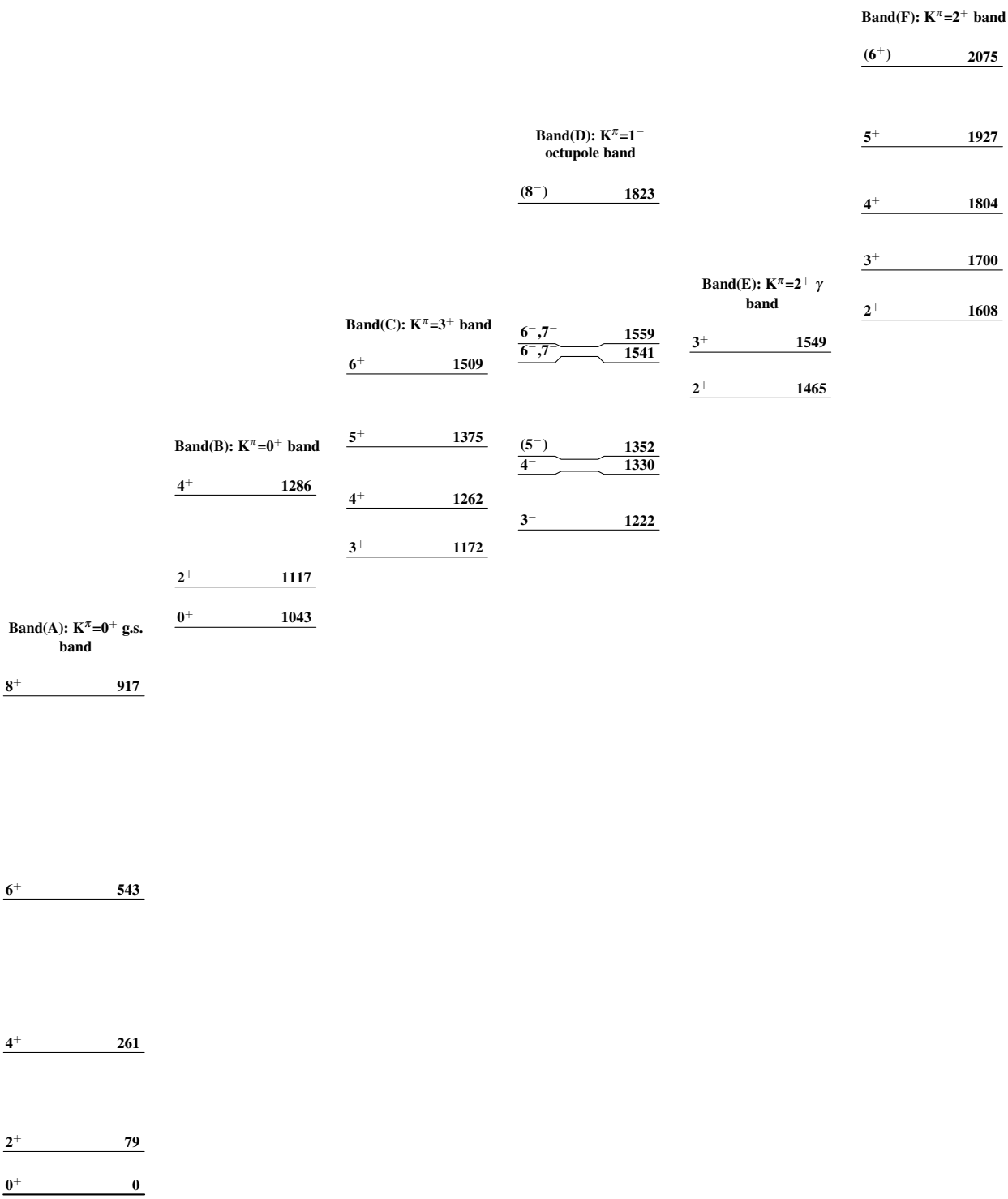
h Band(J): $K^\pi=(5^-)$ band. probable Configuration=((ν 5/2(512))(ν 5/2(642))).

i Band(K): $K^\pi=(4^+)$ band. probable Configuration=((ν 5/2(512))(ν 3/2(521))).

j Band(L): $K^\pi=(8^+)$ band. probable Configuration=((ν 5/2(512))(ν 11/2(505))).

k Possible doublet.

^{173}Yb(d,t) 1972On01



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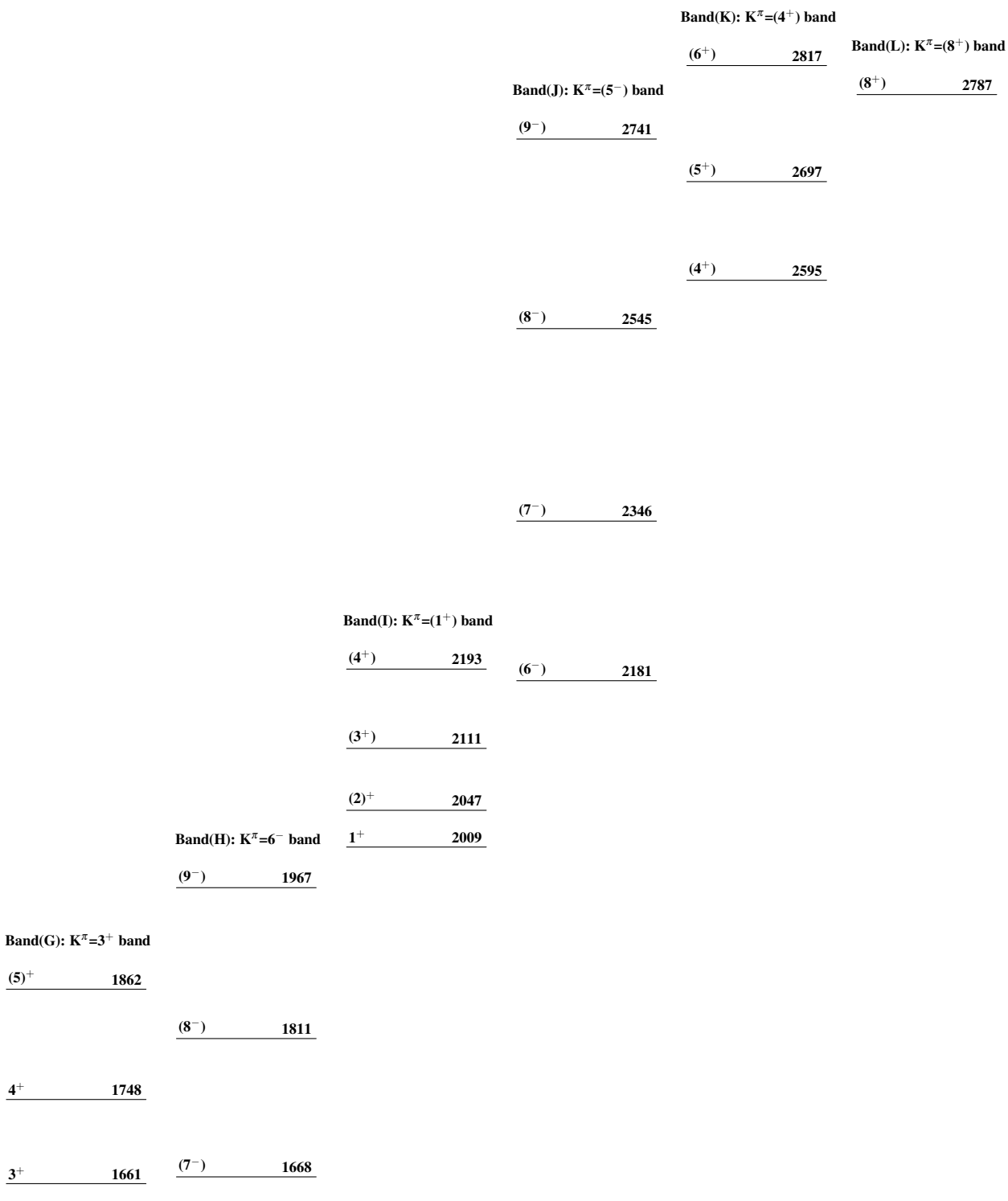
^{173}Yb(d,t) 1972On01 (continued)



$^{172}_{70}Yb_{102}$