

¹²²Te(d,p) 2000Bo24,1975Li22

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J^π(¹²²Te g.s.)=0⁺.

2000Bo24: E=17 MeV deuteron beam was produced from the Tandem accelerator of the Technical University of Munich. Target was 88.4% enriched ¹²²Te on a carbon backing. Reaction products were momentum-analyzed with a Q3D magnetic spectrograph (FWHM=5 keV) and detected with a position-sensitive cathode strip detector. Measured σ(E_p,θ), θ=15° and 30°. Deduced levels. Comparisons with available data. Report 116 levels. **2000Bo24** also report data in (n,γ) E=thermal.

1975Li22: E=7.5 MeV deuteron beam was produced from the MIT-ONR Van de Graaff accelerator. Target was 16.2 μg/cm² 94.8% enriched ¹²²Te on a 3 μg/cm² organic Formvar backing. Reaction products were momentum-analyzed with a multi-gap broad-range magnetic spectrograph (FWHM≈10 keV) and detected with nuclear-track plates. Measured σ(E_p,θ) (15% uncertainty), θ=0° to 172.5°. Deduced levels, J, π, L-transfers, spectroscopic factors from DWBA analysis. Comparisons with available data for neighboring Te isotopes. Report 105 levels.

Other: **1964Jo12**, **1983Za07**.

¹²³Te Levels

Spectroscopic factor C²S is obtained from dσ/dΩ(exp)=N×(2J+1)×C²S×dσ/dΩ(DWBA), where N=1.5 is the normalization factor for (d,p) and J the spin of final state in ¹²³Te (**1975Li22**).

E(level) [†]	L [‡]	(2J+1)C ² S. [‡]	Comments
0.0	0	0.78	E(level): other: 0 (1975Li22).
159.1 5	2	2.02	E(level): other: 159 (1975Li22).
247.2 5	5	3.63	E(level): other: 248 (1975Li22).
384.9 6	[5] [#]	0.08 [#]	
440.0 5	[2] [#]	0.09 [#]	E(level): other: 444 (1975Li22).
489.8 5	[4] [#]	0.14 [#]	E(level): other: 496 (1975Li22).
505.3 5	(2)	≈0.30	E(level): other: 509 (1975Li22). (2J+1)C ² S.: for 496+509 with L=(2) 1975Li22 . Other: 0.39 (2000Bo24).
532.7 5	[3] [#]	0.05 [#]	
598.8 5	0	0.13	E(level): other: 600 (1975Li22).
688.0 5	2	0.27	E(level): other: 691 (1975Li22). (2J+1)C ² S.: other: 0.29 (2000Bo24).
698.7 5	[4] [#]	0.07 [#]	
783.8 5	2	0.42	E(level): other: 785 (1975Li22). (2J+1)C ² S.: or 0.34 (1975Li22). Other: 0.44 (2000Bo24).
862.1 6	[3] [#]	(0.002) [#]	
870.7 7			
879.5 5	[3] [#]	0.18 [#]	E(level): other: 883 (1975Li22).
894.7 5	(2)	≈0.30	E(level): other: 898 (1975Li22). (2J+1)C ² S.: for 883+898 with L=(2) in 1975Li22 . Other: 0.40 (2000Bo24).
920.3 7			
1036.9 5	[2] [#]	0.02 [#]	
1068.7 9	[2] [#]	(0.002) [#]	
1081.7 7			
1099.0 6	[3] [#]	0.003 [#]	
1211.9 7			
1253.4 10	[3] [#]	0.007 [#]	
1318.4 10	[2] [#]	0.015 [#]	
1327.7 6	[2] [#]	(0.03) [#]	

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$^{122}\text{Te}(\text{d,p})$ **2000Bo24,1975Li22** (continued) ^{123}Te Levels (continued)

<u>E(level)[†]</u>	<u>L[‡]</u>	<u>(2J+1)C²S.[‡]</u>	<u>Comments</u>
1344.6 6	1	0.035	E(level): other: 1347 (1975Li22). (2J+1)C ² S.: other: 0.03 (2000Bo24).
1353.8 6	[2] [#]	0.006 [#]	
1414.0 6	[2] [#]	0.11 [#]	
1418 10	(3)	0.18	E(level): from 1975Li22.
1422.8 5	[2] [#]	0.065 [#]	
1446.4 6	[2] [#]	(0.016) [#]	
1474.5 6			
1483.3 6	1	0.038	E(level): other: 1484 (1975Li22). (2J+1)C ² S.: other: (0.06) (2000Bo24).
1558.3 6	[2] [#]	0.026 [#]	E(level): other: 1562 (1975Li22).
1585.1 6			
1622.7 6			
1654.6 8			
1672.3 6	[2] [#]	0.021 [#]	
1682.4 9	3	0.18	E(level): other: 1684 (1975Li22). (2J+1)C ² S.: other: 0.11 (2000Bo24).
1693.6 6			
1707.0 8			
1733.1 6	[2] [#]	0.017 [#]	
1759.4 6	1	0.051	E(level): other: 1761 (1975Li22). (2J+1)C ² S.: other: 0.041 (2000Bo24).
1788.4 6			
1796.6 5			
1840.3 6	[2] [#]	0.027 [#]	
1853.7 6			
1863.8 7	[2] [#]	(0.009) [#]	
1887.7 6	1	0.119	E(level): other: 1890 (1975Li22). (2J+1)C ² S.: other: 0.095 (2000Bo24).
1902.9 9	[2] [#]	(0.008) [#]	
1946.1 7			
1956.7 6	[2] [#]	(0.022) [#]	
1978.2 5	1	0.115	E(level): other: 1980 (1975Li22). (2J+1)C ² S.: other: 0.079 (2000Bo24).
2011.1 6			
2020.4 5	1	0.131	E(level): other: 2122 (1975Li22). (2J+1)C ² S.: other: 0.091 (2000Bo24).
2051.1 5	3	0.77	E(level): other: 2054 (1975Li22). (2J+1)C ² S.: other: 0.42 (2000Bo24).
2065.6 7			
2083.1 9			
2093.7 6	[1] [#]	(0.002) [#]	
2118.4 5			
2130.1 5	1	0.083	E(level): other: 2125 (1975Li22). (2J+1)C ² S.: other: 0.030 (2000Bo24).
2143.7 5			
2151.3 6			
2158.0 5	1	0.194	E(level): other: 2156 (1975Li22). (2J+1)C ² S.: other: 0.089 (2000Bo24).
2197.1 6	[1] [#]	0.034 [#]	
2201.1 6	(2)	0.26	E(level): other: 2201 (1975Li22). (2J+1)C ² S.: or 0.32 (1975Li22). Other: (0.18) (2000Bo24).

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$^{122}\text{Te}(\text{d,p})$ **2000Bo24,1975Li22** (continued) ^{123}Te Levels (continued)

<u>E(level)[†]</u>	<u>L[‡]</u>	<u>(2J+1)C²S.[‡]</u>	<u>Comments</u>
2264.0 11			
2285.0 10			
2296.7 9			E(level): other: 2298 (1975Li22).
2348.2 8			E(level): other: 2357 (1975Li22).
2369.1 7			E(level): other: 2357 (1975Li22).
2376.6 7			E(level): other: 2380 (1975Li22).
2398.7 8			
2413.6 10	3	0.09	E(level): other: 2422 (1975Li22).
2442.6 10			
2457.4 7			
2464.9 7			
2478.7 8			
2497.7 6			
2514.9 6			
2525.5 6			
2533.3 6			
2540.7 6			
2551.6 7	1	0.13	E(level): other: 2547 (1975Li22).
2555.8 6			
2565.2 6			
2572.1 6			
2604.3 6			
2614 6			
2621.8 6	[1] [#]	0.01 [#]	
2630.3 6			E(level): other: 2631 (1975Li22).
2638.1 6			
2643.4 7	[1] [#]	0.009 [#]	
2657.0 6			E(level): other: 2660 (1975Li22).
2670.5 7			
2676.2 6			
2687.0 6	1	0.118	E(level): other: 2688 (1975Li22). (2J+1)C ² S.: other: 0.027 (2000Bo24).
2695 [@] 1			
2713.0 6			
2725.0 6			E(level): other: 2723 (1975Li22).
2735.3 7			
2741.7 7			
2751 [@] 2	(3)	0.15	E(level): other: 2749 (1975Li22).
2773.4 6	1	0.039	E(level): other: 2772 (1975Li22).
2782.0 7			
2794.0 7			
2807.0 6			
2812.3 7	1	0.041	E(level): other: 2812 (1975Li22). (2J+1)C ² S.: other: 0.0007 (2000Bo24).
2834.0 7			
2848.6 7			E(level): other: 2840 (1975Li22).
2857.4 6			
2864.0 7			
2869.5 7			
2875.2 7			
2880.8 9			
2887.3 9			
2894.6 7			E(level): other: 2895 (1975Li22).
2906.1 8			
2915.8 7			E(level): other: 2916 (1975Li22).
2922.5 9			

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$^{122}\text{Te}(\text{d,p})$ **2000Bo24,1975Li22** (continued) ^{123}Te Levels (continued)

<u>E(level)[†]</u>	<u>L[‡]</u>	<u>(2J+1)C²S.[‡]</u>	<u>Comments</u>
2937.4 9	1	0.065	E(level): other: 2941 (1975Li22). (2J+1)C ² S.: other: 0.009 (2000Bo24).
2947.1 10	[1] [#]	0.002 [#]	E(level): from 1975Li22.
2963 10			
2967.9 10			
2983.8 10			E(level): other: 2989 (1975Li22).
3002.5 12			
3007.7 12	1	0.050	E(level): other: 3007 (1975Li22).
3033 10			
3055 10			
3079 10			
3106 10			
3151 10			
3181 10			
3197 10	1	0.064	
3321 10			
3337 10			
3375 10			
3401 10	1	0.052	
3439 10			
3469 10			
3492 10			
3513 10			
3551 10	1	0.110	
3625 10			
3744 10			
3766 10			
3787 10			
3822 10			
3849 10			
3866 10			
3912 10			
3935 10			
3975 10			
4014 10			
4040 10			
4055 10			
4075 10			
4134 10			
4173 10			
4200 10			
4271 10			
4302 10			
4317 10			
4347 10			
4380 10			
4411 10			
4441 10			
4476 10			
4500 10			
4538 10			
4570 10			
4606 10			
4655 10			
4669 10			
4685 10			

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$^{122}\text{Te}(\text{d,p})$ 2000Bo24,1975Li22 (continued) ^{123}Te Levels (continued)

<u>E(level)[†]</u>	<u>E(level)[†]</u>	<u>E(level)[†]</u>	<u>E(level)[†]</u>
4715 10	4854 10	5088 10	5232 10
4748 10	4876 10	5140 10	5329 10
4776 10	4966 10	5169 10	5450 10
4789 10	5015 10	5190 10	

[†] From 2000Bo24 up to 3008 level and from 1975Li22 above that. A systematic uncertainty of 0.5 keV has been added in quadrature (by the evaluator) for those from 2000Bo24. No uncertainty is given in 1975Li22 for level energies and an uncertainty of 10 keV has been assigned by the evaluator, considering an uncertainty of 6 keV given in Q-value in 1975Li22 for the g.s. which is the strongest peak in the their proton spectrum.

[‡] From 1975Li22, extracted from DWBA analysis of experimental differential cross sections, unless otherwise noted. Authors of 1975Li22 used the optical potential which is a local, surface-derivative Saxon-Woods potential without spin-orbit coupling; the parameter values are from 1963Pe28.

[#] From 2000Bo24. Authors estimated roughly the L values by comparing the ratios of DWBA cross section with experimental ones at 15° and 30°, and C²S values are normalized to those for the 1/2⁺ g.s., 3/2⁺ 159 and 11/2⁻ 247 levels in 1975Li22.

[@] Possible doublet (2000Bo24).