^{130}Te(n,n′γ) 1988Be52

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 93, 33 (2001)	11-May-2001

Includes (n,n) and (n,n′).
1988Be52 (also 1980De07): E=reactor fast neutrons, enriched target. Measured Eγ, Iγ, γ(θ), γ(lin pol).
1988Wa05: (n,n′) E=14.1 MeV. Measured σ(θ), deduced β_3.
1981Ko15 (also 1973Ko29): (n,n′) E=0.85-1.2 MeV. Measured σ, optical-model analysis.
(n,n) experiments:
1986Ko06: (n,n) E=0.00057 eV, 1.26 eV, 5.2 eV. Measured neutron scattering lengths.
1988Mu16: (n,n) E≈0.25 MeV. Measured σ(θ), optical-model analysis.
1993Mi06: (n,n) E<300 keV. Measured σ(θ).

^{130}Te Levels

E(level)†	Jπ‡	Comments
0.0	0^+	
839.494 *17*	2^+	
1588.259 *24*	2^+	
1632.999 *22*	4^+	
1815.37 *3*	$(6)^+$	
1885.702 *25*	2^+	
1964.76 *4*	0^+	
1981.550 *23*	4^+	
2101.26 *3*	5^-	
2138.64 *3*	3^+	
2146.43 *4*	$(7)^-$	
2190.616 *23*	2^+	
2282.595 *25*	2^+	
2300.22 *4*	(2^+)	
2330.73 *4*	(4^+)	
2404.66 *4*	6^-	
2432.10 *6*	$(7)^-$	
2435.60 *4*	4^-	
2449.48 *4*	4^+	
2466.89 *4*	2^+	
2527.07 *3*	3^-	
2581.15 *5*	(2^+)	
2607.33 *5*	1	
2689.12 *5*	1	
2714.98? *5*	4^-	
2719.50? *7*	(5^+)	
2736.35 *5*	(5)	Jπ: disagrees with Jπ=(4^+) from 6.3-min ^{130}Sb decay.
2743.14? *4*	1	
2744.98 *4*	$(2^+,3)$	
2770	(3^-)	β_3=0.10 (1988Wa05) E(level): level from (n,n′) (1988Wa05).
2770.86 *8*	(6)	
2782.11 *14*	(7^-)	Jπ: 5^- proposed by 1988Be52 is unlikely due to β feeding of this level from (8^-).
2789.26? *5*	$(2^+,3)$	
2833.38 *6*	$(5^+,6^+)$	
3155.03? *10*		

† From least-squares adjustment to Eγ′s.
‡ based on γ(θ), γ(lin pol), level population data, and statistical model calculation.

^{130}Te(n,n′γ) 1988Be52 (continued)

γ(^{130}Te)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[a]	Comments
182.36 *2*	5.1 *6*	1815.37	(6)$^+$	1632.999	4$^+$				
[x]188.13 *16*	0.080 *12*								
[x]201.18 *13*	0.106 *14*								
[x]204.81 *16*	0.072 *11*								
258.21 *3*	0.55 *6*	2404.66	6$^-$	2146.43	(7)$^-$	M1+E2[@]	+0.21 *6*	0.0516 *4*	α(K)=0.04444 *21*; α(L)=0.00571 *9*; α(M)=0.00114; α(N+..)=0.00027 A_2=−0.43 *8*, A_4=−0.02 *10*.
285.67 *4*	0.59 *7*	2432.10	(7)$^-$	2146.43	(7)$^-$	M1+E2[@]		0.043 *2*	A_2=−0.16 *6*, A_4=0.00 *8*.
[x]288.79 *15*	0.056 *14*								
303.43 *3*	0.60 *7*	2404.66	6$^-$	2101.26	5$^-$	M1(+E2)[@]	+0.02 *2*	0.0335	α(K)=0.02896; α(L)=0.00364; α(M)=0.00072; α(N+..)=0.00017 A_2=−0.21 *4*, A_4=−0.08 *6*.
331.05 *2*	2.2 *3*	2146.43	(7)$^-$	1815.37	(6)$^+$	E1+M2[@]	+0.070 *6*		A_2=−0.110 *8*, A_4=+0.024 *13*.
334.34 *2*	2.1 *3*	2435.60	4$^-$	2101.26	5$^-$	M1+E2[#]	−0.052 *7*	0.0261	α(K)=0.02253; α(L)=0.00283; α(M)=0.00056; α(N+..)=0.00013 A_2=−0.059 *8*, A_4=+0.006 *13*. POL=+0.68 *14*.
348.58 *2*	2.4 *3*	1981.550	4$^+$	1632.999	4$^+$	M1+E2[#]	−0.12 *3*	0.0234	α(K)=0.02023; α(L)=0.00254; α(M)= 0.0005; α(N+..)=0.00012 A_2=+0.251 *15*, A_4=−0.014 *21*. POL=+2.9 *+11−7*.
[x]359.24 *17*	0.12 *2*								
468.27 *2*	8.1 *10*	2101.26	5$^-$	1632.999	4$^+$	E1(+M2)[#]	+0.03 *2*		A_2=−0.206 *3*, A_4=−0.023 *6*. POL=+1.9 *+3−2*.
505.63 *3*	0.48 *6*	2138.64	3$^+$	1632.999	4$^+$	M1+E2	+1.2 *5*		A_2=−0.58 *3*, A_4=0.05 *3*.
[x]521.56 *5*	0.31 *4*								A_2=−0.22 *4*, A_4=−0.08 *7*.
[x]535.50 *4*	0.40 *10*								A_2=+0.45 *2*, A_4=+0.02 *2*.
550.36 *3*	1.27 *16*	2138.64	3$^+$	1588.259	2$^+$	M1+E2[#]	+2.4 *2*		A_2=+0.455 *14*, A_4=+0.072 *21*. POL=+0.9 *+5−4*.
613.72 *3*	0.91 *12*	2714.98?	4$^-$	2101.26	5$^-$	M1+E2[#]	+0.42 *2*		A_2=−0.52 *2*, A_4=−0.01 *3*. POL=+1.2 *+12−7*.
[x]647.64 *6*	0.46 *6*								A_2=+0.24 *3*, A_4=−0.14 *4*.
[x]658.12 *5*	0.39 *5*								A_2=+0.35 *3*, A_4=−0.04 *5*.
669.60 *7*	0.20 *3*	2770.86	(6)	2101.26	5$^-$	D+Q	+0.15 *2*		A_2=−0.01 *3*, A_4=+0.06 *5*.
680.85 *13*	0.15 *2*	2782.11	(7$^-$)	2101.26	5$^-$				A_2=+0.29 *5*, A_4=−0.18 *8*.
697.73 *3*	1.11 *16*	2330.73	(4$^+$)	1632.999	4$^+$	(M1+E2)			A_2=+0.27 *2*, A_4=−0.04 *3*. δ: +1.12 *8* or −0.08 *4*.
[x]732.38 *17*	0.067 *12*								
738.1 *2*	0.061 *11*	2719.50?	(5$^+$)	1981.550	4$^+$				
748.76 *2*	11.2 *16*	1588.259	2$^+$	839.494	2$^+$	M1+E2[#]	+0.65 *15*		A_2=+0.290 *6*, A_4=−0.018 *7*. POL=+0.80 *9*.
793.53 *2*	25 *4*	1632.999	4$^+$	839.494	2$^+$	E2[@]			A_2=+0.242 *5*, A_4=−0.062 *7*.
816.48 *3*	1.12 *16*	2449.48	4$^+$	1632.999	4$^+$	M1+E2[#]	−0.21 *2*		A_2=+0.190 *6*, A_4=−0.011 *10*. POL=+2.6 *+40−13*.
839.49 *2*	100 *3*	839.494	2$^+$	0.0	0$^+$	E2[@]			A_2=+0.204 *5*, A_4=−0.082 *7*.
[x]853.54 *6*	0.16 *6*								
859.30 *4*	0.51 *7*	2744.98	(2$^+$,3)	1885.702	2$^+$				A_2=−0.20 *2*, A_4=+0.01 *3*.

$^{130}_{52}Te_{78}$-2

^{130}Te(n,n′γ) 1988Be52 (continued)

γ(^{130}Te) (continued)

E_γ	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
x888.03 *11*	0.13 *2*							
894.06[b] *14*	0.082 *13*	2527.07	3^-	1632.999	4^+			
904.04 *10*	0.19 *3*	2719.50?	(5^+)	1815.37	$(6)^+$			
921.01 *5*	0.36 *5*	2736.35	(5)	1815.37	$(6)^+$	D+Q	+0.20 *2*	A_2=−0.142 *14*, A_4=−0.005 *22*.
x942.07 *3*	0.64 *9*							A_2=−0.056 *18*, A_4=−0.032 *12*.
x986.52 *3*	0.23 *3*							A_2=−0.02 *2*, A_4=+0.01 *3*.
992.95 *13*	0.091 *14*	2581.15	(2^+)	1588.259	2^+			
x1002.48 *9*	0.15 *2*							
1018.01 *5*	0.27 *4*	2833.38	$(5^+,6^+)$	1815.37	$(6)^+$			A_2=−0.17 *3*, A_4=−0.07 *4*.
x1022.41 *11*	0.071 *12*							
x1030.94[&] *13*	0.14 *2*							A_2=+0.38 *4*, A_4=+0.06 *6*.
1046.21 *2*	5.9 *8*	1885.702	2^+	839.494	2^+	M1+E2[#]	−0.175 *10*	A_2=+0.072 *5*, A_4=−0.021 *7*. POL=+1.9 *+6−3*.
x1053.71 *7*	0.27 *4*							A_2=+0.30 *3*, A_4=−0.10 *5*.
x1066.24 *15*	0.091 *14*							
x1070.47 *17*	0.085 *13*							
x1075.84 *14*	0.081 *13*							
1086.54 *9*	0.14 *2*	2719.50?	(5^+)	1632.999	4^+	(M1+E2)		A_2=−0.54 *13*, A_4=0.04 *18*. δ: −0.21 *11* or −2.6 *+7−10*.
x1097.26[&] *5*	0.20 *3*							
x1100.60 *4*	0.56 *8*							
1103.29 *6*	0.12 *2*	2736.35	(5)	1632.999	4^+			
1112.01 *9*	0.16 *2*	2744.98	$(2^+,3)$	1632.999	4^+			
x1115.03 *5*	0.25 *4*							A_2=−0.14 *4*, A_4=0.00 *6*.
1125.26 *3*	1.09 *15*	1964.76	0^+	839.494	2^+			A_2=−0.009 *10*, A_4=−0.010 *16*. POL=+1.1 *+15−7*.
x1135.36 *6*	0.19 *3*							
1142.02 *2*	1.9 *3*	1981.550	4^+	839.494	2^+	E2		A_2=+0.318 *6*, A_4=−0.055 *8*.
1156.21 *14*	0.093 *15*	2789.26?	$(2^+,3)$	1632.999	4^+			
1173.25 *17*	0.112 *17*	3155.03?		1981.550	4^+			
x1178.24 *5*	0.18 *3*							A_2=−0.01 *4*, A_4=−0.01 *6*.
x1182.45 *9*	0.099 *15*							
x1193.54 *14*	0.085 *13*							
x1219.05 *14*	0.078 *12*							
x1222.25 *18*	0.074 *12*							
x1231.92 *13*	0.15 *2*							A_2=−0.11 *4*, A_4=−0.17 *6*.
x1243.55 *18*	0.076 *12*							
1299.16 *3*	1.19 *17*	2138.64	3^+	839.494	2^+	M1+E2	+0.32 *2*	A_2=+0.157 *9*, A_4=−0.015 *14*.
x1310.1 *3*	0.082 *14*							
x1322.2 *2*	0.078 *13*							
x1341.2 *3*	0.074 *13*							
1351.11 *3*	1.23 *17*	2190.616	2^+	839.494	2^+	M1+E2[#]	−0.27 *2*	A_2=+0.032 *7*, A_4=+0.002 *10*. POL=+1.9 *+82−11*.
x1358.0 *3*	0.043 *8*							
x1368.5 *2*	0.090 *14*							
x1374.65 *16*	0.078 *18*							

$^{130}_{52}Te_{78}$-3

^{130}Te(n,n′γ) 1988Be52 (continued)

γ(^{130}Te) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
[x]1414.34 *16*	0.062 *11*							
1443.09 *2*	1.66 *24*	2282.595	2^+	839.494	2^+	M1+E2[#]	−0.10 *2*	A_2=+0.111 *8*, A_4=−0.003 *12*. POL=+1.8 *+52−10*.
[x]1448.18 *17*	0.043 *8*							
1460.72 *3*	1.28 *18*	2300.22	(2^+)	839.494	2^+	(M1+E2)	−0.20 *2*	A_2=+0.067 *13*, A_4=−0.005 *19*.
[x]1479.11 *15*	0.077 *16*							A_2=−0.26 *7*, A_4=−0.23 *12*.
1491.24 *7*	0.32 *5*	2330.73	(4^+)	839.494	2^+	(E2)		A_2=+0.31 *3*, A_4=−0.10 *4*.
[x]1506.41 *11*	0.18 *3*							
1522.14 *12*	0.13 *2*	3155.03?		1632.999	4^+			A_2=−0.07 *6*, A_4=−0.14 *9*.
[x]1533.12 *19*	0.067 *11*							
1588.19 *8*	0.18 *3*	1588.259	2^+	0.0	0^+	E2		A_2=+0.21 *2*, A_4=−0.06 *4*.
[x]1597.7 *2*	0.067 *11*							
[x]1616.9 *3*	0.047 *8*							
1627.38 *3*	0.95 *13*	2466.89	2^+	839.494	2^+	M1+E2		A_2=−0.067 *15*, A_4=−0.033 *21*.
								δ=−0.48 *4* or 1/δ=−0.02 *3*.
[x]1636.56 *9*	0.16 *2*							A_2=−0.20 *3*, A_4=+0.05 *4*.
[x]1657.8 *3*	0.056 *9*							
1687.56 *2*	1.9 *3*	2527.07	3^-	839.494	2^+	E1(+M2)[#]	+0.030 *6*	A_2=−0.163 *7*, A_4=−0.020 *10*. POL=+1.4 *+17−10*.
[x]1721.85 *13*	0.04 *2*							
[x]1728.3 *2*	0.061 *11*							
[x]1735.5 *2*	0.032 *7*							
1741.64 *4*	0.75 *11*	2581.15	(2^+)	839.494	2^+	(M1+E2)	+0.18 *2*	A_2=+0.327 *9*, A_4=−0.003 *13*.
[x]1752.7 *2*	0.12 *2*							
[x]1764.76 *8*	0.28 *4*							A_2=−0.12 *5*, A_4=−0.02 *8*.
1767.81 *8*	0.22 *3*	2607.33	1	839.494	2^+			
[x]1829.8 *3*	0.13 *2*							
1885.69 *18*	0.12 *2*	1885.702	2^+	0.0	0^+	E2		A_2=+0.14 *7*, A_4=−0.08 *7*.
[x]1893.99 *16*	0.136 *20*							
1905.43 *4*	0.56 *8*	2744.98	$(2^+,3)$	839.494	2^+	D+Q	+0.018 *13*	A_2=−0.176 *14*, A_4=−0.027 *22*.
1949.76 *5*	0.37 *5*	2789.26?	$(2^+,3)$	839.494	2^+			A_2=−0.14 *5*, A_4=−0.03 *7*.
[x]1987.7 *3*	0.034 *7*							
[x]1995.3 *3*	0.067 *11*							
[x]2048.30 *18*	0.092 *14*							
[x]2106.13 *10*	0.16 *2*							
[x]2114.05 *6*	0.26 *5*							
[x]2117.53 *7*	0.18 *3*							A_2=+0.41 *4*, A_4=0.00 *6*.
[x]2170.2 *2*	0.055 *9*							
2190.60 *3*	1.31 *19*	2190.616	2^+	0.0	0^+	E2		A_2=+0.25 *2*, A_4=−0.12 *2*.
[x]2243.7 *2*	0.092 *14*							
[x]2271.8 *4*	0.032 *7*							
2282.60 *7*	0.35 *5*	2282.595	2^+	0.0	0^+	E2		A_2=+0.20 *2*, A_4=−0.11 *3*.
[x]2289.1 *5*	0.044 *8*							
2300.0 *3*	0.057 *9*	2300.22	(2^+)	0.0	0^+	(E2)		A_2=+0.19 *9*, A_4=+0.03 *12*.
[x]2315.0 *2*	0.081 *12*							

$^{130}_{52}Te_{78}$-4

^{130}Te(n,n′γ) 1988Be52 (continued)

γ(^{130}Te) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
[x]2338.0 *4*	0.034 *7*						
[x]2404.2 *3*	0.094 *14*						
2466.94 *18*	0.10 *2*	2466.89	2+	0.0	0+	E2	A_2=+0.25 *7*, A_4=−0.22 *11*.
[x]2480.0 *3*	0.061 *10*						
[x]2500.70 *17*	0.091 *14*						
[x]2560.8 *3*	0.055 *9*						
2607.31 *6*	0.36 *5*	2607.33	1	0.0	0+		A_2=−0.07 *3*, A_4=−0.04 *4*.
[x]2625.59 *18*	0.11 *2*						A_2=−0.20 *9*, A_4=+0.17 *13*.
2689.09 *5*	0.40 *6*	2689.12	1	0.0	0+		A_2=−0.10 *2*, A_4=−0.04 *3*.
[x]2709.6 *4*	0.055 *9*						
2743.11 *4*	0.40 *6*	2743.14?	1	0.0	0+	D	A_2=−0.11 *3*, A_4=−0.06 *4*.
[x]2755.3 *7*	0.060 *10*						
[x]2784.3 *3*	0.074 *12*						
[x]2813.6 *8*	0.037 *7*						
[x]2889.6 *4*	0.080 *12*						
[x]2945.92 *14*	0.13 *2*						
[x]3095.0 *2*	0.094 *14*						
[x]3110.47 *16*	0.092 *13*						
[x]3127.7 *3*	0.050 *8*						
[x]3196.01 *13*	0.102 *15*						
[x]3241.80 *13*	0.13 *2*						
[x]3342.0 *4*	0.052 *9*						
[x]3493.9 *3*	0.062 *10*						
[x]3567.9 *2*	0.057 *9*						
[x]3648.6 *3*	0.041 *7*						
[x]3983.5 *4*	0.050 *8*						

[†] Relative Iγ observed at 120° to the neutron beam.
[‡] From γ(θ), except as noted.
[#] From γ(θ) and γ(lin pol).
[@] From γ(θ) and α(K)exp in ^{130}Sb β^- decay.
[&] Uncertain G.
[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{130}_{52}Te_{78}$-5

^{130}Te(n,n′γ) **1988Be52**

Level Scheme

Intensities: Relative I_γ

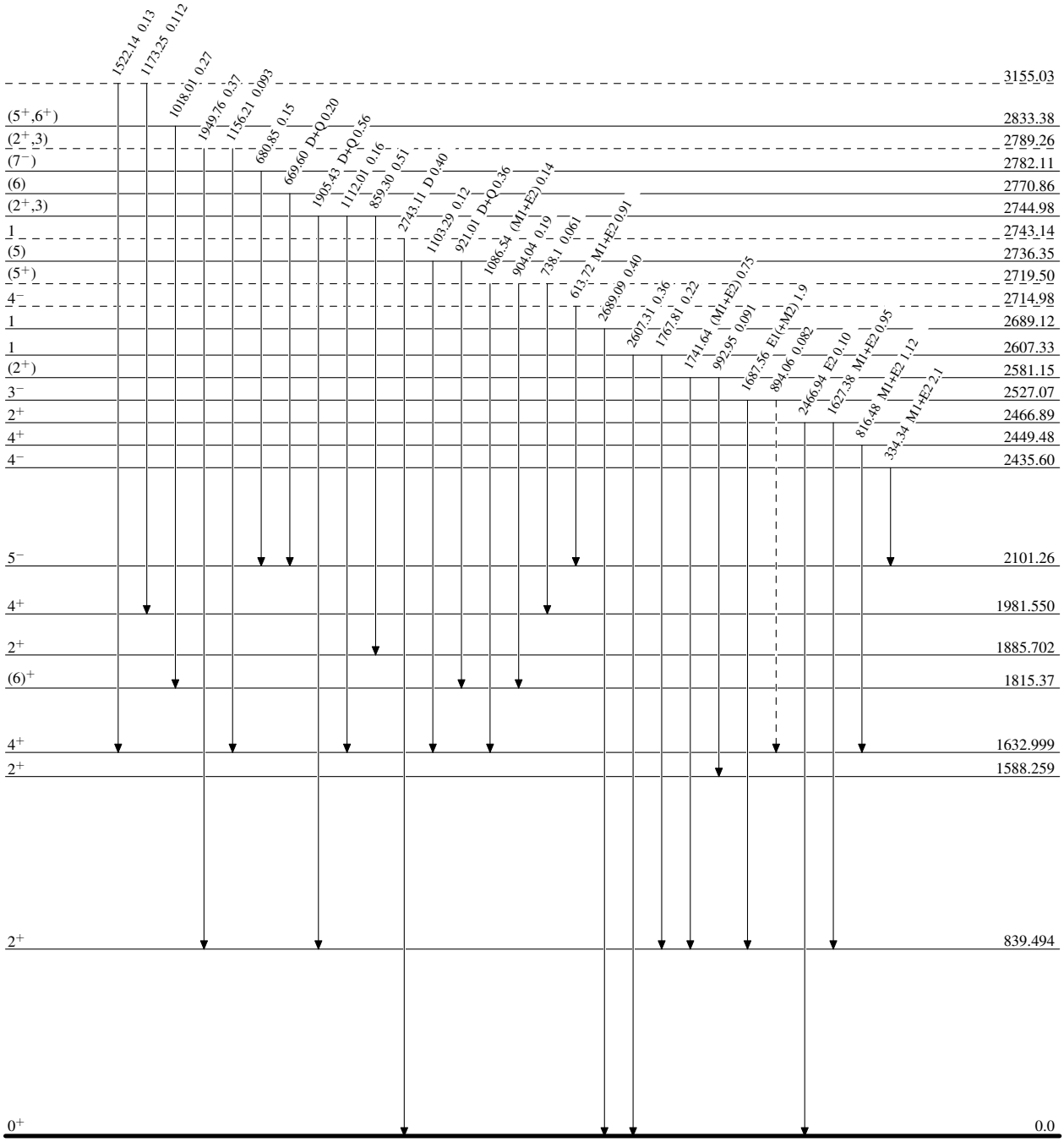
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



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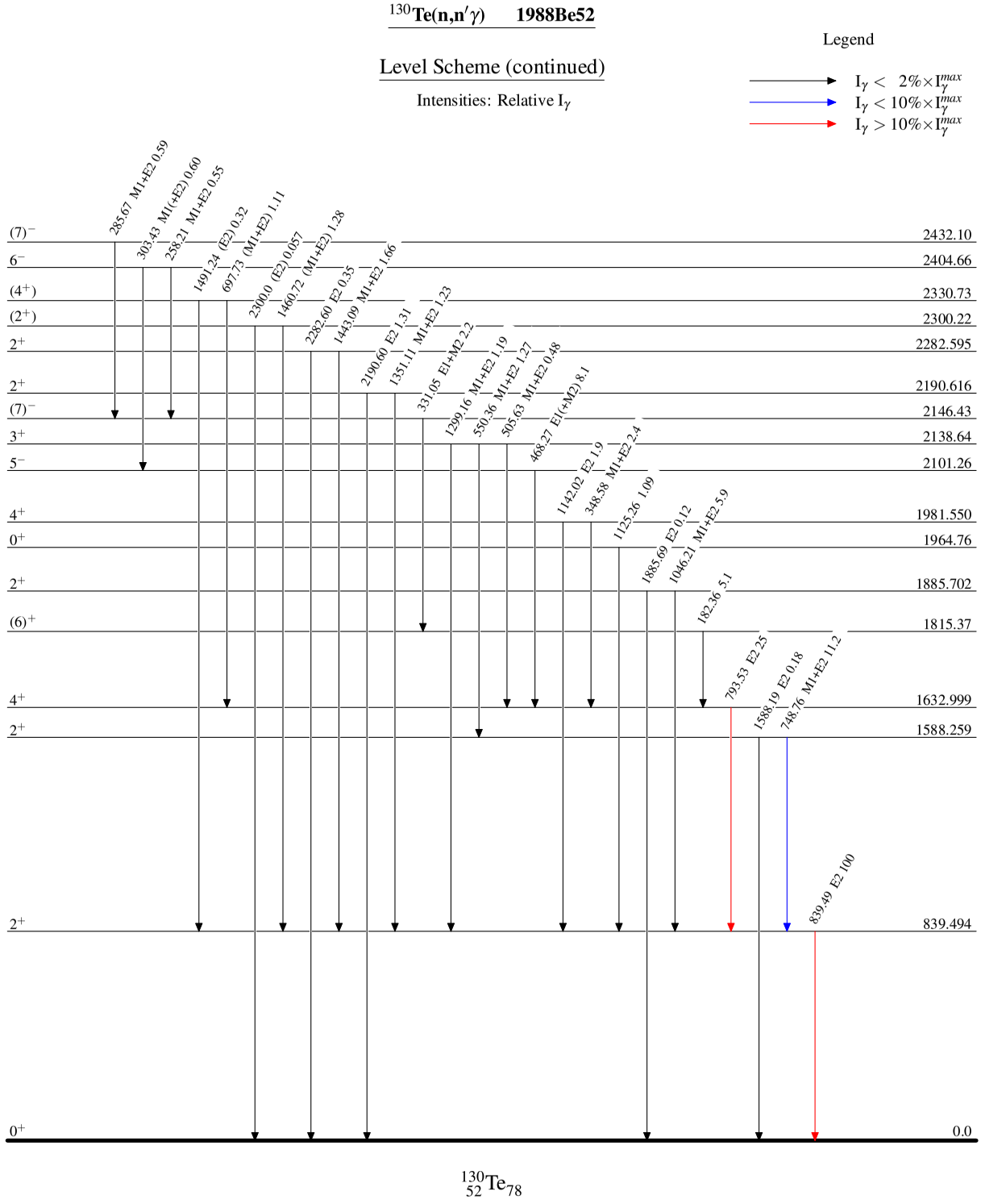
^{130}Te(n,n′γ) 1988Be52
Level Scheme (continued)
Intensities: Relative I_γ
Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
(7)⁻ 2432.10
6⁻ 2404.66
(4⁺) 2330.73
(2⁺) 2300.22
2⁺ 2282.595
2⁺ 2190.616
(7)⁻ 2146.43
3⁺ 2138.64
5⁻ 2101.26
4⁺ 1981.550
0⁺ 1964.76
2⁺ 1885.702
(6)⁺ 1815.37
4⁺ 1632.999
2⁺ 1588.259
2⁺ 839.494
0⁺ 0.0
285.67 M1+E2 0.59
303.43 M1(+E2) 0.60
258.21 M1+E2 0.55
1491.24 (E2) 0.32
697.73 (M1+E2) 1.11
2300.0 (E2) 0.057
1460.72 (M1+E2) 1.28
2282.60 E2 0.35
1443.09 M1+E2 1.66
2190.60 E2 1.31
1351.11 M1+E2 1.23
331.05 E1+M2 2.2
1299.16 M1+E2 1.19
550.36 M1+E2 1.27
505.63 M1+E2 0.48
468.27 E1(+M2) 8.1
1142.02 E2 1.9
348.58 M1+E2 2.4
1125.26 1.09
1885.69 E2 0.12
1046.21 M1+E2 5.9
182.36 5.1
793.53 E2 25
1588.19 E2 0.18
748.76 M1+E2 11.2
839.49 E2 100
$^{130}_{52}Te_{78}$