^{130}Te(^{40}Ar,4nγ) 1987Be07,1986Ba61,1976Bo27

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109, 1103 (2008)	1-Mar-2008

Other: 1983De02 (^{130}Te(^{40}Ar,4n), E(^{40}Ar)=185 MeV).
1987Be07: ^{130}Te(^{40}Ar,4n), E(^{40}Ar)=180 MeV; measured Eγ, $\gamma\gamma\gamma$-coin, DCO ratios (40°, 90°).
1987Ba06, 1986Ba61: ^{130}Te(^{40}Ar,4n), E(^{40}Ar)=180 MeV; measured lifetimes, Doppler shift attenuation.
1976Bo27: ^{130}Te(^{40}Ar,4nγ), E(^{40}Ar)=170-190 MeV; measured recoil distance Doppler shift, Eγ, semi.

^{166}Yb Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0.0[#]	0$^+$	56.7 h *1*	J$^\pi$,T$_{1/2}$: from Adopted Levels.
102.37[#] *3*	2$^+$	1.24[d] ns *6*	
330.27[#] *21*	4$^+$	52.9[d] ps *17*	
667.8[#] *3*	6$^+$	7.8[d] ps *3*	
1098.0[#] *4*	8$^+$	2.14[d] ps *24*	
1328.5[@] *11*	5$^+$		
1605.2[#] *4*	10$^+$	1.0[d] ps *5*	
1617.5 *9*	(4$^-$)		
1704.8[@] *6*	7$^+$		
1789.8[&] *6*	(5$^-$)		
1836.8[c] *11*	(6$^-$)		
1865.5[a] *8*	6$^-$		
1958.2[&] *5*	(7$^-$)		
2071.5[a] *6*	8$^-$		
2138.0[c] *12*	(8$^-$)		
2151.0[@] *6*	9$^+$		
2174.6[#] *5*	12$^+$	0.64[d] ps *33*	
2208.9[&] *6*	9$^-$		
2360.7[a] *6*	10$^-$		
2416.7[&] *5*	11$^-$		
2492.4[c] *13*	(10$^-$)		
2530.6[b] *6*	12$^+$		
2727.7[a] *6*	12$^-$		
2778.3[#] *5*	14$^+$	0.51[d] ps *29*	
2862.5[&] *5*	13$^-$		
2892.4[c] *14*	(12$^-$)		
2896.6[b] *5*	14$^+$		
3165.3[a] *7*	14$^-$		
3272.5[b] *5*	16$^+$	1.14[d] ps *27*	
3351.4[c] *15*	(14$^-$)		
3353.3[&] *5*	15$^-$		
3489.0[#] *5*	16$^+$		
3664.7[a] *7*	16$^-$		
3780.8[b] *6*	18$^+$	0.82[e] ps *10*	
3879.1[c] *16*	(16$^-$)		
3891.4[&] *6*	17$^-$		
4188.8[#] *6*	18$^+$		
4217.5[a] *7*	18$^-$		

Continued on next page (footnotes at end of table)

^{130}Te(^{40}Ar,4nγ) 1987Be07,1986Ba61,1976Bo27 (continued)

^{166}Yb Levels (continued)

E(level)[†]	Jπ[‡]	T1/2	E(level)[†]	Jπ[‡]	T1/2	E(level)[†]	Jπ[‡]	T1/2
4369.3[b] *6*	20+	0.41[e] ps *3*	5815.0[c] *18*	(22−)		8385.7[b] *8*	30+	0.055[e] ps *7*
4471.8[c] *17*	(18−)		6172.1[a] *8*	24−		8675.7[a] *10*	30−	
4477.9[&] *6*	19−		6377.1?[#] *9*	(24+)		9070.5[&] *11*	31−	
4817.9[a] *8*	20−		6506.8[&] *8*	25−		9384.5[b] *9*	32+	0.042[e] ps *7*
4921.7[#] *6*	20+		6552.8[c] *19*	(24−)		9647.3[a] *11*	32−	
5035.6[b] *6*	22+	0.201[e] ps *21*	6580.5[b] *7*	26+	0.083[e] ps *7*	10056.7[&] *12*	33−	
5107.9[&] *6*	21−		6938.7[a] *8*	26−		10444.5[b] *10*	34+	0.035[e] ps *7*
5120.1[c] *17*	(20−)		7293.9[&] *9*	27−		11101.7?[&] *13*	(35−)	
5467.3[a] *8*	22−		7335.8?[c] *19*	(26−)		11556.5[b] *12*	36+	
5648.6[#] *8*	22+		7450.7[b] *7*	28+	0.069[e] ps *7*	12185.7?[&] *17*	(37−)	
5774.2[b] *7*	24+	0.125[e] ps *14*	7772.3[a] *9*	28−		12714.5?[b] *13*	(38+)	
5781.9[&] *7*	23−		8147.7[&] *10*	29−				

[†] From least-squares fit to Eγ.
[‡] From fig. 7 of 1987Be07.
[#] Band(A): K=0+ g.s. band.
[@] Band(B): K=2+ γ-vibrational band.
[&] Band(C): Kπ=5−, α=1 band.
[a] Band(D): Kπ=5−, α=0 band.
[b] Band(E): super band. Becomes yrast for J≥16.
[c] Band(F): Kπ=(2−) band. Although No parity assignment is indicated In fig. 7 of 1987Be07, π=− is assigned In table 2.
[d] From recoil distance Doppler shift (1976Bo27).
[e] From Doppler shift attenuation (1987Ba06).

γ(^{166}Yb)

Eγ[‡]	Iγ[#]	Ei(level)	Jπi	Ef	Jπf	Mult.[†]	α[a]	Comments
102.37[@] *3*		102.37	2+	0.0	0+			
113.0 *5*	0.50 *25*	2071.5	8−	1958.2	(7−)			
152.0 *5*	0.8 *4*	2360.7	10−	2208.9	9−			
206.0 *5*	5.0 *25*	2071.5	8−	1865.5	6−	Q		DCO=1.04 *13* (1987Be07).
227.9 *2*	100 *10*	330.27	4+	102.37	2+			
248.0 *5*	0.50 *25*	1865.5	6−	1617.5	(4−)			
289.0 *5*		1617.5	(4−)	1328.5	5+			Iγ: masked by contaminant G.
289.2 *2*	6.5 *7*	2360.7	10−	2071.5	8−	Q		DCO=1.07 *12* (1987Be07).
301.2 *5*	2.1 *11*	2138.0	(8−)	1836.8	(6−)	Q		DCO=0.9 *3* (1987Be07).
337.5 *2*	93 *9*	667.8	6+	330.27	4+	E2[&]	0.0521	DCO=0.97 *5* (1987Be07).
354.4 *5*	2.1 *11*	2492.4	(10−)	2138.0	(8−)			DCO=0.7 *2* (1987Be07).
356.0 *5*	1.1 *6*	2530.6	12+	2174.6	12+			
366.0 *5*	1.4 *7*	2896.6	14+	2530.6	12+	Q		DCO=1.0 *2* (1987Be07).
367.0 *2*	11.0 *11*	2727.7	12−	2360.7	10−	Q		DCO=1.03 *12* (1987Be07).
375.8 *2*	7.0 *7*	3272.5	16+	2896.6	14+	E2[&]	0.0383	DCO=1.00 *12* (1987Be07).
400.0 *5*	3.0 *15*	2892.4	(12−)	2492.4	(10−)	Q		Mult.: DCO=1.1 *3* (1987Be07).
430.2 *2*	90 *9*	1098.0	8+	667.8	6+	E2[&]	0.0264	DCO=0.88 *6* (1987Be07).
437.6 *2*	12.0 *12*	3165.3	14−	2727.7	12−	(E2)	0.0252	Mult.: DCO=0.98 *12* (1987Be07).
445.9 *5*	3.0 *15*	2862.5	13−	2416.7	11−	Q		Mult.: DCO=0.90 *18* (1987Be07).
459.0 *5*	3.0 *15*	3351.4	(14−)	2892.4	(12−)	(Q)		Mult.: DCO=0.66 *17* (1987Be07).

Continued on next page (footnotes at end of table)

^{130}Te(^{40}Ar,4nγ) 1987Be07,1986Ba61,1976Bo27 (continued)

γ(^{166}Yb) (continued)

Eγ[‡]	Iγ[#]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[†]	α[a]	Comments
490.8 *2*	10.0 *10*	3353.3	15⁻	2862.5	13⁻	(E2)	0.0187	Mult.: DCO=0.92 *9* (1987Be07).
494.3 *2*	31 *3*	3272.5	16⁺	2778.3	14⁺	E2[&]	0.0184	Mult.: DCO=0.77 *4* (1987Be07).
499.4 *2*	13.2 *13*	3664.7	16⁻	3165.3	14⁻	(E2)	0.0179	Mult.: DCO=0.96 *10* (1987Be07).
507.2 *2*	123 *12*	1605.2	10⁺	1098.0	8⁺	[E2]	0.01720	Iγ: for 507.2γ+508.3γ triplet. DCO=0.85 *4* (1987Be07) for 507.2γ+508.3γ triplet.
508.3[b] *2*	123[b] *12*	1836.8	(6⁻)	1328.5	5⁺			Iγ: for 507.2γ+508.3γ triplet. DCO=0.85 *4* (1987Be07) for 507.2γ+508.3γ triplet.
508.3[b] *2*	123[b] *12*	3780.8	18⁺	3272.5	16⁺	[E2]	0.01711	Iγ: for 507.2γ+508.3γ triplet. DCO=0.85 *4* (1987Be07) for 507.2γ+508.3γ triplet.
527.7 *5*	2.2 *11*	3879.1	(16⁻)	3351.4	(14⁻)			
538.1 *2*	12.0 *12*	3891.4	17⁻	3353.3	15⁻	(E2)	0.01483	Mult.: DCO=0.71 *12* (1987Be07).
552.8 *2*	12.0 *12*	4217.5	18⁻	3664.7	16⁻	(E2)	0.01388	Mult.: DCO=0.71 *12* (1987Be07).
569.4 *2*	64 *6*	2174.6	12⁺	1605.2	10⁺	E2[&]	0.01291	DCO=0.84 *4* (1987Be07).
575.1 *5*	3.2 *16*	3353.3	15⁻	2778.3	14⁺	(D)		Mult.: DCO=1.6 *4* (1987Be07).
586.5 *2*	11.1 *11*	4477.9	19⁻	3891.4	17⁻	(E2)	0.01202	Mult.: DCO=0.74 *11* (1987Be07).
588.5 *2*	31 *3*	4369.3	20⁺	3780.8	18⁺	E2[&]	0.01192	Mult.: DCO=0.74 *5* (1987Be07).
592.5 *2*	7.1 *7*	3489.0	16⁺	2896.6	14⁺			Mult.: DCO=0.64 *12* (1987Be07).
592.7 *5*	2.0 *10*	4471.8	(18⁻)	3879.1	(16⁻)	[E2]	0.01172	
600.4 *2*	9.5 *10*	4817.9	20⁻	4217.5	18⁻	(E2)	0.01137	Mult.: DCO=0.76 *12* (1987Be07).
603.6 *2*	48 *5*	2778.3	14⁺	2174.6	12⁺	E2[&]	0.01122	Mult.: DCO=0.89 *12* (1987Be07).
630.0 *2*	6.5 *7*	5107.9	21⁻	4477.9	19⁻	(E2)	0.01015	Mult.: DCO=0.75 *15* (1987Be07).
648.3 *5*	1.9 *10*	5120.1	(20⁻)	4471.8	(18⁻)			
649.4 *2*	8.2 *8*	5467.3	22⁻	4817.9	20⁻	(E2)	0.00945	DCO=0.87 *12* (1987Be07).
666.3 *2*	22.0 *22*	5035.6	22⁺	4369.3	20⁺	E2[&]	0.00891	Mult.: DCO=0.76 *7* (1987Be07).
674.0 *2*	6.1 *6*	5781.9	23⁻	5107.9	21⁻	(E2)	0.00868	Mult.: DCO=0.95 *13* (1987Be07).
687.8 *2*	6.9 *7*	2862.5	13⁻	2174.6	12⁺	(D)		Mult.: DCO=1.4 *4* (1987Be07).
694.9 *5*	1.4 *7*	5815.0	(22⁻)	5120.1	(20⁻)			
699.8 *2*	7.5 *8*	4188.8	18⁺	3489.0	16⁺	(E2)	0.00797	Mult.: DCO=1.01 *12* (1987Be07).
704.8 *2*	7.5 *8*	6172.1	24⁻	5467.3	22⁻	(E2)	0.00784	Mult.: DCO=0.98 *15* (1987Be07).
710.5 *2*	11.3 *11*	3489.0	16⁺	2778.3	14⁺	(E2)	0.00770	Mult.: DCO=1.03 *12* (1987Be07).
722.1 *2*	15.0 *15*	2896.6	14⁺	2174.6	12⁺	Q		Mult.: DCO=1.02 *12* (1987Be07).
724.9 *5*	5.0 *25*	6506.8	25⁻	5781.9	23⁻	[E2]	0.00736	Mult.: DCO=0.65 *3* (1987Be07).
726.9 *5*	4.3 *22*	5648.6	22⁺	4921.7	20⁺	(E2)	0.00731	Mult.: DCO=1.0 *2* (1987Be07).
728.5[c] *5*	1.9 *10*	6377.1?	(24⁺)	5648.6	22⁺	(E2)	0.00728	Mult.: DCO=1.0 *2* (1987Be07).
732.9 *2*	5.9 *6*	4921.7	20⁺	4188.8	18⁺	(E2)	0.00718	DCO=1.0 *2* (1987Be07).
737.8 *5*	1.2 *6*	6552.8	(24⁻)	5815.0	(22⁻)			
738.6 *2*	16.2 *17*	5774.2	24⁺	5035.6	22⁺	[E2]	0.00706	Mult.: DCO=0.68 *12* (1987Be07).
766.6 *2*	5.8 *6*	6938.7	26⁻	6172.1	24⁻	(E2)	0.00650	Mult.: DCO=0.9 *2* (1987Be07).
783.0[c] *5*	1.0 *5*	7335.8?	(26⁻)	6552.8	(24⁻)			
787.1 *2*	4.6 *23*	7293.9	27⁻	6506.8	25⁻	(E2)	0.00614	Mult.: DCO=0.9 *2* (1987Be07).
806.3 *2*	12.0 *12*	6580.5	26⁺	5774.2	24⁺	E2[&]	0.00583	Mult.: DCO=0.89 *10* (1987Be07).
811.6 *2*	5.8 *6*	2416.7	11⁻	1605.2	10⁺			Eγ,Iγ: possibly contaminated by another transition (1987Be07). DCO=1.33 *19* (1987Be07) for possibly contaminated G.
833.6 *2*	5.1 *5*	7772.3	28⁻	6938.7	26⁻	(E2)	0.00542	Mult.: DCO=0.77 *14* (1987Be07).
853.8 *5*	3.5 *18*	8147.7	29⁻	7293.9	27⁻	(E2)	0.00515	Mult.: DCO=0.75 *16* (1987Be07).
860.0 *5*	0.6 *3*	1958.2	(7⁻)	1098.0	8⁺			
870.2 *2*	7.8 *8*	7450.7	28⁺	6580.5	26⁺	[E2]	0.00495	Mult.: DCO=1.0 *12* (1987Be07).
903.4 *5*	3.1 *16*	8675.7	30⁻	7772.3	28⁻	(E2)	0.00457	Mult.: DCO=0.7 *2* (1987Be07).
922.8 *5*	2.5 *13*	9070.5	31⁻	8147.7	29⁻	[E2]	0.00438	Mult.: DCO=0.50 *17* (1987Be07).

Continued on next page (footnotes at end of table)

^{130}Te(^{40}Ar,4nγ) 1987Be07,1986Ba61,1976Bo27 (continued)

γ(^{166}Yb) (continued)

E_γ[‡]	I_γ[#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	α[a]	Comments
935.0 *2*	6.4 *6*	8385.7	30$^+$	7450.7	28$^+$	E2[&]	0.00426	Mult.: DCO=0.82 *15* (1987Be07).
971.6 *5*	1.3 *7*	9647.3	32$^-$	8675.7	30$^-$	(E2)	0.00393	Mult.: DCO=0.7 *2* (1987Be07).
986.2 *5*	1.6 *8*	10056.7	33$^-$	9070.5	31$^-$	(E2)	0.00381	Mult.: DCO=0.7 *2* (1987Be07).
998.8 *5*	3.7 *18*	9384.5	32$^+$	8385.7	30$^+$	(E2)	0.00372	Mult.: DCO=0.77 *15* (1987Be07).
1037.0 *5*	2.5 *12*	1704.8	7$^+$	667.8	6$^+$			
1045.0[c] *5*	1.3 *7*	11101.7?	(35$^-$)	10056.7	33$^-$			
1053.0 *5*	1.0 *5*	2151.0	9$^+$	1098.0	8$^+$			
1060.0 *5*	2.9 *15*	10444.5	34$^+$	9384.5	32$^+$	[E2]	0.00329	Mult.: DCO=1.4 *3* (1987Be07) for contaminated line.
1084[c]	1.0 *5*	12185.7?	(37$^-$)	11101.7?	(35$^-$)			
1111.2 *5*	2.5 *13*	2208.9	9$^-$	1098.0	8$^+$			
1112.0 *5*	1.6 *8*	11556.5	36$^+$	10444.5	34$^+$			Mult.: DCO=1.0 *3* (1987Be07).
1122.0 *5*	0.8 *4*	1789.8	(5$^-$)	667.8	6$^+$			
1158.0[c] *5*	1.0 *5*	12714.5?	(38$^+$)	11556.5	36$^+$			
1290.5 *5*	1.2 *6*	1958.2	(7$^-$)	667.8	6$^+$			

† From DCO ratios, assigning $\Delta\pi$=(no) for stretched Q intraband transitions, unless otherwise noted. note that expected values for DCO ratios from 1987Be07 are 2 for stretched D and 1 for Q (ΔJ=2) or D (ΔJ=0); however, due to deorientation of the reference state, values for expected ΔJ=2 transitions from J>10 states are systematically low (DCO=0.50 *17* In the worst case).

‡ From 1987Be07, unless otherwise noted. ΔE=0.2 keV, except for weakest transitions; ΔE=0.5 keV for the latter and the evaluator assigns this uncertainty if I$\gamma\leq$5.

From ^{130}Te(^{40}Ar,4n), E(^{40}Ar)=180 MeV (1987Be07). Iγ data are mostly obtained from gated coincidence spectra and normalized to the 228.1γ. Intensity values are known to 10%, except for weakest peaks for which uncertainties can be up to 50%. The evaluator assumes the latter to Be those for which I$\gamma\leq$5.

@ From Adopted Gammas.

& Q from DCO ratio; not M2 from RUL.

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.

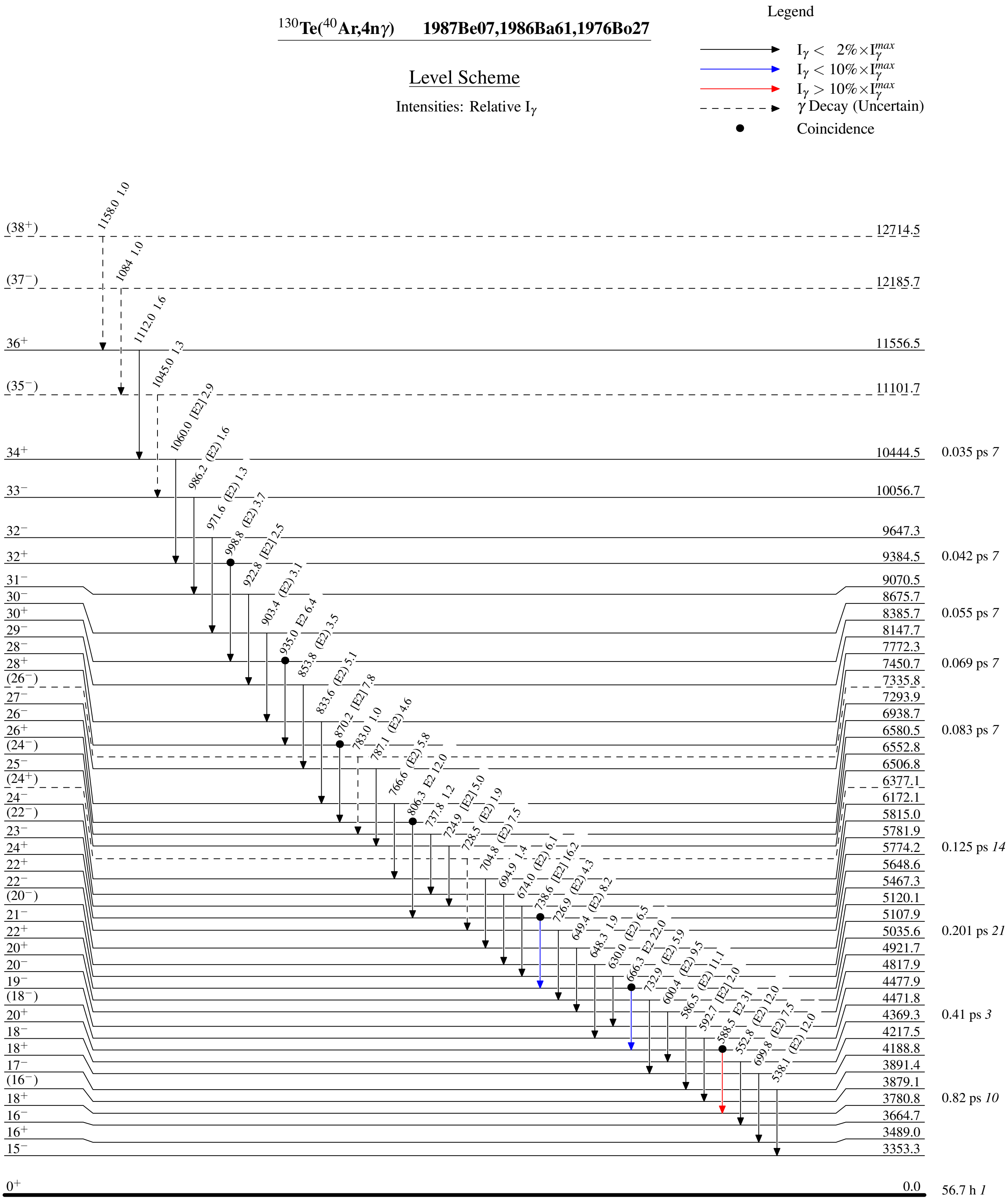
b Multiply placed with undivided intensity.

c Placement of transition in the level scheme is uncertain.

^{130}Te(^{40}Ar,4nγ) 1987Be07,1986Ba61,1976Bo27

Level Scheme

Intensities: Relative I_γ



$^{166}_{70}Yb_{96}$

$^{130}Te(^{40}Ar,4n\gamma)$ 1987Be07,1986Ba61,1976Bo27

Level Scheme (continued)

Intensities: Relative I_γ

& Multiply placed: undivided intensity given

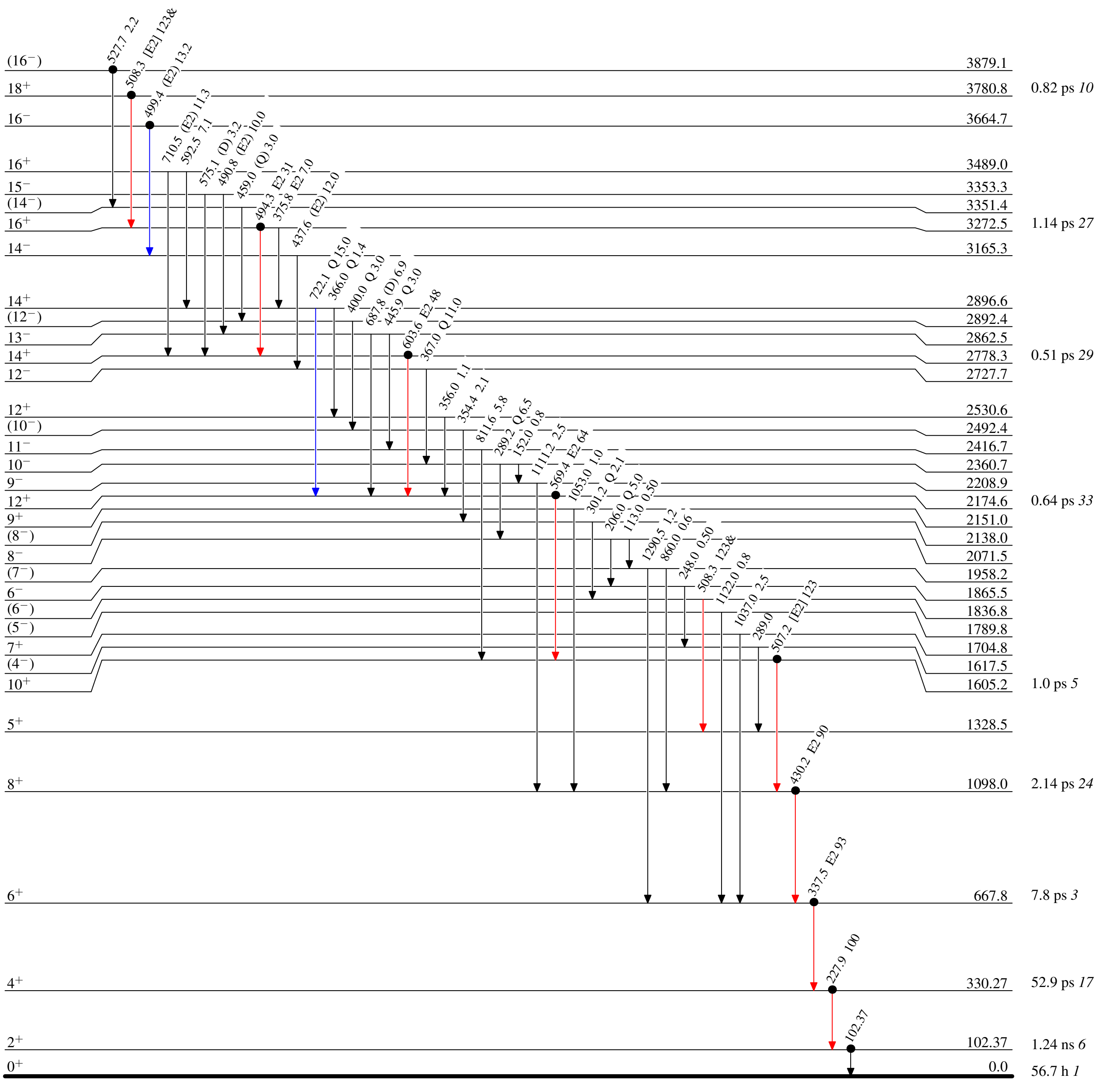
Legend

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

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

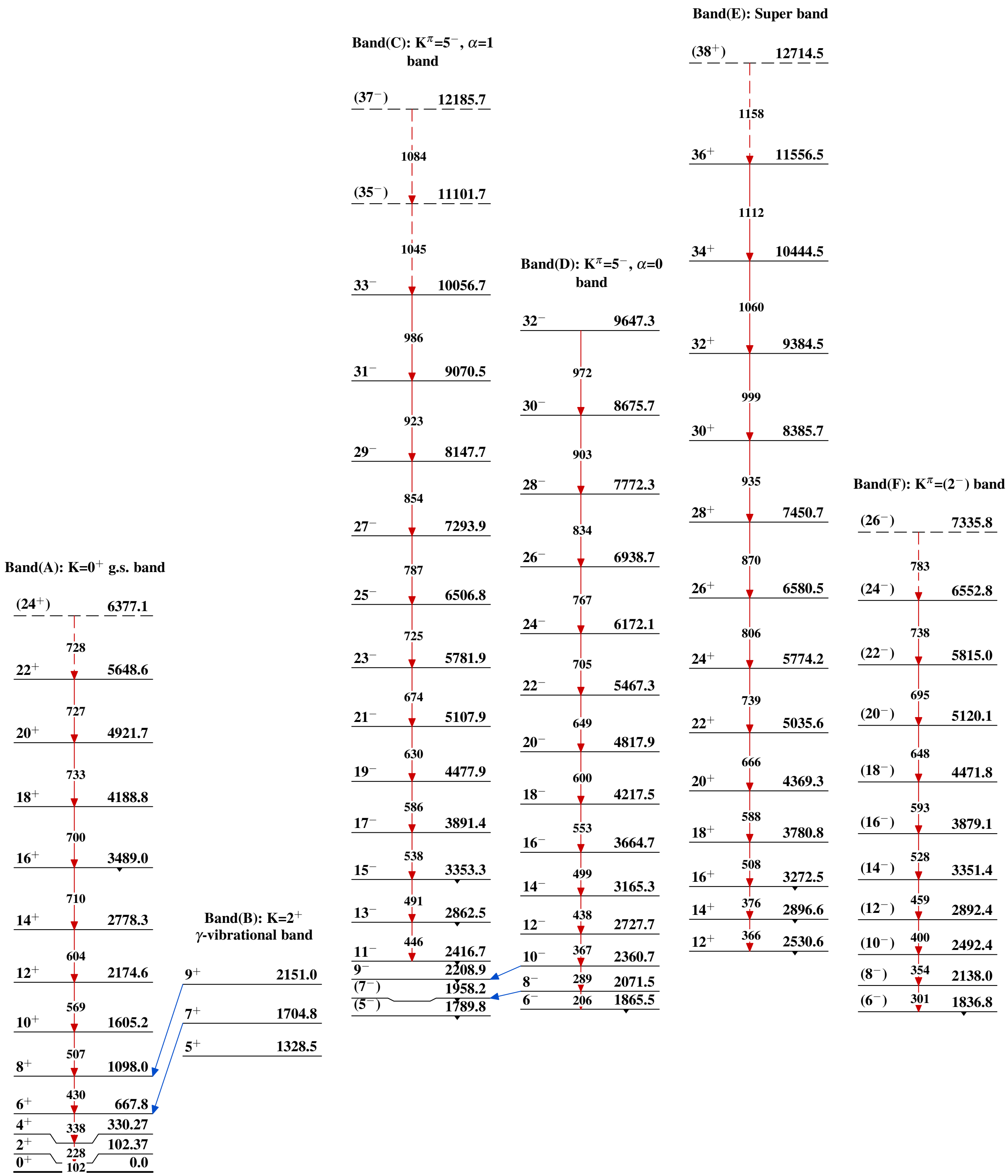
$I_\gamma > 10\% \times I_\gamma^{max}$

Coincidence



$^{166}_{70}Yb_{96}$

^{130}Te(^{40}Ar,4nγ) 1987Be07,1986Ba61,1976Bo27



$^{166}_{70}Yb_{96}$