^{125}Te(α,2nγ) 1985Ur01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. Hashizume	NDS 112, 1647 (2011)	1-Oct-2009

1985Ur01: E=27 MeV, γ, $\gamma\gamma$ coin, $\gamma\gamma$←t), (beam)(γ)(t), $\gamma(\theta)$ (θ=27°, 30°, 40°, 48°, 55°, 67°, and 90°), γ-pol.
Other: 1983Ir02: E=18 MeV, see ^{124}Te(α,nγ).

^{127}Xe Levels

E(level)[†]	J$^\pi$[b]	T$_{1/2}$[a]	Comments
0.0[&]	1/2$^+$		
124.64[@] *8*	3/2$^+$		
297.04 *12*	9/2$^-$		
308.91[‡] *17*	(11/2$^-$)		
321.46 *9*	3/2$^+$		
342.13[#] *12*	7/2$^+$	34 ns *3*	From $\gamma\gamma$(t) (1985Ur01).
375.50[&] *8*	5/2$^+$		
509.94 *13*	(3/2)$^+$		
530.22[@] *10*	7/2$^+$		
645.85 *13*	(9/2)$^+$		
711.3 *4*	7/2$^+$	<2 ns	From $\gamma\gamma$(t) (1985Ur01).
792.28 *18*	(11/2$^-$,13/2$^-$)		
804.61 *13*	5/2$^+$		
828.03[‡] *19*	(15/2$^-$)		
897.60[&] *22*	(9/2$^+$)		
905.14 *24*	1/2$^+$,3/2$^+$,5/2$^+$		
938.22[#] *15*	(11/2)$^+$		
960.04 *15*	(9/2,13/2$^-$)		
1020.8 *4*			
1081.02[@] *23*	11/2$^+$		
1283.35 *24*			
1369.20 *19*	(13/2$^-$,15/2$^-$)		
1466.84 *19*	(13/2$^-$ to 17/2$^-$)		
1508.66[‡] *21*	(19/2$^-$)		
1541.2[&] *3*	(13/2$^+$)		
1622.32[#] *18*	(15/2$^+$)		
1650.5 *4*			
1666.3 *5*			
1704.39 *22*	(13/2$^-$,15/2$^-$)		
1751.8[@] *3*	15/2$^+$		
1924.4 *4*			
2016.6 *4*			
2104.5 *3*	(15/2MPSYMBO<O19/2$^-$)		
2170.4 *5*			
2243.50 *24*	(17/2$^-$,21/2$^-$)		
2274.6[&] *5*	(9/2$^+$,13/2$^+$,15/2$^+$)		
2312.7[‡] *3*	(23/2$^-$)		
2395.12[#] *21*	(15/2$^+$,19/2$^+$)		
2497.9[@] *4*	15/2$^+$,19/2$^+$		
2665.2 *4*	(17/2,19/2,21/2)		
2730.1 *3*		25 ns *3*	T$_{1/2}$: (beam)(γ)(t) (1985Ur01). Authors cannot exclude the possibility of a level with 25-ns T$_{1/2}$ value lying above that at 2730 keV. Then, assignment for the 2730.1 level is tentative.

Continued on next page (footnotes at end of table)

^{125}Te(α,2nγ) 1985Ur01 (continued)

^{127}Xe Levels (continued)

E(level)[†]
3037.0
3052.4
3202.4 *4*

† From a least-squares fit to E(γ's).
‡ Negative parity band.
# Positive parity band-1.
@ Positive parity band-2.
& Positive parity band-3.
a Unless noted otherwise, the $T_{1/2}$'s of the levels reported by 1985Ur01 are less than 25 ns.
b From Adopted Levels.

^{125}Te(α,2nγ) 1985Ur01 (continued)

$\gamma(^{127}Xe)$

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[&]	Comments
11.8 *4*		308.91	(11/2$^-$)	297.04	9/2$^-$				E_γ: From difference of energies of two γ's, 495.2γ and 483.4γ, deexciting 792.3 level.
54.4 *3*		375.50	5/2$^+$	321.46	3/2$^+$				E_γ: From energy difference of 483.3γ and 429.1γ, and of 251.0γ and 196.9γ.
(64.9)		2730.1		2665.2	(17/2,19/2,21/2)				E_γ: Introduced on the basis of the observation that the 1156.5γ has a delayed component with intensity ratio of I(1156.5γ)/I(486.6γ)≈3.
124.7 *1*	100	124.64	3/2$^+$	0.0	1/2$^+$	D+Q			
154.7 *1*	0.8 *2*	530.22	7/2$^+$	375.50	5/2$^+$	D(+Q)	−0.07 *14*	0.245 *6*	α(K)=0.210 *4*; α(L)=0.0276 *18*; α(M)=0.0056 *4*; α(N+..)=0.00141 *9*
172.4 *1*	45 *5*	297.04	9/2$^-$	124.64	3/2$^+$				
196.9[‡] *3*	1.0[‡] *4*	321.46	3/2$^+$	124.64	3/2$^+$				
217.5 *1*	8.8 *5*	342.13	7/2$^+$	124.64	3/2$^+$				
251.0 *2*	0.7 *2*	375.50	5/2$^+$	124.64	3/2$^+$	M1+E2	1 *+13−1*	0.070 *5*	α(K)=0.0584 *25*; α(L)=0.0093 *21*; α(M)=0.0019 *5*; α(N+..)=0.00043 *10* α(N)=0.00039 *9*; α(O)=4.6×10^{-5} *8*
292.3 *2*	0.4 *2*	938.22	(11/2)$^+$	645.85	(9/2)$^+$	M1+E2	−2.1	0.0451	α(K)=0.0374 *6*; α(L)=0.00616 *9*; α(M)=0.001272 *18*; α(N+..)=0.000289 *4* α(N)=0.000259 *4*; α(O)=3.00×10^{-5} *5* $\Delta\delta$: +13−∞.
303.7 *1*	3.1 *2*	645.85	(9/2)$^+$	342.13	7/2$^+$	M1+E2	−3.1 *+7−13*	0.0401	α(K)=0.0332 *5*; α(L)=0.00552 *11*; α(M)=0.001140 *22*; α(N+..)=0.000258 *5* α(N)=0.000232 *5*; α(O)=2.68×10^{-5} *5*
321.5 *1*	2.4 *2*	321.46	3/2$^+$	0.0	1/2$^+$	D(+Q)	−0.8 *+8−73*	0.0341 *3*	α(K)=0.0289 *11*; α(L)=0.0041 *4*; α(M)=0.00084 *8*; α(N+..)=0.00021 *3*
335.5[‡] *3*	0.4[‡] *2*	1704.39	(13/2$^-$,15/2$^-$)	1369.20	(13/2$^-$,15/2$^-$)				
345.0[‡][a] *5*	0.6[‡] *3*	1283.35		938.22	(11/2)$^+$				
348.8 *1*	1.5 *2*	645.85	(9/2)$^+$	297.04	9/2$^-$	E1(+M2)		0.06 *6*	α(K)=0.05 *5*; α(L)=0.007 *7*; α(M)=0.0015 *14*; α(N+..)=0.0003 *3* α(N)=0.0003 *3*; α(O)=4.E−5 *4*
375.4 *1*	3.5 *3*	375.50	5/2$^+$	0.0	1/2$^+$	E2		0.0207	α(K)=0.01731 *25*; α(L)=0.00273 *4*; α(M)=0.000561 *8*; α(N+..)=0.0001277 *18* α(N)=0.0001143 *16*; α(O)=1.340×10^{-5} *19*
385.3 *1*	2.6 *2*	509.94	(3/2)$^+$	124.64	3/2$^+$	M1+E2		0.0203 *12*	α(K)=0.0172 *13*; α(L)=0.00243 *9*; α(M)=0.000495 *21*; α(N+..)=0.000114 *4* α(N)=0.000102 *4*; α(O)=1.235×10^{-5} *18* δ: −3.1 *+12−40* or −0.16 *16*.
389.8[‡] *4*	0.7[‡] *4*	711.3	7/2$^+$	321.46	3/2$^+$				Mult.: Not M2.
395.2 *2*	0.9 *2*	905.14	1/2$^+$,3/2$^+$,5/2$^+$	509.94	(3/2)$^+$	M1+E2	0.3 *+5−2*	0.0199 *8*	α(K)=0.0171 *8*; α(L)=0.00221 *5*; α(M)=0.000449 *11*; α(N+..)=0.0001044

$^{127}_{54}Xe_{73}$-3

$\gamma(^{127}Xe)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[&]	Comments
									19 α(N)=9.28×10^{-5} *18*; α(O)=1.158×10^{-5} *18*
405.6 *1*	6.5 *3*	530.22	7/2$^+$	124.64	3/2$^+$	E2		0.01642	α(K)=0.01377 *20*; α(L)=0.00212 *3*; α(M)=0.000435 *6*; α(N+..)=9.92×10^{-5} *14* α(N)=8.87×10^{-5} *13*; α(O)=1.047×10^{-5} *15*
429.1 *1*	2.0 *3*	804.61	5/2$^+$	375.50	5/2$^+$	M1+E2		0.0151 *13*	α(K)=0.0129 *12*; α(L)=0.00178 *3*; α(M)=0.000362 *5*; α(N+..)=8.36×10^{-5} *14* α(N)=7.45×10^{-5} *12*; α(O)=9.1×10^{-6} *4* δ: −2.7 *+6−10* or −0.14 *7*. Values for a transition from 7/2$^+$ level to 5/2$^+$ level.
458.3[‡a] *8*	<0.8[‡]	1924.4		1466.84	(13/2$^-$ to 17/2$^-$)				
483.3[‡] *4*	2.1[‡] *11*	804.61	5/2$^+$	321.46	3/2$^+$				
483.4 *1*	13.1 *9*	792.28	(11/2$^-$,13/2$^-$)	308.91	(11/2$^-$)	(M1+E2)		0.0110 *12*	α(K)=0.0094 *11*; α(L)=0.00127 *6*; α(M)=0.000259 *10*; α(N+..)=6.0×10^{-5} *3* α(N)=5.33×10^{-5} *23*; α(O)=6.5×10^{-6} *5* δ: −1.7 *+4−6* or −0.45 *12*, if E2 for 483.3γ.
486.6 *1*	1.7 *2*	2730.1		2243.50	(17/2$^-$,21/2$^-$)				
490.6[‡] *3*	1.2[‡] *4*	1020.8		530.22	7/2$^+$				Mult.: ΔJ≤1.
495.2[‡] *3*	1.7[‡] *8*	792.28	(11/2$^-$,13/2$^-$)	297.04	9/2$^-$				
510.9[‡a] *3*	<1.1[‡]	1020.8		509.94	(3/2)$^+$				
519.1 *1*	41.5 *20*	828.03	(15/2$^-$)	308.91	(11/2$^-$)	E2		0.00809 *12*	α=0.00809 *12*; α(K)=0.00686 *10*; α(L)=0.000986 *14*; α(M)=0.000202 *3*; α(N+..)=4.62×10^{-5} *7* α(N)=4.13×10^{-5} *6*; α(O)=4.96×10^{-6} *7*
522.1 *2*	3.6 *3*	897.60	(9/2$^+$)	375.50	5/2$^+$	(E2)		0.00797 *12*	α=0.00797 *12*; α(K)=0.00675 *10*; α(L)=0.000969 *14*; α(M)=0.000198 *3*; α(N+..)=4.55×10^{-5} *7* α(N)=4.06×10^{-5} *6*; α(O)=4.88×10^{-6} *7*
541.2 *1*	1.6 *2*	1369.20	(13/2$^-$,15/2$^-$)	828.03	(15/2$^-$)	M1(+E2)	+0.3 *5*	0.0090 *7*	α=0.0090 *7*; α(K)=0.0078 *6*; α(L)=0.00099 *4*; α(M)=0.000200 *8*; α(N+..)=4.66×10^{-5} *20* α(N)=4.14×10^{-5} *18*; α(O)=5.2×10^{-6} *3*
550.8 *2*	6.3 *3*	1081.02	11/2$^+$	530.22	7/2$^+$	E2		0.00689 *10*	α=0.00689 *10*; α(K)=0.00585 *9*; α(L)=0.000829 *12*; α(M)=0.0001693 *24*; α(N+..)=3.89×10^{-5} *6* α(N)=3.47×10^{-5} *5*; α(O)=4.19×10^{-6} *6*
555.2[‡] *3*	1.0[‡] *3*	1924.4		1369.20	(13/2$^-$,15/2$^-$)				
570.4[‡a] *5*	0.7[‡] *3*	1650.5		1081.02	11/2$^+$				
576.9 *1*	3.5 *2*	1369.20	(13/2$^-$,15/2$^-$)	792.28	(11/2$^-$,13/2$^-$)	D+Q	−0.8 *+2−4*		
[x]587.8[‡] *4*	1.2[‡] *8*								

^{125}Te(α,2nγ) 1985Ur01 (continued)

$\gamma(^{127}Xe)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[&]	Comments
595.7 *3*	2.5 *8*	2104.5	(15/2MPSYMBO<O19/2$^-$)	1508.66	(19/2$^-$)	[@]		
596.1 *1*	8.9 *9*	938.22	(11/2)$^+$	342.13	7/2$^+$	E2[@]	0.00558 *8*	α=0.00558 *8*; α(K)=0.00475 *7*; α(L)=0.000662 *10*; α(M)=0.0001350 *19*; α(N+..)=3.11×10^{-5} *5* α(N)=2.77×10^{-5} *4*; α(O)=3.36×10^{-6} *5*
629.7 *1*	1.6 *2*	1650.5		1020.8				
637.5[‡] *2*	2.8[‡] *9*	1283.35		645.85	(9/2)$^+$			Mult.: Not M2.
638.0[‡] *4*	1.8[‡] *5*	2104.5	(15/2MPSYMBO<O19/2$^-$)	1466.84	(13/2$^-$ to 17/2$^-$)			
638.8 *1*	6.9 *15*	1466.84	(13/2$^-$ to 17/2$^-$)	828.03	(15/2$^-$)	M1+E2	0.0054 *8*	α=0.0054 *8*; α(K)=0.0046 *7*; α(L)=0.00061 *6*; α(M)=0.000123 *12*; α(N+..)=2.8×10^{-5} *3* α(N)=2.54×10^{-5} *25*; α(O)=3.1×10^{-6} *4* α(N)=2.53×10^{-5} *25*; α(O)=3.1×10^{-6} *4* δ: −3.5 +*9*−*17* or −0.21 *11*.
643.6 *2*	2.4 *2*	1541.2	(13/2$^+$)	897.60	(9/2$^+$)	E2	0.00458 *7*	α=0.00458 *7*; α(K)=0.00391 *6*; α(L)=0.000536 *8*; α(M)=0.0001092 *16*; α(N+..)=2.52×10^{-5} *4* α(N)=2.24×10^{-5} *4*; α(O)=2.73×10^{-6} *4*
651.1 *1*	2.5 *2*	960.04	(9/2,13/2$^-$)	308.91	(11/2$^-$)			Mult.: ΔJ=0,1. δ: +0.03 *7* or +30 +∞−20.
663.0 *1*	4.5 *3*	960.04	(9/2,13/2$^-$)	297.04	9/2$^-$			Mult.: ΔJ=0,2; Δπ=no. δ: +0.1 *4* for ΔJ=0.
670.8 *2*	5.0 *4*	1751.8	15/2$^+$	1081.02	11/2$^+$	E2	0.00412 *6*	α=0.00412 *6*; α(K)=0.00352 *5*; α(L)=0.000480 *7*; α(M)=9.76×10^{-5} *14*; α(N+..)=2.25×10^{-5} *4* α(N)=2.01×10^{-5} *3*; α(O)=2.45×10^{-6} *4*
674.6 *1*	3.3 *2*	1466.84	(13/2$^-$ to 17/2$^-$)	792.28	(11/2$^-$,13/2$^-$)	E2	0.00407 *6*	α=0.00407 *6*; α(K)=0.00347 *5*; α(L)=0.000472 *7*; α(M)=9.61×10^{-5} *14*; α(N+..)=2.22×10^{-5} *4* α(N)=1.98×10^{-5} *3*; α(O)=2.41×10^{-6} *4*
680.6 *1*	22.9 *11*	1508.66	(19/2$^-$)	828.03	(15/2$^-$)	E2	0.00398 *6*	α=0.00398 *6*; α(K)=0.00340 *5*; α(L)=0.000461 *7*; α(M)=9.39×10^{-5} *14*; α(N+..)=2.17×10^{-5} *3* α(N)=1.93×10^{-5} *3*; α(O)=2.36×10^{-6} *4*
684.1 *1*	8.4 *5*	1622.32	(15/2$^+$)	938.22	(11/2)$^+$	E2	0.00393 *6*	α=0.00393 *6*; α(K)=0.00336 *5*; α(L)=0.000455 *7*; α(M)=9.26×10^{-5} *13*; α(N+..)=2.14×10^{-5} *3* α(N)=1.90×10^{-5} *3*; α(O)=2.33×10^{-6} *4*
724.4[a] *5*	1.4 *5*	3037.0		2312.7	(23/2$^-$)			
733.2[‡] *3*	1.8[‡] *5*	2016.6		1283.35		M1,E2	0.0039 *6*	α=0.0039 *6*; α(K)=0.0033 *5*; α(L)=0.00043 *5*; α(M)=8.7×10^{-5} *10*; α(N+..)=2.01×10^{-5} *24* α(N)=1.79×10^{-5} *21*; α(O)=2.2×10^{-6} *3* Mult.: ΔJ=0,2; Δπ=no.
733.4[‡] *3*	1.0[‡] *3*	2274.6	(9/2$^+$,13/2$^+$,15/2$^+$)	1541.2	(13/2$^+$)	M1,E2	0.0039 *6*	α=0.0039 *6*; α(K)=0.0033 *5*; α(L)=0.00043 *5*; α(M)=8.7×10^{-5} *10*; α(N+..)=2.01×10^{-5} *24* α(N)=1.79×10^{-5} *21*; α(O)=2.2×10^{-6} *3* Mult.: ΔJ=0,2; Δπ=no.

$^{127}_{54}Xe_{73}$-5

$\gamma(^{127}Xe)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[&]	Comments
734.8 *2*	3.9 *3*	2243.50	(17/2$^-$,21/2$^-$)	1508.66	(19/2$^-$)	M1+E2	0.0038 *6*	α=0.0038 *6*; α(K)=0.0033 *5*; α(L)=0.00043 *5*; α(M)=8.6×10^{-5} *10*; α(N+..)=2.00×10^{-5} *23* α(N)=1.78×10^{-5} *21*; α(O)=2.2×10^{-6} *3*
735.0[‡] *5*	0.9[‡] *3*	2104.5	(15/2MPSYMBO<O19/2$^-$)	1369.20	(13/2$^-$,15/2$^-$)			
744.3 *2*	3.3 *3*	1704.39	(13/2$^-$,15/2$^-$)	960.04	(9/2,13/2$^-$)	M1,E2	0.0037 *6*	α=0.0037 *6*; α(K)=0.0032 *5*; α(L)=0.00041 *5*; α(M)=8.3×10^{-5} *10*; α(N+..)=1.94×10^{-5} *23* α(N)=1.73×10^{-5} *20*; α(O)=2.1×10^{-6} *3* Mult.: ΔJ=0,2; $\Delta\pi$=no. δ: +0.3 *4* for ΔJ=0.
746.1 *2*	1.5 *2*	2497.9	15/2$^+$,19/2$^+$	1751.8	15/2$^+$	M1,E2	0.0037 *6*	α=0.0037 *6*; α(K)=0.0032 *5*; α(L)=0.00041 *5*; α(M)=8.3×10^{-5} *10*; α(N+..)=1.93×10^{-5} *23* α(N)=1.71×10^{-5} *20*; α(O)=2.1×10^{-6} *3* Mult.: ΔJ=0,2; $\Delta\pi$=no. δ: +0.25 *75* for ΔJ=0.
772.8 *1*	3.0 *2*	2395.12	(15/2$^+$,19/2$^+$)	1622.32	(15/2$^+$)	M1,E2	0.0034 *5*	α=0.0034 *5*; α(K)=0.0029 *5*; α(L)=0.00038 *5*; α(M)=7.6×10^{-5} *9*; α(N+..)=1.77×10^{-5} *21* α(N)=1.57×10^{-5} *19*; α(O)=2.0×10^{-6} *3* Mult.: ΔJ=0,2; $\Delta\pi$=no. δ: +0.35 *55*; value for ΔJ=0.
776.7 *2*	2.0 *3*	2243.50	(17/2$^-$,21/2$^-$)	1466.84	(13/2$^-$ to 17/2$^-$)	M1,E2	0.0034 *5*	α=0.0034 *5*; α(K)=0.0029 *5*; α(L)=0.00037 *5*; α(M)=7.5×10^{-5} *9*; α(N+..)=1.75×10^{-5} *21* α(N)=1.55×10^{-5} *19*; α(O)=1.9×10^{-6} *3* Mult.: ΔJ=0,2; $\Delta\pi$=no. δ: +0.4 *6* for ΔJ=0.
804.0 *2*	9.8 *5*	2312.7	(23/2$^-$)	1508.66	(19/2$^-$)	E2	0.00266 *4*	α=0.00266 *4*; α(K)=0.00228 *4*; α(L)=0.000301 *5*; α(M)=6.11×10^{-5} *9*; α(N+..)=1.413×10^{-5} *20* α(N)=1.258×10^{-5} *18*; α(O)=1.548×10^{-6} *22*
809.0[@] *3*	1.0 *2*	3052.4		2243.50	(17/2$^-$,21/2$^-$)			
874.0[‡] *4*	0.4[‡] *2*	1666.3		792.28	(11/2$^-$,13/2$^-$)			
876.0 *4*	1.0 *2*	1704.39	(13/2$^-$,15/2$^-$)	828.03	(15/2$^-$)			Mult.: ΔJ≤1 allows D,Q.
889.7 *2*	2.1 *2*	3202.4		2312.7	(23/2$^-$)			
1156.5 *3*	1.3 *2*	2665.2	(17/2,19/2,21/2)	1508.66	(19/2$^-$)			Mult.: From ΔJ=0,1. δ: −0.05 *7* for ΔJ=1.
1342.4 *4*	1.1 *2*	2170.4		828.03	(15/2$^-$)			

[†] From 1985Ur01, unless noted otherwise.
[‡] Estimated from $\gamma\gamma$-coin spectra.
[#] From $\gamma(\theta)$ and γ-linear pol.
[@] Unresolved in $\gamma(\theta)$. Authors assign ΔJ=2, $\Delta\pi$=no for the dominant 596.1γ.

$^{127}_{54}Xe_{73}$-6

[&] 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.
[a] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

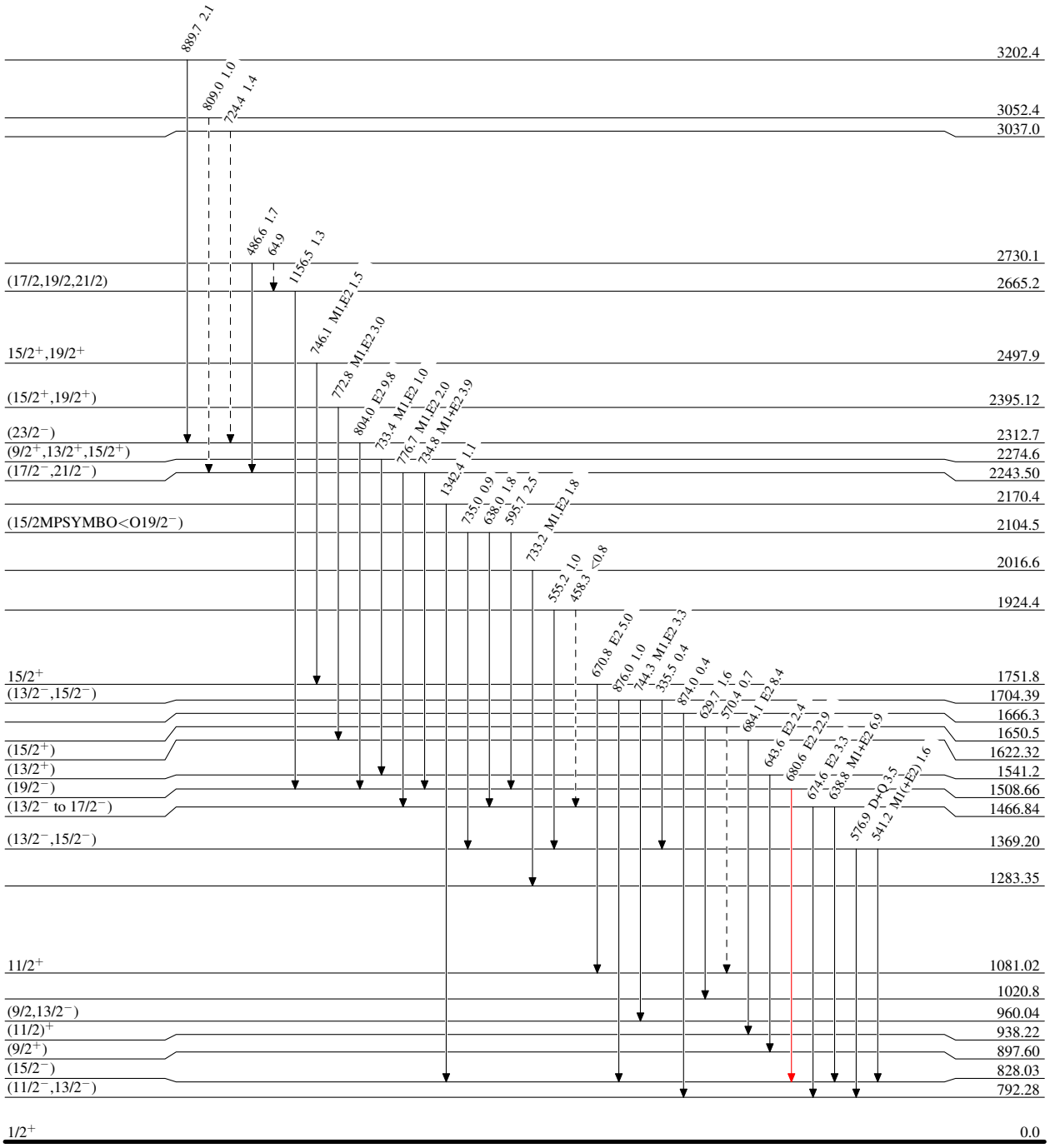
^{125}Te(α,2nγ) 1985Ur01

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)



$^{127}_{54}Xe_{73}$

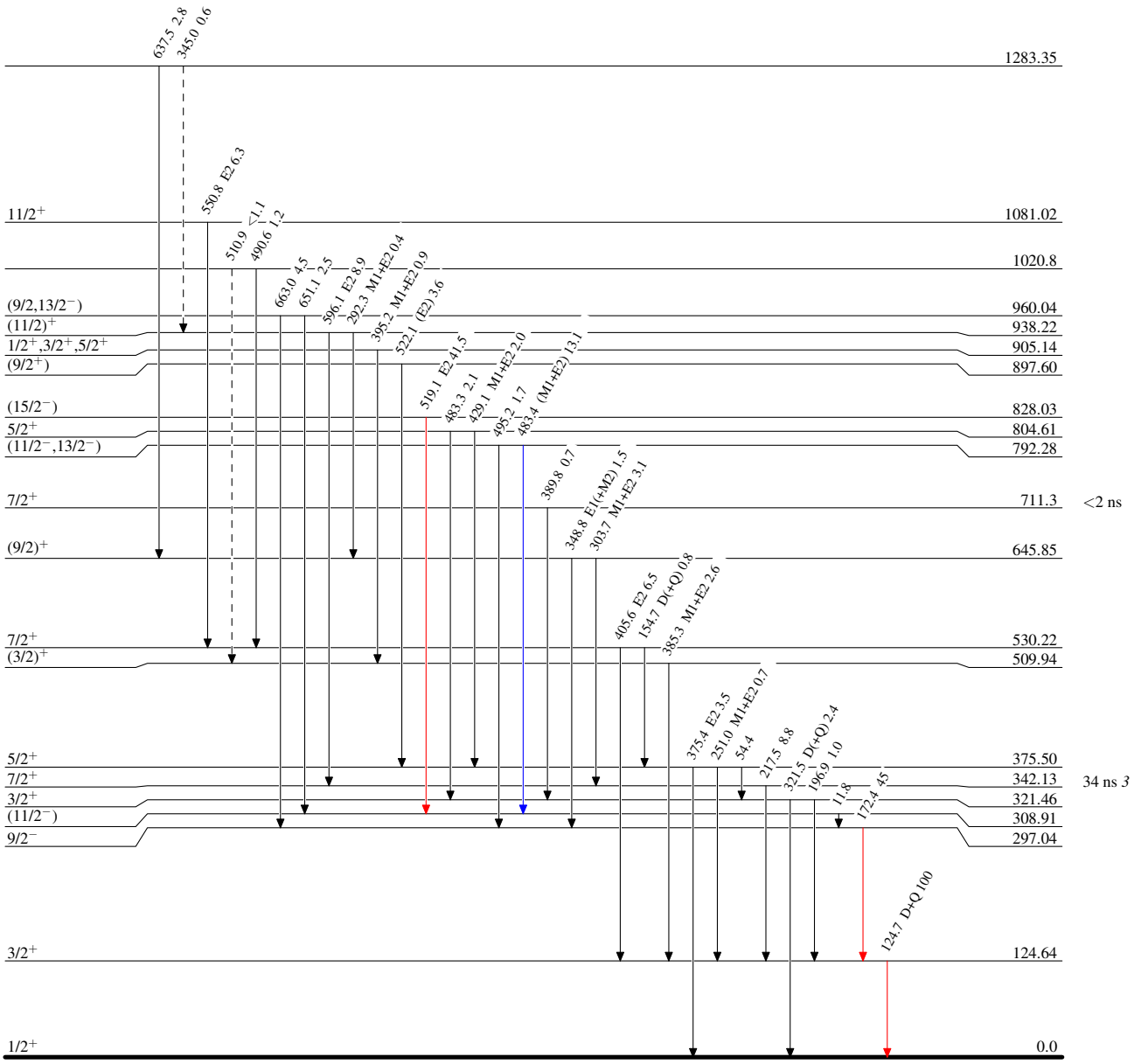
^{125}Te(α,2nγ) 1985Ur01

Level Scheme (continued)

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{127}_{54}Xe_{73}$