Coulomb excitation 1976Sv02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 145,25 (2017)	1-Jul-2017

(α,$\alpha'\gamma$), E=10 MeV. Natural target. Ge(Li), FWHM=2.2 keV at 1332 keV. Measured Eγ, Iγ, $\gamma\gamma$, a,$\gamma(\theta)$, and excitation yields.
(^{16}O,^{16}O$'\gamma$), E=28 MeV to 42 MeV. Measured Doppler shift attenuation.
(p,p$'\gamma$) E=1.8 MeV (1963Al14).
Other: 1972Bo06.

^{99}Tc Levels

B(E2) from excitation yield if B(E2)(181.1 level)=0.0245 *9* as deduced from $T_{1/2}$(181.1)=3.61 ns *7* (corrected by the evaluators for the adopted γ branching).

E(level)	J$^{\pi}$†	$T_{1/2}$‡	Comments
0	9/2$^+$		
140.52 *7*	7/2$^+$		B(E2)↑=0.10 *2* Other: 0.035 (1963Al14).
181.04 *9*	5/2$^+$		B(E2)↑=0.021 (1963Al14) B(E2)=0.0245 *9* from adopted $T_{1/2}$, branching.
625.40 *9*	(9/2)$^+$		B(E2)↑=0.0010 *3*
726.67 *8*	11/2$^+$	1.8 ps *2*	B(E2)↑=0.076 *11*
761.68 *10*	5/2$^+$	0.7 ps *+5−3*	B(E2)↑=0.018 *3*
762.03 *9*	(13/2$^+$)	2.4 ps *3*	B(E2)↑=0.133 *19*
1081.35 *8*	(11/2$^+$)	0.9 ps *3*	B(E2)↑=0.024 *4*

† From Adopted Levels.
‡ From Doppler shift attenuation (1976Sv02). The 1972Bo06 measurement gives systematically smaller values which may be due to an error in the stopping power function for the pressed-powder target. 1976Sv02 used a rolled-metal target.

$\gamma(^{99}Tc)$

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡b]	α[a]	Comments
40.6		181.04	$5/2^+$	140.52	$7/2^+$				
101.3[#] *2*		726.67	$11/2^+$	625.40	$(9/2)^+$				
140.5 *1*	556 *40*	140.52	$7/2^+$	0	$9/2^+$	(M1+E2)	+0.20 *+8−6*	0.119 *9*	α(K)=0.104 *8*; α(L)=0.0129 *14*; α(M)=0.0023 *3* α(N)=0.00037 *4*; α(O)=2.30×10^{-5} *13*
181.1 *1*	72 *7*	181.04	$5/2^+$	0	$9/2^+$	(E2)		0.1479	α(K)=0.1252 *18*; α(L)=0.0188 *3*; α(M)=0.00343 *5* α(N)=0.000523 *8*; α(O)=2.44×10^{-5} *4*
319.2 *2*	≤0.6	1081.35	$(11/2^+)$	762.03	$(13/2^+)$				
484.9 *2*	≤0.4	625.40	$(9/2)^+$	140.52	$7/2^+$				
580.7 *1*	3.5 *3*	761.68	$5/2^+$	181.04	$5/2^+$	(M1+E2)	−0.15 *20*	0.00299	α(K)=0.00262 *5*; α(L)=0.000299 *6*; α(M)=5.42×10^{-5} *11* α(N)=8.64×10^{-6} *16*; α(O)=5.84×10^{-7} *9* B(M1)(W.u.)=0.019 *+9−14*; B(E2)(W.u.)=1 *+4−1* δ: or δ=+2.5 *20*.
580.9[&c]	<1	762.03	$(13/2^+)$	181.04	$5/2^+$				
586.1 *1*	15.6 *8*	726.67	$11/2^+$	140.52	$7/2^+$	(E2)		0.00319	α(K)=0.00279 *4*; α(L)=0.000333 *5*; α(M)=6.04×10^{-5} *9* α(N)=9.52×10^{-6} *14*; α(O)=5.99×10^{-7} *9* B(E2)(W.u.)=23 *3*
621.1 *1*	21.3 *10*	761.68	$5/2^+$	140.52	$7/2^+$	(M1+E2)	+0.19 *6*	0.00256	α(K)=0.00225 *4*; α(L)=0.000256 *4*; α(M)=4.63×10^{-5} *7* α(N)=7.38×10^{-6} *11*; α(O)=4.99×10^{-7} *7* B(M1)(W.u.)=0.09 *+4−7*; B(E2)(W.u.)=8 *+7−8* δ: or δ>+13.
621.5[&c]	<4	762.03	$(13/2^+)$	140.52	$7/2^+$				
625.4 *1*	1.6 *2*	625.40	$(9/2)^+$	0	$9/2^+$	(M1+E2)	<−1	0.00255 *6*	α(K)=0.00224 *5*; α(L)=0.000257 *8*; α(M)=4.66×10^{-5} *14* α(N)=7.41×10^{-6} *20*; α(O)=4.93×10^{-7} *8*
726.7 *1*	100 *5*	726.67	$11/2^+$	0	$9/2^+$	(M1+E2)		0.00179 *3*	α(K)=0.001567 *23*; α(L)=0.000180 *5*; α(M)=3.27×10^{-5} *8* α(N)=5.19×10^{-6} *11*; α(O)=3.43×10^{-7} *7* δ: >0.
(761.7[@])	3.9[@]	761.68	$5/2^+$	0	$9/2^+$				
762.0 *1*	179 *5*	762.03	$(13/2^+)$	0	$9/2^+$	(E2)		1.59×10^{-3}	α(K)=0.001391 *20*; α(L)=0.0001623 *23*; α(M)=2.94×10^{-5} *5* α(N)=4.65×10^{-6} *7*; α(O)=3.01×10^{-7} *5* B(E2)(W.u.)=33 *5*
940.9 *1*	4.8 *3*	1081.35	$(11/2^+)$	140.52	$7/2^+$	(E2)		9.52×10^{-4}	α(K)=0.000835 *12*; α(L)=9.60×10^{-5} *14*; α(M)=1.737×10^{-5} *25*

$\gamma(^{99}Tc)$ (continued)

E_γ	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [a]	Comments
								α(K)=0.000835 *12*; α(L)=9.60×10^{-5} *14*; α(M)=1.737×10^{-5} *25* α(N)=2.76×10^{-6} *4*; α(O)=1.82×10^{-7} *3* B(E2)(W.u.)=11 *4*
1081.3 *1*	8.9 *6*	1081.35	(11/2$^+$)	0	9/2$^+$	(M1+E2)	0.00072 *3*	α(K)=0.000630 *23*; α(L)=7.13×10^{-5} *21*; α(M)=1.29×10^{-5} *4* α(N)=2.05×10^{-6} *7*; α(O)=1.38×10^{-7} *6* δ: >0.

[†] Relative intensities at $E\alpha$=10 MeV, θ=54°.
[‡] From $\alpha\gamma(\theta)$.
[#] Observed only in coincidence a measurement.
[@] Not seen in Coulomb excitation. Iγ deduced from relative branching observed in ^{99}Mo β^- decay.
[&] Placement not adopted.
[a] Additional information 1.
[b] If no value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
[c] Placement of transition in the level scheme is uncertain.

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