^{99}Tc β^- decay (6.0072 h) 1980Al02

History

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

Parent: ^{99}Tc: E=142.6836 *11*; $J^\pi=1/2^-$; $T_{1/2}$=6.0072 h *9*; Q(β^-)=297.5 *10*; %β^- decay=0.0037 *6*
^{99}Tc-E,$T_{1/2}$: Adopted value.
^{99}Tc-%β^- decay: 3.7×10^{-5} *6* from $\Sigma I\beta$.
Measured: γ, β (1980Al02), γ (1972De26,1970Jo24).

^{99}Ru Levels

E(level)	J^π†
0	$5/2^+$
89.60 *21*	$3/2^+$
322.40 *18*	$3/2^+$

† Adopted values.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(117.8 *10*)	322.40	0.00011 *8*	8.5 *4*	av Eβ=30.0 *4* Iβ^-: From %β^- − %β^-(0.0) − %β^-(89.6) = 0.0037 *6* − 0.0010 *3* − 0.0026 *5* = 0.0011% 8. Additional information 1.
(350.6 *10*)	89.60	0.0026 *5*	8.65 *9*	av Eβ=101.9 *5* Iβ^-: see comment with Iβ(g.s.).
(440.2 *10*)	0	0.0010 *3*	9.38[1u] *13*	av Eβ=152.2 *5* Spectrum has first-unique forbidden shape. Iβ^-: Σ(Iβ(g.s.) and Iβ(89.6 level))=3.6×10^{-3}% *6* from measured integrated β spectrum; the decomposition of the first-unique forbidden and the allowed spectrum gives Iβ(g.s.)=1.0×10^{-3}% *3* and Iβ(89 level)=2.6×10^{-3}% *5* (1980Al02).

† Additional information 2.
‡ Absolute intensity per 100 decays.

$\gamma(^{99}Ru)$

Measured Ru K x ray intensity ratios: Kα_2 x ray/Kα_1 x ray=0.5253 *18*, Kβ_1 x ray/Kα_1 x ray=0.1612 *27*, Kβ x ray/Kα x ray=0.1714 *13* (2007Ya02).

E$_\gamma$	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.‡	δ‡*a*	α&	I$_{(\gamma+ce)}$#*b*	Comments
(89.6 *3*)	89.60	$3/2^+$	0	$5/2^+$	E2+M1	−1.56 *2*	1.49 *3*	70 *13*	ce(K)/(γ+ce)=0.470 *6*; ce(L)/(γ+ce)=0.1059 *24*; ce(M)/(γ+ce)=0.0199 *5* ce(N)/(γ+ce)=0.00298 *7*; ce(O)/(γ+ce)=6.92×10^{-5} *15* α(K)=1.170 *22*; α(L)=0.264 *6*; α(M)=0.0495 *11* α(N)=0.00742 *16*; α(O)=0.000172 *4* E$_\gamma$: from level energy difference. I$_{(\gamma+ce)}$: deduced from Iβ=2.6×10^{-3}% *5*.

Continued on next page (footnotes at end of table)

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

E_γ	I_γ [†] [b]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [&]	Comments
232.8 *2*	0.23 *4*	322.40	$3/2^+$	89.60	$3/2^+$	(M1+E2)	0.048 [@] *17*	α(K)=0.041 *14*; α(L)=0.0055 *23*; α(M)=1.02×10^{-3} *42* α(N)=1.60×10^{-4} *64*; α(O)=7.0×10^{-6} *20* E_γ: from 1980Al02. I_γ: from Iγ(232.8γ)/Iγ(140.5γ)=0.095×10^{-6} *17* (1980Al02). Iγ deduced if Iγ(142.6γ)/Iγ(140.5γ)=2.1×10^{-4} *2*, α(140.5γ)=0.114 *3*, α(142.6γ)=40.9 *12* (see ^{99}Tc IT decay), and Branching=3.7×10^{-5}.
322.4 *2*	2.62 *14*	322.40	$3/2^+$	0	$5/2^+$	(M1+E2)	0.017 [@] *4*	α(K)=0.015 *4*; α(L)=0.00190 *51*; α(M)=3.50×10^{-4} *94* α(N)=5.6×10^{-5} *15*; α(O)=2.6×10^{-6} *5* E_γ: from 1970Jo24. I_γ: from Iγ(322.4γ)/Iγ(140.5γ)=1.09×10^{-6} *6* (weighted average of 1.13×10^{-6} *9* (1980Al02), 1.10×10^{-6} *10* (1972De26), and 0.97×10^{-6} *15* (1970Jo24)).

† γ's per 100 decays through this branch.
‡ From Adopted Gammas.
# I(γ+ce) per 100 decays through this branch.
@ Average of pure M1 and E2.
& Additional information 3.
[a] 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.
[b] For absolute intensity per 100 decays, multiply by 3.7×10^{-5}.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays