^{101}Tc β^- decay (14.2 min) 1993Ha42,1975Wr01,1974HeYW

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2006

Parent: ^{101}Tc: E=0.0; $J^\pi=9/2^+$; $T_{1/2}=14.2$ min *1*; $Q(\beta^-)=1613$ *24*; $\%\beta^-$ decay=100.0

Measured: $\gamma\gamma$-coin: 1975Wr01, 1972Co17 (semi-semi); 1971Ar23 (scin-scin), γ Ge(Li) 1974HeYW, γ Ge(Li) 1993Ha42, other: 1971Si03.

^{101}Ru Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	$5/2^+$	stable	
127.22 *3*	$3/2^+$		
306.83 *4*	$7/2^+$	0.053 ns *14*	$T_{1/2}$: from 1973Be72 (1300β)(307γ)(t).
311.35 *4*	$5/2^+$		
422.48 *13*	$3/2^+$		
545.06 *4*	$7/2^+$	≤32 ps	$T_{1/2}$: from 1973Be72 (1060β)(545γ)(t).
616.37 *11*	$3/2^+$,$5/2^+$		
720.02 *6*	$9/2^+$		
842.79 *5*	$(7/2)^+$		
928.72 *5*	$9/2^+$		
938.47 *5*	$(7/2)^+$		
1001.16 *15*	$11/2^+$		

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(612 *24*)	1001.16	0.082 *8*	6.63 *8*	av Eβ=201 *10*
(675 *24*)	938.47	0.85 *2*	5.76 *6*	av Eβ=225 *10*
(684 *24*)	928.72	0.28 *1*	6.27 *6*	av Eβ=229 *10*
(770 *24*)	842.79	1.91 *5*	5.61 *6*	av Eβ=263 *10*
(893 *24*)	720.02	0.19 *1*	6.84 *7*	av Eβ=312 *10*
1070 *30*	545.06	6.44 *16*	5.59 *5*	av Eβ=385 *11* E(decay): 1070 *30* (1971Ar23) β(545γ)-coin, scin-scin.
(1302 *24*)	311.35	0.14 *7*	7.6 *3*	av Eβ=485 *11*
1320 *30*	306.83	90.3 *2*	4.78 *5*	av Eβ=487 *11* E(decay): 1320 *30* (1971Ar23) β-singles, F-K plot, scin. Others: 1951Bo48, 1952Ru10, 1957Ok01. (1320β)(307γ)-coin observed (1971Ar23) scin-scin.

[†] Absolute intensity per 100 decays.

$\gamma(^{101}Ru)$

Iγ normalization: from Σ(Iγ+ce)=100 to g.s., if %$\beta^-\approx$0 to 0 level.
The new results of 1993Ha42 present more precise Iγ values and give also a weighted mean of their results with those of 1971Si03, 1971Ar23, 1972Co17, 1974HeYW, 1975Wr01 and show no evidence for 72.5, 84.8, 174.9, 351.9, 583. 1602.8, 609.3, 694.3, 727.5, 826, 963.4, 968.8 keV proposed by 1974HeYW or 1971Ar23; however, 174.9 and 694.3 are seen in reaction work.

E_γ [†]	I_γ [‡#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α [&]	$I_{(\gamma+ce)}$ [@]	Comments
127.22 *3*	29.6 *9*	127.22	$3/2^+$	0.0	$5/2^+$	M1+E2	+0.17 *4*	0.167 *3*		α(K)=0.1450 *22*; α(L)=0.0180 *3*; α(M)=0.00332 *6*; α(N+..)=0.000560 *10* α(N)=0.000534 *9*; α(O)=2.65×10^{-5} *4* Mult.: from α(K)exp= 0.15 *2* (1973Al16) ce(K)/Iγ. δ: from 1966Wo06 in 3.3-y ^{101}Rh decay.
179.60 *4*	6.5 *5*	306.83	$7/2^+$	127.22	$3/2^+$	E2		0.16		α(K)=0.1339 *19*; α(L)=0.0208 *3*; α(M)=0.00385 *6*; α(N+..)=0.000617 *9* α(N)=0.000596 *9*; α(O)=2.12×10^{-5} *3* B(E2)(W.u.)=13 *4*
184.12 *5*	18.0 *6*	311.35	$5/2^+$	127.22	$3/2^+$	M1		0.06		α(K)=0.0509 *8*; α(L)=0.00606 *9*; α(M)=0.001114 *16*; α(N+..)=0.000190 *3* α(N)=0.000180 *3*; α(O)=9.41×10^{-6} *14*
233.70 *5*	3.00 *13*	545.06	$7/2^+$	311.35	$5/2^+$	M1(+E2)		0.03		α(K)=0.040 *14*; α(L)=0.0054 *23*; α(M)=0.0010 *5*; α(N+..)=0.00017 *7* α(N)=0.00016 *7*; α(O)=6.9×10^{-6} *19*
238.25 *5*	3.38 *14*	545.06	$7/2^+$	306.83	$7/2^+$	M1(+E2)		0.044	15	α(K)=0.038 *13*; α(L)=0.0051 *21*; α(M)=0.0009 *4*; α(N+..)=0.00015 *6* α(N)=0.00015 *6*; α(O)=6.5×10^{-6} *18*
281.6 *7*	0.30 *6*	1001.16	$11/2^+$	720.02	$9/2^+$					
295.17 *13*	0.55 *9*	422.48	$3/2^+$	127.22	$3/2^+$					Iγ: evaluator has omitted the value of 1975Wr01 which gives a discrepant ratio of I(295γ)/I(422γ).
306.83 *3*	1000 *50*	306.83	$7/2^+$	0.0	$5/2^+$	M1+E2	−0.10 *5*	0.0156 *1*		α(K)=0.01361 *22*; α(L)=0.00160 *3*; α(M)=0.000293 *5*; α(N+..)=5.00×10^{-5} *9* α(N)=4.75×10^{-5} *8*; α(O)=2.50×10^{-6} *4* B(M1)(W.u.)=0.014 *4*; B(E2)(W.u.)=1.4 *14* Mult.: from α(K)exp= 0.0130 *5* (1973Al16) ce(K)/Iγ. δ: - 0.10 *5*; δ: from 1973Ka28 $\gamma(\theta$,T) oriented 4.3-d ^{101}Rh source.
311.28 *8*	2.36 *25*	311.35	$5/2^+$	0.0	$5/2^+$	(M1)		0.015		α(K)=0.01304 *19*; α(L)=0.001528 *22*; α(M)=0.000280 *4*; α(N+..)=4.78×10^{-5} *7* α(N)=4.54×10^{-5} *7*; α(O)=2.40×10^{-6} *4*
322.01 *14*	0.41 *5*	938.47	$(7/2)^+$	616.37	$3/2^+$,$5/2^+$					

^{101}Tc β^- decay (14.2 min) 1993Ha42,1975Wr01,1974HeYW (continued)

$\gamma(^{101}Ru)$ (continued)

E_γ[†]	I_γ[‡#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[&]	Comments
383.83 *10*	0.32 *7*	928.72	$9/2^+$	545.06	$7/2^+$				
393.30 *8*	1.13 *9*	938.47	$(7/2)^+$	545.06	$7/2^+$				
422.02 *16*	0.36 *5*	422.48	$3/2^+$	0.0	$5/2^+$				I_γ: see 295γ.
489.10 *15*	0.37 *5*	616.37	$3/2^+,5/2^+$	127.22	$3/2^+$				
516.13 *8*	1.11 *8*	938.47	$(7/2)^+$	422.48	$3/2^+$				
531.42 *5*	11.3 *4*	842.79	$(7/2)^+$	311.35	$5/2^+$				
545.05 *6*	67.2 *18*	545.06	$7/2^+$	0.0	$5/2^+$	M1+E2	−0.98 *10*	0.00403 *7*	α(K)=0.00347 *6*; α(L)=0.000412 *7*; α(M)=7.55×10^{-5} *13*; α(N+..)=1.278×10^{-5} *20* α(N)=1.216×10^{-5} *20*; α(O)=6.19×10^{-7} *9* B(M1)(W.u.)>0.0018; B(E2)(W.u.)>5.2 δ: - 0.98 *10*; δ: from 1973Ka28 $\gamma(\theta,T)$ oriented 4.3-d ^{101}Rh source.
[x]616.3	0.17 *4*								
617.31 *9*	0.60 *4*	928.72	$9/2^+$	311.35	$5/2^+$				
621.99 *12*	0.93 *6*	928.72	$9/2^+$	306.83	$7/2^+$				
627.00 *6*	4.9 *2*	938.47	$(7/2)^+$	311.35	$5/2^+$				
631.74 *12*	0.45 *3*	938.47	$(7/2)^+$	306.83	$7/2^+$				
[x]673.4 *6*	0.35 *5*								
694.30 *15*	0.61 *7*	1001.16	$11/2^+$	306.83	$7/2^+$				
715.53 *4*	7.6 *3*	842.79	$(7/2)^+$	127.22	$3/2^+$				
720.02 *5*	2.42 *12*	720.02	$9/2^+$	0.0	$5/2^+$				
811.13 *9*	0.65 *6*	938.47	$(7/2)^+$	127.22	$3/2^+$				
842.73 *7*	2.53 *10*	842.79	$(7/2)^+$	0.0	$5/2^+$				
[x]911.57 *12*	0.6 *2*								I_γ: other: 0.11 *2* (1971Ar23).
928.72 *6*	1.25 *8*	928.72	$9/2^+$	0.0	$5/2^+$				
938.65 *20*	0.93 *6*	938.47	$(7/2)^+$	0.0	$5/2^+$				

[†] Av from 1975Wr01, 1974HeYW, 1972Co17, 1971Ar23, 1971Si03.
[‡] From 1993Ha42, av from 1975Wr01, 1974HeYW, 1972Co17, 1971Ar23, 1971Si03.
[#] For absolute intensity per 100 decays, multiply by 0.0887 *2*.
[@] Absolute intensity per 100 decays.
[&] 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.
[x] γ ray not placed in level scheme.

$^{101}_{44}Ru_{57}$-3

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Decay Scheme

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