^{86}Tc IT decay (1.10 μs) 2009Ga40,2008Ga04,2000Ch07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh	NDS 124, 1 (2015)	30-Nov-2014

Parent: ^{86}Tc: E=1524; J^π=(6$^+$); $T_{1/2}$=1.10 μs *14*; %IT decay=100.0

2009Ga40,2008Ga04 (also 2007Re18): Fragmentation of ^{107}Ag beam at E=750 MeV. Particle identification through fragment recoil separator. Search for isomers using the RISING (Rare ISotope INvestigations at GSI) array of 15 seven-element cluster Ge detectors. The detectors were placed in three angular rings at 51°, 90°, and 129° with respect to the secondary beam axis. Measured delayed γ-ray spectra. Comparisons with shell-model calculations.

2000Ch07 (also 1997Re12): Fragmentation of ^{92}Mo beam at E=60 MeV/nucleon with a Nb target. Particle identification through LISE3 magnetic spectrometer at GANIL facility. Search for isomers by measuring delayed γ rays using four LEPS detectors.

All data are from 2009Ga40, unless otherwise indicated.

^{86}Tc Levels

E(level)	J^π	$T_{1/2}$	Comments
0	0$^+$		T=1
593	(2$^+$)		T=1
1174	(3,4)		T=1
1443	(4$^+$)		T=1
1524	(6$^+$)	1.10 μs *14*	%IT=100 T=0 S(p) allows proton decay mode also. The isomeric ratio R=41 *7* (2009Ga40), where R=N_{isomer}/(N_{ions}FG), N_{isomer}=number of ions observed in the isomeric state, N_{ions}=total number of ions of that nuclear species, F=correction factor for in-flight losses, G=correction factor for finite measuring time period. J^π: from comparison with shell-model calculations (2008Ga04), a 6$^+$ T=0 is predicted near this energy. 5$^-$ is also possible. $T_{1/2}$: from γ(t) (2009Ga40,2008Ga04). Possible configuration=ν5/2[422]$\otimes\pi$7/2[413], K^π=6$^+$.

γ(^{86}Tc)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	$\alpha^\dagger$	Comments
81	1524	(6$^+$)	1443	(4$^+$)	(E2)	2.67	α(K)=2.06 *3*; α(L)=0.503 *7*; α(M)=0.0932 *13*; α(N+..)=0.01397 *20* α(N)=0.01361 *19*; α(O)=0.000360 *5* Mult.: from α(exp)=3.5 *8* (deduced from intensity-balance arguments, 2008Ga04). Mult=E1+M2 is also possible if J^π=5$^-$ for 1524-keV isomer, with required δ=1.07 to match α(exp)=3.5 *8*.
269	1443	(4$^+$)	1174	(3,4)			
581	1174	(3,4)	593	(2$^+$)			
593	593	(2$^+$)	0	0$^+$			
850	1443	(4$^+$)	593	(2$^+$)			

† 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.

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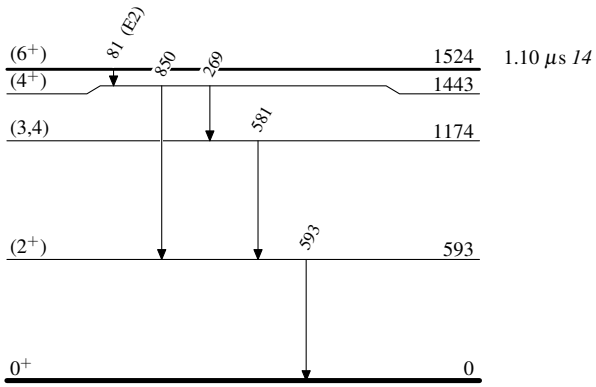
Decay Scheme

%IT=100.0



$^{86}_{43}Tc_{43}$