^{99}Ru(γ,pγ) 1978Ba18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

1978Ba18: E(max)=40 MeV γ beam was from bremsstrahlung radiation with the Giessen electron linear accelerator. Target was about 100 mg/cm^2 ^{99}Ru. x rays were detected with a Low-Energy-Photon (LEP) detector and γ rays were detected with a Ge(Li) detector. Measured Eγ, Iγ, K x ray, γ(t), K x ray(t). Deduced γ-ray multipolarities, mixing ratios.

^{98}Tc Levels

The level sequence (91-69-26-0) proposed by 1978Ba18 is re-ordered as 91-65-22-0 according to (p,nγ) results and other studies. However, the position of the isomeric level is uncertain since no transition to 65 level has been reported. It is either at 91 or 73 keV.

E(level)	J$^\pi$[†]	T$_{1/2}$	Comments
0.0	(6)$^+$		
21.8 *2*	(5)$^+$	2.4 ns *6*	T$_{1/2}$: from Adopted Levels.
65.3 *3*	(4)$^+$		
90.8		14.6 μs *5*	E(level): rounded value from Adopted Levels. The position of the isomeric level is uncertain since no transition to 65 level has been reported. It is either at 91 or 73 keV. T$_{1/2}$: weighted average of 14.8 μs *5* from K x ray(t), 14.4 μs *5* from 43.5γ(t) and 16.4 μs *27* from 21.8γ(t) in 1978Ba18.

[†] From Adopted Levels.

γ(^{98}Tc)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[‡]	Comments
21.8 *2*	0.036 *4*	21.8	(5)$^+$	0.0	(6)$^+$	(M1)	3.1 *1*	Mult.,δ: δ(E2/M1)=0.255 *18* from γ+ce intensity balance of 21.8γ and 43.5γ in (γ,pγ), assuming mult(43.5γ)=M1 and using theoretical conversion coefficients from BrIcc code. But this value would require a large half-life of >0.2 μs for the 21.8 level (lower limit is obtained at RUL=300 for B(E2)(W.u.)), contradicting to the short-lived nature of the 21.8-keV transition as stated in 1978Ba18 and to the measured value of 2.4 ns from $\gamma(\theta)$ in (p,nγ). RUL=300 for B(E2)(W.u.) of 21.8γ would limit δ(E2/M1) to <0.026 for adopted T$_{1/2}$(21.8)=2.4 ns *6*. 1978Ba18 have suggested mult=E1+1% M2, which, however, results in an unreasonably large B(M2)(W.u.). From these considerations, evaluators have assigned mult=M1.
43.5 *2*	0.18	65.3	(4)$^+$	21.8	(5)$^+$	(M1)	3.03 *6*	α(K)=2.64 *6*; α(L)=0.321 *7*; α(M)=0.0584 *12* α(N)=0.00925 *18*; α(O)=0.000599 *12* Mult.: from Adopted Gammas. I$_\gamma$: Iγ(43γ)/Iγ(222γ)=5.1 *5* (1978Ba18).

[†] Relative to K x ray (1978Ba18).

[‡] 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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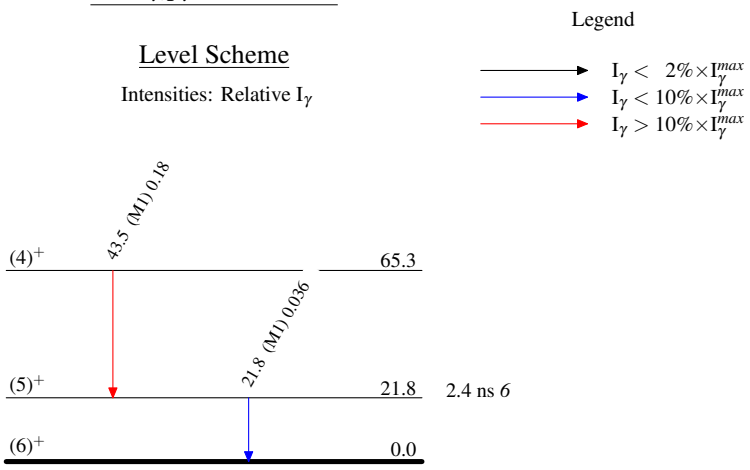
Level Scheme

Intensities: Relative I_γ



$^{98}_{43}Tc_{55}$