^{160}Tm IT decay (74.5 s) 1983Si20

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Parent: ^{160}Tm: E=70 *20*; J^{π}=5; $T_{1/2}$=74.5 s *15*; %IT decay=85 *5*

^{160}Tm-%IT decay: 1983Si20 estimate %IT=85 *5* from the intensities of the 74-s and 9.4-min components of the 264-keV γ ray measured at the beginning of the counting period, assuming that the production cross sections in the (p,5n) reaction for the ^{160}Tm g.s. and the 74.5-s isomer are comparable.

Additional information 1.

The source was produced in the ^{164}Er(p,5n) reaction with E(p)=57 MeV. The γ radiation was studied using three high-resolution Ge detectors, two to measure γ singles, $\gamma\gamma$, and time-sequential data and one to measure γ singles and time-sequential data for x rays and low-energy γ rays. The internal-conversion electron spectrum was measured using a mini-orange spectrometer and a cooled Si(Li) detector. Authors report Eγ, Iγ, $\gamma\gamma$, γ(t), E(ce), Ice.

The decay scheme is that worked up by the evaluator, based on the information given in 1983Si20. This information has been supplemented with other considerations, especially those regarding permissible ranges for γ-ray transition rates as embodied in RUL.

^{160}Tm Levels

E(level)†	J^{π}†	$T_{1/2}$†	Comments
0.0	1^-	9.4 min *3*	
42.11 *5*	2^-		
70 *20*	5	74.5 s *15*	$T_{1/2}$: γ(t) (1983Si20).

† From adopted values.

γ(^{160}Tm)

Neither of the two listed γ rays was directly observed by 1983Si20 but observed in the ^{160}Yb ε and presumably in (HI,xnγ) as well. The 42γ and its properties are well established from the ^{160}Yb ε decay. Its presence in the IT decay has been inferred by the evaluator, since, from RUL, it is quite unlikely that the isomeric state would deexcite directly to the g.s. (via an E4 or M4 γ). It is more likely that the deexcitation takes place (via an E3 or M3 γ) to the 42 level, which decays through the 42γ.

E_γ	I_γ†	E_i(level)	J_i^{π}	E_f	J_f^{π}	Mult.	δ	α‡	$I_{(\gamma+ce)}$†	Comments
28.85#		70	5	42.11	2^-				100	E_γ: from adopted gammas. It is given with with two decimals but with no unc in (HI,xnγ) dataset (2008Lu17 and 2008Su08). Because of missing information it is not clear how this transition was measured, reason for which its existence is questioned by evaluator. Previously 28 *20* was computed by 2005Re18 from the level-energy difference of parent level at 70 *20* and the daughter level at 42. Mult.: from the level scheme, this transition can be either E3 or M3.
42.02 *10*	5.5 *6*	42.11	2^-	0.0	1^-	M1+E2	0.31 *3*	17.1 *20*	100	α(L)=13.4 *15*; α(M)=3.2 *4*

† For absolute intensity per 100 decays, multiply by 0.85 *5*.

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^{160}Tm IT decay (74.5 s) 1983Si20 (continued)

$\gamma(^{160}Tm)$ (continued)

‡ 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.

Placement of transition in the level scheme is uncertain.