

¹⁷⁰Er(⁷Li, α n γ) 2008Hu05

Type	History		
	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	08-Dec-2015

2008Hu05: E(⁷Li)=30 MeV. The ⁷Li fragments into α +³H, then essentially ¹⁷²Tm is populated via ¹⁷⁰Er(³H,n) reaction. Measured E γ , I γ , $\gamma\gamma$, delayed γ rays using CAESAR array of nine HPGe detectors and two LEPS detectors. Comparisons with multi-quasiparticle calculations.

¹⁷²Tm Levels

E(level) [†]	J π	T _{1/2}	Comments
0.0 [‡]	2 ⁻		
62.6 [‡]	3 ⁻		
145.90 [‡] 16	4 ⁻		g _K -g _R =0.67 4, sign unknown.
240.0 [#] 2	3 ⁻		
249.8 [‡] 2	5 ⁻		g _K -g _R =0.68 3, sign unknown.
330.0 [#] 2	4 ⁻		
374.4 [‡] 2	6 ⁻		g _K -g _R =0.65 2, sign unknown.
441.7 [#] 2	5 ⁻		g _K -g _R =0.75 14, sign unknown.
476.2 2	6 ⁺	132 μ s 7	T _{1/2} : γ (t) (2008Hu05), using chopper beam. Configuration= $\pi 7/2[523] \otimes \nu 5/2[512]$, K π =6 ⁺ . The antiparallel coupling of this configuration gives a level at 1 ⁺ , 610.1 which is populated only in β decay studies. The 6 ⁺ bandhead of parallel coupling being lower than the 1 ⁺ bandhead of the antiparallel coupling is consistent with predictions of Gallagher- Moszkowski rules.
519.3 [‡] 5	7 ⁻		
574.7 [#] 7	6 ⁻		
685.3 [‡] 9	8 ⁻		
719.5 [#] 11	7 ⁻		E(level): 729 in level-scheme figure 2 of 2008Hu05 is a misprint.
871.3 [‡] 10	9 ⁻		

[†] From least-squares fit to E γ values.

[‡] Band(A): $\pi 1/2[411] \otimes \nu 5/2[512]$, K π =2⁻. Average g_K-g_R=0.67 3, sign unknown.

[#] Band(B): $\pi 1/2[411] \otimes \nu 5/2[512]$, K π =3⁻. g_K-g_R=0.75 14, sign unknown.

γ (¹⁷²Tm)

The experimental total conversion coefficients were deduced by 2008HuA from intensity balances.

For g_K-g_R values, Q₀=7.7 assumed. Mixing ratios for ΔJ =1 transitions were deduced from the observed crossover to cascade branching ratios (see equation 2 in 2008Hu05 for details).

E γ [†]	I γ [†]	E _i (level)	J _i π	E _f	J _f π	Mult.	α [‡]	Comments
34.6 3	17.9 35	476.2	6 ⁺	441.7	5 ⁻	E1	1.10 3	α (exp)=1.2 4 α (L)=0.857 25; α (M)=0.193 6 α (N)=0.0434 13; α (O)=0.00515 14; α (P)=0.000152 4 I γ : I γ (34.6)/I γ (101.8)=12.4 19/69.2 16.
62.6 3	12.8 20	62.6	3 ⁻	0.0	2 ⁻			
83.3 2	20.9 30	145.90	4 ⁻	62.6	3 ⁻			
90.0 5	4.1 13	330.0	4 ⁻	240.0	3 ⁻			
101.8 1	100 6	476.2	6 ⁺	374.4	6 ⁻	E1	0.318	α (exp)=0.4 1

Continued on next page (footnotes at end of table)

$^{170}\text{Er}(^7\text{Li},\alpha\gamma)$ **2008Hu05 (continued)** $\gamma(^{172}\text{Tm})$ (continued)

E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α^\ddagger	Comments
								$\alpha(\text{K})=0.264$ 4; $\alpha(\text{L})=0.0426$ 6; $\alpha(\text{M})=0.00949$ 14 $\alpha(\text{N})=0.00218$ 4; $\alpha(\text{O})=0.000289$ 5; $\alpha(\text{P})=1.178\times 10^{-5}$ 17
103.9 2	20.3 30	249.8	5 ⁻	145.90	4 ⁻			
111.7 1	7.8 25	441.7	5 ⁻	330.0	4 ⁻			
124.6 2	28.2 35	374.4	6 ⁻	249.8	5 ⁻			
133 1		574.7	6 ⁻	441.7	5 ⁻			
145#@ 1		519.3	7 ⁻	374.4	6 ⁻			
145# 1		719.5	7 ⁻	574.7	6 ⁻			
145.9 2	7.5 20	145.90	4 ⁻	0.0	2 ⁻			$I_\gamma: I_\gamma(145.9)/I_\gamma(83.3)=0.36$ 6.
166@ 1		685.3?	8 ⁻	519.3	7 ⁻			
177.4 2	3.5 11	240.0	3 ⁻	62.6	3 ⁻			
186@ 2		871.3?	9 ⁻	685.3?	8 ⁻			
187.2 2	18.3 25	249.8	5 ⁻	62.6	3 ⁻			$I_\gamma: I_\gamma(187.2)/I_\gamma(103.9)=0.90$ 5.
201.7 2	1.8 8	441.7	5 ⁻	240.0	3 ⁻			$I_\gamma: I_\gamma(201.7)/I_\gamma(111.7)=0.23$ 8.
226.3 2	26.6 35	476.2	6 ⁺	249.8	5 ⁻	E1	0.0390	$\alpha(\text{exp})=0.1$ 2 $\alpha(\text{K})=0.0328$ 5; $\alpha(\text{L})=0.00488$ 7; $\alpha(\text{M})=0.001082$ 16 $\alpha(\text{N})=0.000250$ 4; $\alpha(\text{O})=3.46\times 10^{-5}$ 5; $\alpha(\text{P})=1.630\times 10^{-6}$ 23 $I_\gamma: I_\gamma(226.3)/I_\gamma(101.8)=18.4$ 18/69.2 16. $I_\gamma: I_\gamma(228.5)/I_\gamma(124.6)=1.77$ 7.
228.5 2	50 6	374.4	6 ⁻	145.90	4 ⁻			
240.0 2	12.3 31	240.0	3 ⁻	0.0	2 ⁻			
245 1		574.7	6 ⁻	330.0	4 ⁻			
267.4 4	3.2 11	330.0	4 ⁻	62.6	3 ⁻			
269.5 4		519.3	7 ⁻	249.8	5 ⁻			
277 2		719.5	7 ⁻	441.7	5 ⁻			
295.8 3	8.6 30	441.7	5 ⁻	145.90	4 ⁻			
311@ 2		685.3?	8 ⁻	374.4	6 ⁻			
352@ 1		871.3?	9 ⁻	519.3	7 ⁻			

[†] From e-mail reply of April 18, 2008 from G.D. Dracoulis to B. Singh.

[‡] From BrIcc v2.3b (16-Dec-2014) [2008Ki07](#), "Frozen Orbitals" appr.

Multiply placed.

@ Placement of transition in the level scheme is uncertain.

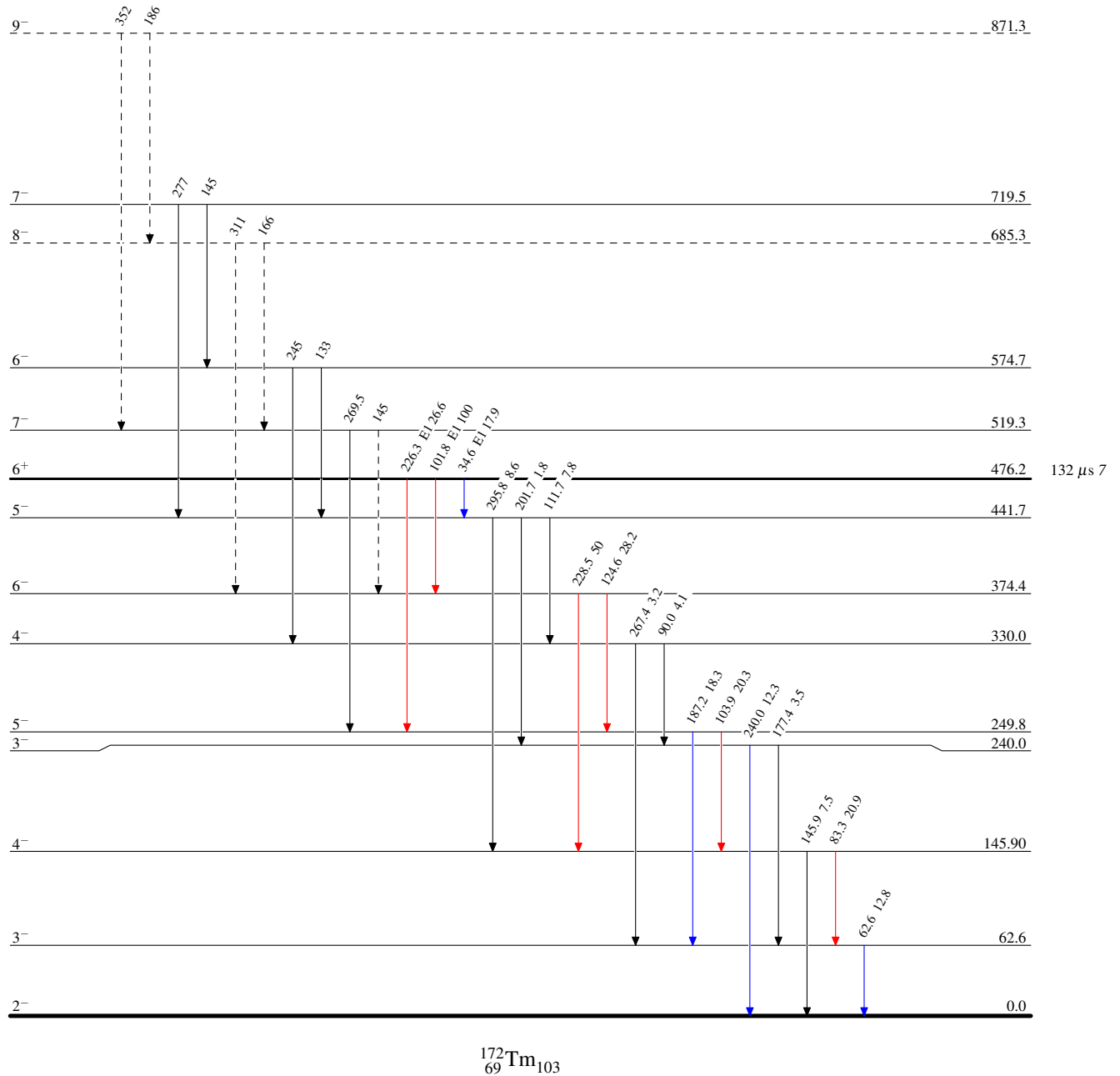
$^{170}\text{Er}(^7\text{Li},\alpha n\gamma)$ 2008Hu05

Legend

Level Scheme

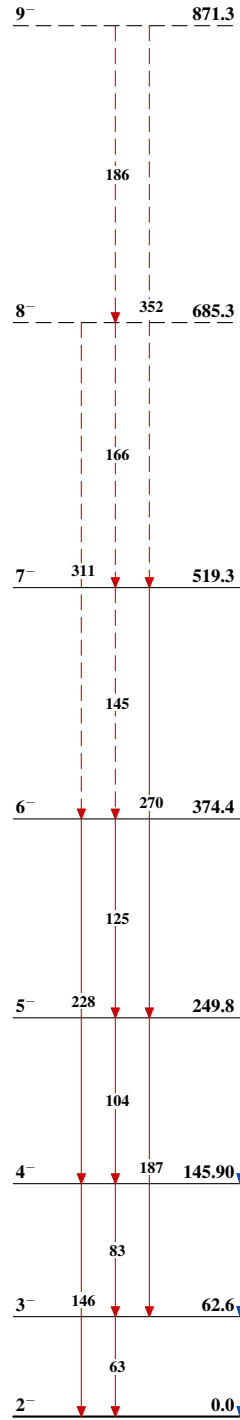
Intensities: Relative I_γ

- ▶ $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- ▶ $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- ▶ $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - -▶ γ Decay (Uncertain)

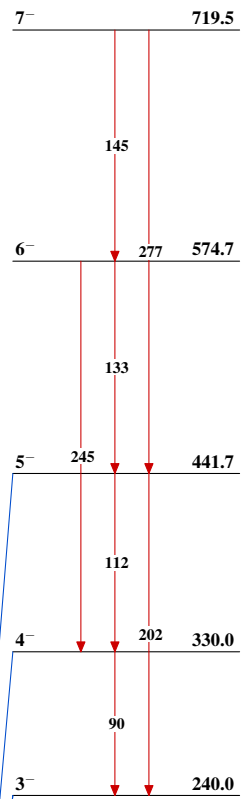


${}^{170}\text{Er}({}^7\text{Li},\alpha n\gamma)$ 2008Hu05

Band(A): $\pi 1/2[411] \otimes \nu 5/2[512]$,
 $K^\pi = 2^-$



Band(B): $\pi 1/2[411] \otimes \nu 5/2[512]$,
 $K^\pi = 3^-$

 ${}^{172}_{69}\text{Tm}_{103}$