

$^{170}\text{Er}(^7\text{Li},\alpha 2n\gamma) E=42\text{ MeV}$ 2009Wa06

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin, E. A. Mccutchan		NDS 151, 334 (2018)	30-Jun-2018

^7Li beam provided by Australian National University 14ud tandem accelerator at E=42 MeV. In the first part of the experiment, γ rays were detected using CAESAR array (six Compton-suppressed coaxial Ge detectors and two planar Ge detectors). In the second part, the ANU Super-e spectrometer was used in lens mode for ce measurements simultaneously with γ rays measurements using one Compton-suppressed Ge detector. Measured E_γ , I_γ , $\gamma\gamma$ -coin, ce, level half-life (by delayed coincidence).

 ^{171}Tm Levels

E(level) [†]	J ^π	T _{1/2}	Comments
0.0 [‡]	1/2 ⁺		
5.19 [‡] 23	3/2 ⁺		
116.70 [‡] 20	5/2 ⁺		
129.10 [‡] 24	7/2 ⁺		
425.06 [#] 22	7/2 ⁻		
520.5 [#] 3	9/2 ⁻		
635.70 [@] 23	7/2 ⁺		
637.3 [#] 3	11/2 ⁻		
752.81 [@] 14	9/2 ⁺		
775.9 [#] 3	13/2 ⁻		
894.21 [@] 24	11/2 ⁺		
935.5 [#] 4	15/2 ⁻		
1059.12 [@] 25	13/2 ⁺		
1116.8 [#] 3	17/2 ⁻		
1246.51 [@] 25	15/2 ⁺		
1455.3 [@] 3	17/2 ⁺		
1674.5 ^{&} 3	19/2 ⁺	1.7 μs 2	%IT=100 T _{1/2} : from decay curves for out-of-beam 352γ and 428γ events (2009Wa06). Configuration= $\pi 7/2[523] \otimes \nu 5/2[512] \otimes \nu 7/2[633]$. Deduced g _K -g _R =0.35 3 from branching ratios of E2 and 219.2γ (assumed to be M1), with K ^π =7/2 ⁺ imposed.
1685.4 [@] 5	(19/2 ⁺)		
1838.8 ^{&} 6	(21/2 ⁺)		
2023.0 ^{&} 8	(23/2 ⁺)		

[†] From least-squares fit to E_γ .

[‡] Band(A): K^π=1/2⁺, $\pi 1/2[411]$ band.

[#] Band(B): K^π=7/2⁻, $\pi 7/2[523]$ band.

[@] Band(C): K^π=7/2⁺, $\pi 7/2[404]$ band. Deduced g_K-g_R=0.33 3, using Q₀=7.6.

[&] Band(D): K^π=19/2⁺, 3-qp band. Configuration= $\pi 7/2[523] \otimes \nu 5/2[512] \otimes \nu 7/2[633]$.

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$\gamma(^{171}\text{Tm})$

The conversion data were normalized to K-conversion coefficient for known E1 multiplicity for 308.4y.

E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	α°	Comments
95.5 3	1.4 5	520.5	9/2 ⁻	425.06	7/2 ⁻			
111.5 1	250 13	116.70	5/2 ⁺	5.19	3/2 ⁺			
115.0 5	‡	635.70	7/2 ⁺	520.5	9/2 ⁻			
116.7 2	9.6 20	116.70	5/2 ⁺	0.0	1/2 ⁺			
116.8 2	0.8 3	637.3	11/2 ⁻	520.5	9/2 ⁻			
117.0 2	4.0 8	752.81	9/2 ⁺	635.70	7/2 ⁺			
124.0 3	59 3	129.10	7/2 ⁺	5.19	3/2 ⁺			
138.6 2	1.6 5	775.9	13/2 ⁻	637.3	11/2 ⁻			
141.4 1	5.0 10	894.21	11/2 ⁺	752.81	9/2 ⁺			
159.6 2	1.5 5	935.5	15/2 ⁻	775.9	13/2 ⁻			
164.3#& 5	#	1838.8	(21/2 ⁺)	1674.5	19/2 ⁺			
164.9 2	1.5 5	1059.12	13/2 ⁺	894.21	11/2 ⁺			
181.3 2	2.0 6	1116.8	17/2 ⁻	935.5	15/2 ⁻			
184.2#& 5	#	2023.0	(23/2 ⁺)	1838.8	(21/2 ⁺)			
187.4 1	4.0 6	1246.51	15/2 ⁺	1059.12	13/2 ⁺			
209.0 5	1.0 4	1455.3	17/2 ⁺	1246.51	15/2 ⁺			
210.7 1	15.1 8	635.70	7/2 ⁺	425.06	7/2 ⁻			
219.2 1	2.9 5	1674.5	19/2 ⁺	1455.3	17/2 ⁺	[M1]	0.340	
230.0#& 5	#	1685.4	(19/2 ⁺)	1455.3	17/2 ⁺			
232.3 2	1.2 4	752.81	9/2 ⁺	520.5	9/2 ⁻			
256.0 5	0.4 2	775.9	13/2 ⁻	520.5	9/2 ⁻			
258.5 1	5.5 5	894.21	11/2 ⁺	635.70	7/2 ⁺			
296.0 1	108.3 22	425.06	7/2 ⁻	129.10	7/2 ⁺	E1		$\alpha(\text{K})\text{exp}=0.015 2$
298.0 5	0.5 2	935.5	15/2 ⁻	637.3	11/2 ⁻			
306.3 1	3.5 8	1059.12	13/2 ⁺	752.81	9/2 ⁺			
308.4 1	236 12	425.06	7/2 ⁻	116.70	5/2 ⁺			
327.8 2	1.5 5	752.81	9/2 ⁺	425.06	7/2 ⁻			
341.0 2	1.0 4	1116.8	17/2 ⁻	775.9	13/2 ⁻			
352.3 1	15.5 9	1246.51	15/2 ⁺	894.21	11/2 ⁺	E2	0.0444	$\alpha(\text{K})\text{exp}=0.025 5$ Measured $\alpha(\text{K})\text{exp}(352\gamma)$ corrected for contribution from ce(M) of 296y.
373.7 2	1.5 5	894.21	11/2 ⁺	520.5	9/2 ⁻			
396.1 2	2.0 5	1455.3	17/2 ⁺	1059.12	13/2 ⁺			
428.0 1	21.7 10	1674.5	19/2 ⁺	1246.51	15/2 ⁺	E2	0.0258	$\alpha(\text{K})\text{exp}=0.017 3$
439.0#& 5	#	1685.4	(19/2 ⁺)	1246.51	15/2 ⁺			
470.5 2	1.0 4	1246.51	15/2 ⁺	775.9	13/2 ⁻			
506.5 2	0.8 3	635.70	7/2 ⁺	129.10	7/2 ⁺			
518.8 2	0.7 3	635.70	7/2 ⁺	116.70	5/2 ⁺			
558.1 3	4.7 6	1674.5	19/2 ⁺	1116.8	17/2 ⁻	[E1]	0.00458	

† Delayed relative γ -ray intensity.

‡ Weak transition.

Tentative prompt transition with no delayed component identified.

@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

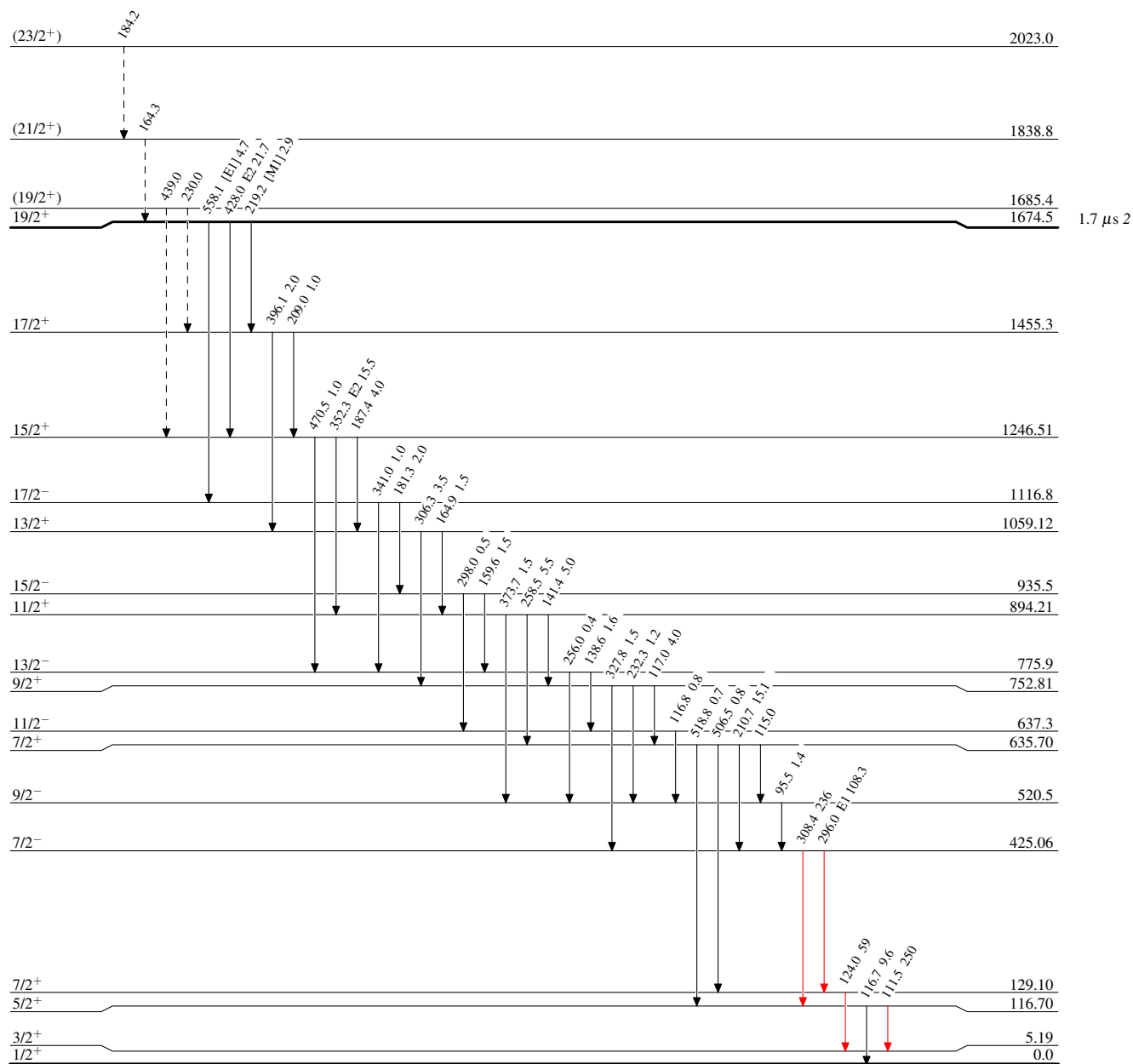
& Placement of transition in the level scheme is uncertain.

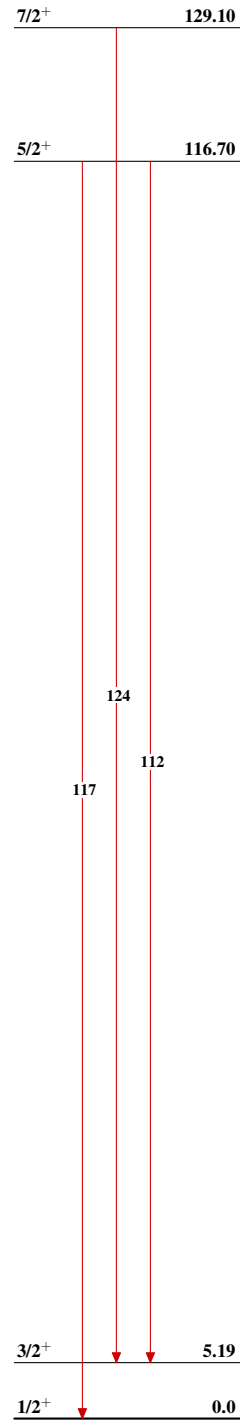
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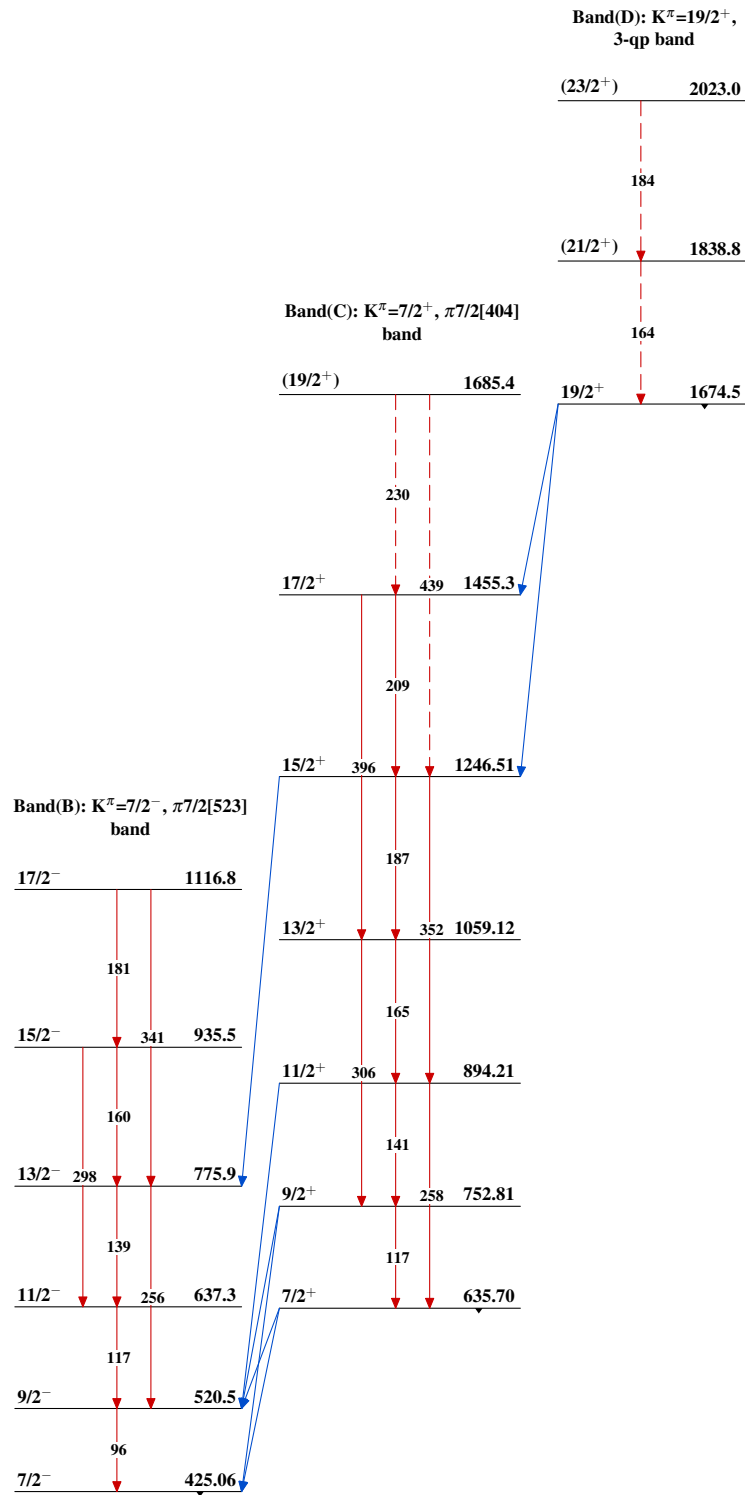
Legend

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)

 $^{171}\text{Tm}_{102}$

$^{170}\text{Er}(^7\text{Li},\alpha 2n\gamma) E=42 \text{ MeV}$ 2009Wa06Band(A): $K^\pi=1/2^+$, $\pi 1/2[411]$
band $^{171}_{69}\text{Tm}_{102}$

$^{170}\text{Er}(^7\text{Li},\alpha 2n\gamma)$ E=42 MeV 2009Wa06 (continued) $^{171}_{69}\text{Tm}_{102}$