

$^{230}\text{Th}(\alpha, \alpha' 2n\gamma)$ 1984Ha21

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Khalifeh Abusaleem	NDS 116, 163 (2014)		31-Dec-2012

E=56 MeV. Measured ce and cey. Iron-free Orange Spectrometer.

 ^{228}Th Levels

The authors do not see transitions from the known 1^- and 3^- members of the $K^\pi=0^-$ band. The level scheme is based on coincidence data, energy fits, and intensity systematics.

E(level) [‡]	J^π [†]	Comments
0 [#]	0 ⁺	
57.8 [#] 10	2 ⁺	
186.8 [#] 11	4 ⁺	
328 [@]	1 ⁻	
377.8 [#] 11	6 ⁺	
396 [@]	3 ⁻	
518.8 [@] 11	5 ⁻	
622.1 [#] 11	8 ⁺	
695.0 [@] 11	7 ⁻	
911.4 [#] 11	10 ⁺	
920.8 [@] 11	9 ⁻	
1189.7 [@] 11	11 ⁻	
1238.7 [#] 11	12 ⁺	
1496.2? [@] 12	(13 ⁻)	E(level): shown as tentative by authors, but γ 's to 11 ⁻ and 12 ⁺ are consistent with adopted data from ($\alpha, 2n\gamma$).
1595.9? [#] 13	(14 ⁺)	E(level): the adopted 14 ⁺ member of this band is at 1599.5-keV from ($\alpha, 2n\gamma$) with $E_\gamma=360.1$ to 12 ⁺ .

[†] From 1984Ha21 based on coin and band structure.

[‡] From a least-squares fit to the E_γ data.

[#] Band(A): g.s. Rotational band.

[@] Band(B): $K^\pi=0^-$ octupole-vibrational band.

 $\gamma(^{228}\text{Th})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
(57.8)	57.8	2 ⁺	0	0 ⁺		E_γ : not seen. E_γ is rounded-off value from adopted γ 's.
129.0 2	186.8	4 ⁺	57.8	2 ⁺	E2	
191.0 1	377.8	6 ⁺	186.8	4 ⁺	E2	
244.3 1	622.1	8 ⁺	377.8	6 ⁺	E2	
257.3 5	1496.2?	(13 ⁻)	1238.7	12 ⁺		
268.9 5	1189.7	11 ⁻	920.8	9 ⁻		
278.4 3	1189.7	11 ⁻	911.4	10 ⁺		
289.3 2	911.4	10 ⁺	622.1	8 ⁺		
298.7 2	920.8	9 ⁻	622.1	8 ⁺		
306.6 5	1496.2?	(13 ⁻)	1189.7	11 ⁻		
317.2 2	695.0	7 ⁻	377.8	6 ⁺		
327.2 4	1238.7	12 ⁺	911.4	10 ⁺		

Continued on next page (footnotes at end of table)

$^{230}\text{Th}(\alpha,\alpha'2\text{n}\gamma)$ **1984Ha21** (continued)

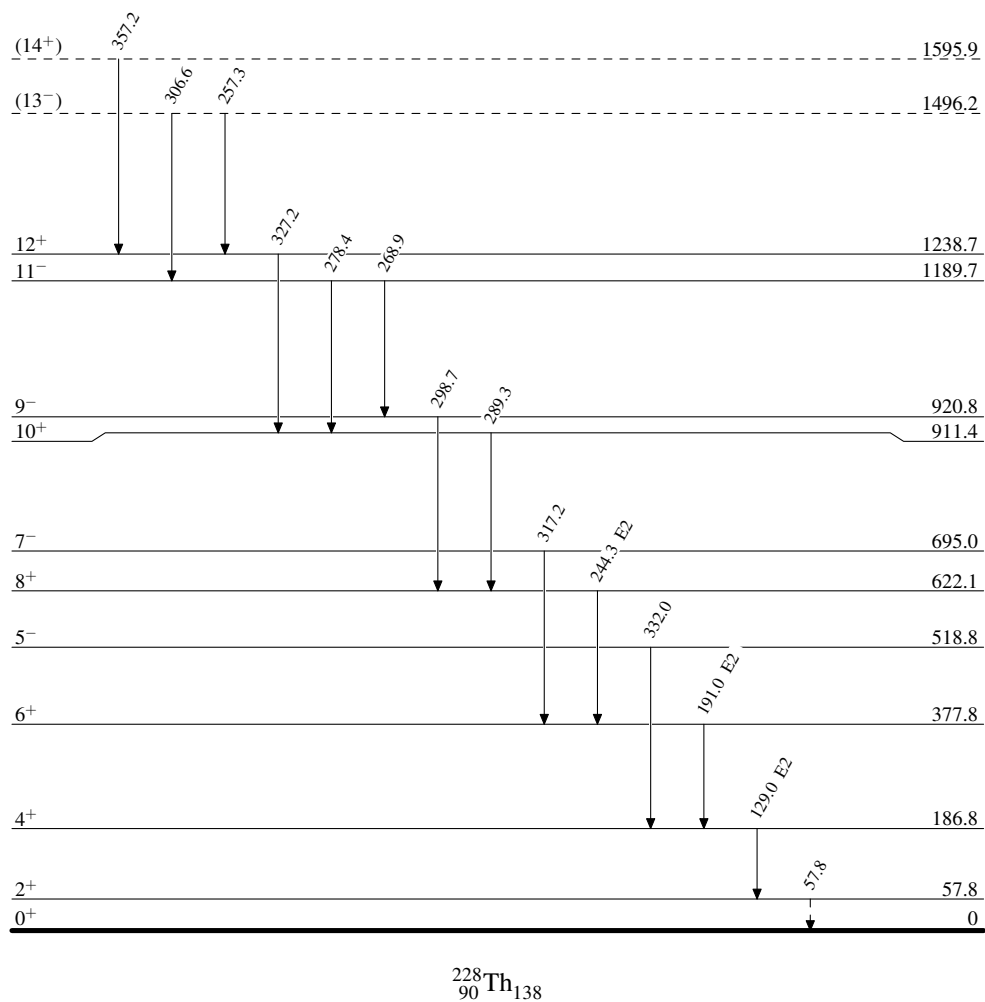
$\gamma(^{228}\text{Th})$ (continued)

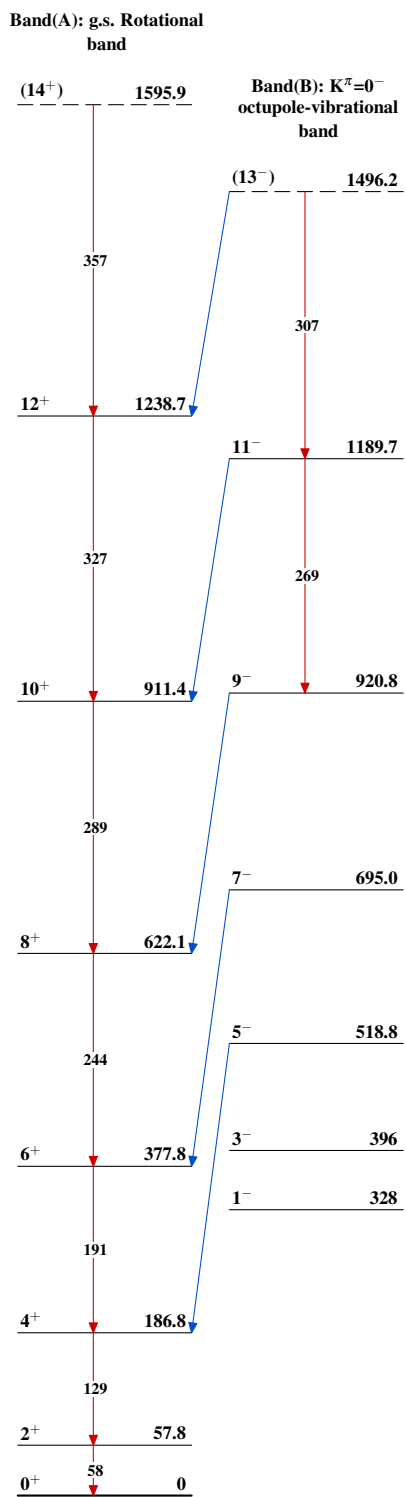
E_γ	$E_i(\text{level})$	J^π_i	E_f	J^π_f
332.0 4	518.8	5 ⁻	186.8	4 ⁺
357.2 5	1595.9?	(14 ⁺)	1238.7	12 ⁺

[†] Multipolarity of 129, 191 and 244 γ 's in the ground-state band are determined as E2 from (L1+L2)/L3 ce data.

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Legend

Level Scheme-----► γ Decay (Uncertain)

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 $^{228}_{90}\text{Th}_{138}$