

$^{230}\text{Th}(\text{p},2\text{n}\gamma)$ 1994Le22

Type	Author	History	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	Citation NDS 109, 2657 (2008)	1-Jun-2008

E=14 MeV. Measured γ , ce, $\gamma\gamma$.

1991Gr13: E=14 MeV, Measured ce, ce- γ , ce-n coin.

 ^{229}Pa Levels

E(level) [†]	J ^{π}	Comments
0 ^a	5/2 ⁺	
11.4 ^a 3	(7/2 ⁺)	
11.6 [#] 3	3/2 ⁻	Additional information 1.
26.7 [#] 4	1/2 ⁻	E(level): from (p,t).
59.1 ^a 5	(9/2 ⁺)	
68.1 [‡] 3	7/2 ⁻	
95.2 ^a ?	(11/2 ⁺)	
99.3 [#]	5/2 ⁻	E(level): from (p,t).
134.10 10	(5/2 ⁻)	J ^{π} : Suggested configuration=5/2[523]+5/2[512].
178.0 [‡] 4	11/2 ⁻	
220.0 [#] 4	9/2 ⁻	
222.5 3	(3/2 ⁺)	
251.9 [@]	1/2 ⁺	E(level): from (p,t).
253.3 3	(7/2 ⁺)	
284.1 [@]	5/2 ⁺	E(level): from (p,t).
303.0 ^{&}	3/2 ⁺	E(level): from (p,t).
338.1 [‡] 4	15/2 ⁻	
377.3 [@] 4	9/2 ⁺	
386.2 [#] 5	13/2 ⁻	
392.4 ^{&} 5	7/2 ⁺	
520.6 ^{&} 5	11/2 ⁺	
521.6 [@] 4	13/2 ⁺	
545.3 [‡] 5	19/2 ⁻	
594.2 [#] 10	17/2 ⁻	
689.2 ^{&} 5	15/2 ⁺	
712.3 [@] 5	17/2 ⁺	
794.6 [‡] 6	(23/2 ⁻)	
840.8 [#] 10	(21/2 ⁻)	

[†] Deduced by evaluators from least-squares fit to γ -ray energies.

[‡] Band(A): K ^{π} =1/2⁻, s=-i band. Main configuration=1/2[530].

[#] Band(B): K ^{π} =1/2⁻, s=+i band. Main configuration=1/2[530].

[@] Band(C): K ^{π} =1/2⁺, s=-i band. Main configuration=1/2[660].

[&] Band(D): K ^{π} =1/2⁺, s=+i band. Main configuration=1/2[660].

^a Band(E): K ^{π} =5/2⁺ band. Main configuration=5/2[642].

$^{230}\text{Th}(p,2n\gamma)$ **1994Le22** (continued)

$\gamma(^{229}\text{Pa})$

Observed In coincidence data.

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.
(11.4)	11.4	(7/2 ⁺)	0	5/2 ⁺		^x 180.8 8					
11.6 [#] 3	11.6	3/2 ⁻	0	5/2 ⁺	E1	183.5 4	521.6	13/2 ⁺	338.1	15/2 ⁻	E1
42.0 3	220.0	9/2 ⁻	178.0	11/2 ⁻	(M1)	190.7 [@] 6	712.3	17/2 ⁺	521.6	13/2 ⁺	E2
48 [@]	59.1	(9/2 ⁺)	11.4	(7/2 ⁺)		199.3 2	377.3	9/2 ⁺	178.0	11/2 ⁻	E1
48.1 3	386.2	13/2 ⁻	338.1	15/2 ⁻	(M1)	207.2 2	545.3	19/2 ⁻	338.1	15/2 ⁻	E2
56.4 3	68.1	7/2 ⁻	11.6	3/2 ⁻	E2	208.2 5	386.2	13/2 ⁻	178.0	11/2 ⁻	(M1)
^x 78.8 3						211.09 [‡] 10	222.5	(3/2 ⁺)	11.4	(7/2 ⁺)	
82.6 [@]	178.0	11/2 ⁻	95.2?	(11/2 ⁺)	(E1)	^x 218.3 5					
86.5 9	220.0	9/2 ⁻	134.10	(5/2 ⁻)	(E2)	241.92 [‡] 10	253.3	(7/2 ⁺)	11.4	(7/2 ⁺)	
88.4 5	222.5	(3/2 ⁺)	134.10	(5/2 ⁻)	E1	^x 247.8 3					
^x 106.0 6						249.3 3	794.6	(23/2 ⁻)	545.3	19/2 ⁻	(E2)
^x 108.1 6						256.1 9	594.2	17/2 ⁻	338.1	15/2 ⁻	(M1)
109.9 2	178.0	11/2 ⁻	68.1	7/2 ⁻	E2	^x 279.4 3					
118.9 3	178.0	11/2 ⁻	59.1	(9/2 ⁺)	E1	^x 295.3 3					
119.2 3	253.3	(7/2 ⁺)	134.10	(5/2 ⁻)	E1	295.5 9	840.8	(21/2 ⁻)	545.3	19/2 ⁻	
122.51 [‡] 10	134.10	(5/2 ⁻)	11.6	3/2 ⁻		300.6 2	520.6	11/2 ⁺	220.0	9/2 ⁻	E1
128.2 [†] @	520.6	11/2 ⁺	392.4	7/2 ⁺		303.0 2	689.2	15/2 ⁺	386.2	13/2 ⁻	E1
134.4 5	520.6	11/2 ⁺	386.2	13/2 ⁻	E1	^x 304.6 6					
^x 137.0 5						^x 322.8 4					
143.3 [†] @	521.6	13/2 ⁺	377.3	9/2 ⁺		343.6 2	521.6	13/2 ⁺	178.0	11/2 ⁻	E1
^x 152.5 4						^x 356.3 4					
^x 160.0 2						374.2 3	712.3	17/2 ⁺	338.1	15/2 ⁻	E1
160.1 2	338.1	15/2 ⁻	178.0	11/2 ⁻	E2	^x 404.8 5					
^x 164.4 3						^x 415.5 5					
167.0 4	712.3	17/2 ⁺	545.3	19/2 ⁻	E1	^x 435.8 4					
168.6 [†] @	689.2	15/2 ⁺	520.6	11/2 ⁺		^x 496.7 5					
172.4 3	392.4	7/2 ⁺	220.0	9/2 ⁻	E1	^x 506.8 5					

[†] Not In coin spectrum.

[‡] From Adopted Gammas.

[#] From (P,ty).

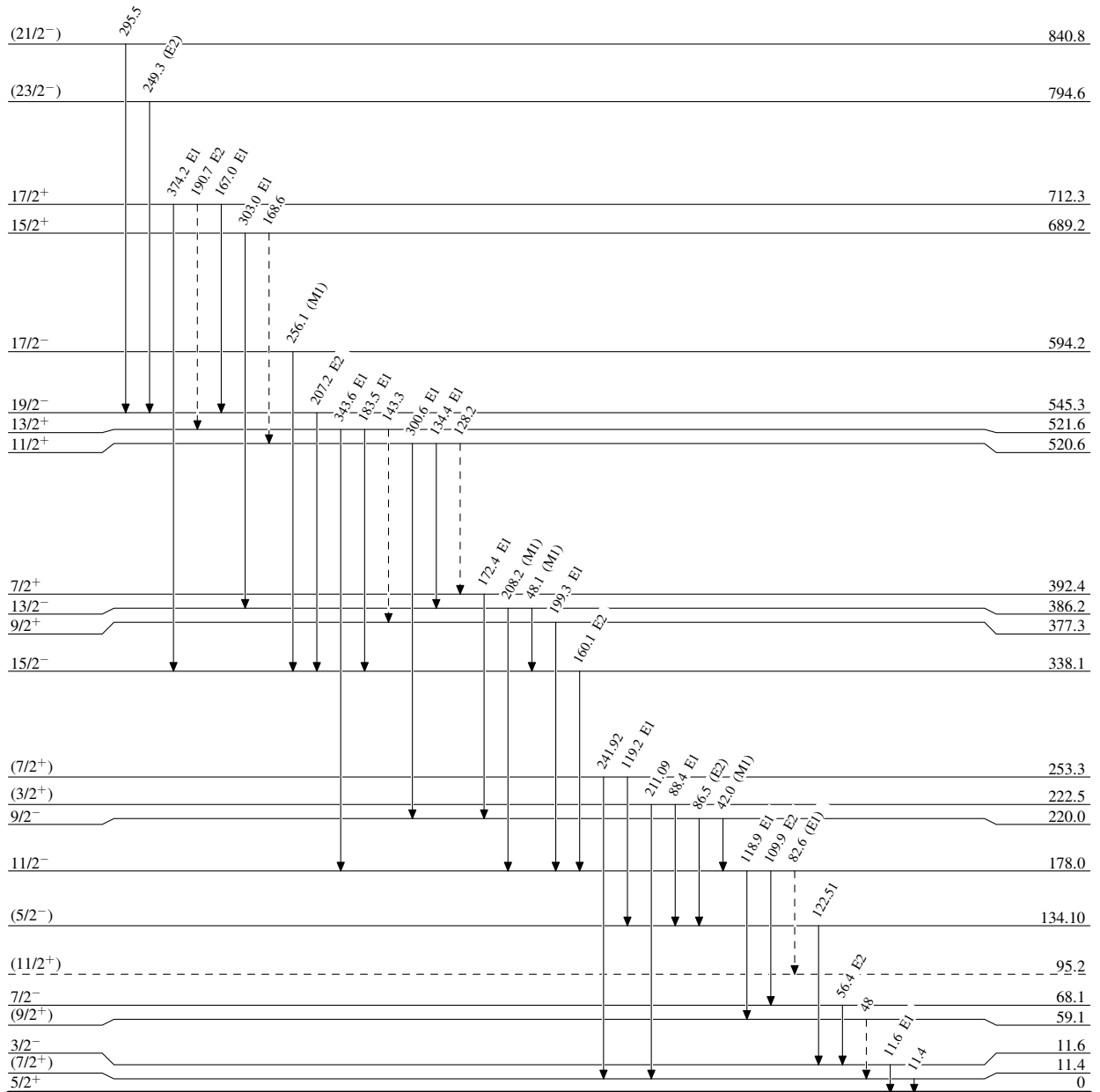
[@] Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

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Legend

Level Scheme

-----► γ Decay (Uncertain) $^{229}_{91}\text{Pa}_{138}$

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