

¹⁴⁰Ce(α,3nγ) **1977Lu04**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 187,1 (2023)	12-Oct-2022

E=40-52 MeV.

Measured: γ, γγ, γ(θ), excitation function.

¹⁴¹Nd Levels

E(level)	J ^π †	T _{1/2}	E(level)	J ^π †	E(level)	J ^π †
0.0	3/2 ⁺		1967.6	7/2 ⁺	3104.9	(21/2)
194.0	1/2 ⁺		2211.6	(11/2) ⁻	4246.3	21/2
757.1	11/2 ⁻	62.0 s 8	2350.2	13/2	4376.8	25/2 ⁽⁻⁾
1224.3	5/2 ⁺		2539.3	15/2 ⁽⁻⁾	4494.9	23/2 ⁽⁻⁾
1344.3	7/2 ⁺		2831.1	15/2 ⁽⁻⁾	4583.0	(23/2)
1624.3	(9/2)		2887.5	17/2 ⁽⁻⁾	5271.0	(25/2)
1871.9			2952.0	(19/2)		

† Adopted values.

γ(¹⁴¹Nd)

E _γ	I _γ †	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.‡	Comments
56.7	2.4 4	2887.5	17/2 ⁽⁻⁾	2831.1	15/2 ⁽⁻⁾		
64.5	9.6 9	2952.0	(19/2)	2887.5	17/2 ⁽⁻⁾		Mult.: A ₂ =-0.04 10.
^x 68.7	0.4 1						
^x 81.2	2.7 3						
^x 86.0	0.8 1						
^x 114.6	1.25 20						
121.0	0.5 1	1344.3	7/2 ⁺	1224.3	5/2 ⁺		
^x 129.0	1.3 2						
130.5	9.0 6	4376.8	25/2 ⁽⁻⁾	4246.3	21/2		Mult.: A ₂ =-0.25 4 indicates a ΔJ=1 transitions, inconsistent with ΔJ _{levels} =2.
^x 144.6	1.7 2						
^x 146.2	3.4 2						
152.9	7.3 6	3104.9	(21/2)	2952.0	(19/2)	D	Mult.: A ₂ =-0.40 8.
^x 171.3	1.1 2						
190.0	2.3 3	2539.3	15/2 ⁽⁻⁾	2350.2	13/2		
194.0	1.3 2	194.0	1/2 ⁺	0.0	3/2 ⁺		
^x 206.4	1.8 4						
218.5	2.8 3	3104.9	(21/2)	2887.5	17/2 ⁽⁻⁾		
^x 246.9	4.0 4						
248.6	9.0 7	4494.9	23/2 ⁽⁻⁾	4246.3	21/2	D	Mult.: A ₂ =-0.16 7.
280.0	5.3 5	1624.3	(9/2)	1344.3	7/2 ⁺		
336.7	7.8 8	4583.0	(23/2)	4246.3	21/2	D	Mult.: A ₂ =-0.17 6.
348.2	50.0 25	2887.5	17/2 ⁽⁻⁾	2539.3	15/2 ⁽⁻⁾		
^x 357.3	3.4 4						
^x 487.5	9.8 10						E _γ : complex line.
587.2	5.0 5	2211.6	(11/2) ⁻	1624.3	(9/2)		
622.4	1.0 7	1967.6	7/2 ⁺	1344.3	7/2 ⁺		
647.6	2.7 2	1871.9		1224.3	5/2 ⁺		
757.1	220 10	757.1	11/2 ⁻	0.0	3/2 ⁺		
^x 781.0	9.5 5						
^x 839.0	11.0 5						
^x 870.5	10.5 5						

Continued on next page (footnotes at end of table)

$^{140}\text{Ce}(\alpha,3n\gamma)$ **1977Lu04 (continued)** $\gamma(^{141}\text{Nd})$ (continued)

E_γ	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
1024.7	9.0 8	5271.0	(25/2)	4246.3	21/2		
1030.5	1.0 2	1224.3	5/2 ⁺	194.0	1/2 ⁺		
^x 1043.2	1.9 2						
1141.1	3.5 5	4246.3	21/2	3104.9	(21/2)		
1224.3	3.3 2	1224.3	5/2 ⁺	0.0	3/2 ⁺		
1294.3 [#]	42.5 25	4246.3	21/2	2952.0	(19/2)	D	Mult.: $A_2=-0.87$ 12.
^x 1324.5	2.3 3						
1344.5	5.0 4	1344.3	7/2 ⁺	0.0	3/2 ⁺		
^x 1355.8	2.0 3						
1359.1 [#]	12.5 8	4246.3	21/2	2887.5	17/2 ⁽⁻⁾	Q	Mult.: $A_2=+0.11$ 7.
^x 1444.5	1.1 2						
1454.5	15.0 9	2211.6	(11/2) ⁻	757.1	11/2 ⁻	D+Q	Mult.: $A_2=-0.95$ 22.
^x 1560.0	1.0 5						
^x 1571.0	7.0 17						E_γ : observed only at $E(\alpha)=45$ MeV.
1593.1	12.7 15	2350.2	13/2	757.1	11/2 ⁻		I_γ : at $E(\alpha)=45$ MeV. Mult.: $A_2=+0.07$ 5.
^x 1705.0	2.0 2						
^x 1722.9	2.0 2						E_γ : observed only at $E(\alpha)=45$ MeV.
1782.2	54.5 37	2539.3	15/2 ⁽⁻⁾	757.1	11/2 ⁻		Mult.: $A_2=+0.08$ 5.
1967.6	2.4 10	1967.6	7/2 ⁺	0.0	3/2 ⁺		
2074.0	18.5 12	2831.1	15/2 ⁽⁻⁾	757.1	11/2 ⁻		

[†] Relative intensities at $E(\alpha)=40$ MeV.

[‡] $\gamma(\theta)$ at $E(\alpha)=52$ MeV assuming $A_4=0$.

[#] 1293 γ intense γ ray placed in $(\alpha,3n\gamma)$ and $(\alpha,5n\gamma)$ at this level was relocated in $(^{24}\text{Mg},\alpha 3n\gamma)$ at 13/2⁻, 2050. 1359 γ also placed in $(\alpha,3n\gamma)$ at this level, was placed in $(^{24}\text{Mg},\alpha 3n\gamma)$ at 4494 level, actually by reversing the order of 250 γ and 1359 γ .

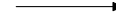


^x γ ray not placed in level scheme.

$^{140}\text{Ce}(\alpha,3n\gamma)$ 1977Lu04

Level Scheme

Intensities: Type not specified

Legend

-  $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
 $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
 $I_\gamma > 10\% \times I_\gamma^{\text{max}}$

