

$^{131}\text{Pr}$   $\varepsilon$  decay (5.71 s) 1996Gi08,1983ViZU

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, I. Mitropolsky, A. Rodionov		NDS 107, 2715 (2006)	17-Jul-2006

Parent:  $^{131}\text{Pr}$ :  $E=152.4$  3;  $J^\pi=(11/2^-)$ ;  $T_{1/2}=5.71$  s 14;  $Q(\varepsilon)=5.44\times 10^3$  6;  $\% \varepsilon + \% \beta^+$  decay=3.6 12

1996Gi08,1993GeZZ:  $^{131}\text{Pr}$   $\varepsilon$  decay [from  $^{96}\text{Mo}(^{40}\text{Ca},2p3n)$ ,  $E=255$  MeV]; measured  $x$ ,  $\gamma$ ,  $\gamma\gamma(t)$ ,  $x\gamma(t)$ ,  $\text{cex}(t)$ ,  $\text{ce}\gamma(t)$ ,  $T_{1/2}$ .

Mass separator, He-jet transport, magnetic electron spectrometer. Comparison with Interacting Boson-Fermion Model calculations.

1983ViZU,1983AkZZ:  $^{132}\text{Pr}$   $\varepsilon$  decay [from  $\text{Ta}(p,X)$ , 1000 MeV]; measured  $\gamma$ ,  $\gamma\gamma$ ,  $T_{1/2}$ . Mass separation.

Others: 1973De25, 1966No05, 1977Gi17.

 $^{131}\text{Ce}$  Levels

The decay scheme is that of 1996Gi08, except as noted. It is built on the basis of coincidence data, energy relationships and multiplicities of the transitions. The level scheme of 1983ViZU is not as complete as of 1996Gi08 and contradicts it somewhat; evaluators have excluded 440.56, 884.1 and 947.6 levels from 1983ViZU level scheme so far as each of them was introduced by two transitions on the basis of energy relationship only and was not placed in 1996Gi08 scheme.

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	$T_{1/2}$	Comments
0.0	$7/2^+$	10.3 min 3	
161.98 5	$9/2^-$	88 ns 2	$T_{1/2}$ : from Adopted Levels.
181.4 4	$(7/2^-)$		
300.27 10	$11/2^-$	120 ps 8	$T_{1/2}$ : from Adopted Levels.
384.61 12	$(11/2^-)$		
548.5 3			
588.7 4	$(5/2^- \text{ to } 13/2^-)$		
600.53 12			
636.68 20	$13/2^-$		
687.0 3			
902.6 3			
985.7 5			

<sup>†</sup> From least-squares fit to  $E\gamma$ 's corresponding to reduced  $\chi^2=0.4$ .

<sup>‡</sup> From Adopted Levels.

 $\gamma(^{131}\text{Ce})$ 

I $\gamma$  normalization: Not given as the level scheme is incomplete.

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>‡</sup>	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult.&
$\approx 85$	$\approx 5$	384.61	$(11/2^-)$	300.27	$11/2^-$	
$\approx 119$	$\approx 5$	300.27	$11/2^-$	181.4	$(7/2^-)$	
138.29 <sup>#</sup> 9	45 5	300.27	$11/2^-$	161.98	$9/2^-$	
161.98 <sup>#</sup> 5	190 20	161.98	$9/2^-$	0.0	$7/2^+$	E1
203.2 3	4 1	384.61	$(11/2^-)$	181.4	$(7/2^-)$	
222.63 <sup>#</sup> 10	44 5	384.61	$(11/2^-)$	161.98	$9/2^-$	
$^x \approx 239$	5 1					
300.5 4	5 1	600.53		300.27	$11/2^-$	
302.4 4	5 1	902.6		600.53		
336.4 2	12 2	636.68	$13/2^-$	300.27	$11/2^-$	
$\approx 349$	$\leq 2$	985.7		636.68	$13/2^-$	
385.0 <sup>b</sup> 2	13 <sup>@</sup> 4	384.61	$(11/2^-)$	0.0	$7/2^+$	

Continued on next page (footnotes at end of table)

$^{131}\text{Pr}$   $\varepsilon$  decay (5.71 s) **1996Gi08,1983ViZU** (continued) $\gamma(^{131}\text{Ce})$  (continued)

$E_\gamma^\dagger$	$I_\gamma^\ddagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$
386.5 <sup>a</sup> 3	8 <sup>a</sup> 2	548.5		161.98	9/2 <sup>-</sup>
386.5 <sup>a</sup> 3	5 <sup>a</sup> 2	687.0		300.27	11/2 <sup>-</sup>
$\approx$ 405	$\leq$ 2	588.7	(5/2 <sup>-</sup> to 13/2 <sup>-</sup> )	181.4	(7/2 <sup>-</sup> )
426.8 <sup>#</sup> 4	23 2	588.7	(5/2 <sup>-</sup> to 13/2 <sup>-</sup> )	161.98	9/2 <sup>-</sup>
438.56 <sup>#</sup> 11	15 2	600.53		161.98	9/2 <sup>-</sup>
474.7 4	7.5 8	636.68	13/2 <sup>-</sup>	161.98	9/2 <sup>-</sup>
525.3 4	8.5 9	687.0		161.98	9/2 <sup>-</sup>
<sup>x</sup> 575 1	2.5 2				
601.1 4	10 2	985.7		384.61	(11/2 <sup>-</sup> )
740.2 4	10 2	902.6		161.98	9/2 <sup>-</sup>

<sup>†</sup> Weighted average from **1996Gi08** and **1983ViZU** when values are available.

<sup>‡</sup> From **1996Gi08**,  $I_\gamma$ 's in level scheme, Fig. 4, differ somewhat from tabular data.

<sup>#</sup> Measured by **1983ViZU** in  $^{131}\text{Pr}$   $\varepsilon$  decay (1.51 min) also.

<sup>@</sup> From **1983ViZU**.  $I_\gamma$  was multiplied by 4.4 to adjust to the scale of **1996Gi08**.

<sup>&</sup> From from  $^{131}\text{Ce}$  IT decay (88 ns).

<sup>a</sup> Multiply placed with intensity suitably divided.

<sup>b</sup> Placement of transition in the level scheme is uncertain.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

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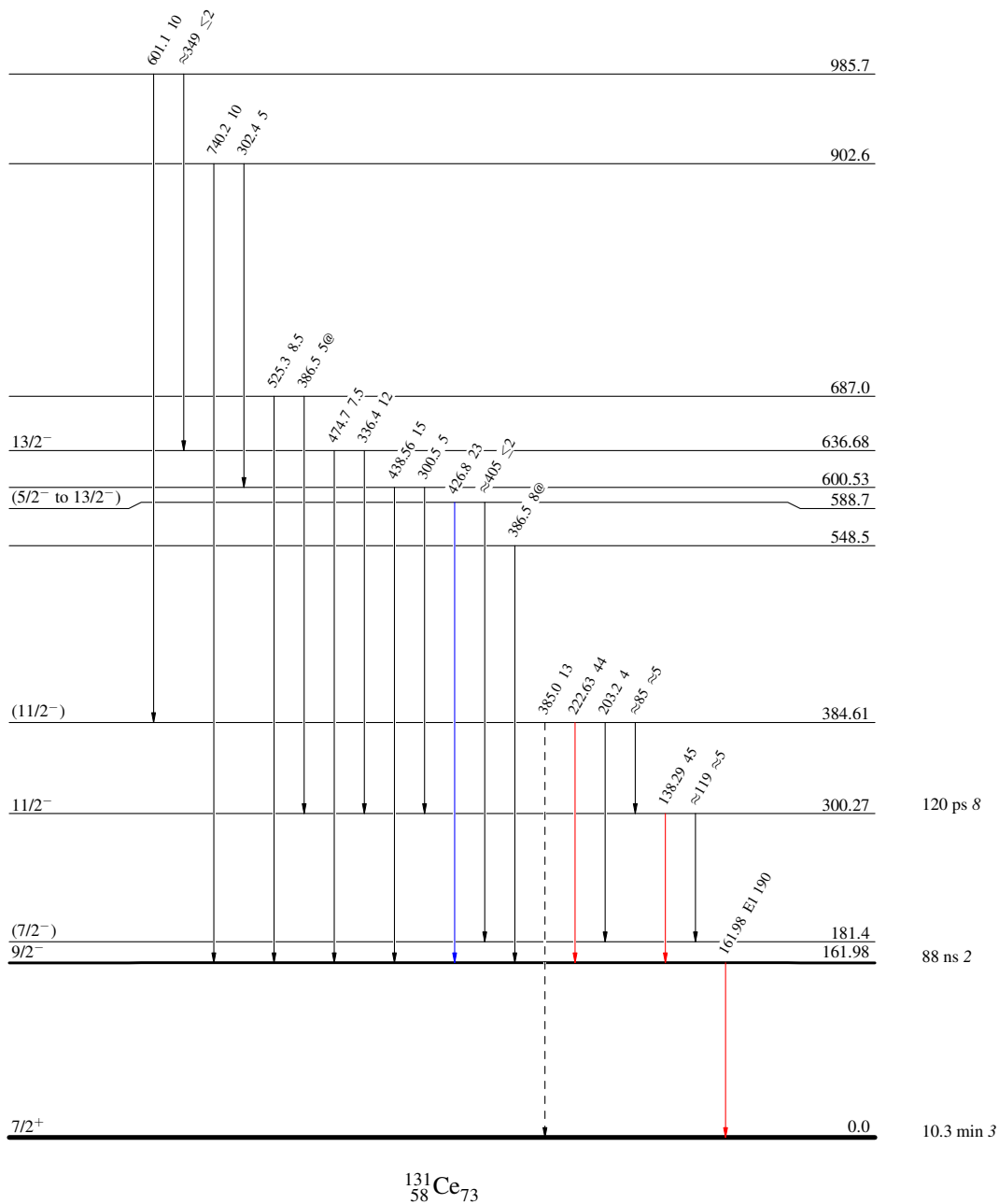
Decay Scheme

Legend

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

Intensities: Relative  $I_\gamma$   
 @ Multiply placed: intensity suitably divided

$^{131}_{59}\text{Pr}_{72}$  (11/2<sup>-</sup>) 152.4 5.71 s 14  
 $Q_\epsilon = 5.44 \times 10^3$  eV  
 $\% \epsilon + \% \beta^+ = 3.6$



$^{131}_{58}\text{Ce}_{73}$