

**Adopted Levels, Gammas**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113, 2537 (2012)	1-Mar-2012

Q( $\beta^-$ )=-5.88×10<sup>3</sup> 14; S(n)=9.23×10<sup>3</sup> 6; S(p)=4.9×10<sup>2</sup> 6; Q( $\alpha$ )=5596 3 2017Wa10  
 Q( $\epsilon$ )=9.57×10<sup>3</sup> 5; S(2n)=20127 6; S(2p)=3.85×10<sup>3</sup> 6; Q( $\epsilon$ p)=5.64×10<sup>3</sup> 6 2017Wa10

**Additional information 1.**

The data on the levels are from the <sup>102</sup>Pd(<sup>58</sup>Ni,3pn $\gamma$ ) reaction, unless noted otherwise. The data on the levels having reported

T<sub>1/2</sub> values are generally obtained from experiments in which they occur as source material from various reactions.

$\gamma$ 's unplaced in the <sup>102</sup>Pd(<sup>58</sup>Ni,3pn $\gamma$ ) reaction are not shown here. For a listing of them, see that data set.

<sup>156</sup>Lu Levels

Cross Reference (XREF) Flags

- A <sup>102</sup>Pd(<sup>58</sup>Ni,3pn $\gamma$ )
- B <sup>160</sup>Ta  $\alpha$  decay (1.7 s)
- C <sup>160</sup>Ta  $\alpha$  decay (1.55 s)

E(level)	J $\pi^\dagger$	T <sub>1/2</sub>	XREF	Comments
0	(2) <sup>-</sup>	494 ms 12	B	$\% \alpha \approx 95$ ; $\% \epsilon + \% \beta^+ \approx 5$ $\% \alpha$ : From gross $\beta$ decay theory (1973Ta30), T <sub>1/2</sub> ( $\epsilon + \beta^+$ ) $\approx$ 10 s. E(level): Assumed to be the g.s. J $^\pi$ : Favored $\alpha$ transition to the (2) <sup>-</sup> level in <sup>152</sup> Tm. T <sub>1/2</sub> : From 1996Pa01. Others: $\approx$ 0.5 s (1979Ho10); 0.73 s 15 (1992Po14).
0+x	9 <sup>+</sup>	198 ms 2	A C	$\% \alpha = 100$ $\% \alpha$ : Assumed to be 100, based on $\% \alpha = 98$ 9 (1996Pa01) and 100 25 (1979Ho10). E(level): Level assumed to lie below the 10 <sup>+</sup> state (see the discussion in the <sup>102</sup> Pd( <sup>58</sup> Ni,3pn $\gamma$ ) data set). From systematics, 2003Au02 estimate x=220 keV 80. J $^\pi$ : Favored $\alpha$ transition to 9 <sup>+</sup> level in <sup>152</sup> Tm. From level systematics in a wide range of nuclides in this region, a 9 <sup>+</sup> state is expected to occur close to the 10 <sup>+</sup> level. Also, from systematics, Configuration=( $(\pi$ 1H11/2)( $\nu$ 1f <sub>7/2</sub> ) <sup>+3</sup> )9 <sup>+</sup> . T <sub>1/2</sub> : From 1996Pa01, $\alpha$ decay. Others: 180 ms 20 (1979Ho10); 179 ms 13 (1992Po14).
0+y $\ddagger$	10 <sup>+</sup>		A	
744.97+y $\ddagger$ 10	12 <sup>+</sup>		A	
1363.42+y $\ddagger$ 15	14 <sup>+</sup>		A	
1677.27+y $\ddagger$ 18	16 <sup>+</sup>		A	
2139.24+y 21	18 <sup>+</sup>		A	
2178.10+y $\ddagger$ 20	18 <sup>+</sup>		A	
2713.4+y 3			A	
2909.51+y $\ddagger$ 23	20 <sup>+</sup>		A	
3962.9+y $\ddagger$ 3	22 <sup>+</sup>		A	
4409.2+y $\ddagger$ 3			A	
4488.1+y 3			A	
4599.7+y $\ddagger$ 3			A	
4975.5+y $\ddagger$ 4			A	
5001.8+y 4			A	
5286.7+y $\ddagger$ 5			A	

Continued on next page (footnotes at end of table)

**Adopted Levels, Gammas (continued)** $^{156}\text{Lu}$  Levels (continued)

† Unless noted otherwise, values are from the  $^{102}\text{Pd}(^{58}\text{Ni},3\text{pn}\gamma)$  reaction.

‡ Band(A): Level sequence based on the  $10^+$  state. Configuration= $((\pi 1h_{11/2})(\nu 1h_{9/2})(\nu 1f_{7/2})^{+2})$ .

<u><math>\gamma(^{156}\text{Lu})</math></u>							
<u><math>E_i(\text{level})</math></u>	<u><math>J_i^\pi</math></u>	<u><math>E_\gamma</math></u>	<u><math>I_\gamma</math></u>	<u><math>E_f</math></u>	<u><math>J_f^\pi</math></u>	<u>Mult.</u>	<u>Comments</u>
744.97+y	12 <sup>+</sup>	744.97 10	100	0+y	10 <sup>+</sup>	E2	$A_2=0.12$ 6.
1363.42+y	14 <sup>+</sup>	618.45 10	100	744.97+y	12 <sup>+</sup>	E2	$A_2=0.18$ 6.
1677.27+y	16 <sup>+</sup>	313.85 10	100	1363.42+y	14 <sup>+</sup>	E2	$A_2=0.17$ 4.
2139.24+y	18 <sup>+</sup>	461.97 12	100	1677.27+y	16 <sup>+</sup>	E2	$A_2=0.21$ 14.
2178.10+y	18 <sup>+</sup>	500.83 10	100	1677.27+y	16 <sup>+</sup>	E2	$A_2=0.37$ 7.
2713.4+y		574.2 2	100	2139.24+y	18 <sup>+</sup>		
2909.51+y	20 <sup>+</sup>	731.41 11	100	2178.10+y	18 <sup>+</sup>	E2	$A_2=0.12$ 4.
3962.9+y	22 <sup>+</sup>	1053.39 12	100	2909.51+y	20 <sup>+</sup>	E2	$A_2=0.35$ 13.
4409.2+y		446.29 10	100	3962.9+y	22 <sup>+</sup>		
4488.1+y		525.17 12	100	3962.9+y	22 <sup>+</sup>		
4599.7+y		190.48 10	100	4409.2+y		M1	$A_2=-0.62$ 18.
4975.5+y		375.81 10	100	4599.7+y		E2	$A_2=0.18$ 4.
5001.8+y		402.16 12	100	4599.7+y			
5286.7+y?		311.2 <sup>†</sup> 4	100	4975.5+y			

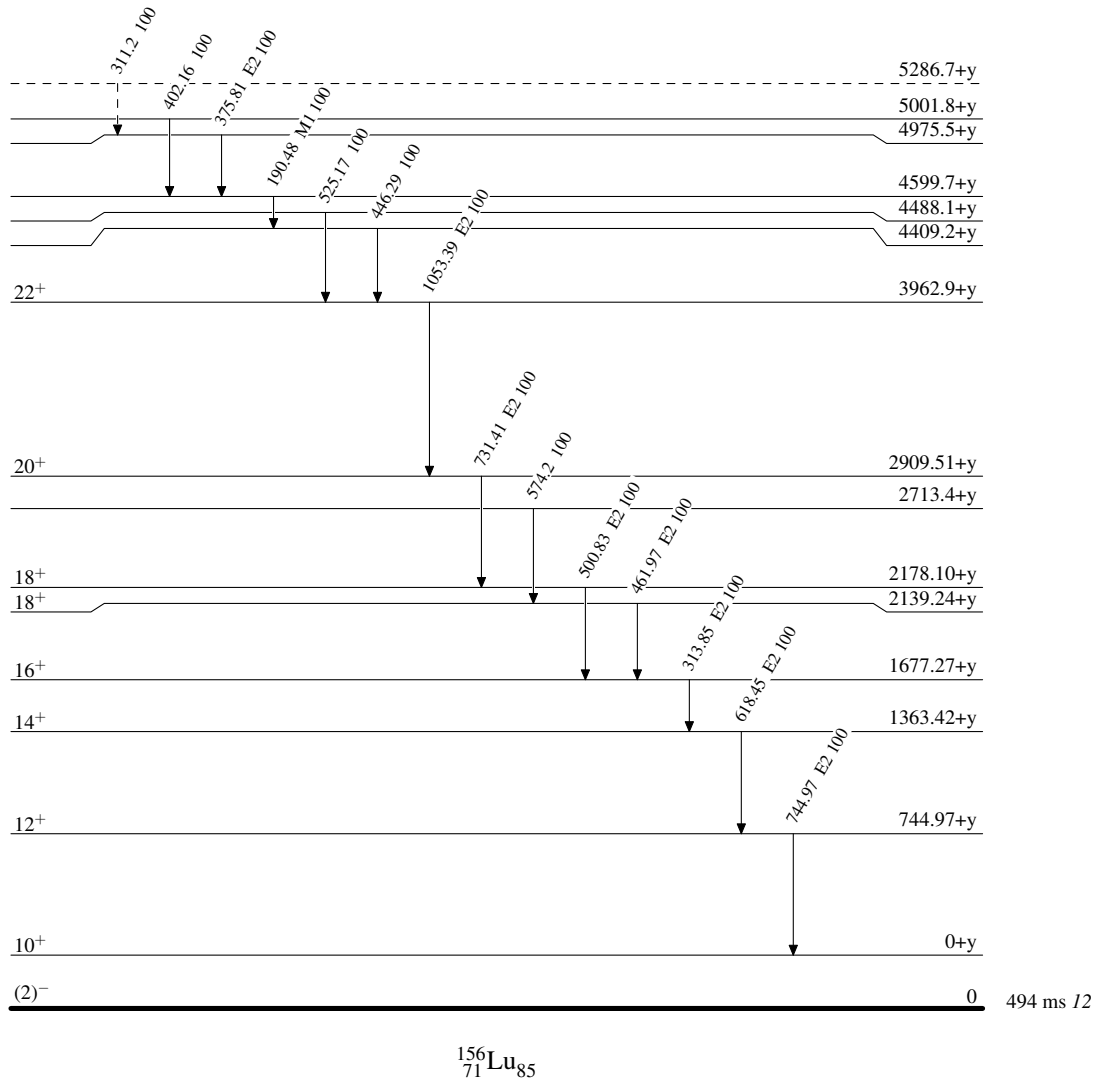
† Placement of transition in the level scheme is uncertain.

**Adopted Levels, Gammas**

Legend

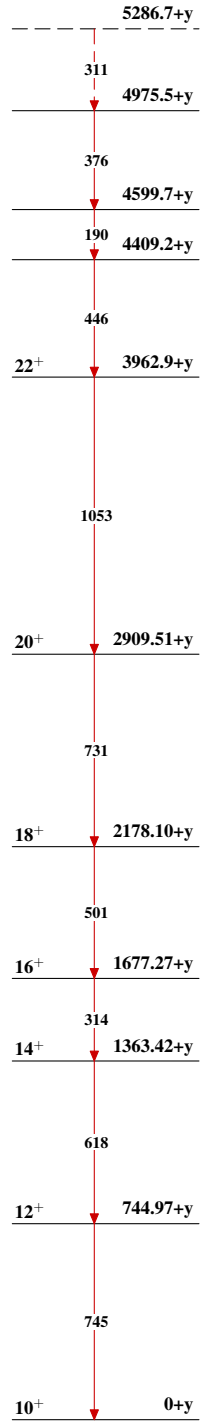
Level Scheme

Intensities: Relative photon branching from each level

-----►  $\gamma$  Decay (Uncertain) $^{156}_{71}\text{Lu}_{85}$

**Adopted Levels, Gammas**

Band(A): Level sequence  
based on the  $10^+$  state

 $^{156}_{71}\text{Lu}_{85}$