

$^{127}\text{I}(\text{p},\text{n}\gamma)$  1983Lo08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. Hashizume	NDS 112, 1647 (2011)	1-Oct-2009

1983Lo08: E=10.5 MeV;  $\gamma$ ,  $\gamma(\theta)$ , ce.

The level scheme is that proposed by 1983Lo08. The 805-keV level is not adopted, and the 720 $\gamma$  from 1307-keV level is removed by comparison with  $^{127}\text{Cs}$   $\beta^+$  decay data (evaluator).

 $^{127}\text{Xe}$  Levels

E(level) <sup>†</sup>	J $\pi$ <sup>‡</sup>	Comments
0.0	1/2 <sup>+</sup>	
125.27 13	3/2 <sup>+</sup>	
308.98 13	(11/2 <sup>-</sup> )	Additional information 1. E(level): from Adopted Levels.
321.75 14	3/2 <sup>+</sup>	
342.77 24	7/2 <sup>+</sup>	
375.53 16	5/2 <sup>+</sup>	
411.60 20	1/2 <sup>+</sup>	
419.8 3	5/2 <sup>-</sup> , 7/2 <sup>-</sup> , 9/2 <sup>-</sup>	
510.27 24	(3/2 <sup>+</sup> )	
587.37 24	3/2 <sup>+</sup>	
646.4 3	(9/2 <sup>+</sup> )	
712.17 24	7/2 <sup>+</sup>	
792.28 <sup>#</sup> 20	(11/2 <sup>-</sup> , 13/2 <sup>-</sup> )	
904.8 3	1/2 <sup>+</sup> , 3/2 <sup>+</sup> , 5/2 <sup>+</sup>	
930.38 16	3/2 <sup>+</sup>	
1283.8 4		
1306.49 16	3/2 <sup>+</sup>	
1534.97 24	3/2 <sup>+</sup>	
1584.01 20	1/2, 3/2, 5/2 <sup>+</sup>	
1973.2 3	3/2	

<sup>†</sup> From a least-squares fit to E $\gamma$ 's.

<sup>‡</sup> From Adopted Levels.

<sup>#</sup> From ( $\alpha$ , 2n $\gamma$ ).

 $\gamma(^{127}\text{Xe})$ 

E $\gamma$ <sup>†</sup>	I $\gamma$ <sup>†</sup>	E $_i$ (level)	J $_i$ $\pi$	E $_f$	J $_f$ $\pi$	Mult. <sup>#</sup>	$\alpha$ <sup>@</sup>	Comments
77.0 2	2.2 7	419.8	5/2 <sup>-</sup> , 7/2 <sup>-</sup> , 9/2 <sup>-</sup>	342.77	7/2 <sup>+</sup>			
124.7 2	100 10	125.27	3/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>			
196.7 2	4.6 14	321.75	3/2 <sup>+</sup>	125.27	3/2 <sup>+</sup>			
217.5 2	19 2	342.77	7/2 <sup>+</sup>	125.27	3/2 <sup>+</sup>	(E2)	0.1210	$\alpha(\text{K})_{\text{exp}}=0.041$ 5; K/L=3.7 7 $\alpha(\text{K})=0.0967$ 14; $\alpha(\text{L})=0.0193$ 3; $\alpha(\text{M})=0.00404$ 6; $\alpha(\text{N}+\dots)=0.000903$ 13 $\alpha(\text{N})=0.000813$ 12; $\alpha(\text{O})=9.03\times 10^{-5}$ 13 Mult.: From Adopted Levels, gammas; but M1+E2 in 1983Lo08.
250.6 2	1.3 4	375.53	5/2 <sup>+</sup>	125.27	3/2 <sup>+</sup>	M1	0.0654	$\alpha(\text{K})_{\text{exp}}=0.054$ 16 $\alpha(\text{K})=0.0563$ 8; $\alpha(\text{L})=0.00727$ 11; $\alpha(\text{M})=0.001475$ 21; $\alpha(\text{N}+\dots)=0.000344$ 5 $\alpha(\text{N})=0.000305$ 5; $\alpha(\text{O})=3.82\times 10^{-5}$ 6 $\alpha(\text{K})_{\text{exp}}=0.020$ 5; K/L=4 2
303.6 2	4.1 12	646.4	(9/2 <sup>+</sup> )	342.77	7/2 <sup>+</sup>	M1	0.0395	

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$^{127}\text{I}(\text{p},\text{n}\gamma)$ <b>1983Lo08 (continued)</b>								
$\gamma(^{127}\text{Xe})$ (continued)								
$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. #	$\alpha^\oplus$	Comments
								$\alpha(\text{K})=0.0340$ 5; $\alpha(\text{L})=0.00437$ 7; $\alpha(\text{M})=0.000886$ 13; $\alpha(\text{N}+..)=0.000206$ 3 $\alpha(\text{N})=0.000183$ 3; $\alpha(\text{O})=2.30\times 10^{-5}$ 4
321.4 2	13 2	321.75	3/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>	M1	0.0341	$\alpha(\text{K})\text{exp}=0.016$ 2; K/L=3.7 9 $\alpha(\text{K})=0.0294$ 5; $\alpha(\text{L})=0.00376$ 6; $\alpha(\text{M})=0.000763$ 11; $\alpha(\text{N}+..)=0.000178$ 3 $\alpha(\text{N})=0.0001580$ 23; $\alpha(\text{O})=1.98\times 10^{-5}$ 3
375.2 2	16 2	375.53	5/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>	(E2)	0.0208	$\alpha(\text{K})\text{exp}=0.013$ 3 $\alpha(\text{K})=0.01734$ 25; $\alpha(\text{L})=0.00273$ 4; $\alpha(\text{M})=0.000562$ 8; $\alpha(\text{N}+..)=0.0001279$ 18 $\alpha(\text{N})=0.0001145$ 17; $\alpha(\text{O})=1.343\times 10^{-5}$ 19
385.0 2	11 2	510.27	(3/2) <sup>+</sup>	125.27	3/2 <sup>+</sup>	M1(+E2)	0.0203 12	$\alpha(\text{K})\text{exp}=0.021$ 5 $\alpha(\text{K})=0.0173$ 13; $\alpha(\text{L})=0.00243$ 9; $\alpha(\text{M})=0.000497$ 21; $\alpha(\text{N}+..)=0.000114$ 4 $\alpha(\text{N})=0.000102$ 4; $\alpha(\text{O})=1.238\times 10^{-5}$ 18
394.5 2	1.9 6	904.8	1/2 <sup>+</sup> ,3/2 <sup>+</sup> ,5/2 <sup>+</sup>	510.27	(3/2) <sup>+</sup>	M1(+E2)	0.0190 12	$\alpha(\text{K})\text{exp}=0.011$ 5 $\alpha(\text{K})=0.0162$ 13; $\alpha(\text{L})=0.00227$ 6; $\alpha(\text{M})=0.000462$ 16; $\alpha(\text{N}+..)=0.0001065$ 25 $\alpha(\text{N})=9.50\times 10^{-5}$ 25; $\alpha(\text{O})=1.154\times 10^{-5}$ 20
411.6 2	2.3 7	411.60	1/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>	M1	0.0181	$\alpha(\text{K})\text{exp}=0.017$ 7; K/L=6 3 $\alpha(\text{N})=8.33\times 10^{-5}$ 12; $\alpha(\text{O})=1.046\times 10^{-5}$ 15 $\alpha(\text{N})=8.33\times 10^{-5}$ 12; $\alpha(\text{O})=1.045\times 10^{-5}$ 15
462.1 2	2.0 6	587.37	3/2 <sup>+</sup>	125.27	3/2 <sup>+</sup>	M1	0.01355	$\alpha(\text{K})\text{exp}=0.007$ 3 $\alpha(\text{K})=0.01169$ 17; $\alpha(\text{L})=0.001481$ 21; $\alpha(\text{M})=0.000300$ 5; $\alpha(\text{N}+..)=6.99\times 10^{-5}$ 10 $\alpha(\text{N})=6.21\times 10^{-5}$ 9; $\alpha(\text{O})=7.80\times 10^{-6}$ 11
483.3 2	10 1	792.28	(11/2 <sup>-</sup> ,13/2 <sup>-</sup> )	308.98	(11/2 <sup>-</sup> )	M1	0.01212	$\alpha(\text{K})\text{exp}=0.007$ 2; K/L=3.2 8 $\alpha(\text{N})=5.55\times 10^{-5}$ 8; $\alpha(\text{O})=6.97\times 10^{-6}$ 10 $\alpha(\text{N})=5.55\times 10^{-5}$ 8; $\alpha(\text{O})=6.96\times 10^{-6}$ 10
586.9 <sup>‡</sup> 2	4.4 13	712.17	7/2 <sup>+</sup>	125.27	3/2 <sup>+</sup>			$\alpha(\text{K})\text{exp}=0.005$ 2; K/L=6 3
608.5 2	0.5 2	930.38	3/2 <sup>+</sup>	321.75	3/2 <sup>+</sup>	E2	0.00529 8	$\alpha(\text{K})\text{exp}=0.002$ 1 $\alpha=0.00529$ 8; $\alpha(\text{K})=0.00451$ 7; $\alpha(\text{L})=0.000625$ 9; $\alpha(\text{M})=0.0001274$ 18; $\alpha(\text{N}+..)=2.93\times 10^{-5}$ 5 $\alpha(\text{N})=2.62\times 10^{-5}$ 4; $\alpha(\text{O})=3.18\times 10^{-6}$ 5
637.4 2	3.4 10	1283.8		646.4	(9/2) <sup>+</sup>	D,E2		$\alpha(\text{K})\text{exp}=0.003$ 1 Mult.: from Adopted Levels, gammas.

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$^{127}\text{I}(\text{p},\text{n}\gamma)$  **1983Lo08 (continued)** $\gamma(^{127}\text{Xe})$  (continued)

$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. <sup>#</sup>	$\alpha^\circledast$	Comments
<sup>x</sup> 680.6 2	0.3 1					M1	0.00526 8	$\alpha(\text{K})_{\text{exp}}=0.010 5$ $\alpha=0.00526 8$ ; $\alpha(\text{K})=0.00455 7$ ; $\alpha(\text{L})=0.000569 8$ ; $\alpha(\text{M})=0.0001150 17$ ; $\alpha(\text{N}+..)=2.68\times 10^{-5} 4$ $\alpha(\text{N})=2.38\times 10^{-5} 4$ ; $\alpha(\text{O})=3.00\times 10^{-6} 5$
<sup>x</sup> 720.0 2	0.8 2					M1+E2	0.0040 6	$\alpha(\text{K})_{\text{exp}}=0.003 1$ $\alpha=0.0040 6$ ; $\alpha(\text{K})=0.0035 6$ ; $\alpha(\text{L})=0.00045 5$ ; $\alpha(\text{M})=9.1\times 10^{-5} 10$ ; $\alpha(\text{N}+..)=2.11\times 10^{-5} 24$ $\alpha(\text{N})=1.87\times 10^{-5} 21$ ; $\alpha(\text{O})=2.3\times 10^{-6} 3$
<sup>x</sup> 802.5 2	1.2 4					M1(+E2)	0.0032 5	$\alpha(\text{K})_{\text{exp}}=0.003 1$ $\alpha=0.0031 5$ ; $\alpha(\text{K})=0.0027 4$ ; $\alpha(\text{L})=0.00034 4$ ; $\alpha(\text{M})=6.9\times 10^{-5} 9$ ; $\alpha(\text{N}+..)=1.61\times 10^{-5} 20$ $\alpha(\text{N})=1.43\times 10^{-5} 18$ ; $\alpha(\text{O})=1.79\times 10^{-6} 24$ $\alpha=0.0032 5$ ; $\alpha(\text{K})=0.0027 5$ ; $\alpha(\text{L})=0.00034 5$ $E_\gamma$ : deexciting $\gamma$ of the 930 level in <b>1983Lo08.</b>
930.5 2	0.7 2	930.38	3/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>	D		
1180.1 2	0.4 1	1306.49	3/2 <sup>+</sup>	125.27	3/2 <sup>+</sup>	D		
1307.6 2	1.5 5	1306.49	3/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>			
1409.7 2	2.2 7	1534.97	3/2 <sup>+</sup>	125.27	3/2 <sup>+</sup>			Mult.: $\Delta J=0,2$ .
1561.6 2	0.6 2	1973.2	3/2	411.60	1/2 <sup>+</sup>	D		
1584.0 2	0.5 2	1584.01	1/2,3/2,5/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>			

<sup>†</sup> From **1983Lo08**.  $\Delta I_\gamma=10\%$  for the strong peaks and 30% for the weak ones.

<sup>‡</sup> Placement is rather questionable from the results of  $^{127}\text{Cs}$   $\beta^+$  decay (evaluator).

<sup>#</sup> From  $\alpha(\text{K})_{\text{exp}}$ , K/L, and  $\gamma(\theta)$  data. The  $\alpha(\text{K})_{\text{exp}}$  and K/L are given explicitly.

<sup>@</sup> Total theoretical internal conversion coefficients, calculated using the BrIcc code (**2008Ki07**) with Frozen orbital approximation based on  $\gamma$ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

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

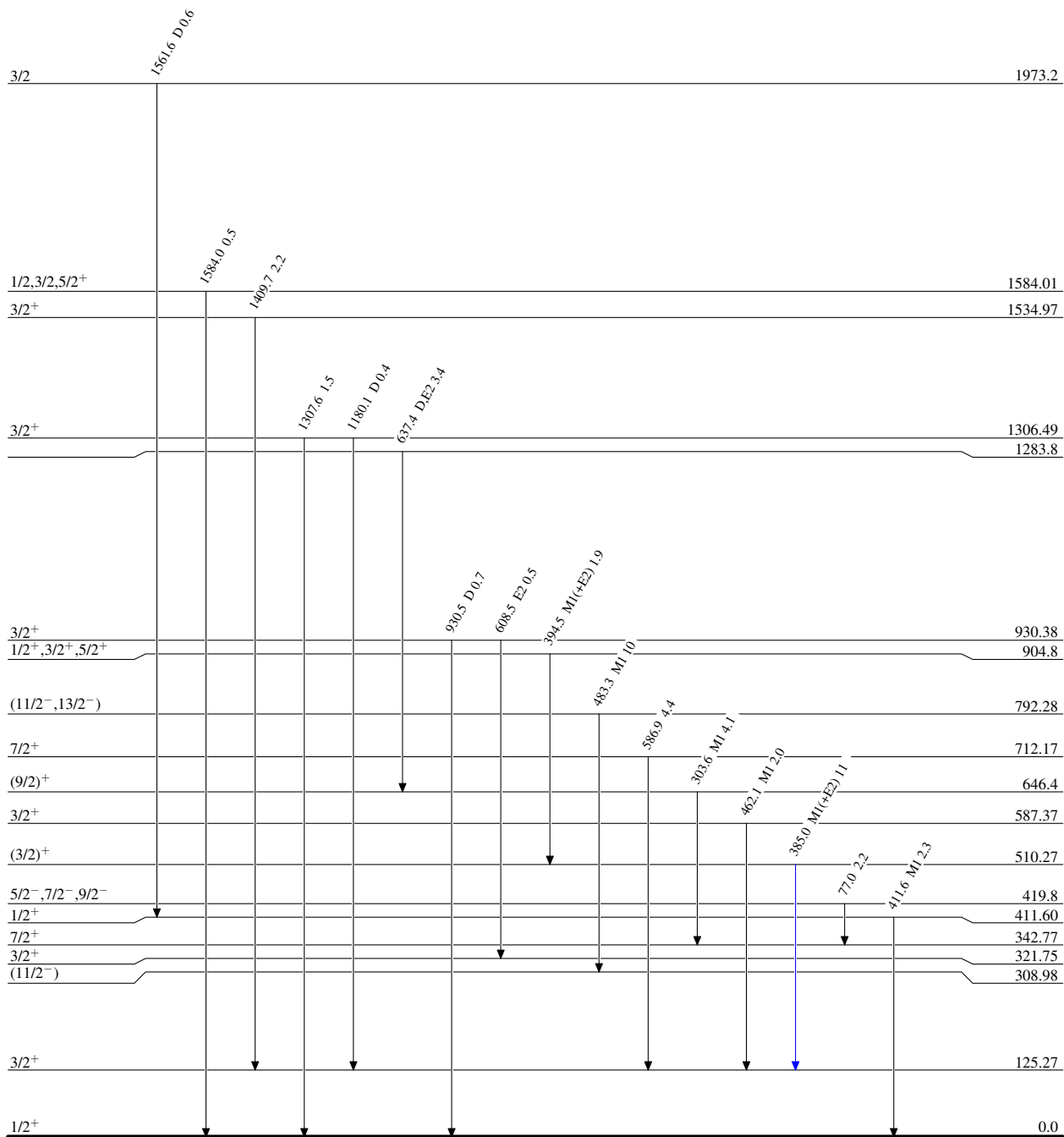
$^{127}\text{I}(\text{p},\text{n}\gamma)$  1983Lo08

## Level Scheme

Intensities: Relative  $I_\gamma$ 

## Legend

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

 $^{127}_{54}\text{Xe}_{73}$

$^{127}\text{I}(\text{p},\text{n}\gamma)$  1983Lo08

## Level Scheme (continued)

Intensities: Relative  $I_\gamma$ 

## Legend

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

