

<sup>64</sup>Zn(<sup>16</sup>O,npγ) 1979Ma09

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh		NDS 110, 1917 (2009)	30-Jun-2009

1979Ma09: E=44, 52 MeV. Measured E<sub>γ</sub>, I<sub>γ</sub>, γγ, γ(θ); γ(θ) from 0° to 90° in 15° steps.

<sup>78</sup>Rb Levels

E(level) <sup>†‡</sup>	J <sup>π</sup> #	Comments
103.3+x	(4 <sup>-</sup> )	E(level): corresponds to 5.74-min isomer.
255.9+x	(5 <sup>-</sup> )	
411.1+x	(6 <sup>+</sup> )@	
480.9+x	(6 <sup>-</sup> )	
655.5+x	(7 <sup>+</sup> )@	
759.4+x	(7 <sup>-</sup> )	
841.1+x	(8 <sup>+</sup> )@	
1207.9+x	(9 <sup>+</sup> )@	
1613.6+x	(10 <sup>+</sup> )	E(level): level proposed (by evaluators) based on 'Adopted Levels'.

<sup>†</sup> From least-squares fit to E<sub>γ</sub>'s.

<sup>‡</sup> Comparison with level scheme in 'Adopted Levels' gives x=8 for 103.3+x, 255.9+x, 480.9+x, 759.4+x levels and x=12 for 411.1+x, 655.5+x, 841.1+x and 1207.9+x levels. The 152.6γ is a doublet with the other component deexciting the 411.1+x level and feeding a level at 258+x which further deexcites through the 155.2γ feeding a level at 107+x. The 366.8-185.6-244.4-152.6-155.2 cascade feeds the 107+x level, instead of 103+x level.

# As proposed by 1979Ma09 based on γ(θ) data and assumed 4<sup>-</sup> for the lowest level. The 4<sup>-</sup> level is now known as an isomer at 111 keV. The same assignments are given in 'Adopted Levels'.

@ Note that parity is from 'Adopted Levels'. 1979Ma09 had proposed negative parity for this level.

γ(<sup>78</sup>Rb)

E <sub>γ</sub>	I <sub>γ</sub> <sup>†</sup>	E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Mult. <sup>‡</sup>	Comments
152.6 <sup>#</sup> 2	84 6	255.9+x	(5 <sup>-</sup> )	103.3+x	(4 <sup>-</sup> )	D	A <sub>2</sub> =-0.53 1; A <sub>4</sub> =+0.01 1 Additional information 1.
155.2 <sup>#</sup> 2	57 5	411.1+x	(6 <sup>+</sup> )	255.9+x	(5 <sup>-</sup> )	D	A <sub>2</sub> =-0.47 1; A <sub>4</sub> =+0.01 1 Additional information 2.
185.6 2	16 2	841.1+x	(8 <sup>+</sup> )	655.5+x	(7 <sup>+</sup> )	D	A <sub>2</sub> =-0.49 3; A <sub>4</sub> =+0.05 3 Additional information 9.
225.0 2	16 2	480.9+x	(6 <sup>-</sup> )	255.9+x	(5 <sup>-</sup> )	D	A <sub>2</sub> =-0.64 3; A <sub>4</sub> =+0.03 1 Additional information 4.
244.4 2	22 3	655.5+x	(7 <sup>+</sup> )	411.1+x	(6 <sup>+</sup> )	D	A <sub>2</sub> =-0.51 3; A <sub>4</sub> =-0.03 1 Additional information 6.
278.5 2	18 4	759.4+x	(7 <sup>-</sup> )	480.9+x	(6 <sup>-</sup> )		I <sub>γ</sub> : γγ data suggest that only 25% of this peak belongs to <sup>78</sup> Rb. Additional information 8.
307.7 2	6 1	411.1+x	(6 <sup>+</sup> )	103.3+x	(4 <sup>-</sup> )	(Q)	A <sub>2</sub> =+0.26 5; A <sub>4</sub> =+0.05 6 Additional information 3.
366.8 2	10 2	1207.9+x	(9 <sup>+</sup> )	841.1+x	(8 <sup>+</sup> )	D	A <sub>2</sub> =-0.65 2; A <sub>4</sub> =+0.05 3 Additional information 11.
377.6 2	10 2	480.9+x	(6 <sup>-</sup> )	103.3+x	(4 <sup>-</sup> )		Additional information 5. I <sub>γ</sub> : contribution from <sup>77</sup> Kr has been subtracted.
397.5 <sup>@&amp;</sup> 2	7 2	655.5+x	(7 <sup>+</sup> )	255.9+x	(5 <sup>-</sup> )		Additional information 7. Angular anisotropy (0° and 90°)=1.2 6.

Continued on next page (footnotes at end of table)

$^{64}\text{Zn}(^{16}\text{O},\text{np}\gamma)$  1979Ma09 (continued) $\gamma(^{78}\text{Rb})$  (continued)

$E_\gamma$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. $^\ddagger$	Comments
405.7 @& 2	5 2	1613.6+x	(10 <sup>+</sup> )	1207.9+x	(9 <sup>+</sup> )	D	$A_2=-0.6$ 2; $A_4=-0.4$ 2
429.7 2	11 2	841.1+x	(8 <sup>+</sup> )	411.1+x	(6 <sup>+</sup> )	Q	$A_2=+0.42$ 4; $A_4=-0.11$ 5 <a href="#">Additional information 10.</a>

$^\dagger$  At  $E(^{16}\text{O})=52$  MeV. Authors give  $I_\gamma$  for 44 MeV also.

$^\ddagger$  Mult=D refers to  $\Delta J=1$  and mult=Q to  $\Delta J=2$  transitions As suggested by  $\gamma(\theta)$  data.

$^\#$  The 152.6 $\gamma$  is doublet in 'Adopted Levels, gammas' and the ordering of the 155.2-152.6 cascade (for one component of 152.6 $\gamma$ ) is reversed in 'Adopted Levels, gammas'.

$^\@$  placement proposed by the evaluators based on 'Adopted Levels, gammas'. This  $\gamma$  was not placed by 1979Ma09.

$^\&$  Placement of transition in the level scheme is uncertain.

$^{64}\text{Zn}(^{16}\text{O},\text{np}\gamma)$  1979Ma09

## Level Scheme

Intensities: Relative  $I_\gamma$ 

## Legend

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

