

$^{67}\text{Zn}(n,n'\gamma)$ 1977SmZH,1982Ko35

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Huo Junde, Huang Xiaolong, J. K. Tuli		NDS 106, 159 (2005)	1-Apr-2005

1977SmZH: E=reactor fast neutrons, measured E_γ , I_γ at 90° to the beam direction.

1982Ko35: E=reactor fast neutrons, measured $T_{1/2}$ by DSAM, level occupancy deduced and compared with Hauser-Feshbach calculations.

^{67}Zn Levels

E(level) [†]	J^π [‡]	$T_{1/2}$ [#]	E(level) [†]	J^π [‡]	$T_{1/2}$ [#]
0.0	$5/2^-$		1875.26 11	$5/2^-$	0.7 ps 4
93.36 4	$1/2^-$		2026.8	$7/2^+$	
184.56 4	$3/2^-$		2065.5	$3/2,5/2,7/2^-$	
393.53 3	$3/2^-$		2084.28 15	$1/2^-,3/2,5/2^-$	
604.66 9	$9/2^+$		2093.3 3		0.028 ps 12
814.75 4	$7/2^-$		2102.64 11		0.14 ps 13
887.63 4	$5/2^-$		2136.70 9	$9/2^{(-)}$	
979.90 5	$5/2^+$		2160.0		
1142.72 7	$1/2^-$		2175.1 5		
1363.49 7	$5/2^-$	0.38 ps +24-10	2242.26 11	$1/2,3/2,5/2^-$	0.046 ps 1
1446.25 9	$3/2^-$		2272.8	$3/2^+,5/2^+$	
1517.29 10	$9/2^-$	0.28 ps +19-10	2409.0	$1/2^+$	
1543.77 7	$3/2^-$	1.0 ps 5	2436.75 19	$11/2^-$	
1603.72 12	$7/2^+$	0.31 ps +14-9	2453.89 22	$13/2^+$	
1640.7 5	$13/2^+$		2488.0		
1656.65 7	$7/2^-$	0.43 ps +28-14	2503.6	$11/2^+$	
1678.18 11	$1/2^+$		2511.5		
1687.3	$3/2,5/2$		2555.6	$1/2^-,3/2^-$	
1732.40 13	$11/2^+$	0.41 ps +15-7	2600.5	$3/2^+,5/2^+$	
1781.24 15	$(3/2,5/2)^+$		2732.22 15	$11/2^-$	
1800.10 9	$7/2^-$	0.59 ps +21-14	2928.56 17		
1807.99 12	$9/2^+$				

[†] From a least-squares fit to the E_γ data.

[‡] From Adopted Levels.

[#] From DSAM (1982Ko35).

$\gamma(^{67}\text{Zn})$

E_γ [†]	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π
91.27 12	11 2	184.56	$3/2^-$	93.36	$1/2^-$
93.31 9	100	93.36	$1/2^-$	0.0	$5/2^-$
^x 176.97 8	0.50 7				
184.58 5	71 6	184.56	$3/2^-$	0.0	$5/2^-$
208.96 5	7.8 8	393.53	$3/2^-$	184.56	$3/2^-$
300.18 5	53 5	393.53	$3/2^-$	93.36	$1/2^-$
^x 309.1 2	0.60 8				
375.5 2	1.0 2	979.90	$5/2^+$	604.66	$9/2^+$
393.60 5	13.6 9	393.53	$3/2^-$	0.0	$5/2^-$
494.13 5	7.5 8	887.63	$5/2^-$	393.53	$3/2^-$
586.46 5	16 2	979.90	$5/2^+$	393.53	$3/2^-$
604.71 9	68 7	604.66	$9/2^+$	0.0	$5/2^-$
630.09 6	3.7 4	814.75	$7/2^-$	184.56	$3/2^-$

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⁶⁷Zn(n,n'γ) 1977SmZH,1982Ko35 (continued)

γ(⁶⁷Zn) (continued)

<u>E_γ[†]</u>	<u>I_γ[†]</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Comments</u>
703.0 5	1.4 2	887.63	5/2 ⁻	184.56	3/2 ⁻	
749.25 7	2.6 3	1142.72	1/2 ⁻	393.53	3/2 ⁻	
768.94 6	2.6 3	1656.65	7/2 ⁻	887.63	5/2 ⁻	
794.27 5	6.0 6	887.63	5/2 ⁻	93.36	1/2 ⁻	
814.82 5	43 4	814.75	7/2 ⁻	0.0	5/2 ⁻	
863.61 12	1.0 2	1678.18	1/2 ⁺	814.75	7/2 ⁻	
887.46 5	17 2	887.63	5/2 ⁻	0.0	5/2 ⁻	
912.24 10	1.4 2	1800.10	7/2 ⁻	887.63	5/2 ⁻	E _γ : assigned by 1977SmZH to 1517 level; assignment changed to 1800 level by 1982Ko35.
^x 947.1 2	0.36 4					
958.00 10	1.8 2	1142.72	1/2 ⁻	184.56	3/2 ⁻	
969.64 9	3.6 4	1363.49	5/2 ⁻	393.53	3/2 ⁻	
979.63 8	7.6 8	979.90	5/2 ⁺	0.0	5/2 ⁻	
999.05 8	6.8 8	1603.72	7/2 ⁺	604.66	9/2 ⁺	E _γ : assigned by 1977SmZH to a 999 level not seen in any other experiment; later assigned to the 1604 level by 1982Ko35.
1036.0 5	4.3 4	1640.7	13/2 ⁺	604.66	9/2 ⁺	
^x 1047.08 10	1.6 2					
1060.5 [‡] 1		1875.26	5/2 ⁻	814.75	7/2 ⁻	
^x 1086.51 8	0.90 10					
1127.73 10	4.4 5	1732.40	11/2 ⁺	604.66	9/2 ⁺	
1143.4 5	0.36 4	1142.72	1/2 ⁻	0.0	5/2 ⁻	
1179.12 8	3.0 3	1363.49	5/2 ⁻	184.56	3/2 ⁻	
1203.32 8	4.6 5	1807.99	9/2 ⁺	604.66	9/2 ⁺	
1215.0 [‡] 1	2.2 3	2102.64		887.63	5/2 ⁻	E _γ : assigned by 1977SmZH to 2732 level; assignment changed to 2103 level by the same authors in 1982Ko35.
1262.4 3	2.1 3	1446.25	3/2 ⁻	184.56	3/2 ⁻	
1270.4 2	0.43 5	1363.49	5/2 ⁻	93.36	1/2 ⁻	
1284.5 5	0.93 15	1678.18	1/2 ⁺	393.53	3/2 ⁻	
1287.5 5	0.93 15	2175.1		887.63	5/2 ⁻	E _γ : this γ ray assigned to 2928.5 level by 1977SmZH; however, such placement implies 3 γ rays from 2828.5 level to 13/2 ⁻ , 3/2 ⁻ , 3/2 ⁻ levels which is unlikely. This γ ray is assigned to the 2174.5 level as seen in (α,nγ) data.
1294.1 2	0.36 4	2436.75	11/2 ⁻	1142.72	1/2 ⁻	
1321.89 8	2.5 3	2136.70	9/2 ⁽⁻⁾	814.75	7/2 ⁻	
1352.77 10	1.6 2	1446.25	3/2 ⁻	93.36	1/2 ⁻	
1359.2 3	0.70 9	1543.77	3/2 ⁻	184.56	3/2 ⁻	
1363.8 5	1.5 2	1363.49	5/2 ⁻	0.0	5/2 ⁻	
1384.4 5	0.50 6	2928.56		1543.77	3/2 ⁻	
1387.9 3	1.6 2	1781.24	(3/2,5/2) ⁺	393.53	3/2 ⁻	
^x 1422.7 2	0.64 7					
1446.4 2	1.4 2	1446.25	3/2 ⁻	0.0	5/2 ⁻	
1450.4 2	0.43 5	1543.77	3/2 ⁻	93.36	1/2 ⁻	
1472.44 15	0.70 8	1656.65	7/2 ⁻	184.56	3/2 ⁻	
1482.33 15	0.36 6	2928.56		1446.25	3/2 ⁻	
^x 1504.7 3	0.93 12					
^x 1514.0 8	4.3 6					
1517.27 10	7.8 9	1517.29	9/2 ⁻	0.0	5/2 ⁻	
1543.74 7	2.4 3	1543.77	3/2 ⁻	0.0	5/2 ⁻	
1549.0 9	0.36 6	2436.75	11/2 ⁻	887.63	5/2 ⁻	
1584.3 2	1.3 2	1678.18	1/2 ⁺	93.36	1/2 ⁻	
1596.6 2	0.68 8	1781.24	(3/2,5/2) ⁺	184.56	3/2 ⁻	
^x 1606.1 3	0.34 5					
1616.2 3	1.9 3	1800.10	7/2 ⁻	184.56	3/2 ⁻	
1621.5 5	1.0 2	2436.75	11/2 ⁻	814.75	7/2 ⁻	

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$^{67}\text{Zn}(n,n'\gamma)$ [1977SmZH,1982Ko35](#) (continued) $\gamma(^{67}\text{Zn})$ (continued)

E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
^x 1654.2 5	0.72 8					
1657.2 3	1.6 2	1656.65	7/2 ⁻	0.0	5/2 ⁻	
1688.0 5	1.1 2	1781.24	(3/2,5/2) ⁺	93.36	1/2 ⁻	
1690.6 5	1.1 2	2084.28	1/2 ⁻ ,3/2,5/2 ⁻	393.53	3/2 ⁻	
^x 1712.0 2	0.33 4					
^x 1778.2 5	1.0 2					
1781.1 3	1.8 3	1781.24	(3/2,5/2) ⁺	0.0	5/2 ⁻	
^x 1784.8 5	0.73 9					
1800.7 2	2.6 4	1800.10	7/2 ⁻	0.0	5/2 ⁻	
1849.2 2	1.4 2	2453.89	13/2 ⁺	604.66	9/2 ⁺	E_γ : assigned by 1977SmZH to 2242 level; assignment changed to 2454 level by the same authors in 1982Ko35 .
1899.7 2	0.69 8	2084.28	1/2 ⁻ ,3/2,5/2 ⁻	184.56	3/2 ⁻	
1908.7 3	1.4 2	2093.3		184.56	3/2 ⁻	E_γ : unplaced γ ray in 1977SmZH ; assigned to 2093 level by the same authors in 1982Ko35 .
1990.7 3	0.57 7	2084.28	1/2 ⁻ ,3/2,5/2 ⁻	93.36	1/2 ⁻	
^x 2016.9 3	0.29 4					
2084.6 4	0.43 6	2084.28	1/2 ⁻ ,3/2,5/2 ⁻	0.0	5/2 ⁻	
^x 2103.5 2	1.0 2					
2137.4 3	0.43 6	2136.70	9/2 ⁽⁻⁾	0.0	5/2 ⁻	

[†] From [1977SmZH](#), unless indicated otherwise.

[‡] From [1982Ko35](#).

^x γ ray not placed in level scheme.

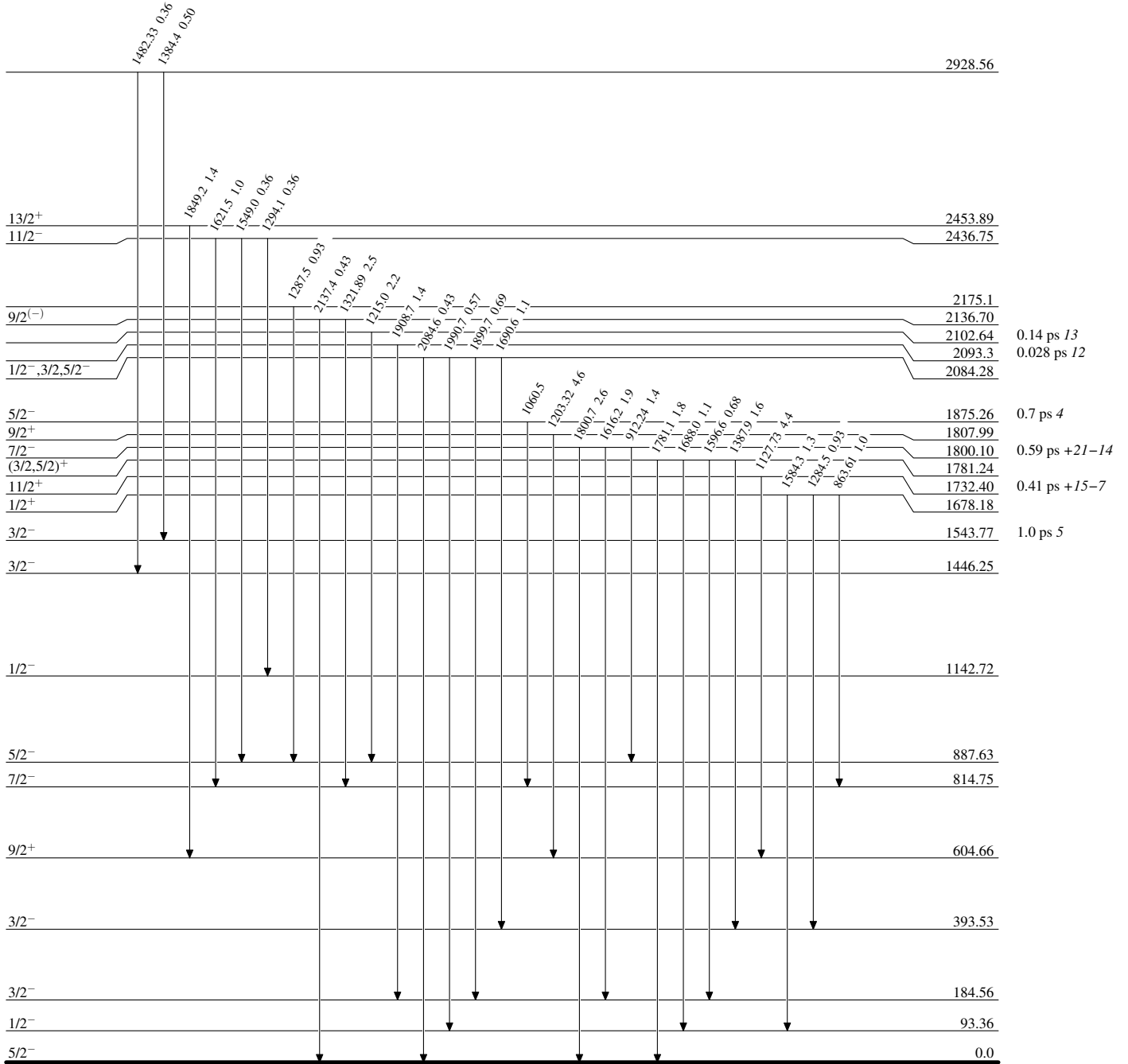
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Level Scheme

Intensities: Relative I_γ

Legend

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



$^{67}_{30}\text{Zn}_{37}$

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Level Scheme (continued)

Intensities: Relative I_γ

Legend

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

