

$^{78}\text{Zn} \beta^-$ decay (1.47 s) 1980Wo08

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

Parent: ^{78}Zn : $E=0.0$; $J^\pi=0^+$; $T_{1/2}=1.47$ s 15; $Q(\beta^-)=6222.7$ 27; $\% \beta^-$ decay=100.0

$^{78}\text{Zn}-Q(\beta^-)$: from 2009AuZZ. Other: 6360 90 (2003Au03).

1980Wo08: measured γ , $\gamma\gamma$, $T_{1/2}$.

Others: 1972MaWL, 1977Al17 (gammas and level scheme are taken from 1972MaWL).

Additional information 1.

The decay scheme is from the detail study of 1980Wo08. 1977Al17 derive $Q(\beta^-)=6010$ 180 from nine $\beta\gamma$ measurements.

1972MaWL, report 12 γ 's only. All transitions with $I_\gamma < 0.1$ $I_\gamma(225\gamma)$ were also also reported by 1972MaWL.

Total decay energy of 6717 keV 175 calculated (by RADLIST code) from level scheme is somewhat higher than the expected value of 6360 keV 90.

 ^{78}Ga Levels

E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]	E(level) [†]	J^π [‡]
0.0	(3 ⁺)	727.73 9	(1 ⁺ ,2,3 ⁺)	1048.21 10	0 to 3 ⁺	2627.0? 10	(1 ⁺ ,2,3 ⁺)
281.38 9	(1 ⁺ ,2,3 ⁺)	860.37 8	1 ⁺	1122.57 19	(1)	2654.89 25	1 ⁺
341.62 8	(1 ⁺ ,2,3 ⁺)	957.59 15	(1 ⁺)	1397.83 17	0 to 3 ⁺	2831.1 4	(1 ⁺)
453.91 8		979.72 9	1 ⁺	1866.61 15	1 ⁺	3424.6 4	(1 ⁺)
635.60 8	(1 ⁺ ,2,3 ⁺)	1031.08 11	1 ⁺	2205.68 14	1 ⁺	3553.9 4	(1 ⁺)

[†] From least-squares fit to $E\gamma$'s.

[‡] From 'Adopted Levels'.

 β^- radiations

E(decay)	E(level)	$I\beta^-$ [†]	Log f_t	Comments
(2669 3)	3553.9	7.1 14	4.2 1	av $E\beta=1123.1$ 18
(2798 3)	3424.6	3.0 7	4.6 1	av $E\beta=1184.5$ 18
(3392 3)	2831.1	1.5 7	5.3 2	av $E\beta=1468.0$ 18
(3568 3)	2654.89	3.6 6	5.0 1	av $E\beta=1552.6$ 18
(4017 3)	2205.68	17.6 17	4.5 1	av $E\beta=1769.0$ 18
(4356 3)	1866.61	12.2 10	4.9 1	av $E\beta=1932.9$ 18
(5100 3)	1122.57	1.2 6	6.2 2	av $E\beta=2293.3$ 18
(5192 3)	1031.08	6.6 16	5.5 1	av $E\beta=2337.7$ 18
(5243 3)	979.72	15.9 17	5.1 1	av $E\beta=2362.6$ 18
(5265 3)	957.59	1.4 8	6.2 3	av $E\beta=2373.4$ 18
(5362 3)	860.37	38 3	4.8 1	av $E\beta=2420.6$ 18

[†] Absolute intensity per 100 decays.

 $\gamma(^{78}\text{Ga})$

I_γ normalization: from $I(\gamma+ce)=100$ for γ 's to g.s. assuming No β^- feeding to g.s..

E_γ	I_γ [‡]	$E_i(\text{level})$	J_i^π	E_f	J_f^π
60.24 3	5.9 4	341.62	(1 ⁺ ,2,3 ⁺)	281.38	(1 ⁺ ,2,3 ⁺)
92.15 7	1.35 25	727.73	(1 ⁺ ,2,3 ⁺)	635.60	(1 ⁺ ,2,3 ⁺)
112.29 3	7.8 6	453.91		341.62	(1 ⁺ ,2,3 ⁺)

Continued on next page (footnotes at end of table)

$^{78}\text{Zn} \beta^-$ decay (1.47 s) **1980Wo08** (continued) $\gamma(^{78}\text{Ga})$ (continued)

E_γ	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
119.36 3	12.7 7	979.72	1 ⁺	860.37	1 ⁺
132.68 13	1.6 6	860.37	1 ⁺	727.73	(1 ⁺ ,2,3 ⁺)
170.71 9	3.9 8	1031.08	1 ⁺	860.37	1 ⁺
172.53 7	6.0 9	453.91		281.38	(1 ⁺ ,2,3 ⁺)
181.68 5	64.0 30	635.60	(1 ⁺ ,2,3 ⁺)	453.91	
187.81 7	5.3 7	1048.21	0 to 3 ⁺	860.37	1 ⁺
224.75 6	100 3	860.37	1 ⁺	635.60	(1 ⁺ ,2,3 ⁺)
262.21 19	6.7 6	1122.57	(1)	860.37	1 ⁺
275.3 [†] 8	1.9 [†] 9	1397.83	0 to 3 ⁺	1122.57	(1)
281.34 18	37.5 22	281.38	(1 ⁺ ,2,3 ⁺)	0.0	(3 ⁺)
303.38 19	7.4 7	1031.08	1 ⁺	727.73	(1 ⁺ ,2,3 ⁺)
321.93 20	7.5 8	957.59	(1 ⁺)	635.60	(1 ⁺ ,2,3 ⁺)
342.2 6	6.2 23	341.62	(1 ⁺ ,2,3 ⁺)	0.0	(3 ⁺)
343.93 25	8.8 27	979.72	1 ⁺	635.60	(1 ⁺ ,2,3 ⁺)
354.22 28	16.6 26	635.60	(1 ⁺ ,2,3 ⁺)	281.38	(1 ⁺ ,2,3 ⁺)
386.20 22	4.2 7	727.73	(1 ⁺ ,2,3 ⁺)	341.62	(1 ⁺ ,2,3 ⁺)
395.48 23	1.8 4	1031.08	1 ⁺	635.60	(1 ⁺ ,2,3 ⁺)
413.07 [†] 29	1.9 [†] 4	1048.21	0 to 3 ⁺	635.60	(1 ⁺ ,2,3 ⁺)
440.5 [†] 7	2.2 [†] 11	1397.83	0 to 3 ⁺	957.59	(1 ⁺)
446.3 3	2.3 6	727.73	(1 ⁺ ,2,3 ⁺)	281.38	(1 ⁺ ,2,3 ⁺)
453.93 15	44.9 21	453.91		0.0	(3 ⁺)
537.58 20	2.3 3	1397.83	0 to 3 ⁺	860.37	1 ⁺
635.56 16	47.5 24	635.60	(1 ⁺ ,2,3 ⁺)	0.0	(3 ⁺)
722.8 4	1.7 5	3553.9	(1 ⁺)	2831.1	(1 ⁺)
727.0 [†] 6	1.9 [†] 9	727.73	(1 ⁺ ,2,3 ⁺)	0.0	(3 ⁺)
744.1 5	2.1 8	1866.61	1 ⁺	1122.57	(1)
749.70 23	8.8 11	1031.08	1 ⁺	281.38	(1 ⁺ ,2,3 ⁺)
762.1 8	1.2 7	1397.83	0 to 3 ⁺	635.60	(1 ⁺ ,2,3 ⁺)
788.2 5	2.7 8	2654.89	1 ⁺	1866.61	1 ⁺
797.6 9	1.3 8	3424.6	(1 ⁺)	2627.0?	(1 ⁺ ,2,3 ⁺)
808.04 25	7.6 11	2205.68	1 ⁺	1397.83	0 to 3 ⁺
818.37 23	4.2 6	1866.61	1 ⁺	1048.21	0 to 3 ⁺
860.30 17	55.9 24	860.37	1 ⁺	0.0	(3 ⁺)
909.05 24	5.1 8	1866.61	1 ⁺	957.59	(1 ⁺)
957.84 29	2.9 5	957.59	(1 ⁺)	0.0	(3 ⁺)
979.76 19	15.1 13	979.72	1 ⁺	0.0	(3 ⁺)
1006.20 19	19.8 14	1866.61	1 ⁺	860.37	1 ⁺
1157.3 6	1.8 7	2205.68	1 ⁺	1048.21	0 to 3 ⁺
1174.3 9	6.0 30	2205.68	1 ⁺	1031.08	1 ⁺
1345.24 18	11.3 9	2205.68	1 ⁺	860.37	1 ⁺
1558.0 11	0.7 5	3424.6	(1 ⁺)	1866.61	1 ⁺
1570.0 4	2.6 7	2205.68	1 ⁺	635.60	(1 ⁺ ,2,3 ⁺)
1623.9 9	0.9 6	2654.89	1 ⁺	1031.08	1 ⁺
1675.2 3	3.0 6	2654.89	1 ⁺	979.72	1 ⁺
1926.9 7	1.6 7	2654.89	1 ⁺	727.73	(1 ⁺ ,2,3 ⁺)
1970.3 6	1.5 6	2831.1	(1 ⁺)	860.37	1 ⁺
2026.8 4	2.7 7	3424.6	(1 ⁺)	1397.83	0 to 3 ⁺
2103.6 6	1.8 10	2831.1	(1 ⁺)	727.73	(1 ⁺ ,2,3 ⁺)
2205.66 29	10.9 11	2205.68	1 ⁺	0.0	(3 ⁺)
2489.4 6	1.8 6	2831.1	(1 ⁺)	341.62	(1 ⁺ ,2,3 ⁺)
2563.9 9	2.2 8	3424.6	(1 ⁺)	860.37	1 ⁺
2626.7 [#] 6	2.2 7	2627.0?	(1 ⁺ ,2,3 ⁺)	0.0	(3 ⁺)
2693.6 6	2.4 7	3553.9	(1 ⁺)	860.37	1 ⁺
3553.9 11	3.0 10	3553.9	(1 ⁺)	0.0	(3 ⁺)

Continued on next page (footnotes at end of table)

$^{78}\text{Zn } \beta^- \text{ decay (1.47 s) } \textbf{1980Wo08 (continued)}$

$\gamma(^{78}\text{Ga}) \text{ (continued)}$

[†] From $\gamma\gamma$.

[‡] For absolute intensity per 100 decays, multiply by 0.439 12.

Placement of transition in the level scheme is uncertain.

