

Adopted Levels, Gammas

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

Q(β^-)=8156 4; S(n)=5785 3; S(p)=12206 3; Q(α)=-10125 7 [2012Wa38](#)
 Note: Current evaluation has used the following Q record \$ 8156 4 5785 3 12205.7327-10125 6 [2009AuZZ,2003Au03](#).
 S(2n)=13552 3, S(2p)=27308 7 ([2009AuZZ,2003Au03](#)).
 Values in [2003Au03](#): S(p)=12270 120; others are within 1 keV of those in [2009AuZZ](#).
 Mass measurement: [2008Ha23](#), [2007Gu09](#) (also [2005Gu36](#)).
 Production: ²³⁸U(p,F) E=25 MeV: [1977Hu09](#), [2002Kr13](#).
[Additional information 1.](#)

⁷⁸Ga Levels

Cross Reference (XREF) Flags

- A ⁷⁸Zn β^- decay (1.47 s)
- B ⁷⁸Ga IT decay (<500 ns)
- C ⁷⁹Zn β^- -n decay (0.995 s)

E(level) [†]	J ^{π}	T _{1/2}	XREF	Comments
0.0	(3 ⁺)	5.09 s 5	ABC	% β^- =100 J ^{π} : log $f^{1u}t$ <8.5 to (2 ⁺) and (4 ⁺); 2205 γ from 1 ⁺ . T _{1/2} : from 1974Gr29 in ⁷⁸ Ga β^- decay (milking experiment). Others: 5.9 s 25 (1980Le22 : from the decay curve for the 619 γ in ⁷⁸ Ga β^- decay), 4.8 s 13 (1972De43), 4.9 s (1970OsZZ), \approx 4 s (1968Wi11).
281.38 9	(1 ⁺ ,2,3 ⁺) [‡]		AB	
341.62 8	(1 ⁺ ,2,3 ⁺) [#]		AB	
453.91 8			A	
559.6 7		<500 ns	B	%IT \approx 100 T _{1/2} : from time correlations between implanted ⁷⁸ Ga nuclei and γ -ray events (c.m. Folden III et al., Phys. Rev. C 79, 064318 (2009)).
635.59 8	(1 ⁺ ,2,3 ⁺) [‡]		A	
727.73 9	(1 ⁺ ,2,3 ⁺) [‡]		A	
860.37 8	1 ⁺		A	J ^{π} : log ft =4.8 from 0 ⁺ .
957.58 16	(1 ⁺)		A	J ^{π} : log ft =6.2 (log $f^{1u}t$ =8.1) from 0 ⁺ ; γ to (3 ⁺).
979.72 9	1 ⁺		A	J ^{π} : log ft =5.1 from 0 ⁺ .
1031.08 11	1 ⁺		A	J ^{π} : log ft =5.5 from 0 ⁺ .
1048.21 10	0 to 3 ⁺		A	J ^{π} : γ to 1 ⁺ .
1122.56 19	(1)		A	J ^{π} : log ft =6.16 (log $f^{1u}t$ =8.0) from 0 ⁺ .
1397.83 17	0 to 3 ⁺		A	J ^{π} : γ to 1 ⁺ .
1866.60 15	1 ⁺		A	J ^{π} : log ft =4.9 from 0 ⁺ .
2205.69 14	1 ⁺		A	J ^{π} : log ft =4.5 from 0 ⁺ .
2627.0? 10	(1 ⁺ ,2,3 ⁺) [#]		A	
2654.88 25	1 ⁺		A	J ^{π} : log ft =5.0 from 0 ⁺ .
2831.1 4	(1 ⁺) [@]		A	J ^{π} : log ft =5.3 from 0 ⁺ .
3424.6 4	(1 ⁺) [@]		A	J ^{π} : log ft =4.6 from 0 ⁺ .
3553.9 4	(1 ⁺) [@]		A	J ^{π} : log ft =4.2 from 0 ⁺ .

[†] From least squares fit to E γ 's.

Adopted Levels, Gammas (continued)

⁷⁸Ga Levels (continued)

‡ γ from 1⁺ and γ to (3⁺).

γ from (1⁺) and γ to (3⁺).

@ % β^- is between ≈ 1 and ≈ 3 with $\log ft = 5.2$ to 4.3 . J^π is restricted to 1⁺ provided no γ rays from higher levels populate these levels.

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

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}^{\dagger}</u>	<u>I_{γ}^{\dagger}</u>	<u>E_f</u>	<u>J_f^{π}</u>
281.38	(1 ⁺ ,2,3 ⁺)	281.34 18	100 6	0.0	(3 ⁺)
341.62	(1 ⁺ ,2,3 ⁺)	60.24 3	95 6	281.38	(1 ⁺ ,2,3 ⁺)
		342.2 6	100 37	0.0	(3 ⁺)
453.91		112.29 3	17.4 13	341.62	(1 ⁺ ,2,3 ⁺)
		172.53 7	13.4 20	281.38	(1 ⁺ ,2,3 ⁺)
		453.93 15	100 5	0.0	(3 ⁺)
559.6		218.0 7	100	341.62	(1 ⁺ ,2,3 ⁺)
		278 [‡]		281.38	(1 ⁺ ,2,3 ⁺)
635.59	(1 ⁺ ,2,3 ⁺)	181.68 5	100 5	453.91	
		354.2 3	26 4	281.38	(1 ⁺ ,2,3 ⁺)
		635.56 16	74 4	0.0	(3 ⁺)
727.73	(1 ⁺ ,2,3 ⁺)	92.15 7	32 6	635.59	(1 ⁺ ,2,3 ⁺)
		386.20 22	100 17	341.62	(1 ⁺ ,2,3 ⁺)
		446.3 3	55 14	281.38	(1 ⁺ ,2,3 ⁺)
		727.0 6	45 21	0.0	(3 ⁺)
860.37	1 ⁺	132.68 13	1.6 6	727.73	(1 ⁺ ,2,3 ⁺)
		224.75 6	100 3	635.59	(1 ⁺ ,2,3 ⁺)
		860.30 17	55.9 24	0.0	(3 ⁺)
957.58	(1 ⁺)	321.93 20	100 11	635.59	(1 ⁺ ,2,3 ⁺)
		957.8 3	39 7	0.0	(3 ⁺)
979.72	1 ⁺	119.36 3	84 5	860.37	1 ⁺
		343.93 25	58 18	635.59	(1 ⁺ ,2,3 ⁺)
		979.76 19	100 9	0.0	(3 ⁺)
1031.08	1 ⁺	170.71 9	44 9	860.37	1 ⁺
		303.38 19	84 8	727.73	(1 ⁺ ,2,3 ⁺)
		395.48 23	20 5	635.59	(1 ⁺ ,2,3 ⁺)
		749.70 23	100 13	281.38	(1 ⁺ ,2,3 ⁺)
1048.21	0 to 3 ⁺	187.81 7	100 13	860.37	1 ⁺
		413.1 3	36 8	635.59	(1 ⁺ ,2,3 ⁺)
1122.56	(1)	262.21 19	100 9	860.37	1 ⁺
1397.83	0 to 3 ⁺	275.3 8	83 39	1122.56	(1)
		440.5 7	96 48	957.58	(1 ⁺)
		537.58 20	100 13	860.37	1 ⁺
		762.1 8	52 30	635.59	(1 ⁺ ,2,3 ⁺)
1866.60	1 ⁺	744.1 5	11 4	1122.56	(1)
		818.37 23	21 3	1048.21	0 to 3 ⁺
		909.05 24	26 4	957.58	(1 ⁺)
		1006.20 19	100 7	860.37	1 ⁺
2205.69	1 ⁺	808.04 25	67 10	1397.83	0 to 3 ⁺
		1157.3 6	16 6	1048.21	0 to 3 ⁺
		1174.3 9	53 27	1031.08	1 ⁺
		1345.24 18	100 8	860.37	1 ⁺
		1570.0 4	23 6	635.59	(1 ⁺ ,2,3 ⁺)
		2205.7 3	96 8	0.0	(3 ⁺)
2627.0?	(1 ⁺ ,2,3 ⁺)	2626.7 [‡] 6	100 32	0.0	(3 ⁺)
2654.88	1 ⁺	788.2 5	90 27	1866.60	1 ⁺
		1623.9 9	30 20	1031.08	1 ⁺

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) $\gamma({}^{78}\text{Ga})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π
2654.88	1 ⁺	1675.2 3	100 20	979.72	1 ⁺
		1926.9 7	53 23	727.73	(1 ⁺ ,2,3 ⁺)
2831.1	(1 ⁺)	1970.3 6	83 33	860.37	1 ⁺
		2103.6 6	100 56	727.73	(1 ⁺ ,2,3 ⁺)
		2489.4 6	100 33	341.62	(1 ⁺ ,2,3 ⁺)
3424.6	(1 ⁺)	797.6 9	48 30	2627.0?	(1 ⁺ ,2,3 ⁺)
		1558.0 11	26 19	1866.60	1 ⁺
		2026.8 4	100 26	1397.83	0 to 3 ⁺
		2563.9 9	81 30	860.37	1 ⁺
3553.9	(1 ⁺)	722.8 4	57 17	2831.1	(1 ⁺)
		2693.6 6	80 23	860.37	1 ⁺
		3553.9 11	100 33	0.0	(3 ⁺)

[†] From β^- decay.

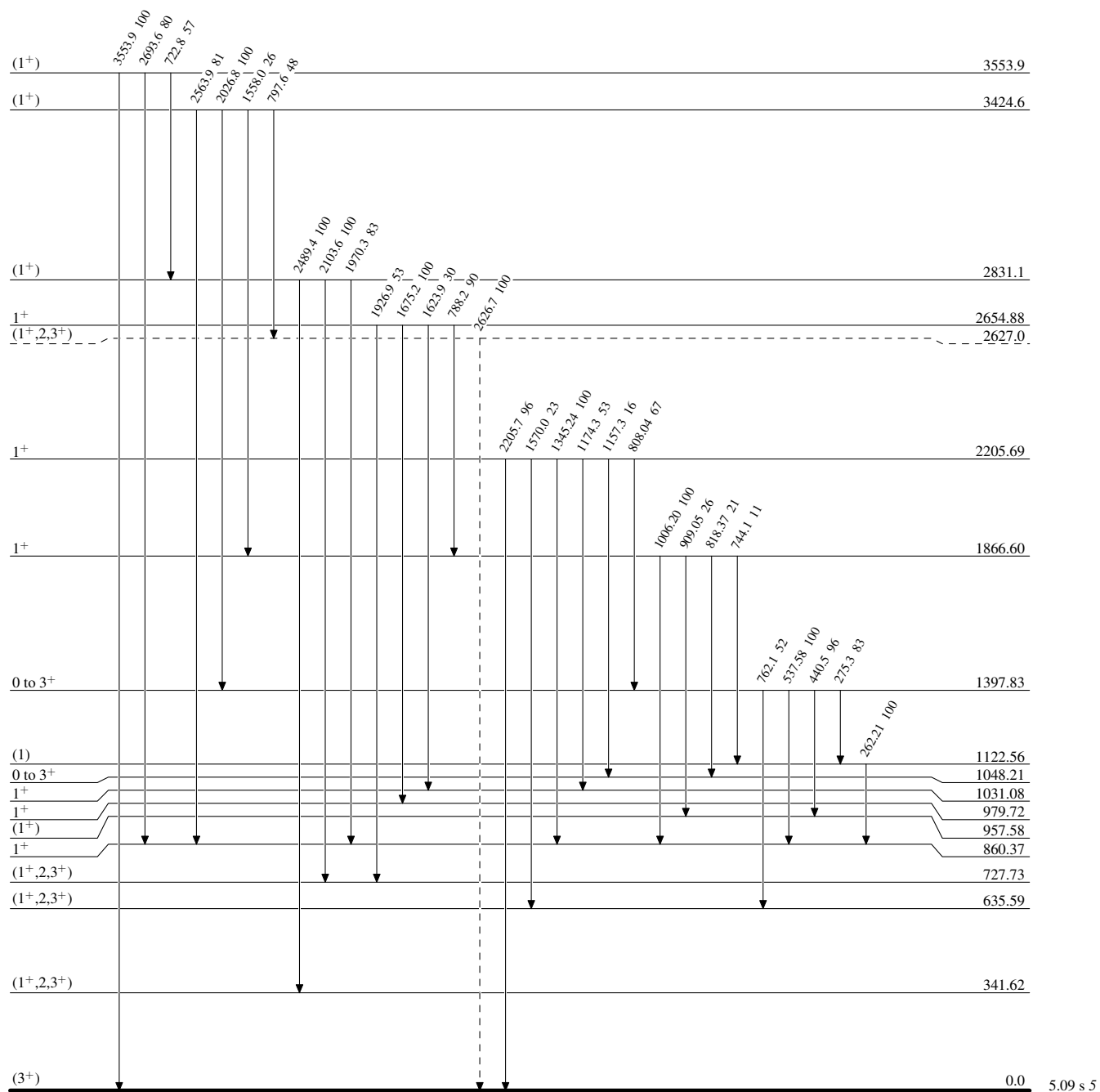
[‡] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----▶ γ Decay (Uncertain) $^{78}_{31}\text{Ga}_{47}$

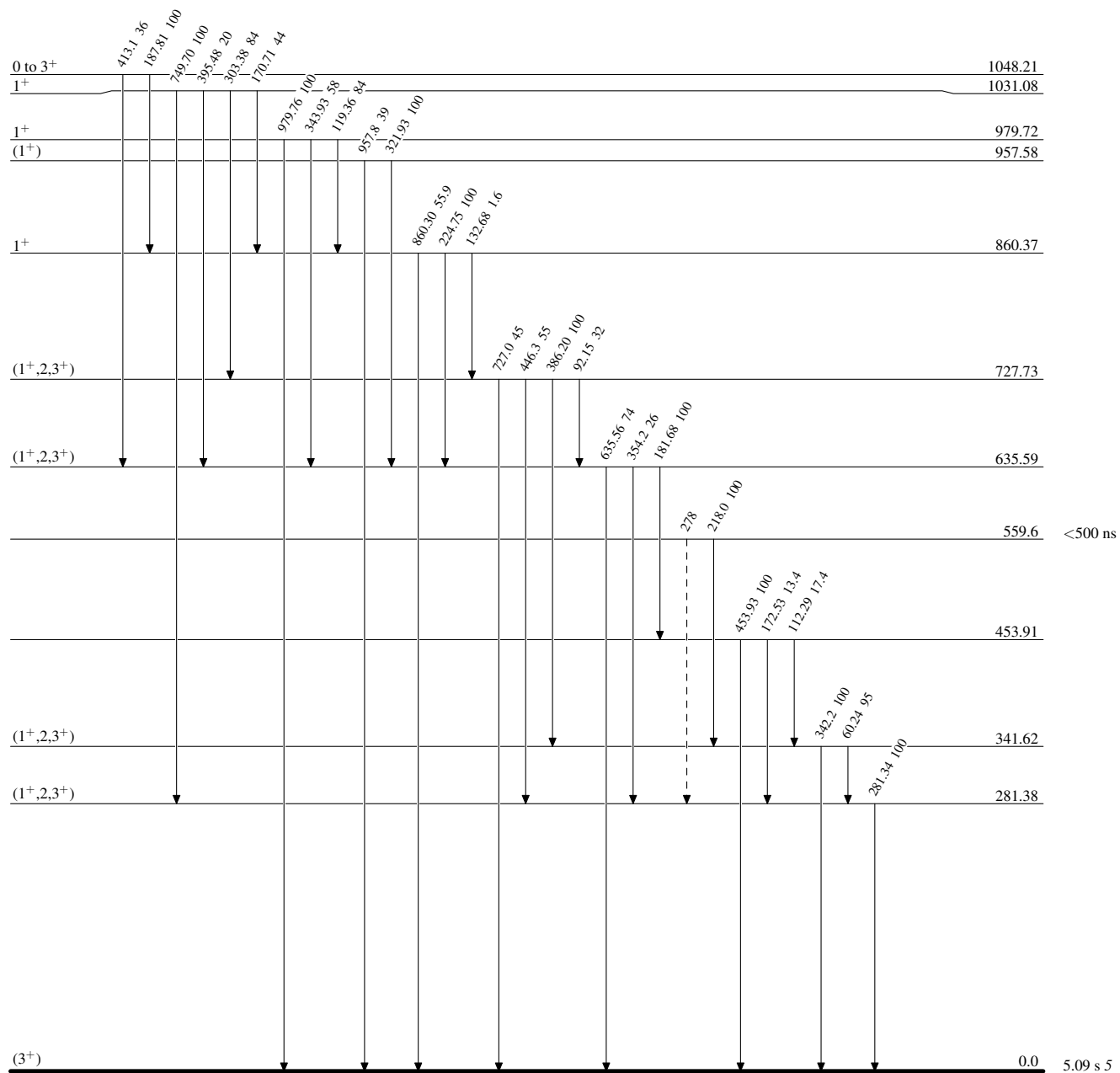
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

-----▶ γ Decay (Uncertain)



$^{78}_{31}\text{Ga}_{47}$