Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 135, 193 (2016)	31-May-2016

Q(β^-)=6980 *40*; S(n)=6913.0 *27*; S(p)=12353.4 *27*; Q(α)=−10501.3 *30* 2012Wa38
S(2n)=12698 *3*, S(2p)=28610 *150* (syst), Q(β^-n)=1243 *4* (2012Wa38).

2010Ch16: measurement of spin and static magnetic and quadrupole moment hyperfine spectra at ISOLDE-CERN using collinear laser spectroscopy. Deduced spin, magnetic moment and quadrupole moment. Comparison with shell-model calculations.

2012Pr11: U(p,X),E(p)=1.4 GeV incident on UC_x target at ISOLDE-CERN facility. Fragments diffused out of target and surface ionized, then accelerated to 30 keV, followed by mass separation and bunched by gas-filled Paul Trap (ISCOOL). Isotope shifts were measured by collinear laser spectroscopy using COLLAPS setup at ISOLDE-CERN. Deduced rms charge radius.

Additional information 1.

Mass measurement: 2008Ha23, 2008Su19.

Nuclear structure calculations: 2015Ka46, 2012Ve03, 2011Ji08, 2008Yo07: calculated levels, J, π.

^{79}Ga Levels

Cross Reference (XREF) Flags

A ^{79}Zn β^- decay (0.746 s)
B ^{80}Zn β^-n decay (561.9 ms)

E(level)	J$^\pi$†	$T_{1/2}$	XREF	Comments
0.0	3/2$^{(-)}$	2.848 s *3*	AB	%β^-=100; %β^-n=0.089 *19* (1993Ru01) μ=+1.047 *3* (2010Ch16,2014StZZ) Q=+0.158 *10* (2010Ch16,2014StZZ,2013StZZ) δ<r^2>(^{71}Ga,^{79}Ga)=+0.290 fm^2 *5*(stat) *87*(syst) (2012Pr11). Isotope shift $\delta\nu$(^{71}Ga,^{79}Ga)=−186.2 MHz *19*(stat) *140*(syst) (2012Pr11). Theoretical $T_{1/2}$=1.76 s, %β^-n=0.06 (2003Mo09). Theoretical $T_{1/2}$=119 s, %β^-n=1.0 (2016Ma12). %β^-n: weighted average given by 1993Ru01 of the following values: 0.113 *11* (1993Ru01), 0.055 *12* (1986Wa17), 0.098 *16* (1980Lu04). The uncertainty given by 1986Wa17 is 0.004 and that by 1980Lu04 is 0.010. 1993Ru01 seem to have increased these uncertainties in obtaining weighted average. Other: 0.10 *1* (1984Ma39,compilation). J$^\pi$: spin measured in 2010Ch16 from hyperfine structure using collinear laser spectroscopy. Parity from probable $p_{3/2}$ configuration. The g.s. and 5.4 are too close to assign $p_{3/2}$ and $f_{5/2}$ uniquely, but some evidence of β^- feeding from g.s. to (1/2$^-$) in ^{79}Ge (log *ft*=5.8) favors negative parity for g.s.. $T_{1/2}$: from weighted average of 2.847 s *3* (1991Kr15, neutron counting), 2.88 s *2* (1993Ru01, neutron and β), and 2.85 s *1* (1986Wa17). Others: 2.63 s *20* (1982FoZZ,1981Ho24), 2.9 s *5* (given by 1977Al17 from an unpublished work from their laboratory), 2.63 s *9* (1976Ru01), 3.00 s *9* (1974Gr29, authors also give 2.8 s *2* from decay curve for a 490γ from a work to be published by the same group), 2.86 s *4* (1970OsZZ). μ,Q: collinear laser spectroscopy (2010Ch16).
5.4 *2*	(5/2$^-$)		A	J$^\pi$: probable $f_{5/2}$ orbital.
278.7 *2*	(7/2$^-$)		A	J$^\pi$: log *ft*=6.12 from 9/2$^+$; γ to 3/2$^{(-)}$.
707.6 *2*	(7/2$^-$)		A	J$^\pi$: log *ft*=6.1 from 9/2$^+$; γ to 3/2$^{(-)}$.
802.6 *2*			A	
871.2 *2*	(7/2$^+$)		A	J$^\pi$: log *ft*=5.62 from 9/2$^+$; γ to (5/2$^-$).
962.6 *2*			A	
1066.0 *4*			A	
1582.2 *2*			A	
1616.0 *2*			A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{79}Ga Levels (continued)

E(level)	XREF	Comments
1838.3 *5*	A	
1919.5 *4*	A	E(level): level is at 1919 or 1807 depending on the ordering of 1100.6γ-1211.9 cascade (1986Ek01).
2214.3 *5*	A	
2561.5 *3*	A	
2649.0 *5*	A	
2741.3 *3*	A	
2919.7 *4*	A	
2977.7 *4*	A	
3020.1 *4*	A	
3334.8 *5*	A	

† The log *ft* values from (9/2$^+$) are in the range 5.4 to 6.4 for most of the excited states. This would limit spins to (7/2,9/2,11/2) for many levels above 1000.

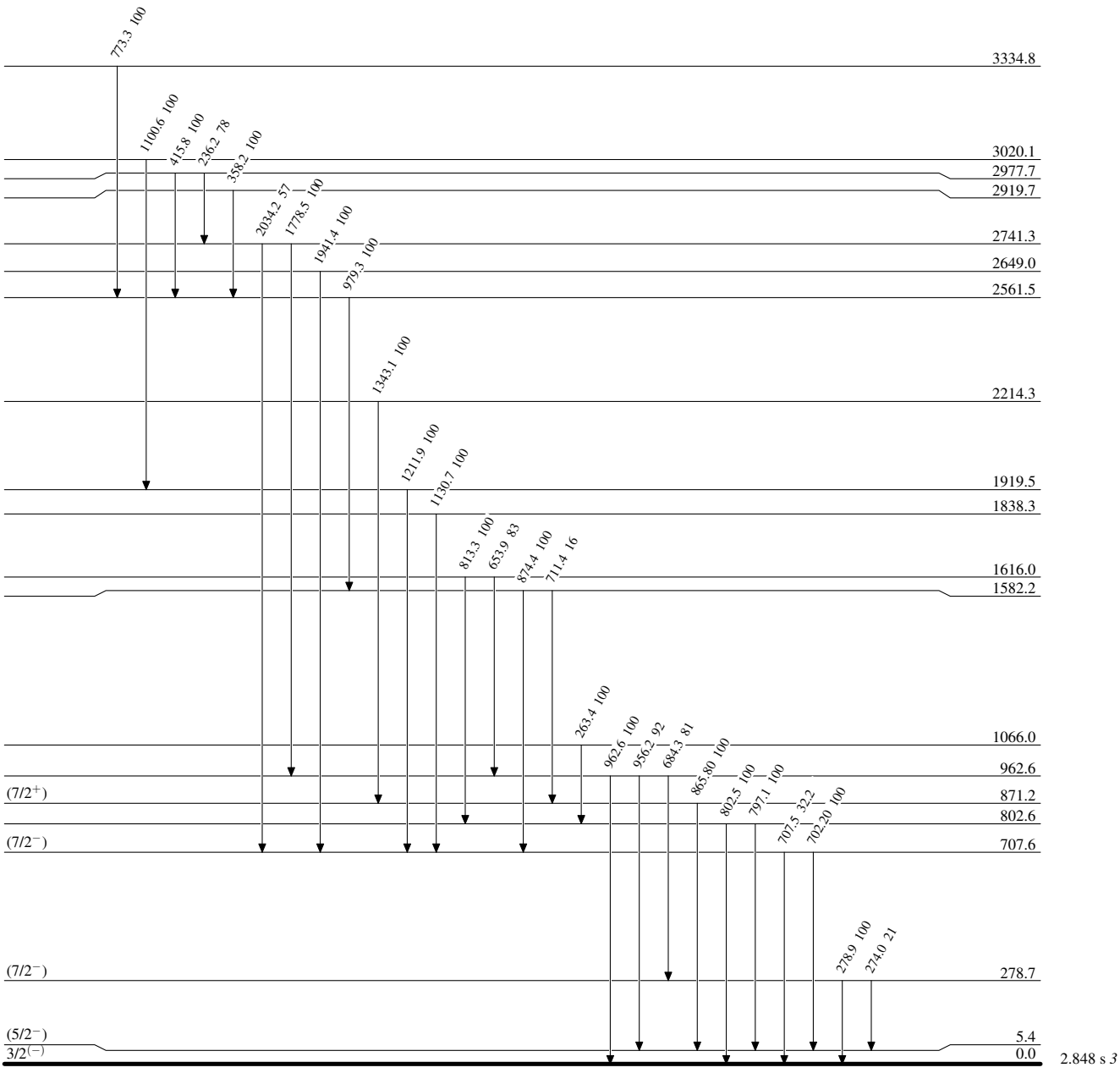
γ(^{79}Ga)

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f
278.7	(7/2$^-$)	274.0 *6*	21 *5*	5.4	(5/2$^-$)
		278.9 *2*	100 *6*	0.0	3/2$^{(-)}$
707.6	(7/2$^-$)	702.20 *10*	100 *3*	5.4	(5/2$^-$)
		707.5 *2*	32.2 *20*	0.0	3/2$^{(-)}$
802.6		797.1 *2*	100 *11*	5.4	(5/2$^-$)
		802.5 *2*	100 *11*	0.0	3/2$^{(-)}$
871.2	(7/2$^+$)	865.80 *10*	100	5.4	(5/2$^-$)
962.6		684.3 *3*	81 *9*	278.7	(7/2$^-$)
		956.2 *5*	92 *18*	5.4	(5/2$^-$)
		962.6 *4*	100 *12*	0.0	3/2$^{(-)}$
1066.0		263.4 *3*	100	802.6	
1582.2		711.4 *4*	16 *5*	871.2	(7/2$^+$)
		874.4 *2*	100 *10*	707.6	(7/2$^-$)
1616.0		653.9 *4*	83 *16*	962.6	
		813.3 *2*	100 *8*	802.6	
1838.3		1130.7 *4*	100	707.6	(7/2$^-$)
1919.5		1211.9 *3*	100	707.6	(7/2$^-$)
2214.3		1343.1 *4*	100	871.2	(7/2$^+$)
2561.5		979.3 *2*	100	1582.2	
2649.0		1941.4 *4*	100	707.6	(7/2$^-$)
2741.3		1778.5 *4*	100 *20*	962.6	
		2034.2 *5*	57 *13*	707.6	(7/2$^-$)
2919.7		358.2 *2*	100	2561.5	
2977.7		236.2 *3*	78 *24*	2741.3	
		415.8 *4*	100 *24*	2561.5	
3020.1		1100.6 *2*	100	1919.5	
3334.8		773.3 *3*	100	2561.5	

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{79}_{31}Ga_{48}$