Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. K. Tuli, E. Browne	NDS 157, 260 (2019)	1-Mar-2019

Q(β^-)=12484 *3*; S(n)=3374 *4*; S(p)=14010 *6*; Q(α)=−1.07×10^4 *5* 2017Wa10

^{82}Ga Levels

Cross Reference (XREF) Flags

A ^{82}Zn β^- decay
B ^{83}Zn β^-n decay

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	(2$^-$)	0.600 s *2*	AB	%β^-=100; %β^-n=22.2 *20* (2016Te09) μ=+0.449 *12* (2017Fa09) Q=−0.200 *80* (2017Fa09) %β^-n: From 2016Te09. Others: 1986Wa17, 1980Lu04. J$^\pi$: From Laser spectroscopy work in 2012Ch51. This assignment is tentative since J$^\pi$=1$^-$,3$^-$ were not ruled out. T$_{1/2}$: Weighted average of 0.602 s *6* (1986Wa17), 0.599 s *2* (1991Kr15), 0.610 s *+83−72* (2010Ho12), 0.592 s *9* (2015Et01), 0.604 s *11* (2016Te09). Other: 1976Ru01. T$_{1/2}$: 2016Te09 value from growth curve for (delayed) neutron activity assigned purely to ^{82}Ga β^-n decay. Uncertainty is from the fit to the neutron activity curve. (In 2016Te09 radioactive ion beam of ^{82}Ga at 30 keV was produced in photofission of ^{238}U using UC$_x$ pellets containing about 60 g of ^{238}U). T$_{1/2}$: 2015Et01 value from fit to ^{82}Ge (first 2$^+$ to g.s.) 1348-keV gamma activity in a 2-s beam on/off cycles. ^{82}Ga nuclides obtained from ^{238}U(e,F), E=50 MeV. T$_{1/2}$: 2010Ho12 value from measurement of time sequence of decay type events correlated with the implanted nuclei (of ^{82}Ga) in Si detectors (2010Ho12) using method of maximum likelihood analysis with input parameters including β-detection efficiency, background, half-lives of daughter and granddaughter nuclei and experimental or theoretical values of %β^-n of all nuclei involved. 2010Ho10 used ^{9}Be(^{86}Kr,X) E=140 MeV/nucleon. μ: Using U(n,X) reaction; deduced from the measured hyperfine parameters in 2017Fa09 and 2010Ch16, relative to μ(^{71}Ga)=+2.56227 *2* (2005St24) and J(^{71}Ga)=3/2. Q: Using U(n,x) reaction; deduced from the measured hyperine parameters 2017Fa09 and 2010Ch16, relative to Q(^{71}Ga)=+0.107 *1* (2008Py02). Other: μ=+0.459 *4*, Q=+0.197 *13* (2012Ch51) using U(p,x). 2012Ch51 also give corresponding values for J=1 and 3. For J=1, μ=+0.364 *3*, +0.019 *4* and Q=+0.117 *9*, −0.549 *29* for two sets of hyperfine parameters A and B. For J=3, μ=+0.510 *4*, Q=+0.271 *17*. δ<r^2>(^{71}Ga,^{82}Ga)=+0.447 fm^2 *23*(stat) *120*(syst) (2012Pr11). Isotope shift $\delta\nu$(^{71}Ga,^{82}Ga)=−222 MHz *9*(stat) *19*(syst) (2012Pr11) measured relative to ^{71}Ga.
34.5 *1*	(2$^-$)	<10 ns	A	J$^\pi$: J$^\pi$=(2$^-$,3$^-$) in 2016Al10. J$^\pi$=3$^-$ is not likely, as it would imply a possible M2 multipolarity for the 2943.8-keV γ ray from the 2973.6-keV level competing with an E1 transition. T$_{1/2}$: Estimated in 2016Al10.
140.7 *3*	(4$^-$)	89 ns *9*	AB	T$_{1/2}$: From 2016Al10. Other: 0.98 μs *+10−9* (2012Ka36) from γ(t) in Be(^{238}U,Fγ); <500 ns (2009Fo05) from time correlations between implanted ^{82}Ga nuclei and γ-ray events in ^{9}Be(^{238}U,X). J$^\pi$: possible E2 γ to (2$^-$) g.s.; no β feeding from ^{82}Zn 0$^+$ parent.

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Adopted Levels, Gammas (continued)

^{82}Ga Levels (continued)

E(level)†	Jπ‡	XREF
366.3 *2*	(1⁻,0⁻)	A
529.7 *3*	(0⁻,1⁻)	A
2978.6 *4*	(1⁺)	A

† From ^{82}Zn β^- decay (2016Al10).
‡ Jπ assignments from 2016Al10, based on allowed or forbidden nature of β- transitions in ^{82}Zn β^- decay. Other: 2007Na28.

$\gamma(^{82}Ga)$

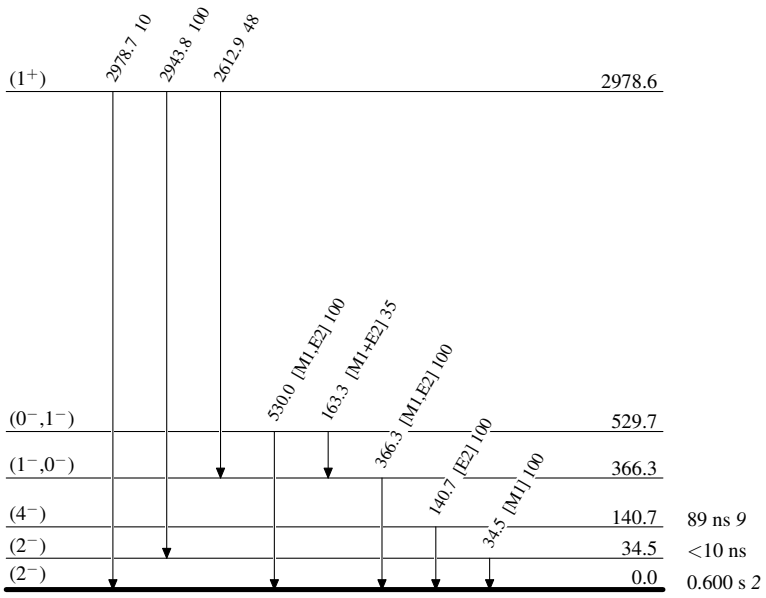
E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.	α‡	Comments
34.5	(2⁻)	34.5 *1*	100	0.0	(2⁻)	[M1]	1.394 *23*	B(M1)(W.u.)>0.022
140.7	(4⁻)	140.7 *3*	100	0.0	(2⁻)	[E2]	0.193 *4*	B(E2)(W.u.)=4.6 *5*
366.3	(1⁻,0⁻)	366.3 *2*	100	0.0	(2⁻)	[M1,E2]	0.0043 *17*	
529.7	(0⁻,1⁻)	163.3 *2*	35	366.3	(1⁻,0⁻)	[M1+E2]	0.065 *46*	
		530.0 *5*	100 *10*	0.0	(2⁻)	[M1,E2]	0.0014 *4*	
2978.6	(1⁺)	2612.9 *11*	48 *21*	366.3	(1⁻,0⁻)			
		2943.8 *4*	100 *21*	34.5	(2⁻)			
		2978.7 *6*	10 *8*	0.0	(2⁻)			

† From ^{82}Zn β^- decay (2016Al10).
‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Adopted Levels, Gammas

Level Scheme

Intensities: % photon branching from each level



$^{82}_{31}Ga_{51}$