Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 114, 1189 (2013)	1-Apr-2013

$Q(\beta^-)$=1831.8 *20*; S(n)=8503.4 *20*; S(p)=16790 *4*; $Q(\alpha)$=−11492.0 *21* 2012Wa38

^{28}Mg production cross sections are reported in:
2012Zh06: ^{9}Be(^{40}Ar,X), E=57 MeV/nucleon.
2011Ti03: ^{nat}Cr(p,X), E=248 to 2605 MeV; ^{56}Fe(p,X), E=249 to 2605 MeV.
2011Ti04: ^{nat}Ni(p,X), E=599 to 2605 MeV ^{93}Nb(p,X), E=1599- and 2605 MeV.
2011Ti05: ^{nat}W(p,X), E=1199-, 1599-, 2605-MeV ^{nat}Ta(p,X), E=1199-, 1598-, 2605-MeV.
2008Ti05: ^{56}Fe(p,X), E=300 to 2600 MeV.
2007No13: ^{9}Be(^{40}Ar,X), E=90A MeV, and ^{181}Ta(^{40}Ar,X), E=94A MeV.
2003Ya20: Cu(^{40}Ar,X), Cu(^{20}Ne,X), E=100 and 230 MeV/nucleon.
2000Da06: ^{124}Sn(p,X), E=8.1 GeV.
2000Ka25: ^{232}Th(γ,F)^{28}Mg, E=12$^-$, 16.5-, 24-MeV bremsstrahlung. Other: 2000Ma75.
1997Fo01: ^{208}Pb(^{37}Cl,X), E=230 MeV.
1997Vo03: ^{56}Fe(p,X), E=800 MeV.

2006Kh08: ^{28}Mg beam, 55.93 MeV/nucleon, bombarded a Si target, measured σ=2069 mb *186* for Si(^{28}Ne,X) reaction and a square reduced absorption radius r_0^2=1.11 fm^2 *10* is deduced and used to study the isospin dependence.

^{28}Mg Levels

Cross Reference (XREF) Flags

A	^{28}Na β^- decay	D	Coulomb excitation
B	^{29}Na β^-n decay	E	^{150}Nd(^{26}Mg,^{28}Mg)
C	^{26}Mg(t,pγ)		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[@]	XREF	Comments
0.0	0$^+$	20.915 h *9*	ABCDE	%β^-=100 δ<r^2>(^{26}Mg,^{28}Mg)=+0.216 fm^2 *9* (statistical) *27* (systematic) (2012Yo01). Charge radius <r^2>$^{1/2}$=3.0695 fm *14* (statistical) *51* (systematic) (2012Yo01). T$_{1/2}$: from 1991Ko34. Other values: 20.88 h *6* (1963We19) and 20.93 h *4* (1974Ro18).
1473.54 *10*	2$^+$	1.2 ps *1*	ABCDE	T$_{1/2}$: Other: 0.93 ps *15* (Coulomb excitation).
3862.15 *14*	0$^+$	0.55 ps *7*	ABC	
4021.0 *5*	4$^+$	105 fs *35*	A C E	
4554.6 *5*	2$^+$	<0.03 ps	ABC	
4561.0 *5*	1$^+$		ABC	J$^\pi$: From ^{28}Na β^- decay.
4878.6 *13*	2$^+$	<0.08 ps	A C	
5171.3 *4*	3$^-$	0.11 ps *9*	A C E	
5184.6 *7*			C	
5193.1 *5*	1	<0.02 ps	A C	
5270.2 *4*	1$^+$	<0.1 ps	A C	J$^\pi$: 1974Ra15 (t,pγ) presents J$^\pi$=1$^-$ in the decay scheme, however, from ^{28}Na β^- decay, 1984Gu19 assigns J$^\pi$=1$^+$.
5470.1 *5*	2		A C	
5672.7 *5*	2$^+$		C	
5702.1 *7*	0$^+$	0.21 ps *3*	C	
5916.9 *11*	(0,1,2)$^+$[#]		A C	
6135 *15*			C	
6416 *15*			C	
6516 *15*			C	

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Adopted Levels, Gammas (continued)

^{28}Mg Levels (continued)

E(level)†	Jπ‡	XREF	Comments
6544.9 *5*	(2+)#	A C	
6599 *15*		C	
6708 *15*		C	
6759 *15*		C	
7200.9 *7*	(0,1,2)+#	A	
7462.0 *4*	(2+)#	A	
8439.4? *11*	(6+)	E	Jπ: 4418γ to 4+ state.

† From a least-squares fit to measured γ-ray energies. ΔE=1 keV is assumed for 4418γ and used in the fitting. Calculated γ-ray energies are obtained after the fitting.
‡ From L values in ^{26}Mg(t,pγ), except otherwise noted.
# From ^{28}Na β^- decay, based on the angular distribution measurements of β and γ-ray emissions.
@ From ^{26}Mg(t,pγ), except otherwise noted.

γ(^{28}Mg)

E_i(level)	J^π_i	Eγ†	Iγ†	E_f	J^π_f	Mult.†	δ†	Comments
1473.54	2+	1473.5‡ *1*	100	0.0	0+	E2		B(E2)(W.u.)=13.4 *12*
3862.15	0+	2388.5 *1*	100	1473.54	2+	E2		B(E2)(W.u.)=2.6 *4* Eγ: Weighted average of data from 2012Ku11, 1984Gu19 (^{28}Na β^- decay), ^{29}Na β^-n decay and ^{26}Mg(t,pγ).
4021.0	4+	2547.7 *6*	100	1473.54	2+	(E2)		B(E2)(W.u.)=10 *4* Eγ: Weighted average of data from 2012Ku11 (^{28}Na β^- decay) and ^{26}Mg(t,pγ).
4554.6	2+	533.6	<2	4021.0	4+			
		692.4	<2	3862.15	0+			
		3082.6 *13*	100	1473.54	2+	M1+E2	+0.04 *3*	B(M1)(W.u.)>0.024 Eγ: Using the Limitation of Relative Statistical Weight (LWM) averaging method of data 3081.3 keV *3* (2012Ku11), 3087.4 keV *9* (1984Gu19) of ^{28}Na β^- decay, 3083.4 keV *7* (t,pγ), and 3080.9 keV *10* (^{29}Na β^-n decay).
		4553.8	<3	0.0	0+			
4561.0	1+	3087.3 *5*	100	1473.54	2+			Eγ: Weighted average of data from 2012Ku11, 1984Gu19 in ^{28}Na β^- decay and ^{29}Na β^-n decay.
4878.6	2+	324	<2.5	4554.6	2+			
		857.6	<2.5	4021.0	4+			
		1016.4	<4	3862.15	0+			
		3404.9‡ *13*	100 *4*	1473.54	2+	M1+E2	+0.35 *6*	B(M1)(W.u.)>0.0046; B(E2)(W.u.)>0.18
		4877 *10*	25 *4*	0.0	0+	E2		B(E2)(W.u.)>0.097
5171.3	3−	292.7	<1	4878.6	2+			
		616.7	3 *1*	4554.6	2+			
		1150.5 *4*	38 *2*	4021.0	4+	(E1)		B(E1)(W.u.)=0.0012 *10* Eγ: Weighted average of 1150.3 keV *4* (t,pγ) and 1151.6 keV *11* (2012Ku11 – ^{28}Na β^- decay).
		3696.8 *6*	100 *2*	1473.54	2+	(E1)		B(E1)(W.u.)=9.E−5 *8* Eγ: Weighted average of 3697.5 keV *7* (t,pγ) and 3694.2 keV *13* (2012Ku11 – ^{28}Na β^- decay).
5193.1	1	314.5	<1	4878.6	2+			

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Adopted Levels, Gammas (continued)

$\gamma(^{28}Mg)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.†	δ†	Comments
5193.1	1	638.5	<1.1	4554.6	2^+			
		1330.9	2.9 *6*	3862.15	0^+			
		3719	11.4 *11*	1473.54	2^+			
		5192.6‡ *5*	100.0 *11*	0.0	0^+			
5270.2	1^+	5269.6‡ *4*	100	0.0	0^+			
5470.1	2	3996.3 *5*	100.0	1473.54	2^+			E_γ: Weighted average of 3996.5 keV *5* (t,pγ) and 3994.9 keV *15* (2012Ku11 – ^{28}Na β^- decay).
		5469	<2	0.0	0^+			
5672.7	2^+	1118	21 *5*	4554.6	2^+			
		1651.6	<7.3	4021.0	4^+			
		1810.4	<5.9	3862.15	0^+			
		4198.5	100 *6*	1473.54	2^+	M1(+E2)	+0.3 *+2−6*	
		5671.5	26 *6*	0.0	0^+	E2		
5702.1	0^+	431.9	17.5 *15*	5270.2	1^+			
		1141	100.0 *19*	4561.0	1^+			
		4227.9	28.5 *16*	1473.54	2^+	[E2]		B(E2)(W.u.)=0.077 *12*
5916.9	$(0,1,2)^+$	4443.0‡ *11*	100	1473.54	2^+			
6544.9	(2^+)	1373.4‡ *2*	<50	5171.3	3^-			
		1990.7‡ *5*	100 *50*	4554.6	2^+			
7200.9	$(0,1,2)^+$	2007.7‡ *4*	100	5193.1	1			
7462.0	(2^+)	2191.7‡ *3*	100 *13*	5270.2	1^+			
		2290.9‡ *6*	<13	5171.3	3^-			
		2906.9‡ *6*	75 *13*	4554.6	2^+			
8439.4?	(6^+)	4418#		4021.0	4^+			

† From ^{26}Mg(t,pγ), except otherwise noted. The γ rays without uncertainty are calculated by the evaluator from level energy (after a least-squares fit to measured γ rays) differences and recoil energy subtraction.
‡ From ^{28}Na β^- decay.
# Placement of transition in the level scheme is uncertain.

Legend

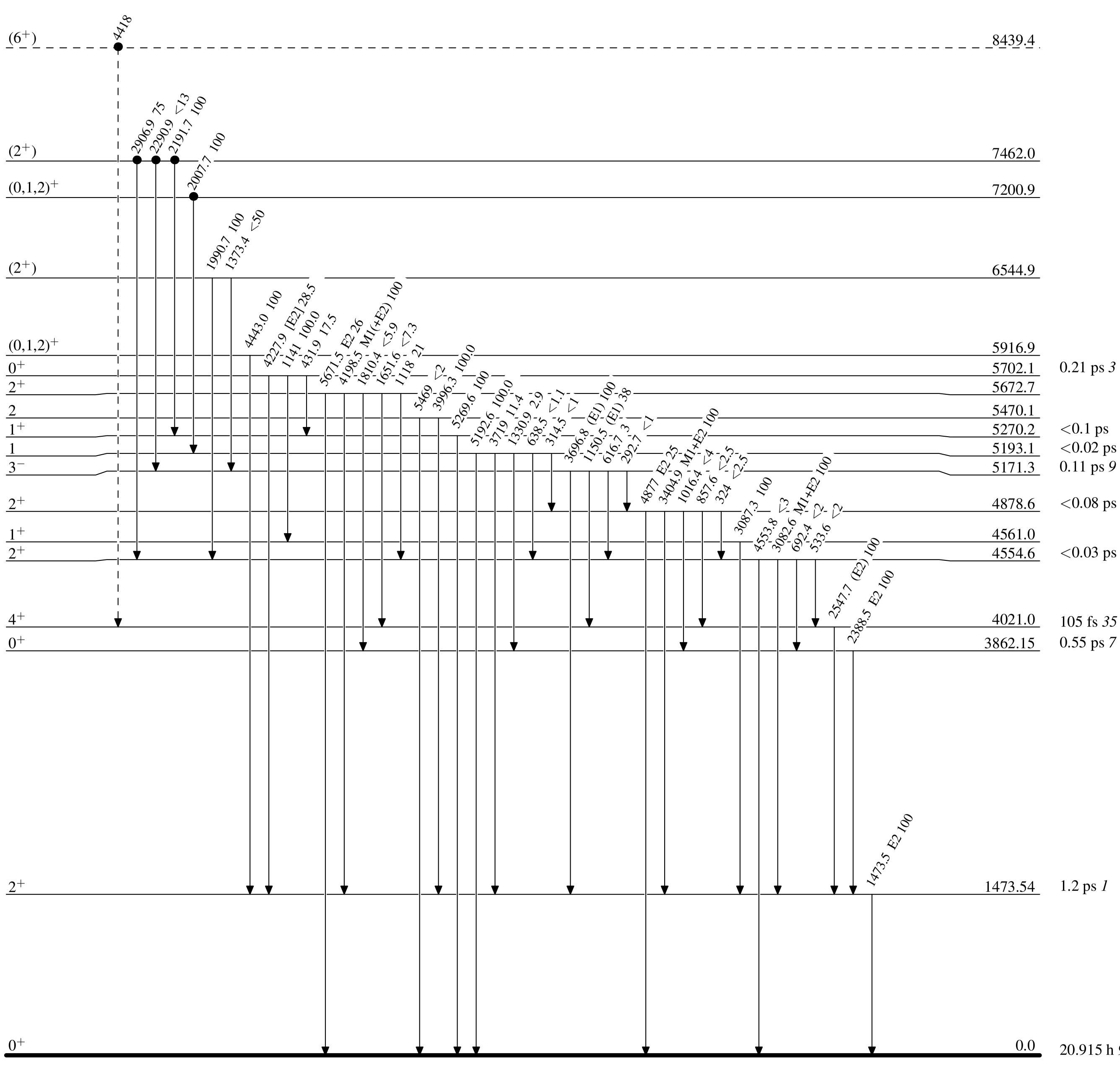
Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

Coincidence



$^{28}_{12}Mg_{16}$