^{22}Na(p,γ) 2011Sa12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia[#], A. Chakraborty[##]	NDS 171, 1 (2021)	1-Jun-2020

Others: 2010Sa26, 2002Wa33, 1996St08, 1990Se09, 1989Go01.
Based on XUNDL: Compiled by J. Chen and B. Singh (McMaster); Dec 9, 2010.
2011Sa12,2010Sa26: E=213, 288, 454 and 610 keV proton beams of about 40 μA produced by a tandem Van de Graaff accelerator at the Center for Experimental Nuclear Physics and Astrophysics (CENPA) of the University of Washington. Radioactive ^{22}Na target made by bombarding thick SiC targets with a 40 μA, 500 MeV proton beam from the TRIUMF cyclotron. The γ rays were detected by two high purity 100% Ge (HPGe) crystals (FWHM=4.4 and 7.4 keV at 1.275 MeV with high rates and 2.2 and 3.0 keV with low rates) surrounded by Pb shielding and scintillators for cosmic-ray rejection. Measured γ yields. Deduced resonance energies and resonance strengths.
All data are from 2011Sa12; unless otherwise stated.

^{23}Mg Levels

E(level)[†]	J$^\pi$[#]	Comments
0.0	3/2$^+$	
450.2 *13*	5/2$^+$	
2051.8 *13*	7/2$^+$	
2715.1 *15*		
7784.7 *12*	3/2$^+$,5/2$^+$	E(level): 7784.6 *16* from E(p)(lab)=213.5 *14* (2011Sa12) and S(p). Resonance strength $\omega\gamma$=5.7 meV *+16−9* (2011Sa12).
7856.1 *10*	(7/2$^+$)	E(level): 7855.9 *13* from E(p)(lab)=288.1 *11* (2011Sa12) and S(p). Resonance strength $\omega\gamma$=39 meV *8* (2011Sa12).
8015.3 *8*		E(level): 8014.8 *11* from E(p)(lab)=454.2 *8* (2011Sa12) and S(p). Resonance strength $\omega\gamma$=166 meV *22* (2011Sa12).
8062[‡] *2*		E(level): From E(lab)=503 *2* (1990Se09).
8163.9 *8*	5/2$^+$	E(level): 8163.6 *11* from E(p)(lab)=609.8 *8* (2011Sa12) and S(p). Resonance strength $\omega\gamma$=591 meV *+103−74* (2011Sa12).
8288[‡] *3*		E(level): From 1990Se09. E(lab)=740 *2* (1990Se09).
8342[‡] *2*		E(level): From E(lab)=796 *2* (1990Se09).

[†] Level energies 7784.7 and above from 2011Sa12, except otherwise noted. Lower levels from γ ray feeding from above levels. E_p(lab) in 2011Sa12 is the adopted value from excitation function and value from E_γ. S(p)=7580.5 *8* in 2011Sa12 from measured masses of ^{23}Mg in 2009Sa38 and 2008Mu05. S(p)=7580.97 *23* (2017Wa10).
[‡] From 1990Se09.
[#] From Adopted Levels.

γ(^{23}Mg)

E$_i$(level)	J$_i^\pi$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$_f^\pi$
7784.7	3/2$^+$,5/2$^+$	5732[#]	11 *5*	2051.8	7/2$^+$
		7332.7 *12*	89 *5*	450.2	5/2$^+$
7856.1	(7/2$^+$)	5140.6 *10*	67 *5*	2715.1	
		5803.2 *13*	26 *4*	2051.8	7/2$^+$
		7405[#]	6.7 *29*	450.2	5/2$^+$
8015.3		5300.1 *8*	51.9 *12*	2715.1	
		5962.7 *8*	43.6 *12*	2051.8	7/2$^+$
		7564[#]	4.5 *8*	450.2	5/2$^+$
8062		8061[‡]		0.0	3/2$^+$

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^{22}Na(p,γ) 2011Sa12 (continued)

$\gamma(^{23}Mg)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Comments
8163.9	$5/2^+$	6111[#]	20.0 *18*	2051.8	$7/2^+$	I_γ: From 1996St08. In 2011Sa12, this γ ray was obscured by ^{19}F background.
		7711.2 *11*	18.6 *13*	450.2	$5/2^+$	
		8162.3 *9*	61.3 *18*	0.0	$3/2^+$	
8288		5572[‡]	100	2715.1		
8342		7890[‡]	100	450.2	$5/2^+$	

[†] From 2011Sa12, except otherwise noted.
[‡] From level energy difference, recoil energy subtracted. Placement in 1990Se09.
[#] From level energy difference, recoil energy subtracted. Placement in 2011Sa12.

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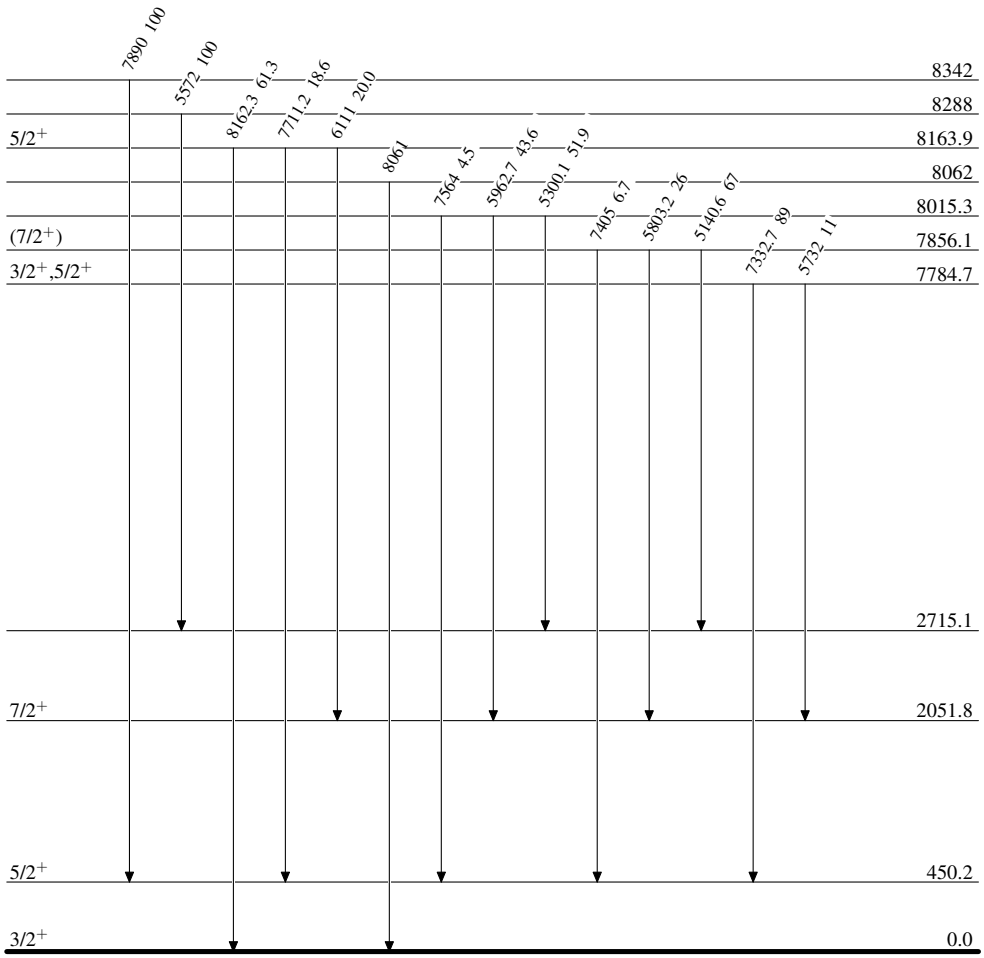
Level Scheme

Intensities: % photon branching from each level



$^{23}_{12}Mg_{11}$