Adopted Levels, Gammas

History

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

Q(β^-)=122.8×10^2 *10*; S(n)=3.82×10^3 *12*; S(p)=20.63×10^3 *21*; Q(α)=−9630 *150* 2012Wa38

1979Sy01: First production of ^{28}Ne isotope from ^{40}Ar fragmentation via ^{12}C(^{40}Ar,X) reaction, E=205 MeV/nucleon, deduced evidence for particle stability.

2007No13: ^{28}Ne production cross section ~0.1 μb is measured in ^{40}Ar fragmentation via ^{9}Be(^{40}Ar,X) reaction, E=90 MeV/nucleon and 94 MeV/nucleon.

2006Kh08: ^{28}Ne beam, E=44.65 and 38.98 MeV/nucleon, bombarded a Si target, measured σ=2376 mb *31* and σ=2423 mb *37*, respectively, for the Si(^{28}Ne,X) reaction and a squared reduced-absorption radius of r_0^2=1.253 fm^2 *12* is deduced and used to study the isospin dependence.

^{28}Ne Levels

Cross Reference (XREF) Flags

- A ^{1}H(^{28}Ne,^{28}Ne′γ)
- B ^{9}Be(^{29}Na,pγ),(^{30}Mg,2pγ)
- C ^{9}Be(^{29}Na,N27NE)
- D Coulomb excitation

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	0$^+$	20 ms *1*	AB D	%β^-=100; %β^-n=12 *1* %β^-2n=3.7 *5* δ<r^2>(^{20}Ne,^{28}Ne)=−0.239 fm^2 *35* (stat) *213* (syst) (2011Ma48). T$_{1/2}$: Average of 21 ms *1* (2063γ-t) and 19 ms *1* (863γ-t) in 2006Tr02. Others: 18.4 ms *5* (2005Tr05), 18 ms *3* (1999Re16), 20 ms *3* (1999Dl01), 21 ms *5* (1997Ta22), 17 ms *4* (1992Te03) and 16 ms *9* (1991Re02). %β^-n: From 2006Tr02 and 2005Tr05. Others: 11 *3* (1999Re16,1999Dl01), and 22 *3* (1992Te03). %β^-2n: From 2006Tr02. Other: 3 *1* (2005Tr05).
0.0+x			B	Additional information 1.
1127+x *4*			B	
1304 *3*	2$^+$	5.7 ps *10*	AB D	J$^\pi$: 1304γ E2 to 0$^+$ state. T$_{1/2}$: Using B(E2)↑=0.0132 *23* (2005Iw02) and the adopted γ-ray properties.
3010 *6*	(4$^+$)		AB	J$^\pi$: 4$_1$+ in ((^{29}Na,pγ)−2007RoZY), based on comparison of the experimental level scheme with the predicted energies by shell model.
3904 *7*	(4$^+$)		BC	XREF: C(3860). E(level): In 2007RoZY − (^{29}Na,pγ) − 3904 keV *7* level is deduced from a single cascade of γ-ray measurements and identified as bound state. In 2012Sm08, 3860 keV *110* level is deduced from the measured decay energy of 32 keV *22* in the ^{27}Ne+n system and the best fit. Considering Sn(^{28}Ne) and the assumption of decay to the g.s., the state is interpreted as unbound in 2012Sm08. The level energies are statistically consistent and located within/around the neutron separation energy (3820 keV *120* − 2012Wa38). Evaluator assumes these states are same and may decay by competing γ rays and neutrons. For this to be significant, one expects the γ-decay lifetime to be short compare to the neutron-decay lifetime. Using the M1 strength in Table 6.1 (2007RoZY) and 894γ, a γ-decay lifetime of 4.9 fs is estimated. Considering Γ=0.09 eV and J$^\pi$=4$^+$ from Table I (2012Sm08) for this state, a neutron-decay lifetime of 7.3 fs is calculated. J$^\pi$: J$^\pi$=4$_2$+, based on comparison of the experimental level scheme with the predicted

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{28}Ne Levels (continued)

E(level)†	Jπ	T1/2	XREF	Comments
				energies and transition strengths from shell model (2007RoZY). For the 3860 keV level $J^\pi=2^+,3^+$, or 4^+ is suggested in 2012Sm08 from shell model calculations.

† From a least-squares fit to γ-ray energies.

γ(^{28}Ne)

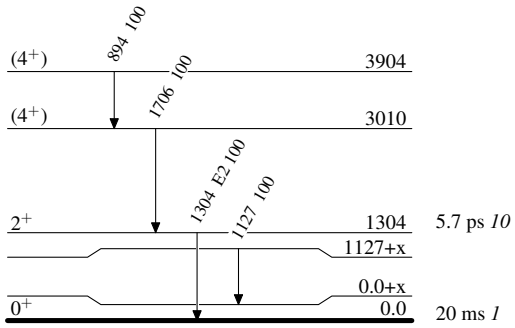
E_i(level)	J_i^π	E_γ†	I_γ	E_f	J_f^π	Mult.	Comments
1127+x		1127 *4*	100	0.0+x			
1304	2^+	1304 *3*	100	0.0	0^+	E2	B(E2)(W.u.)=5.0 *8* E_γ: Others: 1319 keV *22* ((^{28}Ne,^{28}Ne′γ)–2006Do09) and 1320 keV *20* (Coulomb excitation-1999Pr09).
3010	(4^+)	1706 *5*	100	1304	2^+		E_γ: Others: 1711 keV *30* ((^{28}Ne,^{28}Ne′γ)–2006Do09).
3904	(4^+)	894 *4*	100	3010	(4^+)		E_γ: Other: 936 *28* (2005Be60). Placement of this γ ray is based on coincidence (better statistics) with 1706γ forming a single cascade in 2007RoZY. In contrary, the 936 keV γ ray (i.e. 894 keV γ ray in this dataset) is shown to feed the 2^+ state at 1293 keV (1304 keV here), based on γγ coin of the 1293γ with both the 936γ and 1707γ (poor statistics) in 2005Be60.

† From ^{9}Be(^{29}Na,pγ) (2007RoZY).

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{28}_{10}Ne_{18}$