Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ninel Nica, Balraj Singh	NDS 113,1563 (2012)	28-May-2012

Q(β^-)=1.689×10^4 *7*; S(n)=2.67×10^3 *11*; S(p)=1.532×10^4 *7*; Q(α)=−1.397×10^4 *7* 2012Wa38

Note: Current evaluation has used the following Q record 16910 62 *2681* 91 *15283* 64 −13846 *64* 2011AuZZ.

S(2n)=8128 *105*, S(2p)=36435 *134*, Q(β^-n)=9396 *60* (2011AuZZ).

Values in 2003Au03: Q(β^-)=17020 *110*, S(n)=2470 *130*, S(p)=15120 *110*, Q(α)=−13720 *120*, Q(β^-n)=9490 *110*, S(2n)=8010 *140*, S(2p)=36570 *370*.

1977Bu11: identification and production of ^{34}Al isotope in U(p,X) at 800 MeV, spallation reaction, time-of-flight and energy loss measurements, LAMPF facility.

1979We10: production of ^{34}Al in fragmentation of ^{48}Ca beam with Be target at 212 MeV/nucleon at Berkeley Bevalac facility.

Later productions and half-life measurements: 1986Vi09, 1986Du07, 1987Gi05, 1988Mu08, 1989Ba50, 1991Zh24, 1991Or01, 1997Fo01, 2005Ob04, 2007No13.

2001Nu01 (also 2002Nu02): mass-separated ^{34}Al produced in U(p,X) E=1 GeV reaction using uranium carbide target, CERN-ISOLDE facility. Measured Eγ, Iγ, β, $\beta\gamma$, $\beta\gamma\gamma$, βnγ coin, $\beta\gamma$(t), $T_{1/2}$ and delayed neutron-emission probability using Ge and BaF_2 detectors for γ rays, plastic scintillation detectors for β rays and neutrons.

2006Kh08: Cross section and strong absorption radius measurement in Si(^{34}Al,X) reaction at 44.4 MeV/nucleon and 50.9 MeV/nucleon.

2008Hi01: ^{9}Be(^{36}S,xγ) E=77.5 MeV/nucleon. Extracted ^{34}Al beam using LISE fragment separator at GANIL facility. Beam implanted in Si crystal. Measured magnetic moment using nuclear magnetic resonance (NMR) method following β decay.

2006FuZX: In He(^{34}Al,x) E=40 MeV/nucleon reaction, possible prompt γ rays of 383.7 keV *12* and 425.3 keV *11* are identified, but no level scheme is proposed. The ^{34}Al beam was produced by fragmentation of 63 MeV/nucleon ^{40}Ar beam with carbon+Be target at riken facility using rips separator and grape γ detector array.

2012No05: ^{9}Be(^{34}Al,^{33}Al) at ≈900 MeV/nucleon, GSI facility, one-neutron removal reaction. Measured momentum distribution. Deduced single-particle occupancies in g.s. of ^{34}Al. Eikonal analysis.

Additional information 1.

Mass measurements: 2007Ju03 (cyclotron based mass spectrometry), 1987VaZS.

This isotope is interpreted to lie in the "island of inversion" (2008Hi01).

^{34}Al Levels

Cross Reference (XREF) Flags

- A ^{34}Mg β^- decay (20 ms)
- B ^{35}Mg β^-n decay (70 ms)
- C Coulomb excitation

E(level)	J$^\pi$	$T_{1/2}$	XREF	Comments
0	(4$^-$)	56.3 ms *5*	A C	%β^-=100; %β^-n=26 *4* (2001Nu01) μ=(+)2.156 *8* (2008Hi01,2011StZZ) Measured r_0^2=1.187 fm^2 *18* (2006Kh08) in Si(^{34}Al,X) reaction at 44.4 MeV/nucleon and 50.9 MeV/nucleon. Integral cross sections were also measured. %β^-n: others: 27 *5* (1989Ba50), 54 *12* (1988Mu08), 12.5 *25* (1995ReZZ). See also 1999YoZW. Values from 1988Mu08 and 1995ReZZ are in serious disagreement with those from 2001Nu01 and 1989Ba50. J$^\pi$: (4$^-$) supported by g factor measurement, model predictions and several other arguments as listed by 2008Hi01; possible 5$^-$ is excluded from g factor measurement and model predictions. See also 2012No05. Contribution to total neutron-removal cross section from different orbitals in the ground state are: 19-50 mb for $p_{3/2}$ orbital, <39 mb for $s_{1/2}$ orbital, 16-39 mb for $d_{3/2}$ and/or $d_{5/2}$ orbitals, and <11 mb for $f_{7/2}$ orbital (2012No05). Inclusive σ=75 mb *4*. These results are consistent with interpretation in 2008Hi01 from their magnetic dipole moment measurement.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{34}Al Levels (continued)

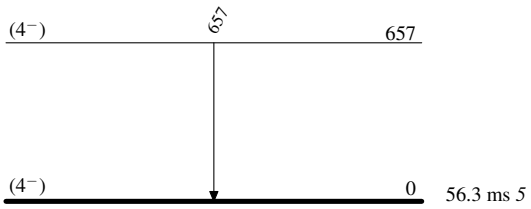
E(level)	J^π	XREF	Comments
			μ: from g factor=0.539 *2* (2008Hi01) by β^--NMR method. Positive spin polarization of ^{34}Al nuclei was observed (2006Tu03) from the analysis of the peak of the momentum distribution in single neutron pickup reaction ^{9}Be(^{36}S,X) E=77.5 MeV/nucleon at GANIL facility; J^π=4$^-$ for ^{34}Al g.s. was assumed in the analysis. $T_{1/2}$: from weighted average of β and γ counting (2001Nu01). Others: 42 ms *6* (1995ReZZ), 70 ms *25* (1988Mu08), 50 ms *25* (1986Du07). See also 1999YoZW.
657 *9*	(4$^-$)	C	B(E2)↑=0.0100 *39* (2001Pr08) J^π: calculated B(E2) values for lowest 2$^-$, 3$^-$ and 4$^-$ states give the best agreement for experimental value for 4$^-$ to 4$^-$ (2008Hi01), but 2001Pr08 obtained best agreement for 4$^-$ to 3$^-$.

$\gamma(^{34}Al)$

E_i(level)	J_i^π	E_γ	E_f	J_f^π	Comments
657	(4$^-$)	657 *9*	0	(4$^-$)	E_γ: from Coulomb excitation.

Adopted Levels, Gammas

Level Scheme



$^{34}_{13}Al_{21}$