Adopted Levels, Gammas

Q(β^-)=14170 *40*; S(n)=5297 *8*; S(p)=15830.7 *89*; Q(α)=−14894.0 *78* 2021Wa16

S(p),Q(α): Deduced by the evaluator using mass excesses of 8318 *5* for ^{34}Mg: a weighted average of 8323 *7* (2019As04) and 8315 *5* (2025Ly01), and 12245.3 *26* for ^{31}Na measured by 2025Ly01; −224 *7* for ^{35}Al from 2021Wa16. Values from 2021Wa16: S(p)=15836 *10*, Q(α)=−14895 *16*.

S(2p)=38400.5 *85*, Q(ε)=−15753 *10*, from mass excesses of 23598.8 *43* for ^{33}Na and 15529.5 *71* for ^{35}Mg measured by 2025Ly01; −224 *7* for ^{35}Al from 2021Wa16. Values from 2021Wa16: S(2p)=38580 *450*, Q(ε)=−15860 *270*.

S(2n)=7869 *10*, Q(β^-n)=11697 *7* (2021Wa16).

Isotope discovery (2012Th10): C(^{40}Ar,X) projectile fragmentation at Berkeley (1979Sy01).

2017Ha23: ^{35}Al produced by ^{9}Be(^{40}Ar,X) at HIRFL. Measured $T_{1/2}$.

2015Mo17: ^{35}Al produced by ^{9}Be(^{40}Ar,X) at E(^{40}Ar)=95 MeV/nucleon at RIKEN. Measured time-of-flight, energy loss, angular distribution of fragments, analyzed transverse momentum distributions for fragments, and deduced formulation for the width of transverse momentum distribution.

2012No05: ^{33,34,35,36}Al produced by Be(^{48}Ca,X) fragmentation at E(^{48}Ca)=1 GeV/nucleon at GSI. Measured 1n removal cross sections and and longitudinal momentum distributions of the residues. σ(^{35}Al->^{34}Al)=75 mb *4* and σ(^{36}Al->^{35}Al)=95 mb *5*.

2012Kw02: ^{35}Al produced by ^{9}Be,^{nat}Ni,^{181}Ta(^{40}Ar,X) at E(^{40}Ar)=140 MeV/nucleon at NSCL. Measured fission fragment spectra, average isobaric velocities, parallel momentum transfers, widths, fragment σ. Comparison with empirical formula EPAX, and predictions from internuclear cascade and deep inelastic models using Monte Carlo ISABEL-GEMINI and DIT-GEMINI codes.

2012Zh06: ^{35}Al produced by ^{9}Be(^{40}Ar,X) at E(^{40}Ar)=57 MeV/nucleon at HIRFL. Measured particle spectra, energy loss, time of flight, fragment yields, momentum distributions, cross sections; deduced fragment excitation energies, mass yield ratios.

2010Ro23: ^{35}Al produced by ^{9}Be(^{40}Ar,X) fragmentation at E(^{40}Ar)=700 MeV/nucleon at GSI. Measured 1n knockout cross sections and longitudinal momentum distributions of the residues. σ(^{35}Al->^{34}Al)=65 mb *18*.

2007No13: ^{35}Al produced by ^{9}Be(^{40}Ar,X) fragmentation at E(^{40}Ar)=100 MeV/nucleon at RIKEN. Measured fragment momentum distributions and production cross sections.

2006Kh08: ^{35}Al produced by ^{181}Ta(^{48}Ca,X) fragmentation at E(^{48}Ca)=60.3 MeV/nucleon at GANIL. Measured energy-integrated reaction cross sections at 30-65 MeV/nucleon using a silicon telescope as both active target and detector. Deduced radii, isospin dependence, and possible halo structure or large deformation.

2006FuZX: ^{35}Al produced by Be,C(^{40}Ar,X) at E(^{40}Ar)=63 MeV/nucleon at RIKEN. He(^{35}Al,X) at E(^{35}Al)=40 MeV/nucleon. Measured Eγ, Iγ.

2005Ti11,2006AnZW: fragmentation of ^{36}S beam at 78 MeV/nucleon at GANIL. Measured β-delayed Eγ, $T_{1/2}$ and delayed neutron emission probability. Deduced levels, J^π, log *ft* for ^{35}Si. (conference paper).

2001Nu01,2002Nu02: ^{35}Al produced at the ISOLDE facility at CERN in fragmentation with 1.0 GeV proton beam on a uranium carbide target. Measured Eγ, Eγ, $\gamma\gamma$, $\beta\gamma$-coin, $T_{1/2}$ and delayed-neutron branches. Deduced levels, J^π, log *ft* for ^{35}Si.

1999YoZW: ^{35}Al produced by ^{9}Be(^{48}Ca,X) and ^{181}Ta(^{48}Ca,X) fragmentations at E(^{48}Ca)=70 MeV/nucleon at RIKEN. Measured $T_{1/2}$ and delayed neutron emission probabilities.

1989Le16,1989MuZU: ^{35}Al produced by ^{181}Ta(^{48}Ca,X) fragmentation at E(^{48}Ca)=55 MeV/nucleon at GANIL. Measured $T_{1/2}$ and delayed neutron emission probabilities.

1988Mu08,1988MuZY,1988BaYZ: ^{35}Al produced by ^{181}Ta(^{86}Kr,X) fragmentation at E(^{86}Kr)=45 MeV/nucleon at GANIL. Measured $T_{1/2}$ and delayed neutron emission probabilities.

Mass measurements: 2017Ga20, 2007Ju03, 1991Or01, 1991Zh24, 1987Gi05.

Theoretical calculations (binding energies, deformation, quadrupole moments, radii, levels, J, π, mass, $T_{1/2}$, etc): 2016Sa46, 2014Ca21, 2013Li39, 2013Sh05, 2011Ki12, 2009Yo05, 2004Kh16, 1994Po05.

^{35}Al Levels

Cross Reference (XREF) Flags

- A ^{36}Mg β^-n decay (6.9 ms)
- B ^{9}Be(^{36}Si,^{35}Alγ)
- C Pb(^{35}Al,^{34}Alnγ)
- D Coulomb excitation

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{35}Al Levels (continued)

E(level)†	Jπ	$T_{1/2}$	XREF	Comments
0	$(5/2)^+$	38.3 ms *4*	ABCD	%β^-=100; %β^-n=38 *2* (2015Bi05); %β^-2n=0 (2001Nu01) %β^-n: From 2015Bi05 evaluation; weighted average of 38 *2* (2005Ti11, 38 *3* in 2006AnZW) and 41 *13* (2001Nu01,2002Nu02). Others: 26 *4* (1995ReZZ,2008ReZZ); 40 *10* (1989Le16); 87 *+37−25* (1988Mu08). J^π: From shell-model calculations and L(^{36}Si,^{35}Al)=2 from 0^+. Major configurations deduced by 2017Ch36 from Coulomb breakup of ^{35}Al on Pb target: for J^π(^{35}Al g.s.)=$5/2^+$, (g.s.,4^- in ^{34}Al)⊗$\nu p_{3/2}$ + (46 keV,1^+ in ^{34}Al)⊗$\nu d_{3/2}$. For $J^\pi=1/2^+$ or $3/2^+$ of ^{35}Al g.s.: (g.s.,4^- in ^{34}Al)⊗$\nu f_{7/2}$ + (46 keV,1^+ in ^{34}Al)⊗$\nu s_{1/2}$. Other configurations for $J^\pi=1/2^+,3/2^+$ of ^{35}Al g.s.: (46 keV,1^+ in ^{34}Al)⊗$\nu s_{1/2}$, (46 keV,1^+ in ^{34}Al)⊗$\nu s_{1/2}$ + (46 keV,1^+ in ^{34}Al)⊗$\nu d_{5/2}$. $T_{1/2}$: weighted average (normalized-residual method) of 38.4 ms *3* (2017Ha23, implant-β correlated decay curve); 36.8 ms *5* (2005Ti11, implant-β correlated decay curve, 36.4 ms *5* in 2006AnZW); 38.6 ms *4* (weighted average by 2001Nu01 from four independent measurements, three β-decays and one γ-decay). Others: 30 ms *4* (1995ReZZ,2008ReZZ, β-decay); 170 ms *+90−50* (1989Le16, β-decay); 30 ms *10* (1988DuZT,1987DuZU); 130 ms *+100−50* (1988Mu08, β-decay). Value is 37.6 ms *14* in 2015Bi05 evaluation, which did include the 2017Ha23 result. Reduced strong absorption radius=1.188 fm^2 *14* from 2006Kh08.
802 *3*			AB	
1007 *4*			B D	XREF: D(1020)
1866 *4*			B	
1975 *4*			B	
2734 *7*			B	
3245 *5*			B	
4275? *9*			B	XREF: B(4275?)

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

γ(^{35}Al)

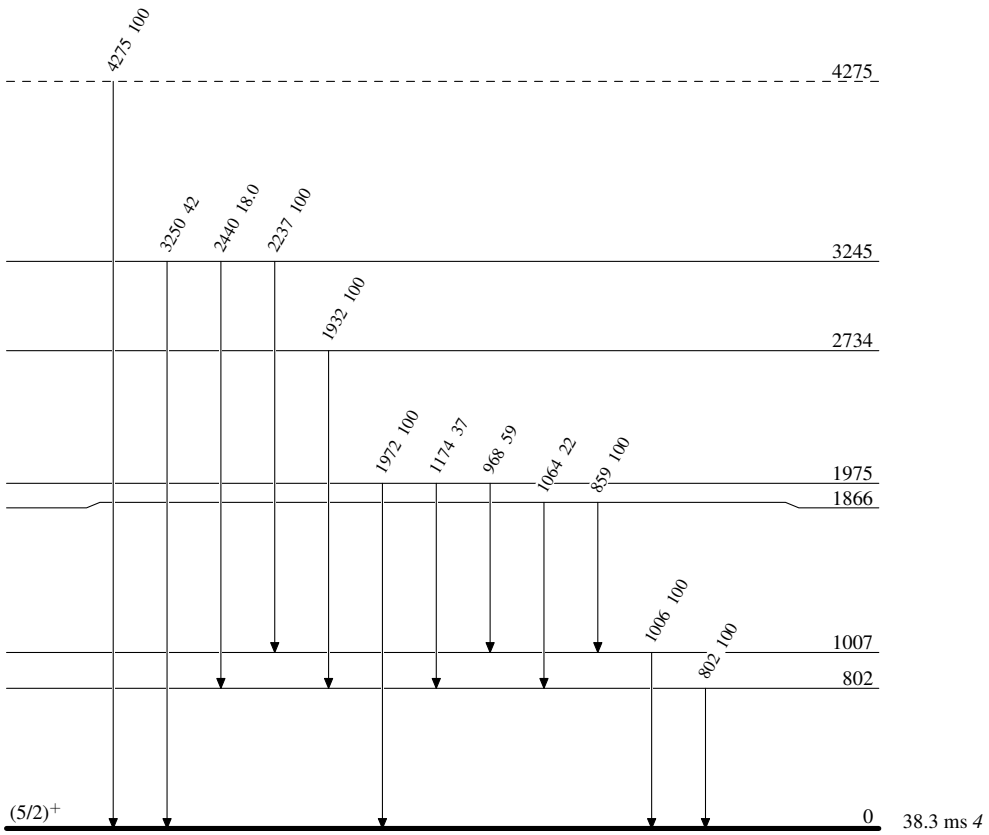
E_i(level)	E_γ†	I_γ†	E_f	J^π_f	Comments
802	802 *4*	100	0	$(5/2)^+$	
1007	1006 *6*	100	0	$(5/2)^+$	B(E2)=0.0142 *52* (1999Ib01). B(E1)≤0.00020 *9*, B(E2)≤0.0125 *56*, B(M1)≤0.0024 *11*, and $5/2^+$->$3/2^{+/-}$ σ=30 mb *14* (2000PrZX). The multipolarities are assumed. E_γ: weighted average of 1003 *4* from (^{36}Si,^{35}Alγ) and 1020 *9* from Coulomb excitation.
1866	859 *4*	100 *8*	1007		
	1064 *4*	22 *6*	802		
1975	968 *4*	59 *4*	1007		
	1174 *5*	37 *4*	802		
	1972 *6*	100 *7*	0	$(5/2)^+$	
2734	1932 *6*	100	802		
3245	2237 *6*	100 *8*	1007		
	2440 *7*	18.0 *26*	802		
	3250 *8*	42 *5*	0	$(5/2)^+$	
4275?	4275 *9*	100	0	$(5/2)^+$	

† From ^{9}Be(^{36}Si,^{35}Alγ), unless otherwise noted.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{35}_{13}Al_{22}$