Adopted Levels, Gammas

History Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	ENSDF	15-Dec-2017

Q(β^-)=1586×10[1] *27*; S(n)=75×10[1] *27*; S(p)=2333×10[1] *66*; Q(α)=−1797×10[1] *38* 2017Wa10

Q(β^-n)=10570 *270*, S(2n)=5470 *270*, S(2p)=44940 *650* (syst) (2017Wa10). Evaluators deduce Q(β^-2n)=7995 *270*, Q(β^-3n)=2525 *270* from mass values in 2017Wa10.

1989Gu03, 1991Or01: first identification of ^{35}Mg nuclide in ^{181}Ta(^{48}Ca,X) reaction at 55 MeV/nucleon at the French National Facility GANIL.

1995ReZZ: Nuclei of interest produced by ^{232}Th(p,X) at 800 MeV in the Time-of-flight spectrometer at the LAMPF accelerator. Measured half-life, delayed neutron-emission probability.

1999YoZW: Fragmentation of ^{48}Ca beam at 70 MeV/nucleon by ^{9}Be and ^{181}Ta targets at RIKEN. Measured half-life and delayed-neutron branches.

2006Kh08: Secondary beams produced by fragmentation of ^{48}Ca beam at 60.3 MeV/nucleon by ^{181}Ta targets at GANIL. Used a silicon telescope as both reaction target and detection system. Measured energy-integrated reaction cross-sections. Deduced radii, isospin dependence.

2007Ts09: Fragmentation of ^{48}Ca beam at 64 MeV/nucleon by ^{9}Be and at 140 MeV/nucleon by ^{181}Ta targets at the National Superconducting Cyclotron Laboratory (NSCL), analyzed cross sections and binding energies.

2011Ka01: E=900 MeV/nucleon secondary ^{35}Mg beam from Be(^{48}Ca,X) primary reaction. Target=CH_2. Fragment separator at GSI facility. Measured interaction cross sections by detecting unreacted Mg particles by Bρ-ΔE-tof method. Deduced matter radius by Glauber model analysis. Comparison with HF and RMF predictions.

Additional information 1.

2012Kw02: ^{9}Be,Ni,^{181}Ta(^{40}Ar,X),E=140 MeV/nucleon, measured fission fragment spectra by energy loss from time-of-flight measurements, average isobaric velocities, parallel momentum transfers, widths, fragment s. Comparison with empirical formula EPAX, and predictions from internuclear cascade and deep inelastic models using Monte Carlo ISABEL-GEMINI and DIT-GEMINI computer codes.

2013StZY: ^{35}Mg activity was produced in ^{9}Be(^{48}Ca,X) at E(^{48}Ca)=345 MeV/nucleon from the RIBF-RIKEN facility. Fragments were separated using BigRIPS and ZeroDegree spectrometers on the basis of Bρ-ΔE-Bρ and TOF measurements with position-sensitive detectors. Separated ions of ^{35}Mg were implanted into CAITEN segmented detector for recoils and β detection. The γ radiation was measured by DALI2 array of NaI(Tl) detectors and three Ge clover detectors. Measured half-life of the decay of ^{35}Mg.

Mass measurements: 2007Ju03, 2001Sa72, 2000Sa21, 1991Or01.

Nuclear structure theory calculations for binding energies, deformation, quadrupole moments, radii, levels, J^π, mass, $T_{1/2}$, etc.: 18 references extracted from the NSR database are listed as document records in the ENSDF dataset.

The ^{36}Na isotope is expected to decay by neutron emission to to ^{35}Mg, but particle instability of ^{36}Na is proposed only from its non-observation.

This nuclide is of possible relevance to “island of inversion” near N=20.

The level scheme from 2011Ga15 is tentative.

^{35}Mg Levels

Cross Reference (XREF) Flags

- A ^{35}Na β^- decay (1.8 ms)
- B ^{9}Be(^{38}Si,^{35}Mgγ)
- C C(^{36}Mg,^{35}Mgγ),(^{37}Al,^{35}Mgγ)

E(level)[†]	J$^\pi$	$T_{1/2}$	XREF	Comments
0	(3/2$^-$,5/2$^-$)	11.3 ms *6*	BC	%β^-=100; %β^-n=52 *46* (2015Bi01); %β^-2n=?; %β^-3n=? %β^-n from 2015Bi01 evaluation, based on value from 2008ReZZ and 1995ReZZ. Other: 52 *11* (1999YoZW, preliminary result). Theoretical $T_{1/2}$=19.4 ms, %β^-n=83.4, %β^-2n=4.1, %β^-3n=0.1 (2016Ma12). Theoretical $T_{1/2}$=15.3 ms, %β^-n=22.8, %β^-2n=14.7, %β^-3n=0.14 (2003Mo09).

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Adopted Levels, Gammas (continued)

^{35}Mg Levels (continued)

E(level)[†]	J^π	XREF	Comments
			$T_{1/2}$: from (implant)β-correlated decay curve (2013StZY). Other: 72 ms *43* from 2008ReZZ and 1995ReZZ.
			J^π: $3/2^-$ proposed by 2017Mo26 from shell-Model calculations with the SDPF-M interaction, and the SDPF-M interaction including the $p_{1/2}$ orbit; a closely spaced $3/2^-$ and $5/2^-$ doublet predicted by 2011Ga15 with $5/2^-$ g.s. from Monte-Carlo shell-model calculations using the SDPF-M effective interaction, and $3/2^-$ g.s. for shell-model calculations using the SDPF-U interaction. 2017Mo26 also predict $3/2^+$ from shell-model calculations in the antisymmetrized molecular dynamics (AMD) framework with the Gogny D1S force. Others: $7/2^-$ from systematics (2017Au03), $3/2^-$ from theory (1997Mo25).
			Mean square absorption radius=1.64 fm^2 *15* from 2006Kh08 in Si(^{35}Mg,X) reaction at E=33.79 and 38.79 MeV/nucleon, also measured energy-integrated cross sections, σ_R=3.9 b *8*. The rms matter radius=3.40 fm *24* (2011Ka01).
0+x		BC	E(level): this level is either the g.s. or at an energy <200 keV, the detection threshold in the experiment by 2017Mo26. It could also be a 30-keV state, $3/2^-$ predicted in shell-model calculations by 2011Ga15. Shell-model calculations by 2017Mo26 predict either a $5/2^-$ level or a $1/2^-$ level below 200 keV excitation, depending on the interaction used.
0+y?		C	E(level): 2017Mo26 suggest a level at an energy of <200 keV from analysis of measured parallel momentum distributions.
206+x *8*		C	J^π: not $1/2^-$ from shell-model calculations (2017Mo26).
445+x *5*	$(3/2^+,5/2^+)$[‡]	BC	
619+x *7*	$(1/2^-,3/2^-)$[‡]	BC	
670+x *8*		BC	

[†] From Eγ values.
[‡] From measured parallel-momentum distribution and deduced L-transfer (2017Mo26).

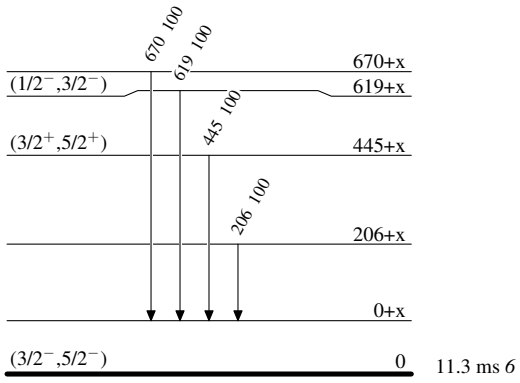
γ(^{35}Mg)

E_i(level)	J_i^π	E_γ	I_γ	E_f	Comments
206+x		206 *8*	100	0+x	New γ observed by 2017Mo26.
445+x	$(3/2^+,5/2^+)$	445 *5*	100	0+x	E_γ: weighted average of 443 *7* (2017Mo26) and 446 *5* (2011Ga15).
619+x	$(1/2^-,3/2^-)$	619 *7*	100	0+x	E_γ: weighted average of 616 *8* (2017Mo26) and 621 *7* (2011Ga15).
670+x		670 *8*	100	0+x	E_γ: from 2011Ga15. This γ is not resolved from the 616-keV in 2017Mo26, but its presence is indicated in the spectra.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{35}_{12}Mg_{23}$