

Adopted Levels, Gammas

$Q(\beta^-)=15753$ 10; $S(n)=859.8$ 87; $S(p)=2.344\times 10^4$ 60; $Q(\alpha)=-1.808\times 10^4$ 27

$Q(\beta^-), S(n), S(p), Q(\alpha)$: Deduced by the evaluator using mass excesses of 15529.5 71 for ^{35}Mg measured by [2025Ly01](#), and 8318 5 for ^{34}Mg ; a weighted average of 8323 7 ([2019As04](#)) and 8315 5 ([2025Ly01](#)); -224 7 for ^{35}Al , 31680 600 for ^{34}Na , and 31180 270 for ^{31}Ne from [2021Wa16](#). Values from [2021Wa16](#): $Q(\beta^-)=15860$ 270, $S(n)=750$ 270, $S(p)=23330$ 660, $Q(\alpha)=-17970$ 380.

$S(2n)=5576.0$ 76, $Q(\beta^-n)=10455.8$ 74, from mass excesses of 15529.5 71 for ^{35}Mg measured by [2025Ly01](#); 4962.9 27 for ^{33}Mg and -2997.6 21 for ^{34}Al from [2021Wa16](#). Values from [2021Wa16](#): $S(2n)=5470$ 270, $Q(\beta^-n)=10570$ 270.

$S(2p)=45070$ 660 (syst) ([2021Wa16](#)).

Isotope discovery ([2012Th10](#)): $\text{Ta}(^{48}\text{Ca}, X)$ projectile fragmentation at GANIL ([1989Gu03](#), [1991Or01](#)).

[2013StZY](#): ^{35}Mg produced by $^9\text{Be}(^{48}\text{Ca}, X)$ fragmentation at $E(^{48}\text{Ca})=345$ MeV/nucleon at RIKEN. Measured $T_{1/2}$ and delayed γ rays.

[2012Kw02](#): ^{35}Mg produced by $^9\text{Be}, ^{\text{nat}}\text{Ni}, ^{181}\text{Ta}(^{40}\text{Ar}, X)$ at $E(^{40}\text{Ar})=140$ 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.

[2011Ka01](#): ^{35}Mg produced by $^9\text{Be}(^{48}\text{Ca}, X)$ fragmentation at GSI. Measured interaction cross sections with C and CH_2 targets at 900 MeV/nucleon. Deduced rms matter radii.

[2011FuZZ](#): ^{35}Mg produced by $^9\text{Be}(^{48}\text{Ca}, X)$ fragmentation at $E(^{48}\text{Ca})=345$ MeV/nucleon at RIKEN. Measured thick target fragmentation and deduced production cross sections.

[2007Ts09](#): Analyzed fragmentation cross sections of ^{48}Ca beam on ^9Be and ^{181}Ta targets.

[2006Kh08](#): ^{35}Mg produced by $^{181}\text{Ta}(^{48}\text{Ca}, X)$ fragmentation at $E(^{48}\text{Ca})=60.3$ 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.

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

Mass measurements: [2025Ly01](#), [2007Ju03](#), [2001Sa72](#), [2000Sa21](#), [1991Or01](#).

Theoretical calculations (binding energies, deformation, quadrupole moments, radii, levels, J , π , mass, $T_{1/2}$, etc): [2023Ra22](#), [2021Ka07](#), [2020Mi15](#), [2016Ba59](#), [2016Sa46](#), [2016Sh05](#), [2015Sh21](#), [2014Ga13](#), [2014Wa14](#), [2013Ch31](#), [2013Li39](#), [2013Sh05](#), [2012Fo27](#), [2012Ho19](#), [2007Ha53](#), [2006Zh19](#), [2005Ch71](#), [2004Kh16](#), [1996Re10](#), [1991Pa19](#), [1991Pa21](#).

 ^{35}Mg LevelsCross Reference (XREF) Flags

- A ^{35}Na β^- decay (2.1 ms)
 B $^9\text{Be}(^{38}\text{Si}, ^{35}\text{Mg}\gamma)$
 C $\text{C}(^{36}\text{Mg}, ^{35}\text{Mg}\gamma), (^{37}\text{Al}, ^{35}\text{Mg}\gamma)$

$E(\text{level})^\dagger$	J^π	$T_{1/2}$	XREF	Comments
0	$(3/2^-, 5/2^-)$	11.3 ms 6	BC	<p>$\% \beta^- = 100$; $\% \beta^- n = 52$ 46; $\% \beta^- 2n = ?$ $\% \beta^- n$: From 2015Bi05 evaluation; originally from 2008ReZZ. Other: 52 11 (1999YoZW, preliminary). Theoretical $\% \beta^- 0n = 29$, $\% \beta^- 1n = 66$, $\% \beta^- 2n = 5$ (2021Mi17). Theoretical $\% \beta^- 0n = 65$, $\% \beta^- 1n = 32$, $\% \beta^- 2n = 3$ (2019Mo01). J^π: $3/2^-$ from shell-model calculations with the SDPF-M and SDPF-M+2p$_{1/2}$ interactions (2017Mo26). Near degenerate 30-keV $3/2^-$ and $5/2^-$ g.s. from Monte Carlo shell-model calculations with the SDPF-M interaction (2011Ga15), and $3/2^-$ g.s. from shell-model calculations with the SDPF-U interaction (2011Ga15). $3/2^-$ from projection of the odd-neutron angular momentum along the symmetry axis and parity of the wave function (2019Mo01). Others: $3/2^+$ from antisymmetrized molecular dynamics (AMD) calculations with the Gogny D1S force (2017Mo26). $T_{1/2}$: 11.3 ms 5 (stat) 4 (syst) (2013StZY, implant-β correlation). Other: 72 ms 43 (2008ReZZ, 1995ReZZ) and ≈ 9 ms (1999YoZW, implant-β correlation, preliminary).</p>

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{35}Mg Levels (continued)

<u>E(level)[†]</u>	<u>J^π</u>	<u>XREF</u>	<u>Comments</u>
			Theoretical $\% \beta^- 0n=29$, $\% \beta^- 1n=66$, $\% \beta^- 2n=5$ (2021Mi17). Theoretical $\% \beta^- 0n=65$, $\% \beta^- 1n=32$, $\% \beta^- 2n=3$ (2019Mo01). J ^π : $3/2^-$ from shell-model calculations with the SDPF-M and SDPF-M+2p _{1/2} interactions (2017Mo26). Near degenerate 30-keV $3/2^-$ and $5/2^-$ g.s. from Monte Carlo shell-model calculations with the SDPF-M interaction (2011Ga15), and $3/2^-$ g.s. from shell-model calculations with the SDPF-U interaction (2011Ga15). $3/2^-$ from projection of the odd-neutron angular momentum along the symmetry axis and parity of the wave function (2019Mo01). Others: $3/2^+$ from antisymmetrized molecular dynamics (AMD) calculations with the Gogny D1S force (2017Mo26). T _{1/2} : 11.3 ms 5 (stat) 4 (syst) (2013StZY, implant-β correlation). Other: 72 ms 43 (2008ReZZ, 1995ReZZ) and ≈9 ms (1999YoZW, implant-β correlation, preliminary). Reduced strong absorption radius=1.64 fm ² 15 from 2006Kh08. The rms matter radius=3.40 fm 24 (2011Ka01).
0+x		BC	E(level): x≤80 keV (2011Ga15 detection threshold); x≤200 keV (2017Mo26 detection threshold). J ^π : Shell-model calculations with the SDPF-M+2p _{1/2} interaction predict a $1/2^-$ level at 141 keV (2017Mo26). Shell-model calculations with the SDPF-M interaction predict a $5/2^-$ level at 84 keV (2017Mo26). Monte Carlo shell-model calculations with the SDPF-M interaction predict a $3/2^-$ level at 30 keV (2011Ga15).
0+y?		C	XREF: C(?) E(level): y≤200 keV (2017Mo26 detection threshold). 2017Mo26 suggested a low-lying L=3 level from the observed L=3 component in the inclusive parallel momentum distribution.
206+x 8		C	J ^π : 2017Mo26 stated that based on the observed weak γ-ray intensity, this level is not the $1/2^-$ level at 141 keV predicted by shell-model calculations with the SDPF-M+2p _{1/2} interaction.
445+x 5	(3/2 ⁺ , 5/2 ⁺)	BC	J ^π : L(³⁶ Mg, ³⁵ Mg)=(2) from 0 ⁺ . $3/2^+$ from shell-model calculations with the SDPF-M+2p _{1/2} interaction (2017Mo26).
619+x 7	(1/2 ⁻ , 3/2 ⁻)	BC	J ^π : L(³⁶ Mg, ³⁵ Mg)=(1) from 0 ⁺ . $3/2^-$ from shell-model calculations with the SDPF-M+2p _{1/2} interaction (2017Mo26).
670+x 8		BC	

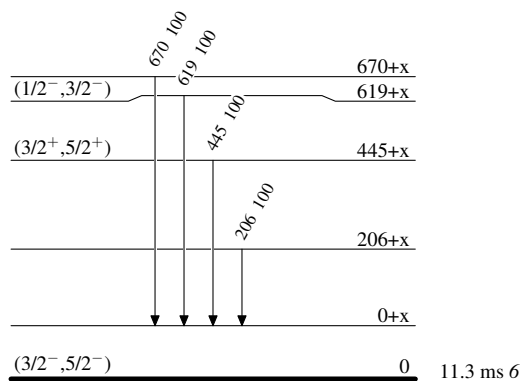
[†] From E_γ data in (³⁸Si, ³⁵Mgγ) and (³⁶Mg, ³⁵Mgγ), (³⁷Al, ³⁵Mgγ).

γ(³⁵Mg)

<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_γ</u>	<u>I_γ</u>	<u>E_f</u>	<u>Comments</u>
206+x		206 8	100	0+x	
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, as this γ is not resolved from the 616γ in 2017Mo26, but its presence is indicated in the fit of the spectrum. 2017Mo26 stated that the origin of the 670γ remained vague.

Adopted Levels, Gammas**Level Scheme**

Intensities: Relative photon branching from each level

 $^{35}_{12}\text{Mg}_{23}$