

^{34}Mg β^- n decay (44.9 ms) [2017Li03,1984La03](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 199,1 (2025)	30-Sep-2024

Parent: ^{34}Mg : $E=0$; $J^\pi=0^+$; $T_{1/2}=44.9$ ms 4; $Q(\beta^-n)=8749$ 30; $\% \beta^-n$ decay=21 7

^{34}Mg - $T_{1/2}$: From $\beta\gamma(t)$ in [2017Li03](#). Other: 20 ms 10 ([1984La03](#)).

^{34}Mg - $Q(\beta^-n)$: From [2021Wa16](#).

^{34}Mg - $\% \beta^-n$ decay: $\% \beta^-n=21$ 7 ([2017Li03](#)) for the decay of ^{34}Mg . Other: $\% \beta^-n=68$ 12 ([1999YoZW](#), preliminary value).

[2017Li03](#): ^{34}Mg source was produced in U(p,X) with $E=1.4$ GeV protons from the Proton Synchrotron Booster at ISOLDE-CERN and using UC_x target. Mg atoms were selectively ionized using resonance ionization laser ion source (RILIS), accelerated to 40 keV, then $A=34$ ions selected by the ISOLDE General Purpose Separator, and finally deposited on a movable tape located at the ISOLDE decay station. γ rays were detected with five HPGe clover detectors and β particles were detected with a plastic scintillator. Measured E_γ , I_γ , E_β , I_β , $\beta\gamma$ -coin, $\beta\gamma\gamma$ -coin, $\beta\gamma(t)$. Deduced levels, J , π , β -decay branching ratios, $\log ft$ for ^{34}Mg decay. Comparison with large-scale shell-model calculations using the SDPF-U-MIX interaction.

[1984La03](#): ^{34}Mg source was produced in Ir(p,X) with $E=10$ GeV protons from the CERN proton-synchrotron. β particles were detected with a thin plastic scintillator and β -delayed neutrons were detected with a 4π liquid scintillator. Measured $E(n)$, $I(n)$, βn -coin, $\beta n(t)$. Deduced parent half-life, β -delayed neutron emission probabilities.

Other: [1999YoZW](#) (preliminary report): measured $\% \beta^-n$, half-life.

 ^{33}Al Levels

$E(\text{level})^\dagger$	J^π^\ddagger	$T_{1/2}$	Comments
0.0	$(5/2)^+$	41.5 ms 1	$T_{1/2}$: from the Adopted Levels.
1618.3	$(5/2)^+$		
2097.7	$1/2^+$		

† From E_γ data.

‡ From the Adopted Levels.

 $\gamma(^{33}\text{Al})$

I_γ normalization: From 100/ $\% \beta^-n$.

E_γ^\dagger	I_γ^\ddagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
1618.3	13 5	1618.3	$(5/2)^+$	0.0	$(5/2)^+$	I_γ : intensity per 100 decays of ^{34}Mg (2017Li03). E_γ : from spectral Fig. 1a in 2017Li03 .
2097.7		2097.7	$1/2^+$	0.0	$(5/2)^+$	

† From [2017Li03](#). Those transitions are assigned to ^{33}Al but not placed in [2017Li03](#). Placements are from the Adopted Levels, Gammas.

‡ Absolute intensity per 100 decays.

Delayed Neutrons (^{33}Al)

$E(^{33}\text{Al})$	$I(n)^\dagger$	Comments
1618.3	13 5	$I(n)$: from $I_\gamma(1618.3\gamma)$.

† Absolute intensity per 100 decays.

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Decay SchemeIntensities: I_γ per 100 parent decays