

$^1\text{H}(^{23}\text{Mg},\gamma)$ 2010Er02

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia, Anagha Chakraborty		NDS 186, 2 (2022)	31-Mar-2022

Adapted from XUNDL dataset compiled by J. Chen and B. Singh (McMaster), May 12, 2010.

H_2 target. Radioactive ^{23}Mg beam of peak intensity $5 \times 10^7 \text{ s}^{-1}$ produced at the ISAC facility at TRIUMF by bombarding a series of silicon-carbide/graphite composite foils with a 500-MeV proton beam at $35 \mu\text{A}$. $A=23$ products were selected using a high-resolution mass separator and accelerated to the beam energies of interest using the ISAC accelerators and the beam was guided through the windowless re-circulating hydrogen target at DRAGON. Prompt γ -rays were detected in an efficient 30-element bismuth germanate (BGO) hexagonal detector array surrounding the gas target cell and recoils were identified using a combination of local time-of-flight measurement with a dual micro-channel plate (MCP) system and a ΔE - E measurement using an isobutane-filled segmented ionization chamber. Measured yield of recoil-coincident γ -rays from proton captures. Deduced resonance energy and resonance strength for the resonance at $E_{\text{R}}=485.7 \text{ keV}$ for the first time. Deduced new reaction rates of $^{23}\text{Mg}(p,\gamma)^{24}\text{Al}$ at temperatures of astrophysical interest.

 ^{24}Al Levels

E(level)	Comments
2346.6 15	E(level): deduced from $S_{\text{p}}(^{24}\text{Al})+E_{\text{R}}$. $E_{\text{R}}=482.5$ 15: weighted average of 485.7 +13-18 (2010Er02), 482.1 20 (2010Wr02), and 480.8 14 (2015Ch58) and $S_{\text{p}}=1864.11$ 23 (2021Wa16). Resonance strength: $\omega\gamma=0.038 \text{ eV}$ +21-15.