

Measurement of the $^{94}\text{Mo}(p,\gamma)^{95}\text{Tc}$ cross section



This work measured the reaction $^{94}\text{Mo}(p,\gamma)^{95}\text{Tc}$ in the energy range of $E_{\text{c.m.}} = 1.5$ to 4.5 MeV. The cross section was carefully mapped out in step sizes ranging from 10 to 50 keV. In order to measure the lower energy points a new filtering method had to be developed to separate out the sum peak of interest from the $^{19}\text{F}(p,\alpha\gamma)^{16}\text{O}$ lines. Then the method for calculating the summing efficiency had to be adapted to account for the use of the filter on the data. With these new methods, excellent agreement with the past measurements is seen.

Additionally, this work provides a much more detailed scan of the $^{94}\text{Mo}(p,\gamma)^{95}\text{Tc}$ reaction across the entire Gamow window for the γ -process. The detailed mapping allowed for the confirmation of resonance-like structures around 2 MeV. The reaction rate was then calculated by numerically integrating the measured cross sections. The resonance-like structures were found to increase the reaction rate at low temperatures.

