MEASUREMENT OF THE 58NI(A,G)62ZN REACTION AND ITS ASTROPHYSICAL IMPACT

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In the innermost layers of type Ia supernovae, temperatures and densities are high enough that the material reaches nuclear statistical equilibrium. Due to the rapid expansion of the ejecta, a significant portion of this material undergoes an alpha-rich freeze-out which creates a mixture of iron-group nuclei and free alpha particles. Therefore, accurate alpha-induced reaction rates on nuclei in the iron region are important for a full understanding of the nucleosynthesis in type Ia supernovae. One such reaction, the 58Ni(a,g)62Zn reaction, was identified in a recent sesitivity study to have an impact on the final abundances of 62Ni, 63Cu, and 64Zn. Cross section measurements of this reaction were performed at the University of Notre Dame using the NSCL SuN detector. The experimental results and comparison to Hauser-Feshbach calculations will be presented. The impact of using the new reaction rates in type Ia supernova nucleosynthesis models will also be discussed.