

The s process and its relation to explosive nucleosynthesis

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Abstract

Considerable effort in experimental nuclear astrophysics, stellar modelling, and observations led to an improved understanding of various nucleosynthesis scenarios in the last decades. This is particularly true for the main s process in low-mass AGB stars, which is largely responsible for the production of about half of the elemental abundances in the mass range $90 \leq A \leq 209$. The weak s process, which produces elements with $A \leq 90$, however, is much less understood. Since this process operates in massive stars it is ultimately linked with the abundance contributions of explosive nucleosynthesis in supernovae (SN II). In this field more accurate neutron capture cross sections in the mass range $56 \leq A \leq 90$ are indispensable for meaningful comparison of model predictions with observational data. The more abundant light elements with $A < 56$ play an important role, since they act as neutron poisons and affect the neutron balance in the star. In this context, new results for neutron capture cross sections on light and medium mass nuclei will be presented and new experimental developments in this field will be discussed.