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Measurement of the p-process branching point reaction 76Se(α,γ)80Kr at DRAGON

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The photo-disintegration process (*p*-process) is thought to be the primary method by which the rare *p*-nuclides (stable isotopes that cannot be produced by either the slow (*s*) or rapid (*r*) neutron capture processes) are produced. This process occurs in the high temperature environments in the late stages of massive stars and in their subsequent explosion as core collapse supernovae. Recent work to explore and expand the capabilities of the DRAGON recoil separator to beams of mass A > 40 has enabled us to make our first measurement of an important *p*-process reaction: ⁷⁶Se(α,γ)⁸⁰Kr. This reaction is of particular interest as ⁸⁰Kr is a possible branching point of the *p*-process. The relative reaction rates of the ⁸⁰Kr(γ,α)⁷⁶Se, ⁸⁰Kr(γ,n)⁷⁹Kr, and ⁸⁰Kr(γ,p)⁷⁹Br will determine the reaction flow from this point, which in turn affects the resulting abundance of p-nuclide ⁷⁸Kr. This measurement and its implications, as well as the preliminary high mass tests. will be discussed.

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