Alpha Induced Thick Target Yield Measurement ON Iridium Isotopes

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The stable proton-rich nuclei between Se and Hg are the so called p-nuclei [1]. The main stellar mechanism synthesizing these nuclei - the so called γ process - is initiated by (γ,n) photodisintegration reactions on preexisting neutron-rich seed nuclei [2]. As the neutron separation energy increases along the (γ,n) path towards more neutron deficient isotopes, (γ,p) and (γ,α) reactions become stronger and process the material towards lower masses.
To calculate the p-nuclei abundance, the reaction rates involved in the γ process have to be known. Stellar rates for (γ,α) photodisintegration reactions should always be derived from alpha-capture to maximize the experimental constraint on the rate [3,4]. Above the A>100 region very few (α,γ) cross sections relevant for the γ process were measured [5,6]. This way, the γ process network calculations rely mostly on theoretical cross sections calculated using the Hauser-Feshbach statistical model.
By the measurement of thick target yield of α induced reactions on iridium, the reliability of the statistical model calculations in this heaviest mass range is checked. The thick target yield of four reactions /^{191}Ir(α,γ)^{194}Au, ^{191}Ir(α,n)^{195}Au, ^{193}Ir(α,n)^{196m2}Au, ^{193}Ir(α,n)^{196}Au/ was determined in the energy range of E_α = 13.4 - 17 MeV by the activation technique using γ- and X-ray counting. Preliminary results of the measurements will be presented.

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