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Alpha induced reaction cross section measurements on ^{197}Au

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\AUTHORS{\underline{T. Sz\"ucs}, Gy. Gy\"urky, Z. Hal\'asz, G.\,G. Kiss, Zs. F\"ul\"op}

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There are a few dozens of isotopes on the proton rich side of the valley of stability which cannot be produced by neutron capture reactions as the majority of the heavy nuclei. These are the so called p-nuclei [1], which are produced mainly via the γ-process [2].
The stellar reaction rate of photoemission of an alpha particle from a heavy nuclei is of crucial importance in the γ-process network calculations in the heavy mass range. These rates are usually derived from statistical model calculations, which need to be validated.
To maximize the experimental constrain on the stellar rate of the photodisintegration reactions, those should be derived from the inverse radiative alpha-capture reaction cross sections [3,4].

This work presents alpha capture reaction cross section measurements on ^{197}Au. In the investigated energy range beside the radiative capture, the (α,n) and (α,2n) reactions take also place. Even if the neutron emitting reactions have no direct impact in the γ-process network calculations, their measured cross sections constrain the statistical model calculations.
Since the reaction products are radioactive the activation technique was employed in this work using γ- and X-ray countings [5].
Even if this isotope is above the range of the γ-process, it is well suited for testing the statistical model calculation in the heavy mass range.

Preliminary results will be presented and compared with literature data and standard statistical model calculation e.g. [6].

\bigskip
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\noindent [1] M. E. Burbidge \textit{et al.}, Rev. Mod. Phys. \textbf{29}, 547 (1957);

\noindent [2] S. E. Woosley and W. M. Howard, Astrophys. J. Suppl. \textbf{36}, 285 (1978);

\noindent [3] G. G. Kiss et al., Phys. Rev. Lett. \textbf{101}, 191101 (2008);

\noindent [4] T. Rauscher et al., Phys. Rev. C \textbf{80}, 035801 (2009);

\noindent [5] G. G. Kiss et al., Phys. Lett. B \textbf{695}, 419 (2011);

\noindent [6] T. Rauscher and F-K. Thielemann, At. Data Nucl. Data Tables \textbf{79}, 47 (2001).

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