

## ACTIVATION OF GOLD AND THORIUM SAMPLES TO SPALLATION NEUTRONS AT JINR NUCLOTRON

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### Abstract

For the design of Thorium based Accelerator Driven Sub-critical Systems (ADS) experimental data of cross-sections of  $\text{Th}^{232}(n,\gamma)$  and  $(n,xn)$  reaction at high energy are very rare and even the evaluated data<sup>7)</sup> are available only up to ~ 20 MeV. According to the simulation codes there are nearly, 12% of spallation neutrons have energy greater than 20 MeV. We have irradiated small ( $3.2 \times 2.5 \text{ cm}^2$ ) thin sample of  $\text{Th}^{232}$  to spallation neutrons and Co-, In-, Bi-, Au-, and Ta- samples to the moderated neutrons at JINR in December 2002. Assuming that neutron flux is given by the Dubna Cascade code, we have estimated partial cross-sections (spectral) of  $\text{Th}^{232}(n,g)$ ,  $\text{Th}^{232}(n,2n)\text{Th}^{231}$ ,  $\text{Th}^{232}(n,5n)\text{Th}^{231}$  and similarly  $\text{Au}^{197}(n,g)\text{Au}^{198}$  and  $\text{Au}^{197}(n,xn)$  reactions through gamma spectroscopy for the prominent gamma peaks. Efforts are being made to estimate the neutron flux by unfolding methods.