Contribution ID: **441** Type: **Oral talk (15 min + 5 min questions)**

PROTON INDUCES PROCESSES ON STRONTIUM ISOTOPES

Tuesday, 12 July 2022 17:50 (20 minutes)

In this study, proton capture and (p,xn) nuclear reactions on natural isotopes of Sr were investigated at incident protons up to 30-35 MeV. Taking into account all nuclear reaction mechanisms, cross sections, angular distributions, and isotope productions have been analyzed. A Hauser-Feshbach formalism was employed to describe compound processes, an approximation of Distorted Wave Born Approximation for direct mechanisms, and an exciton model to explain pre-equilibrium processes [1-3]. In this study, the contribution of the nuclear reactions mechanisms to the cross sections and angular distributions is discussed. These theoretical evaluations were compared with experimental data from literature and with those obtained from FLNP JINR Dubna facilities. Experimental data of fast proton-induced reactions are consistent with theoretical results. Based on the good agreement between theoretical and experimental results, it was possible to derive the dependence of the isomer ratios on the protons' energy. Several calculations use isotope ratios to evaluate spin distributions of reaction products, densities of nuclear states, and nuclear deformation in final states. Computer simulations were conducted to evaluate the production of Yttrium, Rubidium, and other isotopes using angular distributions of incident protons for different targets and intensities of incident protons. Calculations for isotopes and isomer production were compared with experimental data gathered from the literature.
For future experiments at JINR's Dubna facilities involving fast neutron induced reactions, the present data will be used.

1. W. Hauser, H. Feshbach, Phys. Rev, 87, 366 (1952).
2. N. Austern, Direct Nuclear Reaction Theories, New-York, Willey-Interscience (1970).
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The speaker is a student or young scientist

No

Section

1. Experimental and theoretical studies of nuclear reactions

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