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Proton-Induced Energy-Dissipation Reactions on ⁹³Zr at 27 MeV/u in Inverse Kinematics

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Nuclear reactions induced at a few tens of MeV/u are generally governed by the compound and pre-equilibrium processes. During these processes the kinetic energy of a projectile is dissipated into other nucleons in a target. Such energy-dissipation reactions are expected to be a useful tool to produce neutron-deficient nuclei. The present experiment studied the ⁹³Zr+p reaction at 27 MeV/u under inverse kinematics, and the production cross sections for each isotope were measured. The large production cross sections of a few hundred mb were measured for ^{91,92}Nb expected to be important in nuclear transmutation. Alpha-emission channels producing yttrium isotopes were observed as well. The global reaction code TALYS reproduced the measured results and confirmed the primary reaction mechanisms were the compound and pre-equilibrium processes. In this poster presentation we will report the experimental details, the preliminary results of the recent experiment on ⁹³Zr+p, and the possible interpretation of the results.

Experimental study on nuclear physics

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