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Measurement of $^{130}\mathrm{Sn}(d,p)$ and $^{130}\mathrm{Te}(d,p)$ reactions with TiNA for Neutron Capture Rate in r-process Nucleosynthesis

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Neutron capture rate on neutron-rich nuclei is one of the most uncertain nuclear physics parameters to understand the r-process nucleosynthesis in the universe. According to the network simulation of the nucleosynthesis, the neutron capture on $^{130}\mathrm{Sn}$ significantly affects the final abundances of the r-process. To reduce the uncertainty, we performed the experiment to study the neutron capture rate of $^{130}\mathrm{Sn}$ using the surrogate ratio method at the BigRIPS-OEDO beamline in RIKEN's RIBF. In this experiment, we measured $^{130}\mathrm{Sn}(d,p)$ and $^{130}\mathrm{Te}(d,p)$ reactions separately in inverse kinematics to determine the ratio of the gamma emission probabilities from the respective unbound states. The protons recoiled from the CD_2 solid target were detected by a recoil particle detector array, TiNA.
The present status of the analysis will be discussed.

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