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## First success of RI-beam separation and particle identification for nuclei with atomic number $Z > 82$ at RIKEN RI beam factory

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A wide variety of RI beams can be produced from the  $^{238}\text{U}$  primary beam with 345 MeV/u at RIBF. The RI beam production of heavy isotope, especially  $Z > 82$ , becomes complicate and difficult, because the charge state can change in any beam-line materials at this energy. The RI beam separation in the fragment separator is affected not only by  $Z$  and  $A$ , but also by the charge state in the separator. The purification of the RI beam becomes worse because a different RI beam is selected for a different charge state, i.e. fully stripped or hydrogen-like ion etc.

We considered the RI beam separation in case many charge state combinations are possible. It was found that the RI beam can be well purified against main contaminants of the fission fragments and the primary beam when the proper charge state combination is selected.

The RI beams around  $^{208}\text{Rn}$  were produced from the  $^{238}\text{U}$  primary beam to verify our consideration. The main contaminants were surprisingly well eliminated. The particle identification was also succeeded by the measured information without a total kinetic-energy detector, thus the RI beam is ready for the use of secondary reaction studies. In this conference, the considered principle of RI beam separation and the experimental details will be presented.

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