

Mass measurements of neutron-rich In isotopes in the $A \approx 130$ region across the $N=82$ neutron shell at TITAN, TRIUMF

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The atomic masses of exotic nuclei provide key information for the understanding of nuclear structure and astrophysics. Exotic nuclei can be produced with very high rates at the ISOL facility ISAC at TRIUMF (Vancouver, Canada). TRIUMF's Ion Trap for Atomic and Nuclear Science (TITAN) is a multiple ion-trap system for high-precision mass measurements and in-trap decay spectroscopy. A multiple-reflection time-of-flight mass spectrometer (MR-TOF-MS) has been installed and integrated into the TITAN experiment. It is based on an established concept tested at the FRS Ion Catcher at GSI. It is well suited to perform high precision mass measurements, particularly for short-lived isotopes produced at low rate. Furthermore, the ion of interest can be separated from isobaric contaminations with mass-selective re-trapping prior to the mass measurement itself, thus improving the background handling capabilities of the MR-TOF-MS. Such improved capabilities of TITAN have been used to measure the masses of neutron-rich indium isotopes. The new mass values will reduce the nuclear uncertainties associated with the production of $A \approx 130$ isotopes in the r-process.