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Nuclear structure below ^{100}Sn studied by mass spectrometry

Mass spectrometry is a versatile and sensitive probe for studying the nuclear structure and decay properties of nuclei. The FRS Ion Catcher at GSI in Germany is a setup for high-accuracy mass spectrometry of projectile fragmentation by using the Multiple-Reflection Time-Of-Flight Mass Spectrometer (MR-TOF-MS) technique. An MR-TOF-MS enables highly accurate, fast and sensitive measurements of nuclei with very low yields and short half-lives, far away from the valley of stability.

One of the interesting regions under investigation is in the medium-heavy and neutron-deficient side of nuclides below the doubly-magic ^{100}Sn nucleus. The region is known with a resonance in Gamow-Teller transitions due to the large Q_{EC} values close to the proton drip-line and also the special configurations of the nucleons in $1g_{9/2}$ and $1g_{7/2}$ orbitals near the $Z = N = 50$ shell closure.

In this contribution, we present mass measurements of nuclei near $N = 50$, Gamow-Teller strength calculations for the even-even isotones at $N = 50$, and new assignments of isomeric and ground states. This includes the first direct mass measurement of ^{98}Cd ground state and the discovery of new low-lying isomeric states of ^{97m}Ag [1] and ^{94m}Rh together with the shell model calculations for spin parity assignments. The discovery of ^{97m}Ag constitutes the first measurement of a nuclear isomeric state using the MR-TOF-MS technique.

[1] C. Hornung et al., Physics Letters B 802 (2020)

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