

Beta Decay Studies of Proton Rich Nuclei, an important ingredient for rp-process calculations.

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We have performed a series of beta-decay experiments at fragmentation facilities on $T_z=-1/2$, $T_z=-1$ and $T_z=-2$ nuclei. Most of these nuclei lie on the rp-process path and therefore some of the quantities we have measured such as $T_{1/2}$ values are important ingredients in performing reaction flow calculations for light curve estimates and testing astrophysical models of X-ray bursters. At this conference we have presented the results of measurements of $T_{1/2}$ values for 25 nuclei and compared with previous values.

KEYWORDS: rp-process, beta decay experiments, fragmentation facilities.

1. Introduction, experiments and results

Many of the heavier neutron-deficient nuclei are thought to be produced in the astrophysical rp-process. The site of the rp-process is thought to be on the surfaces of neutron stars where H and He from a companion star are accreting. It occurs during the repeated thermonuclear flashes, called X-ray bursts. There have been many attempts to model X-ray bursters, partly because it might help us to understand the properties of neutron stars. To test such astrophysical models requires a solid and reliable foundation of measurements of the properties of nuclear reactions and decays along the rp-process pathway. Among these properties the decay half-lives are important.

Here we present a brief summary of the results we have obtained at different fragmentation facilities, namely GSI-Darmstadt, GANIL-Caen, RIKEN-Nishina Center-Tokyo on the beta decay of proton rich nuclei. A summary of the nuclei analysed so far are presented in Tables I-V.

The first experiment was performed at GSI, as part of the Stopped-beam RISING campaign. The