

$T_Z = -1$ and $T_Z = -2$ β -decay studies using ^{78}Kr fragmented beams at BigRIPS, part II

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Spin-isospin excitations can be studied by beta-decay and charge exchange reactions in mirror nuclei, shedding light on mirror symmetry, hence we can compare our results on the beta decay of proton-rich nuclei with the results of charge exchange experiments when appropriate targets for the mirror nuclei are available¹⁾. Accordingly we have performed experiments at GSI and GANIL to study $T_Z = -1$ ²⁾ and $T_Z = -2$ ^{3,4)} nuclei respectively where it became clear that the study of heavier, more exotic systems, demands beam intensities available only at the RIKEN Nishina Center. We have performed an experiment using the fragmentation of a 345 MeV·A ^{78}Kr beam with typical intensity of 200 particle nA on a Be target. The fragments were separated in flight using the BigRIPS separator and implanted in three WAS3ABi double-sided Si strip detectors. The implantation setup was surrounded by the EUROBALL-RIKEN Cluster Array (EURICA). The description of the experiment is explained in another contribution to this progress report with the same title called part I. In this contribution the particle identification plot is also presented. Here we present the preliminary analysis of the $t_{1/2}$ values of ^{58}Zn and ^{66}Se with improved accuracy and a new $t_{1/2}$ value for ^{64}Se parent nuclei carried out using correlations between the selected ion (setting conditions on the particle identification plot) and the characteristic γ rays of the daughter nuclei measured with the EURICA array in prompt coincidence with β -signals in the same DSSSD pixel. Preliminary results presented in Figs 1 and 2 give an impression of the quality of the data. Further analysis is in progress.

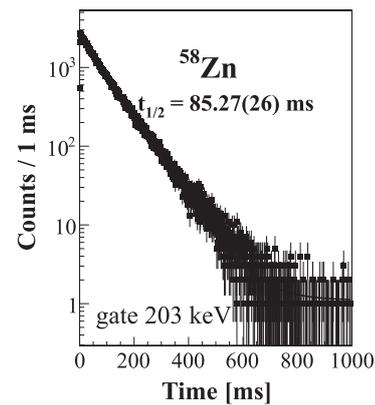


Fig. 1. Time correlations between ^{58}Zn implanted ions in WAS3ABi and the 203 keV γ rays detected in EURICA. The solid line represents the fit to the decay curve.

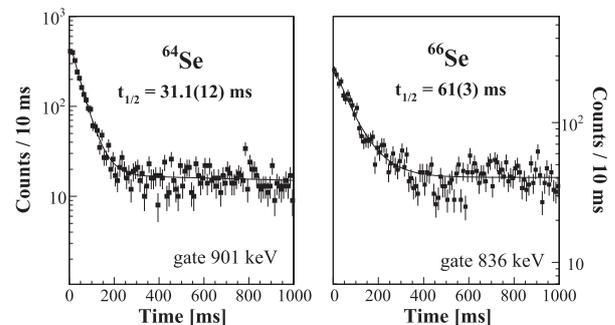


Fig. 2. Time correlations between ^{64}Se (left) and ^{66}Se (right) ions implanted in WAS3ABi and 901 and 836 keV γ rays respectively detected in EURICA. The solid lines represents the fit to the decay curves.

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