Results on ^{64}As decay measured at BigRIPS

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We have performed an experiment at RIKEN to study the decay of the $Tz = -2$ exotic nucleus ^{64}Se. Some preliminary results have been presented in Refs. 1) and 2). As shown in in Fig. 1 several nuclei are produced in the decay chain of ^{64}Se. This includes the $Tz = -1$ ^{64}As, where little is known and there is no information on the β delayed protons. Fortunately ^{64}As is produced directly in the primary reaction. By placing the implantation condition on ^{64}As we have obtained an improved value for the $T_{1/2}$ and the first experimental information on the β delayed protons.

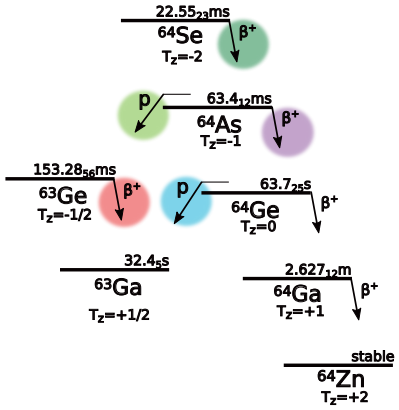

Fig. 1. Scheme showing the full decay chain of ^{64}Se. Pink colour indicates ^{64}As, the nucleus study in the report.

Both ^{64}Se and ^{64}As were produced in the fragmentation of a 345 MeV/u ^{78}Kr beam with typical intensity of 200 pnA on a Be target. The fragments were separated in flight using BigRIPS and implanted in WAS3ABi double-sided Si strip detectors. The implantation setup was surrounded by the Ge Array (EURICA).

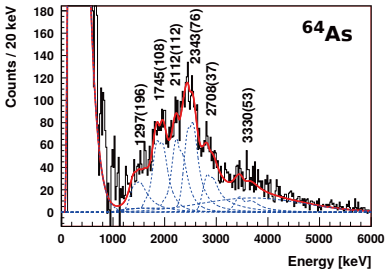

Fig. 2. Preliminary results on the β delayed protons emitted in the decay of ^{64}As using the implantation condition on ^{64}As (see text).

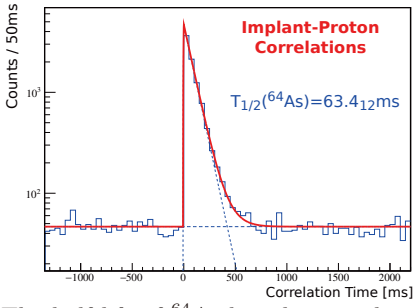

Fig. 3. The half life of ^{64}As based on implant-proton correlations using the implantation condition on ^{64}As.

In Figs. 2 and 3 we present the first experimental spectrum of the β delayed protons and the fit of the $T_{1/2}$ of ^{64}As derived from the correlations between the implanted ^{64}As ions in WAS3ABi and the particle decay in the same pixel. The proton spectrum was calibrated as in Ref. 2) and the $T_{1/2}$ analysis is described in Ref. 1). Information on the β delayed γ rays of ^{64}As is presented in a separate contribution to this Accelerator Progress Report.

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References

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