THE PRODUCTION OF ^{91}NB FOR A MEASUREMENT OF THE ^{91}NB(p,γ) REACTION AT FRANZ

Benedikt Thomas, Philipp Erbacher, Jan Glorius, Markus Reich, Anne Sauerwein, Stefan Schmidt, and Kerstin Sonnabend

Institut für Angewandte Physik, Goethe University Frankfurt, D-60438 Frankfurt a.M., Germany

With the high proton current delivered by the HF-linear-accelerator FRANZ which is currently built at Goethe University Frankfurt, Germany, it will be possible to perform measurements in direct kinematics of (p,γ) and (n,γ) reactions using targets with a limited amount of target nuclei. This is the case, *e.g.*, if the reaction to be studied starts with a radioactive nucleus which does not naturally exist on earth.

One example for such a nucleus is ^{91}Nb where the radiative proton-capture reaction is of special interest for the production of the most abundant *p* nucleus ^{92}Mo in thermonuclear supernovae. The goal of our investigation is the determination of the cross section of the ^{91}Nb(p,γ)^{92}Mo reaction at 2 MeV proton energy and thereby in the astrophysically relevant region.

To perform this measurement, ^{91}Nb has to be produced in a sufficient amount. One possible way is the activation of an enriched ^{92}Mo sample with protons of 20 MeV energy. The dominant reaction channels at this energy – (p,2n), (p,pn), and (p,2p), respectively – all end in ^{91}Nb if subsequent β decays are taken into account. None of the other open reaction channels are thought to produce a significant amount of other Nb isotopes. Thus, it should be possible to produce both a sufficient amount of ^{91}Nb and a sufficiently clean probe.

We will present our first steps towards a controlled production of 91Nb.

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