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CROSS SECTION MEASUREMENTS OF LIGHT ION PRODUCTION USING (P,XP) REACTIONS

Neutron-rich beams are being developed at iThemba LABS to study nuclear structure away from stability. This is also the opportunity of deepening our understanding of astrophysical origin of elements. The interest of using (p,xp) reactions in the production of exotic nuclei, lies in the fact that proton beams have a large penetrating power and can be produced with high intensity. Some measurements have been performed at iThemba LABS using, 7Li, 9Be and natB targets with proton projectiles of energy 50 MeV and 66 MeV. The detection setup included two electron spectrometers composed of a 5mm thick plastic scintillator, for energy loss measurement, and a thin window Germanium detector (LEPS) for residual energy measurement. The E- ΔE technique with this combination of detectors allows particle identification and high-resolution measurement simultaneously. Lanthanum Bromide detectors where also used to measure gamma particles. Some preliminary results will be presented. Beryllium and Boron are chosen here because they can be used in oxide, carbide or nitride form that can sustain large temperature amplitudes and therefore can be used in place as Uranium carbide in the current design of the ISOL source of iThemba LABS. This is important as there is no significant cost or resources implications. In addition, light targets produce a lot less species which makes debugging easier. The results of this investigation will be used to evaluate the feasibility of light neutron rich beams at iThemba LABS.

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