MEASUREMENT OF ⁹BE(³HE,P₁)11B NUCLEAR REACTION CROSS SECTIONS AT ENERGY RANGE 0.5–2.35 MEV

N. CATARINO^a, E. ALVES^a, R. MATEUS^a, J. CRUZ^b

^aIPFN, Instituto Superior Técnico, U. Lisboa, 1049-001 Lisboa, Portugal ^bLIBPhys- UNL, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, Monte da Caparica, 2892-516 Caparica, Portugal

The interaction between the plasma and the wall materials in a fusion reactor is the key factor in determining the useful life of the wall components. This interaction includes the erosion and redeposition of material in the plasma-facing wall, accompanied by the formation of alloys from the different materials present. These processes are critical for the retention of hydrogen isotopes by the wall materials. Determining the amount and the depth profile of Be and other elements is crucial for understanding those phenomena making the knowledge of its cross sections essential for ion beam analysis of these systems.

The discrepancies and lack of knowledge on fundamental parameters required for ion beam techniques, raised the need to fill the gaps in the experimental data base of the nuclear differential cross-section reactions induced by ³He in ⁹Be. In this work we determined the ⁹ For ⁹Be(³He,p_x)¹¹B (i = 0 - 9) cross-sections, obtained using a thin beryllium film target at the backscattering angles between 110° and 165° with a 5° step and in the energy range between 1.0 and 2.5 MeV, which is the relevant energy range for the ion beam tchniques. The results were compared with the two previous studies in the same energy range. The results are in very good agreement with one of these studies and were benchmarked with the measurement of thick target reaction yields from a pure beryllium target at 2.0 MeV for 115°, 135° and 155°.