

BN and SiO₂ as targets for proton-induced reactions on gaseous elements: N and O

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Oxygen, carbon and nitrogen are the main ingredients of human tissue beyond hydrogen ($\sim 62\%$ of atoms). The proton-induced reactions on those light nuclei often lead to the production of relatively short lived β^+ emitters ($T_{1/2} \simeq 2 - 20$ minutes) [1], which may be used for on-line PET diagnosis during hadron therapy with proton beam (kinetic energies below ~ 230 MeV). While the reaction on carbon leading to the production of ^{11}C has been extensively studied, the cross section for reactions on nitrogen and oxygen are not sufficiently known, particularly at proton energies above few tens of MeV. Nitrogen and oxygen, as gaseous elements, are much more difficult targets compared to carbon. This contribution presents the experiments, where solid BN [2] and SiO₂ targets were used to study the reactions induced by protons below 60 MeV, delivered by the AIC-144 cyclotron of the Institute for Nuclear Physics in Cracow.

[1] P. Sękowski *et al.*, Acta Phys. Pol. A **139** (2021) 454-456.

[2] P. Sękowski *et al.*, AIP Conf. Proc. **2778** (2023) 050005-1.