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Orientation Effect in d(d,n)3He Reaction Initiated by 20 keV Deuterons at Channeling in Textured CVD – Diamond Target

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In Ref. [1] the authors investigated the neutron yield in the d(d,n)3He reaction using textured CVD-Diamond and 20 keV deuteron beam from HELIS accelerator which delivers the deuteron beam with small angular and energy divergences. The authors of [1] suggested that the observed enhancement of neutron yield is connected both with the screening and channeling effects.

To clarify the role of channeling in enhancement of neutrons yield in d(d,n)3He reaction in CVD-Diamond crystal target, we present here the results of computer simulations. The deuterons trajectories in a CVD microcrystal are simulated using the computer code Basic Channeling with Mathematica[™] (BCM-1) [2], which allows calculate angular and spatial distribution of channeled particles in a thin crystals, see e.g. [3]. The simple model to calculate the reaction yield revealed the remarkable orientation effect directly connected with flux-peaking of deuterons in a crystal. The comparison with experimental data [1] is performed.

References

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