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A review on Effect of Ion Implantation on Hexagonal Boron Nitride

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**Abstract content (Max 300 words)
Formatting &
Special chars**

The extreme properties of cubic BN (c-BN), similar to or even superior to diamond, have led to a great deal of research on techniques for its synthesis. The study herein focuses on the synthesis of c-BN from the hexagonal phase (h-BN) by radiation effect using the ion implantation process. The effect of varying implantation parameters including the ion mass, the ion fluence (1×10^{14} - 1×10^{15} ions/cm²), the implantation energy (30 - 150 keV) and implantation temperature, with respect to the end-products are investigated. The presence of the c-BN phase is inferred using glancing incidence XRD (GIXRD) at glancing angles $0.01 \leq \omega \leq 0.5$ and Scanning Transmission Electron Microscopy (STEM). The GIXRD pattern after implantation exhibited c-BN and r-BN. These diffraction peaks were determined to be dependent on the incident glancing angle's penetration depth for the X-rays, which corresponded to the penetration depth of the different ions in h-BN from simulations. Transmission Electron Microscopy showed high density regions in h-BN after implantation with HRTEM lattice fringes with lattice parameter of the c-BN in the implanted region.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD)?

PhD

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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