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## Properties of Cubic Boron Nitride Particles formed by Ion Implantation.

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Hardness measurements of poly-crystalline hexagonal boron nitride (h-BN) ion implanted samples were carried out using the FM-700 (Vickers) micro-hardness tester. Previously, it has been shown that the implantation of h-BN with different ions structurally deforms the irradiated surface layer to cubic-BN nano-particles as revealed by Raman spectroscopy, X-ray diffraction and electron microscopy, and the measured hardness increases with ion fluence. In the present study, the h-BN samples were implanted with 150 keV helium (He<sup>+</sup>), lithium (Li<sup>+</sup>), boron (B<sup>+</sup>) and neon (Ne<sup>+</sup>) ions at different ion fluences from  $1 \times 10^{14}$  to  $5 \times 10^{16}$  ions/cm<sup>2</sup>, while varying the sample temperature from room temperature to 300°C. The stress, strain and Young's modulus of the formed cubic-BN nanoparticles were determined from micro-indentation measurements. The results show that maximum stress on the samples was induced at an ion dose of  $5 \times 10^{15}$  ions/cm<sup>2</sup> and the calculated Young's modulus at that fluence was 0,3 GPa for all ions.

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