

Abstract Submitted
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Growth of thin, transparent and high quality phase pure hBN films MUHAMMAD SAJJAD, XIOAN ZHANG, PETER FENG, University of Puerto Rico — A simple approach using pulse laser deposition technique was made in order to obtain multi layers transparent hexagonal boron nitride films at low substrate temperature (700 °C) with iron nano-particles as catalyst. The catalyst helped in creating reactive species of boron and nitrogen to react quickly and formed h-BN base layer. The formation of film layers were studied systematically with increasing amount of catalyst keeping same experimental conditions and steps. Transparent and ultra thin base layer was obtained using small amount of catalyst. However, with increasing amount of catalyst, few more layers were formed on the base layer which affected the transparency of the films. Therefore, it was revealed that with optimized amount of catalyst helped in nucleating ultra thin transparent layers of BN with clear variation in atomic wall layers, sharp edge of the film, shape and surface smoothness. Scanning Electron Microscopy was used to analyze the surface images of hBN thin films whereas Energy Dispersive X-Ray spectroscopy (EDS) verified dominance of boron and nitrogen in the structure. The crystalline structure of the films was analyzed with Raman spectroscopy and XRD technique.

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