

Abstract Submitted  
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**Synthesis of boron nitride using a micro hollow cathode discharge deposition reactor.**<sup>1</sup> CLAUDIA LAZZARONI, HIBA KABBARA, SALIMA KASRI, LUDOVIC WILLIAM, VIANNEY MILLE, XAVIER AUBERT, GUILAUME LOMBARDI, ALEXANDRE TALLAIRE, Universite Paris 13 - LSPM CNRS UPR 3407 — In this study, a Micro Hollow Cathode Discharge reactor is used to deposit hexagonal boron nitride (h-BN), a strategic material which is highly demanded for electronic and optoelectronic applications. The deposition reactor is composed of two chambers and the micro-plasmas, arranged into an array, are located at the junction between them. The array consists of an anode-dielectric-cathode sandwich through which several holes of 400  $\mu\text{m}$  in diameter are drilled. The higher pressure chamber (several tens of mbar), favors the production of high density plasma, and consequently high nitrogen dissociation, while the lower pressure chamber (several mbar) limits the nitrogen recombination. The polarizable and heating substrate holder is located in the lower pressure chamber where the boron precursor is injected. The polarization of the substrate holder allows the discharge to be expanded from the holes to the substrate. The deposited films are characterized by X-ray diffraction and Raman spectroscopy to evaluate the h-BN phase purity and quality, and by scanning electron and confocal laser microscopy to observe the surface morphology. The influence of the operating conditions (pressure, gas mixture, bias voltage,..) on the deposited film properties will be presented.

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