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Experimental characterization of a MHCD in Ar/N_2 mixture: Ar($1s_5$) and N density measurements by absorption spectroscopy ALICE REMIGY, CLAUDIA LAZZARONI, GUILLAUME LOMBARDI, HIBA KABBARA, LUDOVIC WILLIAMS, Universite Sorbonne Paris Nord, Laboratoire des Sciences des Procedes et des Materiaux, LSPM, CNRS, UPR 3407, F-93430, Villetaneuse, France, GRARD BAUVILLE, THIBAULT DARNY, KRISTAQ GAZELI, STPHANE PASQUIERS, JOAO SANTOS-SOUSA, Universite Paris Saclay, CNRS, Laboratoire de Physique des Gaz et des Plasmas, 91405 Orsay, France, NELSON DE OLIVEIRA, Synchrotron SOLEIL, Saint-Aubain, France — An experimental characterization of a Micro Hollow Cathode Discharge (MHCD) in Ar/N_2 mixture, used in a deposition reactor of hexagonal boron nitride (h-BN), has been carried out. h-BN is a highly requested material for electronic and optoelectronic, given its large band gap and compatibility with graphene. The absolute densities of N-atoms and metastable argon (Ar($1s_5$)) have been measured. Ar ($1s_5$) is an important species in the dissociation process of N_2, whereas N-atoms are required for growing h-BN films. The Ar ($1s_5$) has been measured by means of tunable diode laser absorption spectroscopy (TDLAS) and the N-atoms density was assessed with the VUV high resolution Fourier Transform spectrometer of the DESIRS beamline of the SOLEIL synchrotron. We have performed a parametric study, varying the MHCD hole diameter, the percentage of N_2 in the Ar/N_2 mixture, the discharge current and the gas pressure, so as to investigate their effect on the absolute densities of Ar($1s_5$) and N-atoms. The results are compared to those of a global model of the MHCD.

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