

Abstract Submitted
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Global model of a micro hollow cathode discharge in Ar /N₂ used for nitride synthesis CLAUDIA LAZZARONI, SALIMA KASRI, LSPM CNRS, Institut Galilee, Universite Sorbonne Paris Cite, Universite Paris 13 — A global model of a Micro Hollow Cathode Discharge (MHCD) in argon (Ar) with an admixture of nitrogen (N₂), working at several hundreds of Torr, is presented. MHCDs allow high electron densities and therefore high dissociation degree of nitrogen to be reached which is particularly suited for nitride deposition given the high bond energy of molecular nitrogen. The global model is based on the numerical resolution of the particle balance equations and the power balance equation. The model is run until the steady state is reached and we obtain the plasma parameters that are the species densities and the electron temperature. A particular focus is given to the atomic nitrogen density, a key parameter for the deposition and growth of nitride films. A parametric study is done varying the gas pressure and the N₂ fraction in Ar. Despite being fed by a DC power supply, MHCDs operate in steady state and in self-pulsed mode, both captured by the model. The effect of the MHCD mode (steady or self-pulsed) on the plasma parameters is also presented.

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