Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Modelling and diagnostics of microwave H2/CH4/B2H6 plasma for boron-doped diamond deposition NADIRA DERKAOUI, CATHERINE ROND, FABIEN BENEDIC, ALIX GICQUEL, LIMHP-CNRS UPR 1311 — High power electronic industry needs high quality boron doped p-type semiconducting diamond that can be grown by microwave plasma operating in H2-B2H6-CH4 mixtures. The understanding of the processes involved in the plasma phase needs to develop a research based on plasma modelling as well as spectroscopic analysis, the goal in particular being identifying the boron containing species responsible for boron diamond doping. A thermochemical modelling for describing H2/CH4/B2H6 mixture discharges include a rather detailed chemical kinetics model for carbon and hydrogen containing species, and a simpler B-species model involving only BHx species (x=0-3). Calculations draw up spatial profiles of gas and electron temperatures, as well of different species densities. Furthermore, spatially resolved spectroscopic measurements are compared to calculations, allowing us to draw some conclusions on the key processes for production and loss of B containing species in gas phase a well as on the surface.

Nadira Derkaoui
LIMHP-CNRS UPR 1311

Date submitted: 11 Jun 2010 Electronic form version 1.4