

Abstract Submitted  
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**Optical emission diagnostics and modeling of H<sub>2</sub>-rich microwave plasmas containing B<sub>2</sub>H<sub>6</sub>.**<sup>1</sup> NICHOLAS ARNOLD, Auburn University, KOLLAL CHAKRABARTY, University of Alabama at Birmingham, STUART LOCH, Auburn University, AARON CATLEDGE, University of Alabama at Birmingham — In-process control of the local plasma environment during microwave plasma chemical vapor deposition is important in predicting coating structure and properties. In this regard, an understanding of the plasma characteristics such as gas temperature, column density, and populations of collisionally excited species as well as their dependence on deposition conditions such as microwave power, chamber pressure, and feedgas concentrations is needed. In this study, we use optical emission spectroscopy in conjunction with collisional-radiative and LTE models to investigate these aspects for H<sub>2</sub>-rich plasmas with/without small admixtures of diborane (B<sub>2</sub>H<sub>6</sub>) and ammonia (NH<sub>3</sub>) associated with growth of boron nitride films.

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