

Abstract Submitted
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Homoepitaxial Diamond Growth on Planar and Non-planar Substrates Using Carbon-13 Precursors¹ GOPI SAMUDRALA, University of Alabama at Birmingham, SAMUEL WEIR, Lawrence Livermore National Laboratory, YOGESH VOHRA, University of Alabama at Birmingham — The growth of single crystal diamond by microwave plasma Chemical Vapor Deposition has been carried out on [100] oriented Type Ia natural diamond anvils as well as planar Type Ib synthetic diamond substrates. The effects of substrate geometry, concentrations of Carbon-13 gas precursors, nitrogen concentration in the plasma, and substrate temperatures on homoepitaxial diamond growth have been investigated. These results will be presented along with the observed changes in growth rate and surface morphology of the grown films with the variation of each parameter. We have also investigated nitrogen incorporation in diamond lattice by photoluminescence spectroscopy. Results obtained from the study on non-planar substrates have a direct impact on the growth chemistry used in the fabrication of designer diamond anvils for high pressure research.

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