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STM AND ELECTROCHEMICAL INVESTIGATION OF HOMOEPITAXIAL BORON-DOPED CVD DIAMOND FILMS

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ABSTRACT

Homoepitaxial growth of boron-doped CVD diamond films was carried out on (100) and (111) oriented substrates. Atomic resolution images were obtained for both (100) and (111) surfaces using scanning tunneling microscopy. STM images reveal the presence of a 2x1-monohydride reconstruction for the untreated (100) surface and a 1x1 reconstruction for the untreated (111) surface. No other atomically resolved reconstructions were observed under a wide range of growth conditions. Non-aqueous electrochemical investigations were carried out on the films exhibiting atomically resolved reconstructions. Evidence for potential-induced surface-reconstruction and surface chemical modification of the (100) 2x1-monohydride surface has been observed.

Keywords: Homoepitaxial, STM, Electrochemical Modification, Diamond, Surface Reconstruction

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