Electrochemical characterization of microcristalline boron doped diamond.

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In recent years, Boron Doped Diamond (BDD) thin films fabricated by chemical vapour deposition (HFCVD) have attracted great interest because its exhibits several characteristics such as: great mechanical resistance, chemical stability and large potential window. This combined performance suggests several uses as, for example, waste water treatments, electronalytical sensors and also electrochemical synthesis. In this work, the films were deposited on silicon substrate by HF CVD with a gaseous mixture of argon, methane and hydrogen (90:19:1). The boron addition was obtained from H_2 forced to pass through a bubbler containing B_2O_3 dissolved in methanol. The samples were examined by electrochemical impedance spectroscopy (EIS), capacitance-potential technique and contact angle. The surface energy analysis was determined by wetting method (sessile drop) according to extended Fowkes method. The charge carriers were calculated from Mott Schottky plots. The study correlates the surface energy with the level doping by the capacitance potential measurements ("Mott Schottky plots") and the mechanism of electron transfer by EIS.

Keywords: Boron doped diamond, electrochemical impedance spectroscopy, Wettability,

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