Structure and Electrochemical Properties of Nitrogen Doped Diamond-like Carbon Film Synthesized by Low Temperature Neutral Beam Enhanced Chemical Vapor Deposition

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doi: 10.20964/2018.02.11

Received: 27 September 2017 / Accepted: 19 November 2017 / Published: 28 December 2017

We report nitrogen doping diamond-like carbon film synthesis by a new technique called neutral beam enhanced chemical vapor deposition. The deposition is processed in UV/electron damage-free environment, and the substrate temperature is controlled at room temperature. The film structure was investigated by X-ray photoelectron spectroscopy and Fourier transform infrared spectroscopy. The N/C ratio is 0.26, and doped nitrogen atoms exist in forms of amine and inside the aromatic ring, which helps increase film electrical conductivity. Cyclic voltammograms were carried out and the results indicate the DLC: N film qualified as electroanalysis sensor material.

Keywords: DLC film, NBECVD, cyclic voltammograms

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