

Abstract Submitted  
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**X-ray photoelectron spectroscopy of Ni doped boron carbides<sup>1</sup>**

NINA HONG, Physics & Astronomy University of Nebraska-Lincoln, M.A. LANGELL, Chemistry University of Nebraska-Lincoln, S. ADENWALLA, Physics & Astronomy University of Nebraska-Lincoln — Ni acts as an n-type dopant for semiconducting boron carbide (BC). A series of samples with increased Ni doping were grown on Si substrates using plasma enhanced chemical vapor deposition (PECVD) and characterized using IV measurements and X-ray photoelectron spectroscopy (XPS). Increased Ni doping leads to a linear increase in Ni concentration as evidenced by the intensity of the Ni 2p photoemission peak relative to that of the B 1s peak; concomitantly, the IV curves indicate that the BC becomes increasingly n doped. B1s peak shapes shows B-C and B-B bonding structure, and the C1s peak shows B<sub>11</sub>C icosahedra bonds and C-B-C chain bonds in all samples. The overall binding energies for B and C agree with the results from sputter deposited stoichiometric B<sub>4</sub>C [1]; in these PECVD grown samples, however, the graphite peak commonly seen in the sputter deposited B<sub>4</sub>C is absent. [1] I. Jimenez, L. J. Terminello, *et al.* J. Elect. Spec. Relat. Phenom., 101-103, 611-615 (1999).

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Nina Hong  
Physics & Astronomy University of Nebraska-Lincoln

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