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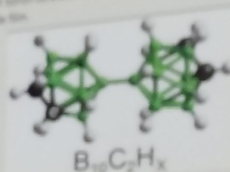
Improving K-Dielectric Semiconductors: Novel Boron Carbides for Neutron Voltatics

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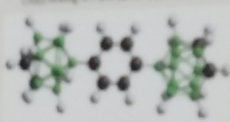
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Approach

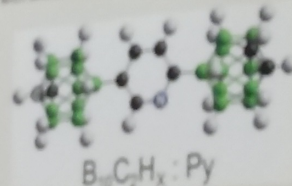
Four types of boron carbides were made into heterojunction diodes with silicon for this study, each one made out of a different boron carbide film.



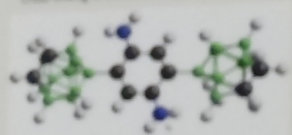
Cross linking in Pure Boron Carbide



Cross linking in Boron Carbide with Benzene



Cross linking in Boron Carbide with Pyridine



Cross linking in Boron Carbide with Diaminobenzene

Each of these films was created through plasma enhanced chemical vapor deposition (PECVD). Current-voltage (I-V) and capacitance-voltage (C-V) curves were created for each diode to study how each film behaved while external voltages were applied to them individually. The C-V curves used AC currents at frequencies of 1, 10, and 100 kHz as well as 1 and 10 mHz. In order to evaluate the current in the I-V curves independently of the size of the film, the ratio between the forward bias gradient and the reverse bias gradient was calculated.

Results

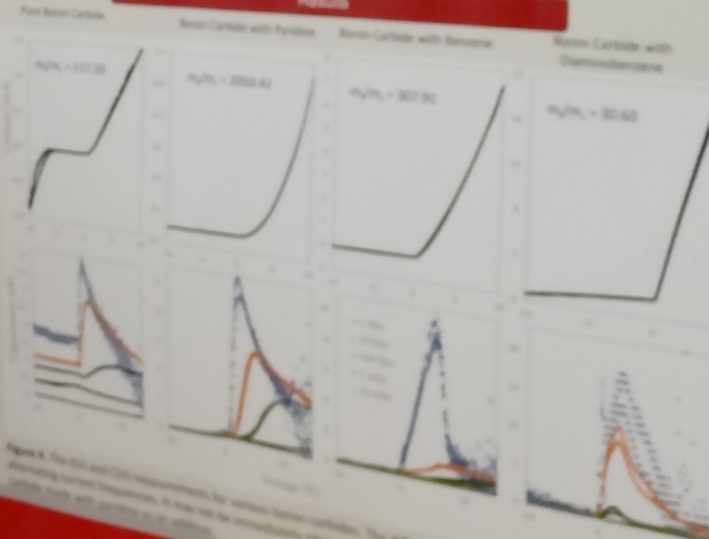


Figure 4. The I-V and C-V measurements for various boron carbides. The different C-V curve colors correspond to different measuring current frequencies. It does not seem immediately obvious, but the best performance overall comes from the boron carbide diode with pyridine as its additive.

The experimental or benzene is significantly better than the carbide films. It is that boron-carbide and carbide diodes will need to be studied with boron carbide with a boron carbide, and not a semiconductor.

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