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SiBCN-CNT/Graphene Paper Electrode LAMUEL DAVID, GURPREET SINGH, Kansas State Univ — We demonstrate synthesis and electrochemical performance of novel molecular precursor-derived ceramic (PDC)/carbon nanotube embedded graphene self-supporting composite papers as Li-ion battery electrode. The papers were prepared through vacuum filtration of various PDC-graphene oxide (GO) dispersions in DI water followed by thermal reduction at elevated temperatures that resulted in a homogenous PDC/reduced GO papers that were highly crumpled, mechanically robust and consisted of a 3-D electrically conducting network. These electrodes showed electrochemical capacities as much as approx. 300 $mAh.g^{-1}$ with respect to total weight of the electrode (approx. 500 $mAh.g^{-1}$ w.r.t. active material), with negligible capacity loss for more than 1000 cycles. Boron-doped silicon carbon nitride (Si(B)CN/graphene) outperformed its un-doped counterparts (SiCN/graphene), both in terms of electrochemical capacity, cycling stability and coulombic efficiency.

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