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Self-standing paper based anodes prepared from siliconcarbonitride-MoS_2 composite for Li-ion battery applications LAMUEL DAVID, GURPREET SINGH, Kansas State University — We study synthesis of free-standing polymer derived SiCN/ MoS_2 composite paper anode for Li-ion battery application. This was achieved following a two-step approach: First, polysilazane was interfaced with exfoliated MoS_2 nanosheets which upon pyrolysis resulted in SiCN/MoS_2 composite. Second, dispersion of SiCN/MoS_2 in isopropanol was vacuum filtered resulting in formation of a self-standing composite paper. Physical and chemical characterization of the composite was carried out by use of electron microscopy, Fourier transform infrared spectroscopy (FT-IR) and Thermo-gravimetric analysis (TGA). FT-IR data indicated complete conversion of polysilazane precursor to SiCN ceramic, while electron microscopy confirmed layered structure of the paper. Thermo-gravimetric analysis showed enhanced thermodynamic stability of the composite paper up to 800 °C. Electrochemical analysis of SiCN/MoS_2 composite paper anodes showed that Li-ion can reversible intercalate in the voltage range of 0-2.5 V with a first cycle discharge capacity of 770 mAh/g at a current density of 100 mA/g.

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