Supporting Information

Nano silicon carbide: a new lithium-insertion anode material on the horizon

T. Sri Devi Kumari^{*a,b*}, D. Jeyakumar^{*a*} and T. Prem Kumar^{*b,**}

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15 Supporting Information

Thermogravimetric and differential thermal analyses of SiCsyn were carried out in air at a heating ramp of 2° C min⁻¹ (TA Instruments, model SDT Q600). The thermal profiles (Fig. S1)

- 20 show an exothermic reaction between about 520 and 600°C corresponding to the loss of surface carbon on SiC-syn. The weight loss of 9.2% represents the amount of carbon deposited on the SiC during the synthesis process. An increase in the weight of the sample beyond 604°C indicates a partial oxidation of the
- ²⁵ material into SiO₂. This was further confirmed by XRD analysis. As can be seen from the accompanying XRD patterns (Fig. S2), the carbon in the as-synthesized SiC-syn was absent when it was heated to 600°C. However, additional peaks, corresponding to SiO₂, could be seen in the sample heated up to 800°C.
- Besides XRD, the formation of SiC was confirmed by XPS analysis (Thermo Scientific, model MultiLab 2000). Fig. S3 presents the Si 2p, C 1s and O 1s XPS spectra recorded with SiC-syn. The presence of an SiO₂ layer on SiC-syn is indicated by the peak at a binding energy of 103.9 eV in the Si 2p spectrum, while
- the one at a binding energy of 101.4 eV relates to Si in SiC.^{S1} The asymmetric profile of the spectrum suggests the presence of oxygen-depleted silica (SiO_x, 1<x<2) on the surface of SiC.^{S2,S3} as well as to C atoms bonded to four nearest neighbor carbons as in adventitious (free) carbon or in graphite.^{S9}

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Fig. S1. TG and DTA curves of SiC-syn.



Fig. S2. XRD patterns of (bottom) as-synthesized SiC-syn; (middle) SiCsyn heated to 600°C in air; and (top) SiC-syn heated to 800°C in air.

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Fig. S3. (a) Si 2p; (b) O 1s; and (c) C 1s XPS spectra of SiC-syn.