New Anode Framework for Rechargeable Lithium Batteries

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Experimental Section

MATERIALS CHARACTERIZATION

Powder x-ray diffraction (XRD) data were collected with a Rigaku D/max x-ray diffractometer (Cu Kα radiation, \( \lambda = 1.5418 \, \text{Å} \)) operating at 40 kV and 30 mA in a 2θ range of 10 – 80° with a step of 0.04°. Micrographs of the samples were taken with a scanning electron microscope (SEM, SHIMADZU SSX-550).

ELECTROCHEMISTRY

The electrodes were fabricated from a 75:20:5 (wt%) mixture of active material, acetylene black as a current conductor, and polytetrafluoroethylene as a binder. The active material and conductor were mixed completely first, then the binder was added and the mass mixed again. The mixture was rolled into thin sheets and punched into 7-mm-diameter circular disks as electrodes. The typical electrode mass was ~ 2 mg. Electrochemical measurements were carried out with CR2032 coin cells. The electrolyte used for analysis was 1 M LiPF₆ in 1:1 EC/DEC. The sealed cells were taken out of the glove box and placed in a battery-testing system (Arbin BTS-2043); they were aged for 12 h before the first discharge to ensure full absorption of the electrolyte into the electrode. A 5 min rest period was employed between the charge and discharge steps.
Fig. S1. X-ray powder diffraction patterns of TNO, C-TNO, and C-DTNO samples.
Fig. S2. Resistivity of DTNO sample under zero field up to 300 K (a standard four-probe method); the inset shows temperature dependence of zero-field-cooled (ZFC) susceptibility for DTNO sample.