

Ultra-thin Carbon-coated Mesoporous SnO₂ Anode Material for Li-ion batteries

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Highly ordered mesoporous SnO₂ materials with bicontinuous *Ia3d* meso-porous structure are uniformly coated with carbon species through a dehydration reaction between 2,3-dihydroxyl-naphtalene and surface hydroxyl group in meso-porous SnO₂.

The reversible capacity of carbon coated highly ordered mesoporous SnO₂ was 672.4mAh/g (the optimum amount of carbon species in carbon coated mesoporous SnO₂ is 12 wt%), which is a near theoretical capacity with superior cycle stability (103.9% cycle retention after 100 cycle). Such behavior is derived from the ultra-thin carbon layer covering on mesoporous SnO₂ surface which acts as buffer layer to accommodate volume change of SnO₂ and physical barrier to prevent aggregation of Sn formed during the Li alloying and dealloying.