

Improved electrochemical behavior of Tungsten coated Silicon monoxide-Carbon composite anode in lithium ion battery

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This study focus on effects of Tungsten coated silicon monoxide-carbon composite anode in lithium ion battery. Tungsten was coated through sputtering and the morphology of electrode was observed by EDX, SEM, TEM and EPMA. Tungsten coated silicon monoxide-carbon composite/lithium cobalt oxide(LCO) cells (2032 coin cell) were assembled in a dry room. The discharge-charge cycling was performed with cut-off voltage of 2.75-4.3V. The electrochemical characteristics of the coated cell were rationalized through impedance analysis, voltage profile, cycle data and SEM. The lithiation capacity of Tungsten coated SiO-C/LCO cell was estimated 1082mAh/g in 1st cycle at 0.1c rate. It's larger than pure SiO-C/LCO which has 956mAh/g in 1st cycle at 0.1c rate. And also delithiation capacity of Tungsten coated SiO-C/LCO is larger than pure SiO-C/LCO, each of values were 725mAh/g and 635mAh/g in 1st cycle at 0.1c rate. Because of electrical conductivity of Tungsten, lithium ions are preserved more in Tungsten coated SiO-C than pure SiO-C.

capacity electrode for lithium ion batteries, Nano Lett. 9 (2009)3370-3374 [2]I.W. Seong, W.Y. Yoon., J. Power Sources., 195(2010)6143.

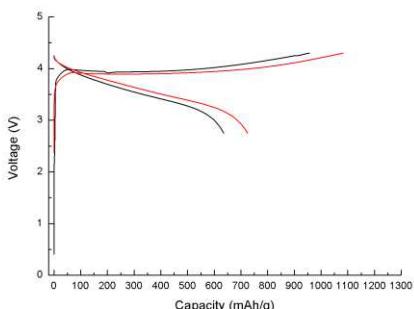


Fig1. Voltage profile of Tungsten coated SiO-C/LCO cell(red) and pure SiO-C/LCO cell (black)

Reference to a journal publication

[1]L.-F. Cui, Y. Yang, C.-M. Hsu, Y. Cui, Carbon-silicon core-shell nanowires as high