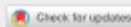


# Investigation on synthesis of SnO<sub>2</sub> nano-particles using sol-gel process for energy storage application

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## ABSTRACT

One of the greatest challenges in the twenty-first century is unquestionably energy storage. It is now essential that new, low-cost and environmentally friendly energy conversion and storage systems are to be found. Metals that store Lithium are the most appealing and competitive candidates for new types of anode (negative electrodes) in Lithium ion rechargeable batteries. SnO<sub>2</sub> has been demonstrated to be one of the most promising anode materials for high performance Lithium-ion batteries (LIBs) due to its high theoretical specific storage capacity (782 mAh/g) as compared with the commercially used graphite. In the present work, secondary Li-ion battery was fabricated using SnO<sub>2</sub> nanoparticles synthesised by Sol-gel process as anode material without any surface modification. TEM analysis confirmed the nanometric size of the synthesised SnO<sub>2</sub> nanoparticles. Electrochemical impedance study has been carried out for the assembled cell of configuration SnO<sub>2</sub> electrode sheet/ 1 M LiPF<sub>6</sub> PC:DME 1:1/ Li metal. The ohmic resistance ( $R_{\Omega}$ ) and the charge-transfer resistance ( $R_{ct}$ ) are found to be 2.28Ω and 52Ω respectively. The Galvanostatic charge/discharge profile was studied at three current rates such as 0.44C, 0.88C and 1C in the potential window between 0.1 V to 1.2 V and their coulombic efficiencies were analysed.

🔍 KEYWORDS: SnO<sub>2</sub> anode material lithium-ion battery sol-gel process

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