

Microwave synthesis of SnO₂ nanoparticles on graphene sheets as a anode material for lithium ion batteries

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Graphite has been used as an anode material in lithium-ion battery. However, there was a definite limitation because of low theoretical capacity(372mAh g⁻¹). To solve the limitation, SnO₂ nanoparticles were decorated on the graphene sheets by microwave synthesis. The microwave synthesis was more simple and easier than other conventional methods. First of all, reduced graphene oxide(rGO) is dispersed in graphene oxide(GO) with 2-propanol. After the dispersion is finished, SnCl₂ solution is stirred with the mixture by magnetic bar. The as-prepared mixture was transformed to a hydrogel by vacuum filtration. Finally, when the hydrogel was exposed to the microwave irradiation for 10min, graphene-SnO₂(G-SnO₂) was synthesized. The G-SnO₂, LiPF₆ in 1:1 EC/DMC and lithium metal were applied to the anode, electrolyte and cathode in lithium-ion battery, respectively. Capacity was around 1,000mAh g⁻¹ in 100mA g⁻¹ current density and the performance was maintained until 100cycle. Furthermore, redox peak was confirmed by CV measurement.