Invited Speech II

Electrochemical Performances of Graphene Nanosheet/Molybdenum Disulfide Cathode Materials for Lithium Secondary Cells

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Abstract. Graphene Nanosheet (GNS)/Molybdenum disulfide (MoS2)-sulfur composites were prepared by in situ solution-phase method. The practical implementation of lithium sulfur battery has not been realized by low discharge capacity and fast capacity decay during cycling owing to dissolution of lithium polysulfide into the electrolyte. In this work, we found that the GNS/MoS2 composites mitigate the polysulfide dissolution and enhance the cycling stability via the MoS2 interaction. Electrochemical performances of prepared composites were evaluated in lithium batteries by galvanostatic cycling and cyclic voltammetry. When applied as the cathode in lithium sulfur batteries, GNS/MoS2 composites exhibited a high reversible capacity of 1143.4 mAh g⁻¹ in the first cycle and maintain a satisfactory cyclability. The results indicate that the GNS/MoS2 composites based lithium sulfur batteries have a potential to replace the current Li-ion batteries.