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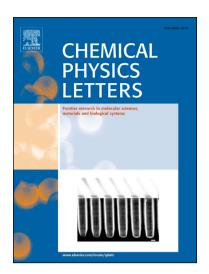
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A novel CoS₂/reduced graphene oxide/multiwall carbon nanotubes composite as cathode for

high performance lithium ion battery

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Abstract

To improve the electrochemical performance of the CoS₂ cathode, a CoS₂/reduced graphene

oxide/multiwall carbon nanotubes (CoS₂/rGO/MWCNTs) composite was synthesized. The mixture

showed a high initial discharge capacity of 1562.6 mAh g⁻¹ and a capacity of 884.9 mAh g⁻¹ after

100 cycles at the current density of 100 mA g⁻¹ which were higher than that of CoS₂/rGO and

CoS₂/MWCNTs. The improved electrochemical performances were attributed to rGO and

MWCNTs which ensured fast Li⁺ and electronic transport in the composite. What's more, rGO

sheets wrapping tightly outside CoS₂/MWCNTs in CoS₂/rGO/MWCNTs composite

accommodated volume expansion of CoS₂ and prevented CoS₂ gathering.

Keywords: rGO, MWCNTs, CoS₂, Electrochemical performances

Introduction

Nowadays, kinds of green energy such as solar power, wind power and tidal power have

become optional substitutes for petroleum and coal. For energy storage, lithium ion battery has

been studied for decades since it is first assembled by Whittingham¹ and is attracting more and

more concerns due to the high energy density and the environmentally friendly property. ²⁻⁶ In the

studies of lithium ion batteries, metal sulfides cathodes have attracted much attention because of

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