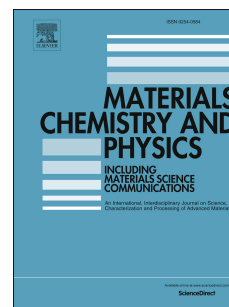


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Mesoporous CoO/reduced graphene oxide as bi-functional catalyst for Li-O₂ battery with improved performances

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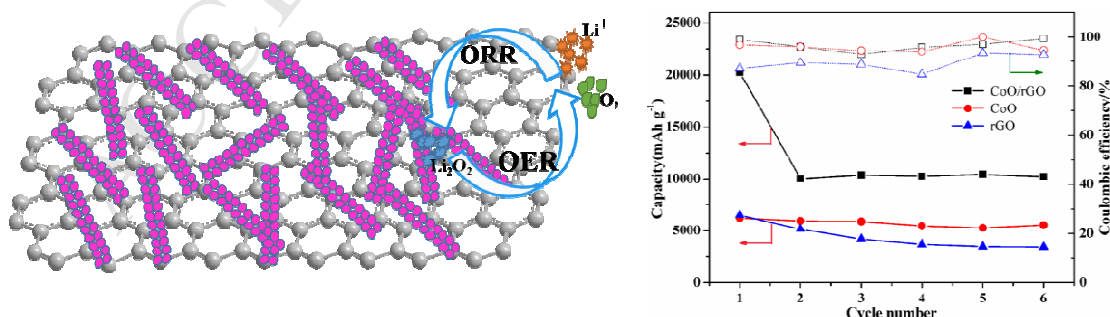
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Abstract

Wheat-like mesoporous CoO nanorods grown on the reduced graphene oxide (CoO/rGO) is synthesized by a simple hydrothermal method. Owing to synergistic effect between CoO and rGO, the CoO/rGO hybrid exhibits a good initial capacity of 20254 mAh g⁻¹ along with a high coulombic efficiency (98.9%) at 200 mA g⁻¹. In addition, the batteries show an excellent rate capability (13952 mAh g⁻¹ at 800 mA g⁻¹) and enhanced cycling stability (69 cycles with the capacity limited to 1000 mAh g⁻¹ at 200 mA g⁻¹). The electrochemical performance is intimately related to the unique architecture (i.e., hierarchical mesoporous structure), facilitating the reversible formation and decomposition of insoluble Li₂O₂. The results of electrochemical tests confirm that the CoO/rGO hybrid is a promising candidate for the Li-O₂ batteries.

Graphical abstract



Highlights

Wheat-like mesoporous CoO nanorods are prepared and investigated in Li-O₂ batteries.

High initial capacity (20254 mAh g⁻¹) and cycle stability (69 cycles) are shown.

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