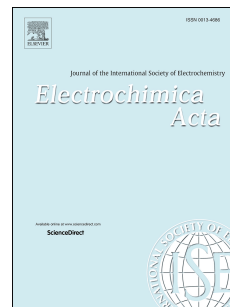


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Two-dimensional β -cobalt hydroxide Phase Transition Exfoliated to Atom Layers as Efficient Catalyst for Lithium-oxygen Batteries

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KEYWORDS: Atom-layered nanosheets; Exfoliation; Electrocatalyst; Li-O₂ batteries

ABSTRACT

Metal-oxygen batteries, especially Li-oxygen batteries (LOBs), have attracted tremendous research attentions in the past decades. It is necessary to design novel cost-effective catalysts in the development of high performance rechargeable LOBs. Herein, we prepare the atom-layered two-dimensional (2D) β -Co(OH)₂ nanosheets (AL- β -Co(OH)₂) *via* phase transition of layered α -Co(OH)₂ nanosheets (α -Co(OH)₂) in a mild wet chemical process. The thickness of AL- β -Co(OH)₂ is less than 1.5 nm. It is the first time of using atom-layered β -Co(OH)₂ in the system of LOBs and this material shows outstanding catalytic performance. The AL- β -Co(OH)₂ nanosheets as electrocatalysts in LOBs can better reduce the over-potential, enhance the specific capacity and improve cycling capability. It demonstrates a high initial capacity 11841 mAh g⁻¹ at a current density of 100 mA g⁻¹. It displays long cycle stability more than 70 cycles with a capacity restriction of 1000

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