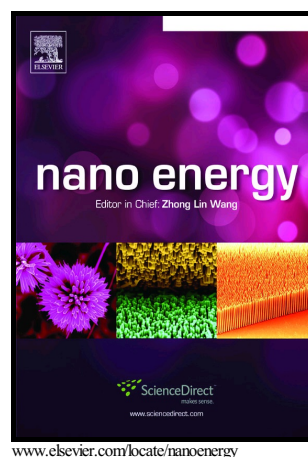


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Operando observations of RuO₂ catalyzed Li₂O₂ formation and decomposition in a Li-O₂ micro-battery

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Abstract

RuO₂ displays excellent bifunctional catalysis towards the oxygen reduction and evolution reactions of Li-O₂ battery. Nevertheless, how the solid catalyst successively catalyzes solid Li₂O₂ formation and decomposition, confronting passivation and loss of RuO₂/Li₂O₂ contact, during discharging and charging remains a mystery. Here we report operando observations of RuO₂ catalyzed oxygen reduction and evolution reactions of Li₂O₂ by utilizing a liquid cell scanning transmission electron microscope. Upon discharging, RuO₂ obviously accelerates formation of soluble LiO₂ intermediates and acts as preferential sites of Li₂O₂ precipitation. During charging, the catalytic activation of RuO₂ takes place at electrolyte-RuO₂-Li₂O₂ triple-phase

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