Electrocatalytic Activity of Co-based Perovskite Oxides for Oxygen Reduction and Evolution Reactions

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Cathode of aqueous Li-air battery requires high electrocatalytic activities for oxygen reduction reaction and oxygen evolution reaction. Pure Co-based perovskite oxide (LaCoO_3) was prepared by an auto-combustion method at a relatively low calcination temperature (640°C), and La of $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ was partially substituted with Sr to enhance its electrocatalytic activities. $\text{La}_{0.7}\text{Sr}_{0.3}\text{CoO}_3$ showed excellent catalytic activity for the oxygen evolution reaction, and its activity for the oxygen reduction reaction was increased with 5 wt% Pt loading. The electrochemical activity of perovskite was investigated by linear sweep voltammetry and electrochemical impedance spectroscopy.

Keywords: perovskite oxides, oxygen reduction reaction, oxygen evolution reaction, LaCoO_3 , electrochemical analysis

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