The Preparation and Electrochemical Properties of Perovskite $\text{La}_{0.6}\text{Sr}_{0.4}\text{CoO}_{3-d}$ for Catalytic Reduction of Oxygen

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$\text{La}_{0.6}\text{Sr}_{0.4}\text{CoO}_{3-d}$ powder in nanoscale was produced through flame spray synthesis (FSS), which was a process method of particles in large scale. Then, the catalytic performance of the powder as a bi-functional catalyst towards oxygen evolution reaction (OER) and oxygen reduction reaction (ORR) was evaluated. The effect of this processing method on the as-prepared powders was studied through nitrogen adsorption (BET), thermal gravimetric analysis (TGA) and X-ray powder diffraction (XRD). The remarkable electrocatalytic activities were observed in all the synthesized $\text{La}_{0.6}\text{Sr}_{0.4}\text{CoO}_{3-d}$ compared with Ketjen black. Combined with the structure and electrochemical properties, a systematical study on the catalytic activity of $\text{La}_{0.6}\text{Sr}_{0.4}\text{CoO}_{3-d}$ towards both OER and ORR was carried out. Besides, the battery capacity of $\text{La}_{0.6}\text{Sr}_{0.4}\text{CoO}_{3-d}$ was investigated in a lithium-air battery as an air cathodic catalyst.

Keywords: Perovskite; Oxygen reduction reaction; Oxygen reduction reaction; Oxygen evolution reaction; Cathode

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