Development of Carbon Supported Perovskite-Oxide for Lithium Ions Battery Application

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Perovskite-type oxide catalyst-based carbon electrodes were studied as air electrodes for aqueous lithium-air secondary batteries, which were comprised of a carbon black air electrode with La₀.₈Sr₀.₂Fe₀.₈Mn₀.₂O₃ catalyst, an aqueous electrolyte solution of saturated LiOH with 10 M LiCl, and a water-stable lithium electrode. The oxygen evolution reaction (OER) and oxygen reduction reaction (ORR) benefited from the expanded surface area of La₀.₈Sr₀.₂Fe₀.₈Mn₀.₂O₃ during charge and discharge. The La₀.₈Sr₀.₂Fe₀.₈Mn₀.₂O₃ electrocatalyst-based lithium-air batteries showed desirable cycle stability and rate capability, low overpotential, increased specific capacity of initial discharge and other improved electrochemical behaviors.

Keywords: La₀.₈Sr₀.₂Fe₀.₈Mn₀.₂O₃; Perovskite; Lithium-air secondary batteries; Catalyst; Oxygen reduction reaction; Oxygen evolution reaction

FULL TEXT

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