Controlled Synthesis of Co₃O₄ Electrocatalysts with Different Morphologies and Their Application for Oxygen Evolution Reaction

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The effect of the Co₃O₄ catalysts with different morphologies on the oxygen evolution reaction (OER) performance is not clearly. Herein, we have synthesized urchin-like Co₃O₄, Co₃O₄ nanosheets, Co₃O₄ nanoparticles and Co₃O₄ nanospheres. These Co₃O₄ materials with different morphologies are applied as the electrocatalysts for OER, and their OER performances are also compared with related literature results. The obtained overpotentials for OER are 308, 342, 350 and 448 mV at the current density of 10 mA cm⁻² in 1 M KOH on urchin-like Co₃O₄, Co₃O₄ nanosheets, Co₃O₄ nanoparticles and Co₃O₄ nanospheres, respectively. The catalytic mechanism of the urchin-like Co₃O₄ for OER is explored by electrochemical oxidation of H₂O₂. This study is helpful to understand the relationship between the morphology and the OER performance of the Co₃O₄ electrocatalysts.

Keywords: Cobalt oxide; Oxygen evolution; Urchin-like; H₂O₂ sensor.

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