One-pot Synthesis of Coral-like Ru/Carbon Composites as Superior Electrocatalysts for the Hydrogen Evolution Reaction

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A highly active and stable catalyst is crucial for the hydrogen evolution reaction (HER). In this study, a novel coral-like Ru/carbon (Ru/C) electrocatalyst was synthesized via a solvothermal approach with the assistance of 8-hydroxyquinoline (8-HQ). This catalyst exhibited excellent performance for the HER in acidic media. The overpotential of the Ru/C catalyst was 41 mV at a current density of 10 mA/cm², the Tafel slope was 46 mV/dec, which was only 12 mV/dec higher than that of the Pt/C catalyst (34 mV/dec). Moreover, the Ru/C catalyst exhibited excellent stability. We believe that this novel Ru/C catalyst is a viable substitute for commercial Pt/C catalysts.

Keywords: Ruthenium; 8-hydroxyquinoline; electrocatalyst; solvothermal; Hydrogen evolution reaction.

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