

Bimetallic Oxide/Hydroxide Composite for Electrocatalytic Oxygen Evolution Reaction

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Abstract : In this work, a bimetallic oxide/hydroxide composite, ZNDP-1, was synthesized for electrocatalytic oxygen evolution reaction (OER) using Zn(II) and Ni(II) precursors along with polyvinylpyrrolidone (PVP) and dopamine (DA). Microscopic studies showed the formation of ZnO and Ni(OH)₂ in composite. The growth modification ability of PVP and adhesive property of polydopamine from DA were utilized to obtain a 3D interconnected structure. In alkaline medium, ZNDP-1 showed a low over potential of 170 mV (@10 mA cm⁻² current density) and a Tafel slope of 90 mV dce⁻¹ with significant stability for OER. The surface defects, porosity and synergism within metal centers caused such intriguing electrocatalytic activity.

Keywords : Transition metals; bimetallic oxide/hydroxide composite; synergism; electrocatalysis; oxygen evolution reaction.