Ni-based 3D nanoflower alloy catalysts for highly active oxygen evolution reaction

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Designing highly efficient electrocatalysts for oxygen evolution reaction (OER) plays a key role in the development of various renewable energy storage and conversion devices. In this work, we synthesize Ni-based 3D nanoflower alloy catalysts by using Ni, Fe, Co precursors as primary reactants, $NaBH_4$ as a reducing reagent, and carbon dot as a structure-directing reagent. HRSEM, TEM, XRD and XPS measurements are carried out to analyze the morphology and chemical composition of the developed materials. The electrocatalytic activities of the developed NiFe and NiCo 3D nanoflower catalysts are also carefully evaluated. The overpotentials of NiFe and NiCo catalysts at 10 $mAcm^{-2}$ are 1.66 V and 1.69 V, respectively.