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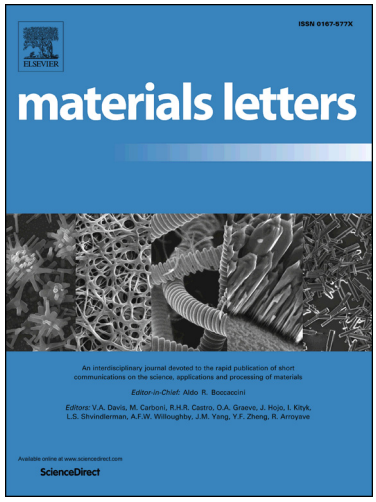

Metal Ni-decorated Fe_3O_4 nanoparticles: a new and efficient electrocatalyst for oxygen evolution reaction

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Metal Ni-decorated Fe_3O_4 nanoparticles: a new and efficient electrocatalyst for oxygen evolution reaction

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Abstract

A composite of Ni/Fe_3O_4 has been fabricated based on NiFe layered double hydroxide (NiFe-LDH) as precursor. Owing to the synergetic electrical coupling effect of Fe_3O_4 and Ni in the composite, the obtained Ni/Fe_3O_4 displays excellent oxygen evolution reaction (OER) activity with a small overpotential of 275 mV at a current density of 20 mA cm^{-2}, much better than those reported for most of other materials. Besides, the obtained catalyst also presents outstanding stability (there was no obviously OER current density degradation in 11 hour). These results indicate the possibility for the fabrication of a promising electrocatalyst with effective and low-price by reducing NiFe-LDHs into hybrid materials.

Keywords

Ni/Fe_3O_4 nanosphere; nanocomposites; powder technology; electrocatalyst; oxygen evolution reaction

1. Introduction

Oxygen evolution reaction (OER) plays a crucial role in a number of energy conversion and storage processes, such as fuel cells and rechargeable metal-air batteries [1]. Currently, owing to the low abundance and high price of precious metals electrocatalyst, extensive efforts have been focused on developing transition-metal-based electrocatalysts for OER because of their