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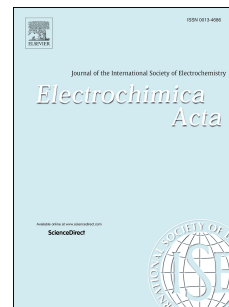
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Improving the Performance of Water Splitting Electrodes by

Composite Plating with nano-SiO₂

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Abstract

The electrochemical splitting of water requires efficient functional electrodes. Herein, we report the fabrication of electrocatalyst consisted of an electrodeposited **NiFeP** alloy film which was composite plated with nano-SiO₂ on nickel foam. The structure and morphology of the film were characterized by X-ray photoelectron spectroscopy (XPS), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The results showed that the surface area of this **NiFeP**-SiO₂ co-deposition alloy film can be significantly increased after electrochemical etching in a KOH solution. The water splitting properties of the alloy film were evaluated using electrochemistry. By using the **NiFeP**-SiO₂/NF(Etched) as a bifunctional electrode, total water splitting has been demonstrated in a two-electrode cell with a current density of 10 mA cm⁻² at an applied voltage of 1.57 V, which exhibited enhanced water splitting activity in comparison to the analogue cell using the pristine **NiFeP**/NF electrode.

Keyword: composite plating • nano-SiO₂ • water splitting • electrodes • alloy films

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