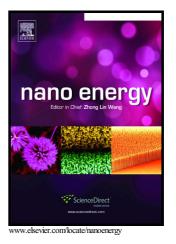
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Elaborately Assembled Metal Sulfides as a Bifunctional Core-Shell Structured Catalyst ACCEPTED MANUSCRIPT

for Highly Efficient Electrochemical Overall Water Splitting

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Abstract

Low efficiency, short lifetimes, and limited kinds of catalysts are still three fundamental shortcomings that have plagued electrochemical water splitting. Herein, we rationally synthesized a cost-effective $Co_3S_4@MoS_2$ hetero-structured catalyst that has proven to be a highly active and stable bifunctional catalyst for both hydrogen evolution reaction (HER) and oxygen evolution reaction (OER) in an alkaline environment. The heterostructure was obtained *via* a first hydrothermal approach to obtain hollow Co_3S_4 nanoboxes based on the ionic exchange reaction between $Fe(CN)_6^{3-}$ of Co-Fe Prussian blue analogue (PBA) and S^{2-} at 120 °C, and the subsequent *in-situ* growth of MoS₂ nanosheets on the surface of Co_3S_4 nanoboxes at an elevated temperature of 200 °C. The synergistic effects between the active and stable HER catalyst of MoS₂ and the efficient OER catalyst of Co_3S_4 , as well as the morphological superiority of hollow and Download English Version:

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