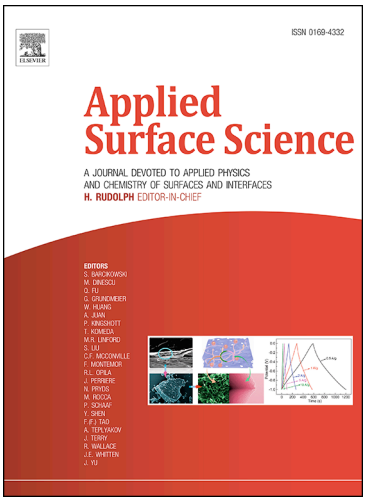

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PII: S0169-4332(18)32620-5
DOI: https://doi.org/10.1016/j.apsusc.2018.09.194
Reference: APSUSC 40498

To appear in: *Applied Surface Science*

Received Date: 5 August 2018
Revised Date: 16 September 2018
Accepted Date: 23 September 2018

Please cite this article as: Z. Wu, M. Song, Z. Zhang, J. Wang, H. Wang, X. Liu, Porous Two-dimensional Layerd Molybdenum Compounds Coupled with N-doped Carbon Based Electrocatalysts for Hydrogen Evolution Reaction, *Applied Surface Science* (2018), doi: https://doi.org/10.1016/j.apsusc.2018.09.194

Porous Two-dimensional Layerd Molybdenum Compounds Coupled with N-doped Carbon Based Electrocatalysts for Hydrogen Evolution Reaction

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Abstract

Developing an efficient and inexpensive non-precious electrocatalyst to reduce the overpotential of hydrogen evolution reaction (HER) is of critical importance for the large scale production of hydrogen energy. Herein, a two-dimensional layered molybdenum-based catalyst coupled with N-doped carbon was prepared through a facile and scalable hydrothermal-low temperature pyrolysis strategy. Particularly, the content of carbon source and pyrolysis temperature have an extremely important influence on the composition of the catalyst. Moveover, the relationship between chemical composition and catalytic performance was investigated systematically. Impressively, the optimal electrocatalyst possesses excellent catalytic performance in terms of the low overpotential (121 mV) with a small Tafel slope (54 mV dec^{-1}). More importantly, This work provide an avenue to the future design and preparation of other molybenum based electrocatalysts.

Key words: Two-dimensional structure; Molybdenum; N-doped Carbon; Electrocatalysts; Hydrogen Evolution Reaction

Introduction

Hydrogen, as a potential green and sustainable alternative to traditional fossil energy,