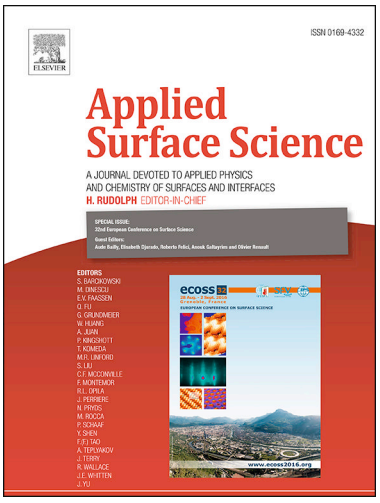
Accepted Manuscript



Ammonium nickel phosphate on nickel foam with a Ni^{3+}-rich surface for ultra-sensitive nonenzymatic glucose sensors'

Xinxin Wang, Huamei Jian, Qi Xiao, Suping Huang

PII: S0169-4332(18)32100-7
DOI: https://doi.org/10.1016/j.apsusc.2018.07.202
Reference: APSUSC 40017

To appear in: *Applied Surface Science*

Received Date: 26 April 2018
Revised Date: 5 July 2018
Accepted Date: 29 July 2018

Please cite this article as: X. Wang, H. Jian, Q. Xiao, S. Huang, Ammonium nickel phosphate on nickel foam with a Ni^{3+}-rich surface for ultrasensitive nonenzymatic glucose sensors', *Applied Surface Science* (2018), doi: https://doi.org/10.1016/j.apsusc.2018.07.202

Ammonium nickel phosphate on nickel foam with a Ni^{3+}-rich surface for ultrasensitive nonenzymatic glucose sensors

Xinxin Wang[a], Huamei Jian[a], Qi Xiao[a], and Suping Huang[b]*

[a] School of Minerals Processing and Bioengineering, Central South University, Changsha 410083, China.

[b] State Key Lab of Powder Metallurgy, Central South University, Changsha 410083, China.

*corresponding author: Qi Xiao

E-mail: xiaoqi88@csu.edu.cn. Tel: +86-731-88830543. fax: +86-731-88879815.

Highlights:

- The proportion of Ni^{3+}/Ni^{2+} of the electrode treated by H_2O_2 solution were increased.
- The K_{cat} of Ni^{3+}-rich surface electrode is much bigger than the untreated electrode.
- The $NH_4NiPO_4 \cdot H_2O$/Ni foam exhibited a low enough detection limit of 0.009 μM.
- Ni^{3+}-rich surface electrode showed a ultra high sensitivity (11361 $\mu A \cdot mM^{-1} \cdot cm^{-2}$).

Abstract

We propose a new, simple and effective strategy to enhance the electro-catalytic activity by regulating the valence states of the electro-catalyst. The proportion of Ni^{3+}/Ni^{2+} on the ammonium