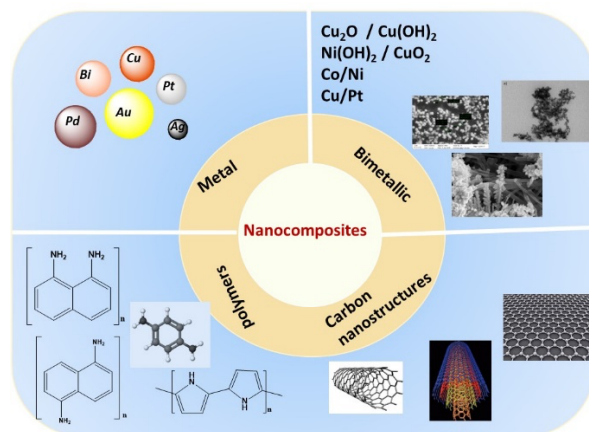


Electrosynthesis of eco-friendly catalysts based on metallic nanoparticles supported on conducting polymers : Energy and Environmental applications

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Abstract

In a challenging international context, with a global warming higher than expected, research scientists are looking for new sources of clean energy which is vital for the future of our planet. Here in, the catalytic performances of mono- and bi-metal catalysts deposited on conducting polymer-based supports for the electrooxidation of methanol and ethanol reactions or as electrochemical sensors will be explored. To reduce the time of synthesis, our research delves into a rapid novel and straightforward electrochemical method for the synthesis of Ni-Cu alloy catalyst for oxidation of alcohols as well as Hydrogen evolution reaction (HER). For this purpose, the electrosynthesis of our electrocatalysts was performed in one step by using one batch containing Nickel sulfate and copper sulfate in Potassium Chloride solution. Two different electrochemical approaches have been carefully investigated for the deposition of our composite (galvanostatic and potentiostatic mode). Various parameters influencing the deposition process, namely the concentration of salt, the time and mode of deposition were thoroughly scrutinized. Electrochemical methods such as linear voltammetry (LSV), cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS) have been used to study hydrogen reduction in alkaline and acidic media, as well as the performance of the catalysts. Our work provides a feasible, straightforward approach for preparing low cost-effective electrocatalysts for energy conversion and sensor device [4,5].



Recent Publications

1. [Copper nanoparticle modified chain-like platinum nanocomposites for electro-oxidation of C1-, C2-, and C3-type alcohols](#), R Bayat, A El Attar, M Akin, M Bekmezci, **M El Rhazi**, F Sen, International Journal of Hydrogen Energy, 51(2024) 577
2. [New and Ultra-Rapid Approach for Electrosynthesis of Highly Efficient Catalysts of Poly \(para-phenylenediamine\) Supported Copper Oxide for Ethanol Oxidation in Alkaline Medium](#), Anas El Attar, Badr Bouljoihel, Amine Ezzahi, **Mama El Rhazi**, ChemElectroChem, 2023
3. [Smartphone-Assisted Electrochemical Sensor Based on Mg_{0.5}Co_{2.5}\(PO₄\)₂ and Carbon Black for Trace Bisphenol A Detection](#), O Salhi, L Oularbi, T Ez-zine, A El Attar, S Chemchoub, M. ElRhazi, ChemElectroChem, 10 (9) 2023
4. Electrosynthesis of eco-friendly electrocatalyst based nickel-copper bimetallic nanoparticles supported on poly-phenylenediamine with highest current density and early ethanol oxidation onset potential, S Chemchoub, A El Attar, L Oularbi, SA Younssi, F Bentiss, C Jama, Mama El Rhazi, International Journal of Hydrogen Energy, 47, 2022, 3908



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