Nickel Hexacyanoferrate Derived β -Ni(OH)₂ Flakes as Electrochemical Sensor for Sensitive Detection of Hydrazine

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A β -Ni(OH)₂ flakes modified carbon paste electrode [Ni(OH)₂/CPE] has fabricated for hydrazine sensing. The β -Ni(OH)₂ flakes derived from nickel hexacyanoferrate (NiHCF) through a facile in situ electrochemical method and characterized by Fourier transform infrared spectrometry, X-ray diffraction, and scanning electron microscopy. Meanwhile, the electrochemical performances of the modified electrode studied by electrochemical impedance spectroscopy, chronocoulometry, cyclic voltammetry, and linear sweep voltammetry. Owing to the large active surface area and enhanced electron transfer efficiency of β -Ni(OH)₂ flakes, the Ni(OH)₂/CPE showed enhanced catalytic activity toward the oxidation of hydrazine compared with NiHCF/CPE and unmodified CPE. Under the optimized conditions, the amperometric current presented linear dependence on the concentration of hydrazine in the ranges of 0.1 ~ 600 μ M with the detection limit of 0.04 μ M. Furthermore, the sensor has applied for the determination of hydrazine in water samples.

Keywords: Nickel hydroxide flakes; nickel hexacyanoferrate, hydrazine; electrocatalysis; electrochemical sensors

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