

AN APPLICATION OF IRON OXIDE NANOPARTICLES IN ELECTROCHEMISTRY AT RCPTM

JAKUBEC Petr, ZBOŘIL Radek

Palacky University Olomouc, Olomouc, Czech Republic, EU

Abstract

In the past decade, it has been found that nanomaterials play an important role in many analytical applications such as nanomaterial-based sensors or biosensors [1]. Among others iron oxide nanoparticles exhibit great chemical stability, biocompatibility, low toxicity which make them suitable for biomedical applications including drug delivery, immunoassay etc [2, 3]. It has been also shown, that iron oxide nanoparticles have some specific electrical advantages such as a high specific capacitance or narrow bandgap. On account of these properties, iron oxide nanoparticles appear as a promising candidate for electronic devices [4, 5].

In this work two different applications will be presented. A new simple electrochemical sensor for the detection of antibiotics chloramphenicol has been developed. The amplification strategy of this sensor is based on application of nanocomposite consists of magnetite nanoparticles stabilized with carboxymethyl cellulose (Fe₃O₄-CMC) and decorated with nanometer-sized gold nanoparticles (Fe₃O₄-CMC@Au). The second part is devoted to the application of iron oxide nanoparticles (gamma-Fe₂O₃, Fe₃O₄) in electrochemical sensing of paraquat herbicide.

Keywords: Iron oxides, nanoparticles, voltammetry, electrochemistry

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