One-Pot Synthesis of a Graphene-TiO₂ Nanocomposite for the Sensitive Determination of Cadmium(II) in Environmental Water

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Heavy metal ions in environmental water have posed a significant risk to human health due to their biodegradability and potential accumulation in aquatic organisms. This study proposed the synthesis of a TiO₂-graphene nanocomposite for the detection of cadmium ions via an electrochemical route. Then, different methods were used to characterize and analyse the features and morphology of the obtained TiO₂-graphene nanocomposite. Based on the optimization of the electrochemical detection conditions, this nanocomposite material was applied to the detection of Cd(II) in real water specimens from a tourism area. The electrochemical sensor for Cd(II) detection was proved applicable to protect the environment of this tourism area.

Keywords: Cadmium ions; TiO₂; Graphene; Electrochemical determination; Tourism scenic protection

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