Electrochemical Study of Hydrogen Peroxide Detection on MnO₂ Micromaterials

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Herein we report that urchin-like MnO₂ micromaterials, caddice-clew like MnO₂ micromaterials and MnO₂ nanoflowers were prepared by hydrothermal method. All the crystalline phases were α -MnO₂, which was essential to evaluate the relationship between electrochemical performances and morphologies of MnO₂ crystals for H₂O₂ detection. The value of H₂O₂ oxidation peak current on all the MnO₂ crystals modified electrode were all much higher than glassy carbon electrode. The performances of H₂O₂ detection were in the following order: urchin-like MnO₂ micromaterials > MnO₂ nanoflowers > caddice-clew like MnO₂ micromaterials. Here more electro-activity sites might be the most important factor of the increased oxidation peak current. The redox processes of H₂O₂ on all the three MnO₂ sample modified electrodes were controlled by diffusion. The results presented in this study that the as prepared MnO₂ materials have good application prospect in detecting H₂O₂.

Keywords: Electro-analysis, Manganese dioxide, Hydrothermal method, Hydrogen peroxide

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