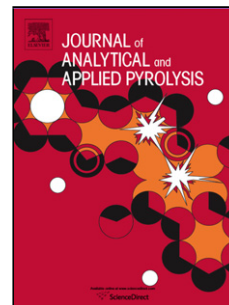


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Highly sensitive H₂O₂ sensor based on annealed MnO₂/Al₂O₃ nanofibers prepared by a novel spray pyrolysis deposition

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Highlights

- First report on the fabrication of MnO₂/Al₂O₃ electrode for H₂O₂ detection.
- Post annealing of MnO₂ favored c- axis orientation.
- SEM reveals nano fibrous morphology favorable for electrochemical sensing.
- Nanocomposited electrode exhibit very low detection limit towards H₂O₂.

Abstract

In the present work, we report the annealing effect on the properties of MnO₂ nanofibers prepared onto sapphire substrate for electrochemical detection of H₂O₂. The MnO₂/sapphire nanocomposite films prepared by a novel spray deposition route were investigated for its optical and microstructural properties. The red shift in the absorption peak with increase in the annealing temperature was attributed to strain relaxation in MnO₂ crystallites. The film annealed at 400 °C show significant change in morphology from nanofibre to nanonoodles like structure with large diameter, which provided large electrochemical active surface favorable for sensing. The electrochemical performance of nanocomposited MnO₂/Al₂O₃ electrode annealed at 400 °C

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