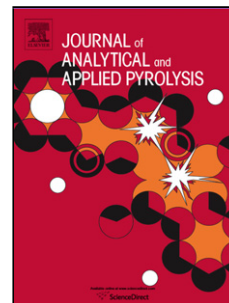


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Preparation of activated carbon, zinc oxide and nickel oxide composites for potential application in the desulfurization of model diesel fuels

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Highlights

- New preparation method to commercial activated carbon was developed
- Improved desulfurization by incorporation of metal oxides on AC
- AC/NiO/ZnO oxide possessed higher adsorption capacity
- Metal oxides loaded AC could be employed as low-cost adsorbent

Abstract

The present study focuses on the new method for preparation of activated carbon (AC), activated carbon/zinc oxide (AC/ZnO), and activated carbon/zinc oxide/nickel oxide (AC/NiO/ZnO), as potential alternative adsorbents to commercially activated carbon (CAC) for the desulfurization of model diesel fuels (MDFs) at ambient temperature. The textural properties, the morphology and the crystallinity of as-synthesized adsorbents were examined by N₂-physisorption, field emission scanning electron microscopy (FESEM) and X-ray diffraction (XRD), respectively. The as-developed adsorbents were evaluated for desulfurization of thiophene (T), benzothiophene (BT), and dibenzothiophene (DBT) in n-hexane. Our results show that the incorporation of metal oxides (ZnO and NiO) onto the

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