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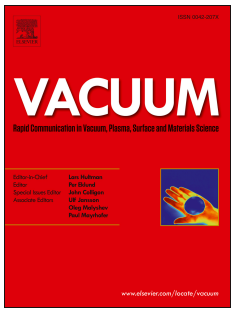

Facile synthesis of mesoporous MnO_2 nanosheet and microflower with efficient photocatalytic activities for organic dyes

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Facile synthesis of mesoporous MnO_2 nanosheet and microflower with efficient photocatalytic activities for organic dyes

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Abstract

MnO_2 nanosheets and microflowers are prepared by a facile one-step hydrothermal method with a $KMnO_4$-Na_2SO_4 aqueous solution system in this paper. Photocatalytic properties of the as-prepared products for different organic dyes are investigated under ultraviolet light and visible light irradiation at room temperature. The MnO_2 nanostructures with mesoporous structures exhibit enhanced photocatalytic performance under UV light, the degradation efficiency up to 91.1% within 30 min for methylene blue and 89.8% for methyl orange within 120 min. Moreover, the possible mechanism of photocatalytic degradation for MB was proposed. MnO(OH) existing in the product provides more ·OH during the degradation process, as well as influences the band gap of the product, which enhanced the separation of the photo-induced electron-hole pairs, thereby improved photocatalytic activity of MnO_2 nanostructure. The results reveal that the as-prepared MnO_2 nanostructures might have a potential application for organic contaminants degradation in water purification field.

Keywords: manganese dioxide; nanostructures; solvothermal synthesis; photocatalysts.

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