

Sintesis dan karakteristik Fe₂O₃, Mn₂O₃, Fe₂O₃/Mn₂O₃ dan Fe₂O₃/Mn₂O₃/Graphene dalam aktivitas foto-fenton untuk mendegradasi limbah pewarna = Synthesized and characterization of Fe₂O₃, Mn₂O₃, Fe₂O₃/Mn₂O₃ and Fe₂O₃/Mn₂O₃/Graphene in photo-fenton activity for dye waste degradation

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Abstrak

Nanokomposit Fe₂O₃/Mn₂O₃-Grafena dengan variasi persen berat grafena berhasil disintesis dengan metode hidrotermal. Hasil X-ray Diffraction (XRD) dapat menunjukkan bahwa sampel tidak memiliki pengotor. Kehadiran graphene dalam nanokomposit telah berhasil ditunjukkan dengan mengukur spektroskopi Raman dan spektroskopi sinar-X dispersif energi (EDX). Peningkatan spesifik dalam area sampel seiring bertambahnya graphene, dapat dikonfirmasi melalui isotherm adsorpsi-desorpsi N₂. Vibrating Sample Magnetometer (VSM) menunjukkan bahwa magnetisme sampel menurun dengan meningkatnya graphene. Uji aktivitas foto-Fenton nanokomposit Fe₂O₃/Mn₂O₃ dengan adanya graphene digunakan untuk mengevaluasi degradasi metilen biru (MB) dan jingga metil (MO) di bawah paparan sinar UV. Hasil foto-Fenton optimum diperoleh pada nanokomposit Fe₂O₃/Mn₂O₃-7G 0,2 g/L dengan 2 mL H₂O₂ pada pH 4. Spesies aktif yang berperan dalam aktivitas foto-Fenton adalah OH. Nanokomposit Fe₂O₃ /Mn₂O₃-7G juga menunjukkan sifat dapat digunakan kembali.

.....Fe₂O₃/Mn₂O₃-Graphene nanocomposite with various weight percent graphene was successfully synthesized by hydrothermal method. The results of X-ray Diffraction (XRD) can show that the sample has no impurities. The presence of graphene in nanocomposites has been successfully demonstrated by measuring Raman spectroscopy and energy dispersive X-ray spectroscopy (EDX). The specific increase in sample area as graphene increases, can be confirmed through the N₂ adsorption-desorption isotherm. The Vibrating Sample Magnetometer (VSM) shows that the magnetism of the sample decreases with increasing graphene. Photo-Fenton activity test of Fe₂O₃/Mn₂O₃ nanocomposite in the presence of graphene was used to evaluate the degradation of methylene blue (MB) and methyl orange (MO) under UV light exposure. Optimum photo-Fenton results were obtained on Fe₂O₃/Mn₂O₃-7G 0.2 g/L nanocomposite with 2 mL H₂O₂ at pH 4. The active species that played a role in photo-Fenton activity was OH. Fe₂O₃/Mn₂O₃-7G nanocomposites also showed reusability.