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 isoterm 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.