Pengaruh penambahan nanographene platelets terhadap uji aktivitas sono-, photo- dan sonophoto-catalytic couple-nanomaterial oksida besi dan oksida seng untuk limbah pewarna methylene blue = The influence of addition of nanographene platelets to sono-, photo- and sonophoto-catalytic activity of couple nanomaterial iron oxide and zinc oxide for methylene blue dye

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Abstrak

Komposit Fe3O4/ZnO/NGP dengan variasi wt NGP 5 , 10 dan 15 telah disintesis dengan menggunakan metode sol-gel dan co-precipitation. Pengukuran X-Ray Diffraction XRD , Energy Dispersive X-Ray EDX , nitrogen adsorption spectroscopy, Vibrating Sample Magnetometer VSM , Fourier Transform Infrared FTIR , dan Differential Thermal Analysis-Thermal Gravimetric Analysis DTA-TGA dilakukan untuk mengidentifikasi struktur, surface area, sifat magnet, vibrasi molekul dan analisis termal material. Pengujian aktivitas catalytic dilakukan dibawah paparan radiasi sinar ultraviolet, ultrasonik dan gabungan dari UV dan ultrasonik terhadap larutan limbah pewarna methylene blue. Komposit Fe3O4/ZnO/NGP 10wt menunjukkan degradasi maksimum pada aktivitas catalytic dengan dosis 0.2 g/L. Pada aktivitas catalytic, pengaruh penambahan scavenger menunjukkan bahwa hole merupakan spesies aktif utama yang berperan penting dalam aktivitas catalytic. Proses reusability membuktikan bahwa komposit Fe3O4/ZnO/NGP 10wt merupakan material yang baik yang dapat digunakan kembali pada aktivitas catalytic.
.....Fe3O4 ZnO NGP composites with variations of wt NGP 5 , 10 and 15 were synthesized using sol gel and coprecipitation methods. Measurement of X Ray Diffraction XRD , Energy Dispersive X Ray EDX , nitrogen adsorption spectroscopy, Vibrating Sample Magnetometer VSM , Fourier Transform Infrared FTIR , and Differential Thermal Analysis Thermal Gravimetric Analysis DTA TGA to identify structures, surface area, magnetic properties, molecular vibrations and thermal analysis of materials. The catalytic activity test is performed under exposure of ultraviolet, ultrasonic and combination of ultrasonic and UV irradiation to methylene blue dye solution. The Fe3O4 ZnO NGP 10wt composite showed maximum degradation in catalytic activity at a dose of 0.2 g L. In catalytic activity, the effect of scavenger addition indicates that holes are the main active species that play an important role in catalytic activity. The reusability process proves that the Fe3O4 ZnO NGP 10wt composite is a good material which can be reused in catalytic activity.