

INTISARI

FOTOKATALIS NANOPARTIKEL MAGNETIK COBALT ZINC FERRITE (CoZn-Fe₂O₄) UNTUK DEGRADASI ZAT PEWARNA METHYLENE BLUE (MB)

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Aktivitas fotokatalis nanopartikel magnetik CoZn-Fe₂O₄ dalam mendegradasi zat pewarna methylen blue (MB) telah berhasil dilakukan. Material nanopartikel magnetik CoZn-Fe₂O₄ disintesis menggunakan metode kopresipitasi dengan suhu 90⁰C. Aktivitas fotokatalis dilakukan dengan beberapa variasi massa nanopartikel CoZn-Fe₂O₄. Hasil dikarakterisasi menggunakan X-Ray Diffraction (XRD), Transmission Electron Microscopy (TEM), dan spektrofotometer UV-VIS. Hasil karakterisasi menggunakan XRD menunjukkan struktur spinel cubic ferrite dengan ukuran kristalit sebesar 8,4 ± 0,1 nm. Hasil karakterisasi menggunakan TEM menunjukkan bahwa sampel mengalami aglomerasi dan memiliki bentuk bulatan yang tidak sempurna. Karakterisasi aktivitas fotokatalis yang dilakukan menggunakan spektrofotometer UV-VIS menunjukkan adanya peningkatan prosentase degradasi. Variasi massa katalis mempengaruhi proses degradasi, dengan massa sebesar 0,15 gram merupakan massa yang efektif dalam mendegradasi MB. Nanopartikel masih dapat digunakan untuk mendegradasi MB kembali dengan nilai prosentase degradasi yang lebih rendah.

Kata kunci : nanopartikel magnetik *Cobalt Zinc Ferrite* (CoZn-Fe₂O₄), kopresipitasi, fotodegradasi, *methylene blue* (MB)

ABSTRACT

PHOTOCATALIS MAGNETIC NANOPARTICLES COBALT ZINC FERRITE (CoZn-Fe₂O₄) FOR DEGRADATION OF METHYLENE BLUE

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The photocatalyst activity of CoZn-Fe₂O₄ magnetic nanoparticles in degrading methylene blue (MB) dye has been successfully carried out. CoZn-Fe₂O₄ magnetic nanoparticle material was synthesized using the coprecipitation method at a temperature of 90⁰C. Photocatalyst activity was carried out with several mass variations of CoZn-Fe₂O₄ nanoparticles. The results were characterized using X-Ray Diffraction (XRD), Transmission Electron Microscopy (TEM), and UV-VIS spectrophotometer. The results of characterization using XRD showed the spinel cubic ferrite structure with a crystallite size of 8.4 ± 0.1 nm. The results of characterization using TEM showed that the sample experienced agglomeration and had an imperfect sphere. The characterization of the photocatalyst activity carried out using a UV-VIS spectrophotometer showed that there was an increase in the percentage of degradation. The variation of catalyst mass affects the degradation process, with a mass of 0.15 grams which is an effective mass in degrading MB. Nanoparticles still can be used to degradate MB again with lower degradation value.

Keywords : magnetic nanoparticles Cobalt Zinc Ferrite (CoZn-Fe₂O₄), co-precipitation, photodegradation, methylene blue (MB)