

Sintesis dan karakterisasi nanokomposit $MgFe_2O_4$ dan $MgFe_2O_4/NGP$ untuk degradasi limbah pewarna methylene blue melalui proses photocatalytic = Synthesize and characterization of nanocomposite $MgFe_2O_4$ and $MgFe_2O_4/NGP$ for methylene blue degradation by photocatalytic process.

Daffa Aulia Ekanara, author

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Abstrak

Pada studi ini, saya menggunakan metode fotokatalitik untuk mendegradasi limbah cat pewarna organik dalam limbah air menggunakan $MgFe_2O_4$ dan $MgFe_2O_4$ -nanographene ($MgFe_2O_4/NGP$) nanopartikel. $MgFe_2O_4$ dan $MgFe_2O_4/NGP$ (mengandung persentase NGP yang bervariasi) disintesis melalui metode hidrotermal. Kedua bahan ini digunakan sebagai katalis dalam proses fotokatalitik mendegradasi limbah organik Methylene-Blue dalam solusi cair, dibawah radiasi cahaya merah. Karakteristik dari sample ($MgFe_2O_4$ & $MgFe_2O_4/NGP$) dilakukan menggunakan X-ray Diffraction, Raman Spectroscopy, UVVIS Spectroscopy, XRF, TGA, BJH, XPS, TEM, HRTEM, SAED, EDX dan BET. Hasil dari penelitian ini menunjukkan bahwa $MgFe_2O_4/NGP$ mempunyai kemampuan fotokatalitik yang lebih baik dibandingkan dengan $MgFe_2O_4$. Efek dari konsentrasi NGP (wt%) untuk mendegradasi MB didiskusikan. Spesies aktif dalam proses fotokatalitik juga dipelajari melalui scavenger test.

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In the current study, we use the photodegradation method for the removal of organic dye molecule in wastewater using $MgFe_2O_4$ and $MgFe_2O_4$ -nanographene platelets ($MgFe_2O_4/NGP$) nanoparticles. $MgFe_2O_4$ and $MgFe_2O_4/NGP$ (containing various amounts of NGP) were synthesized using the hydrothermal method. Both of them used as a catalyst for photocatalytic degradation of methylene blue (MB), i.e. our organic dye in aqueous solution under red light irradiation. Characteristics of our samples ($MgFe_2O_4$ & $MgFe_2O_4/NGP$) were characterized using X-ray diffraction, Raman Spectroscopy, UVVIS Spectroscopy, XRF, TGA, BJH, XPS, TEM, HRTEM, SAED, EDX, and BET. The result of our work showed that $MgFe_2O_4/NGP$ mostly have a better photocatalytic performance compared to pure $MgFe_2O_4$. The effect of NGP concentration (wt%) on the photocatalytic degradation of MB was discussed. Active species who'd take effect on the photocatalytic process was also studied by the scavenger test.