

Pengaruh penambahan atom nikel dan surfaktan cetyltrimethylammonium bromide (CTAB) terhadap struktur sifat optik, dan aktivitas fotokatalitik nanopartikel zink oksida (ZnO) = The effect of Ni doping and (CTAB) on structure optical properties, and photocatalytic activity of (ZnO) nanoparticle

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Abstrak

Nanopartikel ZnO yang dimodifikasi oleh CTAB dan didop dengan empat variasi konsentrasi atom Ni berhasil dibuat melalui metode kopresipitasi. Seluruh sampel dikarakterisasi oleh pengukuran energy dispersive X-ray spectroscopy (EDX), X-ray diffraction (XRD), fourier transform infrared (FTIR) spectroscopy, electron spin resonance (ESR), field emission scanning electron microscope (FESEM), dan UV-Vis spectrophotometry.

Hasil pengukuran memperlihatkan bahwa penambahan CTAB dan konsentrasi atom dopant mempengaruhi morfologi dan sifat optik dari seluruh sampel. Pengujian aktivitas fotokatalitik sampel dilakukan pada larutan methyl orange (MO) dan methylene blue (MB) di bawah paparan sinar UV selama 2 jam. Hasil yang diperoleh menunjukkan bahwa efisiensi kinerja degradasi fotokatalitik dari sampel meningkat seiring dengan bertambahnya konsentrasi atom dopant.

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CTAB-modified ZnO nanoparticles doped with four different concentrations of Ni were successfully synthesized by co-precipitation method. All samples were characterized using energy dispersive X-ray spectroscopy (EDX), X-ray diffraction (XRD), fourier transform infrared (FTIR) spectroscopy, electron spin resonance (ESR), field emission scanning electron microscope (FESEM), and UV-Vis spectrophotometry. The results demonstrated that the addition of CTAB and doping concentration affect the morphology and optical properties of the samples. The photocatalytic activity test of all samples was studied by observing the degradation of methyl orange (MO) and methylene blue (MB) under UV light irradiation. The result indicates that the performance of photocatalytic activity from all samples increases along with the increasing concentration of atomic dopant.