

Green Synthesis dan Karakterisasi Nanokomposit ZnO/NiWO₄ menggunakan Ekstrak Daun Alpukat (*Persea americana*) serta Uji Aktivitas Fotokatalitiknya = Green Synthesis of ZnO/NiWO₄ Nanocomposite Using Alpukat (*Persea americana*) Leaf Extract and Its Photocatalytic Application

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Abstrak

Pada penelitian ini, nanopartikel ZnO, NiWO₄, dan ZnO/NiWO₄ berhasil disintesis dengan cara metode green synthesis menggunakan ekstrak daun alpukat (*Persea americana*) dalam sistem satu fasa. Kandungan ekstrak air daun alpukat adalah alkaloid, saponin dan polifenol. Nanopartikel ZnO, NiWO₄, dan ZnO/NiWO₄ dikarakterisasi menggunakan spektrofotometer Ultraviolet-Visible Diffuse Reflectance Spectroscopy (UV-Vis DRS), X-Ray Diffraction (XRD), Fourier Transform InfraRed (FTIR), Transmission Electron Microscopy (TEM) dan Scanning Electron Microscopy Energy Disperse X-Ray (SEM-EDX). Hasil karakterisasi UV-Vis DRS, nanopartikel ZnO, NiWO₄, dan ZnO/NiWO₄ memiliki band gap 3,15 eV, 2,35 eV, dan 3,03 eV. Hasil uji aktivitas fotokatalitiknya menggunakan nanokomposit ZnO/NiWO₄ terhadap malasit hijau dibawah iradiasi sinar tampak selama 2 jam memiliki persen degradasi tertinggi dibandingkan dengan NiWO₄ dan ZnO. Persen degradasi ZnO/NiWO₄, NiWO₄, ZnO adalah 96,20%, 79,22%, 48,30%.

.....In this research, ZnO, NiWO₄, and ZnO/NiWO₄ nanoparticles were successfully synthesized by means of green synthesis method using avocado (*Persea americana*) leaf extract in a single phase system. The secondary metabolites of avocado leaf water extract are alkaloids, saponins and polyphenols. ZnO, NiWO₄, and ZnO/NiWO₄ nanoparticles were characterized using a spectrophotometer Ultraviolet-Visible Diffuse Reflectance Spectroscopy (UV-Vis DRS), X-Ray Diffraction (XRD), Fourier Transform InfraRed (FTIR), Transmission Electron Microscopy (TEM) and Scanning Energy Microscopy Electron Disperse X-Ray (SEM-EDX). The results of the photocathlytic activity test using the ZnO/NiWO₄ nanocomposite against malachite green under visible light irradiation for 2 hours had the highest degradation percent compared to NiWO₄ and ZnO. The degradation percentages of ZnO/NiWO₄, NiWO₄, ZnO were 96.81%, 79.71%, 51.38%.