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Ekstrak daun Afrika (vernonia amygdalina del.) sebagai media green synthesis nanopartikel Nd2O3-Ag2O dan studi aktivitas fotokatalitiknya = Green synthesis Nd2O3-Ag2O nanoparticle by vernonia amygdalina del. leaf extract and its photocatalytic activities

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Abstrak

Green synthesis nanopartikel Nd2O3, Ag2O dan nanopartikel Nd2O3-Ag2O dilakukan karena mudah, murah dan ramah lingkungan. Dalam penelitian ini, ekstrak daun afrika (Vernonia Amygdalina Del.) kemudian diberi nama EDA digunakan untuk mensintesis nanopartikel Nd2O3-Ag2O. Metabolit sekunder pada EDA berperan sebagai sumber basa dan capping agent, yang ditentukan melalui uji fitokimia. Pola difraksi dan kristalinitas ketiga nanopartikel tersebut dikonfirmasi menggunakan X-Ray Diffraction, sedangkan morfologi ditentukan menggunakan Scanning Electron Microscopy-Energy Dispersive X-ray Analysis dan Transmitted Electron Microscopy. Fourier Transform-Infra Red digunakan untuk menunjukkan interaksi antara EDA dengan nanopartikel. Bilangan gelombang Nd-O pada nanopartikel Nd2O3 muncul di daerah 426 cm-1, Ag-O pada nanopartikel Ag2O di daerah 825 cm-1. Sedangkan bilangan gelombang Ag-O (855 cm-1), Nd-O (424 dan 667 cm-1) terdapat pada nanopartikel Nd2O3-Ag2O. Ukuran distribusi dari ketiganya berada di antara 1-100 nm yang dikonfirmasi menggunakan Particle Size Analyzer. Band gap nanopartikel Nd2O3-Ag2O yaitu sebesar 3,29 eV. Aktivitas fotokatalitik nanopartikel Nd2O3-Ag2O disimulasikan terhadap degradasi Metilen Biru (MB). Hasil degradasi sebesar 93, 71%. <hr>Green synthesis of Nd2O3, Ag2O and Nd2O3-Ag2O nanoparticles has been investigated lately due to its properties of inexpensive, easy to use, and eco-friendly material. At current research, Vernonia amygdalina Del. leaf extract was used to synthesize Nd2O3, Ag2O and Nd2O3-Ag2O nanoparticles. The secondary metabolite of Vernonia amygdalina Del. leaf extract plays a role as a base source and a capping agents, which can be determined by phytochemical test. The diffraction pattern and crystallinity of Nd2O3, Ag2O and Nd2O3-Ag2O nanoparticles were confirmed by using X-ray Diffraction, while the morphology can be determined using Scanning Electron Microscopy-Energy Dispersive X-ray Analysis and Transmitted Electron Microscopy. Fourier Transform-Infra Red (FT-IR) spectra was used to show the interaction between Vernonia amygdalina Del. leaf extract and nanoparticles. FT-IR characterization showed the wave number of Nd2O3 at 426 cm-1, Ag2O at 825 cm-1, and Nd2O3-Ag2O nanoparticles at 424 and 855 cm-1. The size distribution of Nd2O3, Ag2O and Nd2O3-Ag2O nanoparticles at 1-100 nm were confirmed by Particle Size Analyzer. UV-Vis DRS characterization proved the energy band gap of Nd2O3-Ag2O nanoparticles at 3,29 eV. The photocatalytic activity of Nd2O3-Ag2O nanoparticles was observed by determining the degradation of methylene blue, which was identified at 93.71%.