SYNTHESIS OF Fe/La_2O_3 NANOPARTICLES BY USING FLOPPERS PLANT (*Kalanchoe pinnata (Lam)*) LEAF EXTRACT AS METHYLENE BLUE PHOTOCATALYST

ABSTRAC

Eco-friendly nanoparticles can be synthesized by using plant extracts. Nanoparticles (NPs) Fe/La_2O_3 synthesized by using floppers plant leaf extract (*Kalanchoe Pinnata (Lam*) (CBle). The secondary metabolites contained in CBLe were used as weak bases and stabilizing agents in the synthesis of Fe/La_2O_3 NPs. Fe/La_2O_3 NPs were characterized by using UV-Visible, X-Ray Diffraction (XRD), Fourier Transform Infra Red (FTIR) and Scanning Electron Microscope (SEM). UV-Vis spectra showed that Fe/La_2O_3 formed were characterized with the absorption at a wavelength of 250 nm, the results was also strengthened by FTIR and XRD data. The morphology of Fe/La_2O_3 NPs is spherical, slightly agglomerated. The size of Fe/La_2O_3 nanoparticles is 84,86 nm. Fe/La_2O_3 NPs was tested for its photocatalytic activity against methylene blue degradation, the percentage of methylene blue degradation was 87% with a reaction rate constant ($k=1.12 \times 10^{-2}$). Based on these results, it can be concluded that Fe/La_2O_3 NPs synthesized by using CBle were able to degrade methylene blue.

Keywords : Floppers plant, Fe/La_2O_3 NPs, photocatalytic, methylene blue.

SINTESIS NANOPARTIKEL Fe/La_2O_3 MENGGUNAKAN EKSTRAK DAUN COCOR BEBEK *(Kalanchoe pinnata (Lam))* SEBAGAI FOTOKATALIS METILEN BIRU

ABSTRAK

Sintesis nanopartikel ramah lingkungan dapat dilakukan dengan menggunakan ekstrak tanaman. Nanopartikel (NP) Fe/La_2O_3 disintesis menggunakan ekstrak daun cocor bebek (*Kalanchoe Pinnata (Lam*) (CBle). Kandungan metabolit sekunder yang terdapat pada CBLe digunakan sebagai basa lemah dan agen penstabil dalam sintesis NP Fe/La_2O_3. NP Fe/La_2O_3 dikarakterisasi menggunakan UV-Visible, X-Ray Diffraction (XRD), Fourier Transform Infra Red (FTIR) dan Scanning Electron Microscope (SEM). Spektra UV-Vis menunjukkan nanopartikel Fe/La_2O_3 terbentuk ditandai dengan adanya serapan pada panjang gelombang 250 nm, hasil tersebut juga diperkuat oleh data FTIR dan XRD. Morfologi nanopartikel Fe/La_2O_3 berbentuk bola, sedikit beraglomerasi. Ukuran nanopartikel Fe/La_2O_3 adalah 84,86 nm. Nanopartikel Fe/La_2O_3 dilakukan uji aktivitas fotokatalitiknya terhadap degradasi metilen biru, persentase terdegradasi metilen biru sebesar 87% dengan nilai konstanta laju reaksi ($k=1,12 \times 10^{-2}$). Berdasarkan hasil ini dapat disimpulkan bahwa nanopartikel Fe/La_2O_3 yang disintesis menggunakan CBle mampu mendegradasi metilen biru.

Kata kunci : Cocor bebek, Np Fe/La_2O_3, fotokatalitik, metilen biru.