

One-Pot Synthesis and Characterization of Magnesium Oxide Nanoparticles Prepared by Calliandra Calothyrsus Leaf Extract

Authors : Indah Kurniawaty, Yoki Yulizar, Haryo Satriya Oktaviano, Adam Kusuma Rianto

Abstract : Magnesium oxide nanoparticles (MgO NP) were successfully synthesized in this study using a one-pot green synthesis mediated by Calliandra Calothyrsus leaf extract (CLE). CLE was prepared by maceration of the leaf using methanol with a ratio of 1:5 for 7 days. Secondary metabolites in CLE, such as alkaloids and flavonoids, served as a weak base provider and capping agent in the formation of MgO NP. CLE Fourier Transform Infra-Red (FTIR) spectra peak at 3255, 1600, 1384, 1205, 1041, and 667 cm⁻¹ showing the presence of vibrations O-H stretching, N-H bending, C-C stretching, C-N stretching and N-H wagging. During the experiment, different CLE volumes and calcined temperatures were used, resulting in a variety of structures. Energy Dispersive X-ray Spectrometer (EDS) and FTIR were used to characterize metal oxide particles. MgO diffraction pattern at 2θ of 36.9°; 42.9°; 62.2°; 74.6°; and 78.5° which can be assigned to crystal planes (111), (200), (220), (311), and (222), respectively. Scanning Electron Microscopy (SEM) was used to characterize the surface morphology. The morphology ranged from sphere to flower-like resulting in crystallite sizes of 28, 23, 12, and 9 nm.

Keywords : MgO, nanoparticle, calliandra calothyrsus, green-synthesis

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