

COMPARATIVE STUDY OF MgO NANOPARTICLES SYNTHESIZED IN THE PRESENCE OF SODIUM DODECYL SULPHATE AND ALOE VERA

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Abstract. In this paper, two methods for the synthesis of MgO nanoparticles (NPs) are described, using sodium dodecyl sulphate and Aloe Vera extract as dispersing agents. Different quantities of dispersing agent and sodium hydroxide were used in the synthesis of the NPs. The synthesized NPs were calcined at different temperatures. The morphology and size of the MgO NPs were characterized using scanning electron microscopy (SEM-EDX) and X-ray diffraction (XRD), respectively. The EDS and XPS analyses show that both synthetic routes produce the nanoscale MgO phase. FTIR spectra for MgO NPs annealed at different temperatures show slight changes in intensity and small shifts in the vibration modes with increasing calcination temperature. The functional groups and optical properties were studied using FTIR and UV-Vis spectroscopy. XRD analysis revealed the presence of the Mg(OH)₂ phase in the as-grown NPs, while the MgO phase was formed at a calcination temperature of 700°C. The experimental data indicate that the average crystallite size of the synthesized MgO NPs is slightly influenced by the dispersing agent.

Keywords: MgO nanoparticles, sodium dodecyl sulphate, aloe vera, the coprecipitation method.