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## Green Synthesis of Pectin-Stabilized ZnO Nanocomposites for Photocatalysis

The development of environmentally benign nanocomposite materials has gained significant attention in photocatalytic applications, particularly for wastewater treatment. In this study, a pectin-zinc oxide (ZnO) nanocomposite was synthesized using a green, solution-based route that leverages the natural polysaccharide pectin as a biopolymeric stabilizer and matrix. The structural, morphological, and optical characteristics of the resulting composite were analyzed using X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), and UV-Vis spectrophotometry. The results confirmed the successful incorporation of ZnO nanoparticles within the pectin matrix, exhibiting a uniform dispersion and reduced particle agglomeration. Photocatalytic activity was assessed by the degradation of a model organic dye under UV and visible light irradiation.

### Academic or Professional Status

Undergraduate Student

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