

Biosynthesis of ZnO nanoparticles by leaf extract of *Plumeria* and characterization

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Green synthesis of metal oxide nanoparticles using plant extract is a promising alternative to traditional method of chemical synthesis. It is one of the best ways to control different sizes of nanoparticles. In this context, we report the synthesis of ZnO nanoparticles by biological method using *Plumeria* plant extract. ZnO nanoparticles were synthesized using $\text{Zn}(\text{CH}_3\text{COO})_2$ and *Plumeria* leaf extract as the solvent. ZnO nanoparticles were characterized by UV-visible spectroscopy, Powder X-ray diffraction (PXRD), Fourier Transform Infrared spectroscopy (FT-IR) techniques. UV-visible spectroscopic analysis indicates that the maximum absorption peak at 356.0 nm corresponding to the characteristic band of ZnO nanoparticles. Peaks at 544 cm^{-1} and 545 cm^{-1} in IR spectrum indicate the characteristic absorption of Zn-O bond for the biosynthesised ZnO nanoparticles with 1 mL and 20 mL of plant extracts respectively. PXRD pattern shows 2θ values at 31.71° , 34.39° , 36.24° , 47.52° , 56.56° , 62.86° , 67.91° and 69.02° which could be indexed as the ZnO - wurtzite structure. Further, the average crystallite size was estimated as of 27.23 nm for ZnO nanoparticles by using Debye Sherrer's formula.

Keywords: ZnO, biosynthesis, nanoparticles, absorption and diffraction

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