

Photodegradation, Antibacterial & Antioxidant Assessment of Zinc Oxide Nanoparticles Using *Smilax Aspera* Leaf Extract: An Eco Approach †

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Abstract: The endeavor of this research accounts for a superficial green route scheme by using an extract of leaves of *Smilax aspera* as a stabilizing and capping agent. Zinc Oxide nanoparticles (ZnO-NPs) were examined through UV-visible Spectrophotometer, X-Ray Diffraction (XRD), EDX (Energy Dispersive X-rays spectroscopy), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM). The NPs demonstrate potential photocatalytic activity for the degradation of Methyl Orange (MO) and Methylene Blue (MB) dyes upon exposure to sunlight. We investigated the antibacterial action of ZnO-NPs against two gram-positive and *Staphylococcus aureus*, *Streptococcus pneumoniae*, and three-gram-negative microbes viz, *Klebsiella pneumoniae*, *Escherichia coli*, and *Pseudomonas aeruginosa* correspondingly). In general, the trial result proposes that ZnO-NPs could be created as an antibacterial specialist against a wide scope of microorganisms to oversee and stay away from scattering and determination of bacterial contaminations. On the other hand, 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging evaluation of obtained nanoparticles resulted in percentage inhibition in concentration-dependent mode.

Keywords: ZnO NP; Tauc-plot; photodegradation; antibacterial; antioxidant efficacy.

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Conflicts of Interest

On behalf of all entitled authors, I, Aayasha Negi (Research Scholar Department Of Chemistry), declare that the submitted manuscript is original and has not been or is not being submitted to any other journal.