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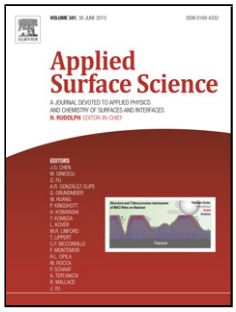

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Author: K. Elumalai S. Velmurugan

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Green synthesis, characterization and antimicrobial activities of Zinc Oxide nanoparticles from the leaf extract of *Azadirachta indica* (L.)

K. Elumalai [a], *S. Velmurugan* *[b]

[a]*Department of Physics, Annamalai University, Annamalai Nagar–608002, India*
[b]*Department of Engineering Physics (FEAT), Annamalai University, Annamalai Nagar–608 002,India.*

Abstract

The synthesis of metal and semiconductor nanoparticles is an expanding research area due to the potential applications in the development of novel technologies. Especially, biologically synthesized nanomaterial has become an important branch of nanotechnology. The present work, described the synthesis of Zinc oxide nanoparticles (ZnO NPs) using leaf aqueous extract of *Azadirachta indica* (L.) and its antimicrobial activities. The nanoparticles was obtain characterized by UV- visible spectroscopy, Photoluminescence (PL), X- ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), Scanning electron microscope (SEM) analysis, Energy dispersive X-ray analysis (EDAX), Field emission scanning electron microscopy (FESEM) and Atomic force microscope (AFM) analysis. In this study we also investigated antimicrobial activity of green synthesized ZnO NPs. The results depicted concentration of ZnO NPs was increased (50, 100, 200 µg/ml) and also increase in antimicrobial activities was due to the increase of H_2O_2 concentration from the surface of ZnO. However, green synthesized ZnO NPs was more potent than Bare ZnO and leaf of *A.indica.* Finally concluded the zinc oxide nanoparticles exhibited interesting antimicrobial activity with both gram positive and gram negative bacterial and yeast at micromolar concentration.

Keywords: ZnO NPs, Green synthesis, XRD, FT-IR, Antimicrobial activities.