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Green Preparation and Activity Evaluation of Nano Zinc Oxide

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**Abstract:**

**Background/Objective:** [Green synthesis of nano zinc oxide (Nano ZnO) using navel orange peel as the raw material.]

**Methods:** [Using navel orange peel as the raw material, nano zinc oxide (Nano ZnO) powder was green-prepared by the solution combustion method. The obtained product was structurally analyzed and morphologically observed using FTIR (Fourier Transform Infrared Spectroscopy), XRD (X-ray Diffraction), and SEM (Scanning Electron Microscopy). The antioxidant and antibacterial properties of the green-synthesized Nano ZnO were verified using the Brand-Williams method and the transparent inhibition zone method.]

**Results:** [The results indicated that the Nano ZnO particles prepared using navel orange peel extract as a biological template had good crystallinity, with an average particle size of about 26.3 nm. This nanomaterial exhibited excellent antioxidant activity, with a 3.0g/L Nano ZnO solution achieving a 96.71% scavenging rate for 1,1-diphenyl-2-picrylhydrazyl radicals (DPPH·). Additionally, the green-synthesized Nano ZnO demonstrated antibacterial effects against Staphylococcus aureus.]

**Conclusion:** [It was ultimately proved that nano zinc oxide (Nano ZnO) can be green prepared using navel orange peel as raw material.]

**Keywords:** [Navel orange peel; Nano zinc oxide; Green preparation; Nanotechnology; Environmental protection]