

**WSTA 15th Gulf Water Conference**  
**Water in the GCC, The Role of Technology in Effective Water Management**  
**28–30 April 2024, Doha, Qatar**

**Green synthesis of zinc oxide nanoparticles for wastewater treatment**

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**ABSTRACT**

This study focuses on the use of a green synthetic strategy to synthesize zinc oxide nanoparticles using *Albizia lebbek pods* extract. The synthesized nanoparticles were characterized using ultraviolet-visible spectroscopy, Fourier-transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), and scanning electron microscopy (SEM). The influence of nanoparticles preparation method was examined. XRD patterns confirmed the formation of hexagonal wurtzite structure and SEM results showed high agglomeration with irregular shape. The catalytic degradation of methyl orange and methylene blue dyes using the synthesized nanoparticles was examined. Results indicate that the removal efficiency of 87 and 82% was obtained for methyl orange and methyl blue within 60 min using nanoparticles dosage (0.02 g) and initial dye concentration (40 ppm). The experimental data were suitably fitted by Langmuir isotherm indicating a monolayer nature of the adsorption process. The obtained results demonstrate that the synthesized zinc oxide nanoparticles could be effectively utilized as adsorbents for the removal of methylene blue and methyl orange from aqueous solutions.

*Keywords:* Green synthesis; ZnO; Wastewater; Contaminants

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