



Citrus paradisi fruit peel extract mediated green synthesis of copper nanoparticles for remediation of Disperse Yellow 125 dye

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ABSTRACT

In the present research work, low cost and eco-friendly copper nanoparticles were prepared by a reduction method using grapefruit (*Citrus paradisi*) peels extract as the reducing agent. The nanoparticles were characterized by using UV-visible and scanning electron microscopy (SEM) techniques. The absorption peak at 525 nm in UV-visible spectrum indicated the nature of copper nanoparticles. SEM analysis showed the morphology and structure of copper nanoparticles. The nanoparticle size ranged from 56 to 59 nm. The synthesized copper nanoparticles were utilized for the decolorization of Disperse Yellow 125 dye following the optimization of reaction conditions concentration of dye and copper nanoparticles, concentration of dye and copper nanoparticles, pH, reaction time and temperature. The targeted dye was decolorized 73.5% at 0.01% concentration of dye, 0.05% copper nanoparticles concentration, and 6 pH at 50°C. The experimental results showed that COD and TOC removal efficiencies were 75.56% and 77.23%, respectively. The degradation pathway of the target dye was also studied.

Keywords: Green synthesis; Copper nanoparticles; *Citrus paradisi*; Disperse Yellow 125 dye Decolorization; Mineralization; Degradation

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