



## Enhanced photodegradation activity of cuprous oxide nanoparticles towards Congo red for water purification

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### ABSTRACT

Photocatalysis possesses enormous potential to facilitate the removal of environmental pollutants in the environment friendly ways. The nanostructured metal oxides have been found to show promising photocatalytic efficiencies toward organic pollutants. The present study deals with the synthesis of cuprous oxide and cupric oxide nanoparticles and characterization of their physiochemical, and photocatalytic properties using X-ray diffraction (XRD), scanning electron microscopy (SEM), Fourier transform infrared spectrometer (FT-IR), and UV-visible spectrometer. The as synthesized products were easily collected and purified and also tested for their photocatalytic activity toward water purification for removal of Congo red dye under sunlight. The impact of various factors on the catalytic efficiency of the synthesized nanoparticles, including catalyst concentration, reaction time, and pH of the solution has also been investigated. Both of these synthesized oxides of copper proved worthy of the said photocatalytic reaction and the results demonstrated an effective photodegradation of the Congo red under sunlight. It was found that Cu<sub>2</sub>O possessed higher photodegradation efficiency of 90% as compared to 54% degradation efficiency of CuO.

*Keywords:* Cu<sub>2</sub>O; CuO; Nanoparticles; Congo red; Photocatalytic activity; Water purification

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