

Synthesis of CuO and ZnO nanoparticles and CuO doped ZnO nanophotocatalysts.

ABSTRACT

Nanocrystalline copper oxide (CuO) particles were precipitated by using different sources of copper salts and oxalic acids. The transformation to monoclinic CuO is achieved by heating the copper precipitate at 300°C for 4 h. Dice-like and flower-like structures were obtained from the effects of by-product's acidity to the morphology of copper oxalate (Cu (C₂O₄)). The particle sizes of all samples, determined by transmission electron microscopy (TEM), were in the range of 10-30 nm. 0.5% CuO doped ZnO (CuO-ZnO) nanophotocatalysts were successfully prepared by mixing synthesized CuO nanoparticles with synthesized ZnO in absolute methanol. No significant changes in morphology were observed between the undoped and doped ZnO except for a higher surface area obtained for CuO doped ZnO. The doping of CuO on ZnO also resulted in enhanced photocatalytic performance of ZnO in the photodegradation of methyl orange dye.

Keyword: Zinc oxide; CuO doped ZnO; Photocatalyst; Degradation.