

Algerian partner contact

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Abstract

Sol-gel synthesis of pure and doped ZnO and TiO₂ nanopowders for application in photo-catalysis.

In the first part, we synthesize nanometric powders of ZnO and TiO₂ that are both pure and doped with Aluminum, Indium, Iron, and Cobalt using the sol-gel technique. X-ray diffraction (XRD) is used to explore their crystallographic structure, scanning electron microscopy (SEM) is used to investigate their morphology, and XPS, photoluminescence (PL), UV-visible, IR, and Raman are used to investigate their electrical and optical properties.

The second part used the sol-gel spin and dip-coating methods to deposit undoped and doped ZnO and TiO₂ thin films onto glass substrates. As a function of dopant and doping rate, the optical properties of thin films and the photocatalytic properties of powders are investigated.

Keywords: ZnO, TiO₂, Sol-gel technique, Spin and Dip coating, Photocatalysis, Dopant, optical properties