

**Preparation of ZnO on TiO₂ multilayers structures with ganglia like morphology.
Decolouration effect on Malachite Green dye under UV light.**

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Nanostructured ZnO on TiO₂ multilayers structures were prepared on glass substrate by sol-gel method using dip coating technique.

Dense or porous TiO₂ films with different thickness were deposited as a bottom layer, after that it was covered by one or two ZnO films. Structures containing three ZnO layers were obtained in order to compare the photocatalytic properties with the multilayers structures.

Titania dense films were obtained from TiCl₄ ethanol solutions, while for the porous films was used ethylcellulose modified solution. The ZnO films are prepared from solutions containing Zn(CH₃COO)₂·2H₂O, 2-methoxyethanol and monoethanolamine.

The structures were characterized by X-ray Diffraction (XRD), Energy Dispersive X-ray Spectroscopy (EDAX) and Scanning Electron Microscopy (SEM).

Only peaks of wurtzite ZnO crystalline phase were registered on X-Ray diffractograms. Pure ZnO films have crystallites about 30 nm, while the ZnO on TiO₂ multilayers possess crystallite sizes in the range 40-55 nm. All oxide structures possess a ganglia like morphology.

The photocatalytic degradation of Malachite Green dye is faster on the structures with bottom dense titania layers than those with porous titania films. The best photocatalytic activity of Malachite Green dye is registered for the structures with pure ZnO films (more than 77 % for 3 hours).