

Photocatalytic degradation of organic pollutants

in wastewater by means of ZnO thin films:

ZnO low-dimensional thin films used as a potential material for water treatment



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Motivation



- Wide band gap (3.37 eV),
- High electrical conductivity (≈ 10 Ω·cm),
- High charge carrier mobility,
- Large binding energy (60 meV),
- Photocatalytic activity,

Aim

Fields of application:

- · Gas sensor devices,
- Flat-panel displays,
- Solar cells,
- Photodiodes



Characterization of surface properties of ZnO low-dimensional conductive oxide nanostructures and investigation of photocatalytic activity of ZnO thin films under UV irradiation





SEM image of nanostructured ZnO porous thin films deposited at the Si(100) substrate by DC reactive magnetron sputtering.

Results and Discussion



XPS spectrum of ZnO oxide thin films

Conclusions

- Properly selected ZnO nanostuctured porous thin films proved to be efficient materials for the photocatalytic degradation of methylene blue, and can find application in water remediation
- · Reusability of the ZnO thin films was demonstrated



Photocatalytic degradation of methylene blue (0.3 mg/L) in the presence of the ZnO thin film.

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