

## عنوان مقاله:

High Photocatalytic Performance in the Photodegradation of MB Dye of Photocatalytic Efficiency of ZnO/Fe<sub>3</sub>O<sub>4</sub> and TiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> Under Visible Light Irradiation

## محل انتشار:

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## خلاصه مقاله:

Zinc Oxide (ZnO) nanorods and titanium dioxide (TiO<sub>2</sub>) nanostructures thin films were prepared onto glass substrates by the chemical bath deposition (CBD) method. The ZnO was structured as nanorods (NRs) while TiO<sub>2</sub> was formed as nanoflowers plate as confirmed by Field-Emission Scanning Electron Microscope (FESEM) images. The ZnO/Fe<sub>3</sub>O<sub>4</sub> and TiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> nanostructures thin films were prepared via drop-casting Fe<sub>3</sub>O<sub>4</sub> NPs onto the grown ZnO and TiO<sub>2</sub> nanostructures thin films. The diameter of Fe<sub>3</sub>O<sub>4</sub> NPs was deposited onto ZnO NRs thin films and TiO<sub>2</sub> nanostructures thin films was ranged from ۸nm to ۵۹nm with dominated range between ۱۰nm to ۳۰ nm. The crystalline structure of prepared samples was investigated through X-ray diffraction (XRD) method. However, the particles size of Fe<sub>3</sub>O<sub>4</sub> was estimated by XRD as well as FESEM images was around ۲۲ nm. The photocatalytic activity of the as-prepared ZnO/Fe<sub>3</sub>O<sub>4</sub> and TiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> nanostructures thin films was investigated against methylene blue (MB) dye at room temperature with a pH value of ۱۰ under different exposure time by visible light. The photodegradation rate of MB dye by ZnO/Fe<sub>3</sub>O<sub>4</sub> and TiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> nanostructures thin films was higher than that obtained by ZnO and TiO<sub>2</sub> nanostructures thin films. The best photodegradation rate of MB dye was ۱۰۰% after exposure time of ۱۸۰ min was obtained by ZnO/Fe<sub>3</sub>O<sub>4</sub> nanostructures thin film whereas it was ۸۲% for TiO<sub>2</sub>/Fe<sub>3</sub>O<sub>4</sub> nanostructures thin films after exposure time of ۲۴۰ min.

## کلمات کلیدی:

ZnO/Fe<sub>3</sub>O<sub>4</sub>, TiO<sub>2</sub> /Fe<sub>3</sub>O<sub>4</sub>, core/shell, photocatalysis, MB dye

## لینک ثابت مقاله در پایگاه سیویلیکا:

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