PREPARATION AND PHOTOCATALYTIC ACTIVITY OF IODINE-DOPED ZNO NANOSTRUCTURES

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Abstracts - This work reports on the preparation and photocatalytic activity of thin films of iodine-doped ZnOnanoflowers deposited on glass substrate using a simple growth process based on hydrothermal synthesis. Addition of iodic acid (5–20 vol%) in the reaction mixture allows the introduction of iodine ions in the form of I^- or IO_3^- in the ZnO lattice, as suggested by X-ray photoelectron spectroscopy. Doping ZnO nanostructured films with iodine did not impact their morphology, while it has a significant influence on their optical properties. Indeed, the nanostructured ZnO films, prepared in the presence of iodic acid, display a large increase of the visible luminescence, which reaches a maximum at a concentration of 10 vol%. Finally, the photocatalytic activity of the ZnO nanostructured films for the photodegradation of a model pollutant, rhodamine B, was evaluated under UV and visible light irradiation. While under UV light irradiation, both undoped and iodine-doped ZnO films show a similar behavior, the photocatalytic performance of iodine-doped under visible light irradiation is significantly enhanced in comparison to that of undopedZnO.