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Synthesis and Characterizations of Cd-Doped ZnO Multipods for Environmental Remediation Application

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Abstract

Well-crystalline Cd-doped ZnO multipods were synthesized by simple and facile hydrothermal process by using zinc chloride, cadmium chloride, hexamethylenetetramine and ammonium hydroxide at low-temperature. The synthesized materials were characterized in terms of their morphological, structural, compositional and optical properties. The morphological investigations done by field emission scanning electron microscopy (FESEM) reveal that the synthesized products are multipods shaped and grown in high density. The structural and compositional properties, observed by X-ray diffraction (XRD), energy dispersive spectroscopy (EDS) attached with FESEM and Fourier transform infrared (FTIR) spectroscopy exhibit that the synthesized multipods are well-crystalline and possessing wurtzite hexagonal phase pure Cd-doped ZnO. The as-synthesized Cd-doped ZnO multipods exhibited good optical properties as was confirmed by UV-vis. spectroscopy. Finally, the as-synthesized Cd-doped ZnO multipods were used environmental remediation application. For this, the synthesized multipods were used as an effective photocatalyst for the photocatalytic degradation of acridine orange (AO) which exhibit similar to 92.4% degradation within 90 min. This work demonstrates that doped ZnO materials could be used as efficient photocatalyst for the photocatalytic degradation of various organic dyes and chemicals.

Keywords

Author Keywords: Cd-Doped ZnO Multipods; Environmental Remediation; Photocatalytic Degradation

KeyWords Plus: ASSISTED PHOTOCATALYTIC DEGRADATION; AQUEOUS-SOLUTION; DYE; NANOPARTICLES; ORANGE; TiO2

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