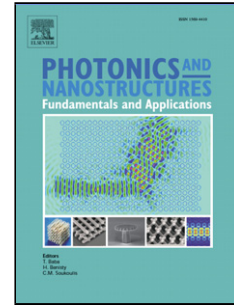


Accepted Manuscript

Title: Photocatalytic rendition of Zn²⁺-doped Bi₂O₃ nanoparticles

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PII: S1569-4410(17)30203-1
DOI: <https://doi.org/10.1016/j.photonics.2018.05.008>
Reference: PNFA 656

To appear in: *Photonics and Nanostructures – Fundamentals and Applications*

Received date: 14-7-2017
Revised date: 3-5-2018
Accepted date: 21-5-2018

Please cite this article as: VIRUTHAGIRI G, P. K, SHANMUGAM N, Photocatalytic rendition of Zn²⁺-doped Bi₂O₃ nanoparticles, *Photonics and Nanostructures - Fundamentals and Applications* (2018), <https://doi.org/10.1016/j.photonics.2018.05.008>

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Photocatalytic rendition of Zn²⁺-doped Bi₂O₃ nanoparticles

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Highlights

- Undoped and Zn-doped α -Bi₂O₃ were synthesized.
- A relatively small particle size of inorganic Zn was used as an additive with α -Bi₂O₃.
- The 0.15 M sample exhibited the highest photocatalytic activity (twice) compared to that of undoped Bi₂O₃.
- Enhancement of activities was due to the effective charge separation.
- XRD, UV-Vis, FTIR, PL, FESEM with EDAX, and HR-TEM analyses were investigated.
- XRD confirmed that the synthesized products were crystalline in nature with a monoclinic crystal structure.
- UV-Vis analysis showed that emission at the visible region indicates increasing optical property.

Abstract

The present work analyzes the photocatalytic activity of Bi₂O₃ in the pure and Zn²⁺-doped forms in the degradation of the organic dye methylene blue (MB) under solar light irradiation. For this study, nanoparticles of bismuth oxide (Bi₂O₃) and different levels of Zn²⁺-doped Bi₂O₃ were prepared by a simple chemical precipitation method. The phase form of Bi₂O₃ is confirmed by X-ray diffraction. The optical properties of the samples were studied by UV-Vis-Diffuse Reflectance spectroscopy and photoluminescence. The morphologies of the products were

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