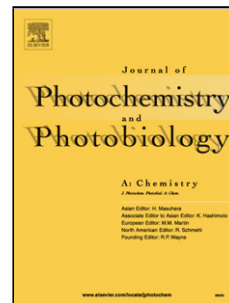


Accepted Manuscript

Title: Effect of transition metal ion (Cr^{3+} , Mn^{2+} and Cu^{2+}) doping on the photocatalytic properties of ZnWO_4 nanoparticles

Authors: Dimple P. Dutta, Parth Raval



PII: S1010-6030(17)31796-3
DOI: <https://doi.org/10.1016/j.jphotochem.2018.02.026>
Reference: JPC 11157

To appear in: *Journal of Photochemistry and Photobiology A: Chemistry*

Received date: 7-12-2017
Revised date: 9-1-2018
Accepted date: 19-2-2018

Please cite this article as: Dimple P.Dutta, Parth Raval, Effect of transition metal ion (Cr^{3+} , Mn^{2+} and Cu^{2+}) doping on the photocatalytic properties of ZnWO_4 nanoparticles, *Journal of Photochemistry and Photobiology A: Chemistry* <https://doi.org/10.1016/j.jphotochem.2018.02.026>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Effect of transition metal ion (Cr^{3+} , Mn^{2+} and Cu^{2+}) doping on the photocatalytic properties of ZnWO_4 nanoparticles

Dimple P. Dutta^{a,*} and Parth Raval^b

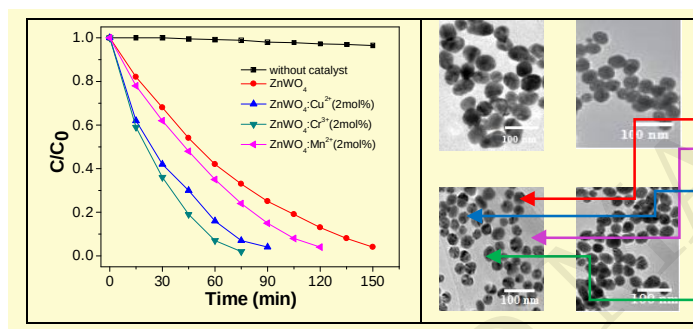
^aChemistry Division, Bhabha Atomic Research Centre, Mumbai 400 085, India

^bIndian Institute of Science Education and Research, Mohali, Punjab 140 306, India

Graphical Abstract

Graphical Abstract

Cr^{3+} , Mn^{2+} and Cu^{2+} doping in nano ZnWO_4 leads to decreased band gap, improved separation of photogenerated charge carriers and enhanced photocatalytic activity under simulated solar irradiation for degradation of dye effluents.



Highlights

- Undoped and transition metal (Cr^{3+} , Mn^{2+} and Cu^{2+}) doped ZnWO_4 nanoparticles have been synthesized sonochemically.
- The size and band gap of ZnWO_4 nanoparticles decreased on transition metal ion doping.
- $\text{ZnWO}_4:\text{Cr}^{3+}$ (2mol%) shows the best photocatalytic efficiency under simulated solar irradiation.
- The critical role played by effective e^-/h^+ separation for the ultimate photodegradation of the pollutants has been elucidated by PL spectra of the samples.
- The nanoparticles could be readily separated from the reaction system by low-speed centrifugation after photocatalytic use, which is favorable for separation and reuse.
- After five recycles, the nanoparticles did not exhibit an obvious loss in activity, confirming its stability upon recycling.
- The reasons for this improvement in photocatalytic activity of the doped samples under visible light irradiation have been discussed.

Download English Version:

<https://daneshyari.com/en/article/6492623>

Download Persian Version:

<https://daneshyari.com/article/6492623>

[Daneshyari.com](https://daneshyari.com)