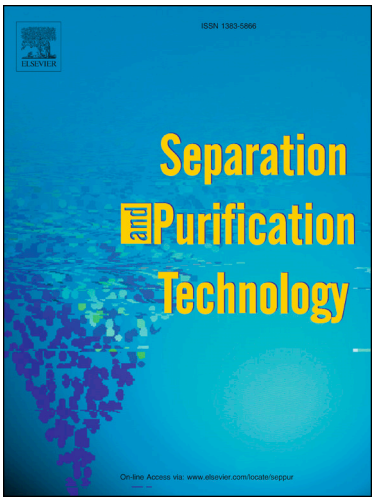

Efficient degradation of azo dye pollutants on $ZnBi_{38}O_{58}$ nanostructures under visible-light irradiation

Hassan Najafian, Faranak Manteghi, Farshad Beshkar, Masoud Salavati-Niasari

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Efficient degradation of azo dye pollutants on $ZnBi_{38}O_{58}$ nanostructures under visible-light irradiation

Hassan Najafian[a], Faranak Manteghi[a], Farshad Beshkar[c], Masoud Salavati-Niasari[b]*

[a] *Department of Chemistry, Iran University of Science and Technology, Tehran, Iran*

[b] *Institute of Nano Science and Nano Technology, University of Kashan, Kashan, P. O. Box. 87317-51167, I. R. Iran*

[c] *Young Researchers and Elite Club, Arak Branch, Islamic Azad University, Arak, Iran*

* Corresponding author. Tel.: +98 31 55912383; Fax: +98 31 55913201

E-mail address: salavati@kashanu.ac.ir (M. Salavati-Niasari)

Abstract

A novel and facile approach of preparing $ZnBi_{38}O_{58}$ nanostructures was developed utilizing the amino acid-assisted sol-gel combustion route. In this study, the mixtures of various gelling agents and amino acids as fuel and different molar ratios of amino acid to total metals have been employed to prepare the nanostructured $ZnBi_{38}O_{58}$ with sphere-like, plate-like, cubic-like and polyhedral-like morphologies. The formation of as-synthesized nanocrystalline $ZnBi_{38}O_{58}$ and its elemental composition, shape, structure and optical characteristics are analyzed utilizing UV–Vis, FESEM, FT-IR, XRD and EDS. In addition, the photocatalytic performance of as-produced $ZnBi_{38}O_{58}$ nanostructures with different morphologies was studied by degradation of acid blue 92 dye as water contaminant under visible light irradiation.

Keywords: $ZnBi_{38}O_{58}$; Nanostructures; Sol-gel combustion; Polyhedral-like; Photocatalytic performance.