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Synthesis, characterization and photocatalytic activity of TiO₂/ZnO-supported phosphomolybdic acid nanocomposites

Mahmoud Taghavi¹, Masoumeh Tabatabaee², Mohammad Hasan Ehrampoush¹, Mohammad Taghi Ghaneian^{1*}, Mojtaba Afsharnia³, Ali Alami⁴, Jalal Mardaneh⁵

1- Environmental Science and Technology Research Center, Department of Environmental Health Engineering, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

2- Department of Chemistry, Yazd Branch, Islamic Azad University, Yazd, Iran

3- Department of Environmental Health Engineering, School of Public Health, Social Development & Health Promotion Research Center, Gonabad University of Medical Sciences, Gonabad, Iran

4- Social Determinants of Health Research Center; Department of Social Medicine, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran

5- Department of Microbiology, School of Medicine, Gonabad University of Medical Sciences, Gonabad, Iran

*Corresponding Author: Mohammad Taghi Ghaneian, e-mail:mtghaneian@yahoo.com, Tell: +983538209110

Abstract

Three nanocomposites of phosphomolybdic acid supported on TiO₂ and ZnO nanoparticles were synthesized and characterized by means of FESEM, FTIR and XRD analysis. Photocatalytic activity of the synthesized nanocomposite was investigated for aniline as an organic pollutant model. Relatively, good degradation efficiency above 70% was achieved for all nanocomposites in presence of hydrogen peroxide as electron scavenger.

The kinetic study showed that photocatalytic degradation of aniline followed the Langmuir-Hinshelwood model. Results showed that hydroxyl radicals and holes play an important role in photocatalytic degradation of aniline using synthesized nanocomposites. These results suggested that synthesized nanocomposites could be promising photocatalysts in the removal of aniline from aqueous solutions.

Keywords: heteropolyanions, phosphomolybdic acid, polyoxometalate, photocatalytic activity, aniline, TiO₂, ZnO

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