PHOTOCATALYTIC ACTIVITY OF METAL OXIDE NANOPARTICLES FOR REMOVAL OF THE HERBICIDE FLUROXYPYR FROM WATER

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Abstract

The photocatalytic materials absorb the photons having energy equals to or more than the band gap energy between the valence and conduction bands of the photocatalyst. The positive holes in the valence band either oxidize the water to produce hydroxyl radical or pollutant, whereas excited electrons reduce the adsorbed oxygen on the photocatalyst in the conduction band [1]. Till date a wide range of metal oxide/semiconductor-based nanomaterials have been explored for the photocatalytic degradation of harmful and toxic organic pollutants into the non-toxic products [2,3]. The aim of this work was to investigate removal of the herbicide fluroxypyr from double distilled water in the presence of novel TiO_2, MgO and ZnO nanoparticles under UV and simulated solar irradiation. It was found that TiO_2 photocatalyst showed higher photocatalytic activity for removal of fluroxypyr from water compared with MgO and ZnO. However, a major drawback of photocatalyst is that it has higher rate of recombination of photogenerated electron-hole pairs, which suppressed its catalytic potential [1,4]. Because of that it was investigated the photodegradation behaviour of fluroxypyr in aquatic systems using UV and simulated solar irradiation in the presence of TiO_2/$(NH_4)_2S_20_8$. The efficiency of elimination the herbicide from double distilled water was monitored by UFLC–DAD technique.

Acknowledgments

This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Project No. 172042).

References

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