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DECONTAMINATION OF PESTICIDE RESIDUES IN WATER SAMPLES USING COPPER AND ZINC CO-DOPED TITANIA NANOCATALYST

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Abstract

Copper and Zinc co-doped titania nano photocatalyst (Cu-Zn-TiO_2 NPC) was fabricated and characterized using room temperature X-ray diffraction (XRD), field emission electron microscopy (FESEM) with high-resolution transmission electron microscopy (HRTEM) and energy dispersion X-ray (EDX). X-ray diffraction studies of the Cu^{2+}-Zn^{2+}/TiO_2 show the presence of anatase phase TiO_2 and in the sample prepared from 0.05, 0.10, 0.15 and 0.20 mmol have also shown the presence of anatase phase only. The photocatalytic efficiency of the synthesized catalysts was investigated by the photocatalytic degradation of aqueous bispyribac sodium under sun light irradiation, and it was found that the Cu and Zn co-doped TiO_2 catalysts has better photocatalytic activity. It can be also showed that with the addition of dopants to titania hinders the growth of nanoparticles. This can be attributed of the fact that there is a more efficient electron-hole creation in Cu and Zn co-doped TiO_2 in sunlight, contrary to un-doped TiO_2 which can be excited only in UV irradiation. Photocatalytic studies of bispyribac sodium at various conditions such as acidic, basic and neutral reveals that the activity is enormously increased with co-doped TiO_2 is proved to be effective for photocatalysis of bispyribac sodium and is more effective in basic medium.

Keywords: bispyribac sodium**,** Cu-Zn-TiO_2 NPC, DT 50, FTIR, photocatalytic activity, XRD

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