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STUDIES ON TITANIUM OXIDE CATALYST DOPED WITH HEAVY METALS (CADMIUM, COPPER AND NICKEL)

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Abstract

In order to improve the photo-efficiency of the electronic process as well as the response into the visible part of the spectrum, TiO_2 doping with heavy metal (cadmium, cooper and nickel) have been employed. The objectives of this work are: (a) to prepare doped Me(Cd, Cu, Ni) TiO_2 by doctor blade (DB) and spray pyrolysis deposition (SPD) techniques, (b) to characterize the catalysts, (c) to study and compare the activity of the Cd-TiO_2, Cu-TiO_2 and Ni-TiO_2 catalysts on methyl orange (MO) photodegradation using these novel substrates. The phase structure, microstructure and surface properties of the films were characterized by using X-ray diffraction (XRD) and atomic force microscopy (AFM). The samples Me-TiO_2-DB presents a higher photocatalytic degradation efficiency of MO than Me-TiO_2-SPD, but the SPD is a low cost deposition technique for large area thin films and is economically more attractive than doctor blade.

Key words: doctor blade, heavy metal ion doping, methyl orange, photocatalytic activity, spray pyrolysis deposition

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