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PREPARATION AND CHARACTERIZATION OF NANOCOMPOSITE MATERIAL BASED ON TiO_2-Ag FOR ENVIRONMENTAL APPLICATIONS

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Abstract

A simple and efficient method for preparing Ag-doped TiO_2 nanoparticles was successfully developed, by associating the sol-gel method and the impregnation-reduction. While titanium dioxide is one of the most used solids as photocatalyst, silver is particularly interesting for applications in biological and chemical detection and for its antibacterial properties. Moreover, in photocatalysis silver acts as an electron sink and donor in capturing the photogenerated electrons. The structural and morphological properties of the TiO_2-Ag samples were investigated by XRD, SEM, TEM, SAED and EDAX. The crystallinity degree increased by calcination at 650°C and the nature of the phases changed from anatase to a mixture of anatase, rutile and silver in metallic form and silver oxide. The photocatalytic properties of the synthesized product were evaluated in the UV-assisted photodegradation of Rhodamine 6G and Methyl Blue dyes. The photocatalytic performance in dyes decomposition of the doped samples was better than pure TiO_2.

Key words: nanocomposite, photocatalyst, silver, titanium dioxide

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