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PHOTOCATALYTIC PROPERTIES OF TITANIA - FLY ASH THIN FILMS

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Abstract

The paper presents the results obtained when using thin films (doctor blade) of titanium oxide powder (Degussa P25) and fly ash activated with NaOH, for advanced treatment of complex waters resulted in the textile industry. There are studied the heavy metal (cadmium, copper) adsorption and the dyes (methyl orange and methylene blue) photo-degradation using these novel substrates. The thin films crystallinity (XRD), morphology and roughness (AFM) were evaluated and no significant changes were registered due to mixing.
The heavy metal adsorption occurred on both components and a synergic effect can be assumed, based on the TiO_2 surface activation due to the alkaline environment, produced by the HO^- adsorbed/desorbed on/from fly ash. The working pH was 7.9…8.3, above the zero charge point of methyl orange (4.4), when its adsorption on fly ash is not likely. The alkaline pH values have been found to be favorable for the photocatalytic degradation of methylene blue.

Key words: fly ash, heavy metal, methyl orange, photocatalytic activity, TiO_2

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