عنوان مقاله:

Influence of Chemical Structures of Various Dyes and Surface Characteristics of ITO Powder and Nanocrystalline Films on Photocatalytic Activity

محل انتشار:

دومین همایش ملی نانو مواد ونانوتکنولوژی (سال: 1389)

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خلاصه مقاله:

Nanocrystalline indium tin oxide (ITO) thin film and powder have been prepared by sol–gel procedure and characterized by various bulk and surface techniques. Some anionic dyes including direct yellow (color index, C.I. Direct 42), Red Solophenyl 3BL (C.I. Direct 80), light yellow X6G (C.I. Reactive Yellow 2) and a cationic dye, methylene blue (MB, C.I. Basic Blue 9) were degraded by using UV-irradiated ITO in suspension supported on glass. Effects of some operational parameters on the photocatalytic activity such as surface properties of catalysts, annealing temperature, dye solution pH, and chemical structure of selected dyes have been discussed. The photocatalytic activity improves with increasing annealing temperature for both ITO powder and film. The photodegradation of different dyes shows pH dependence, indicating that the reaction occurs at the ITO surface and not in the solution. The results suggest that the rate of azo dyes oxidation is dependent on dye structure, the natureand the number of substituents. Sulfonated azo dyes such as Light Yellow X6G and Red Solophenyl 3BL were decolorized to more extent compared with carboxylated dye, Direct Yellow 42. Higher photocatalytic activities have been found for ITO coated on glass by the sol–gel method.

کلمات کلیدی:

Thin films; Sol-gel preparation; surface properties; Microstructure