عنوان مقاله:

Processing of Nanostructured TiO2 and Modification of Its Photocatalytic Behavior for Methylene Blue Degradation

محل انتشار:

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نویسندگان:

Mohammad Sajjadnejad - *Department of Materials Engineering, School of Engineering, Yasouj University, Yasouj, Iran*

Hooman Karimi Abadeh - *Department of Materials Science and Engineering, School of Engineering, Shiraz University, Shiraz, Iran*

خلاصه مقاله:

In this work, sol-gel process was chosen to produce a photocatalytic film to degrade methylene blue. To study the structural and morphological properties, a base sol of TTIP, I-PrOH, and DEA were created. Then, with addition of 45 g/L PEG 2000, 30 g/L TiO2, and 15 g/L PEG 2000+30 g/L TiO2, three other additional sols were produced. The results of the thermogravimetry and differntial thermal analysis indicated that a calcination temperature of 550 °C is sufficient to calcinate all four layers formed in four sols. Structural X-ray studies showed that, calcination temperature is dependent of the composition. The results of this study revealed that, substrate will have an effect on the photocatalytic behavior. It was concluded that the rough sand blasted surface because of creating more film islands that enhances photocatalytic behavior is a better substrate surface condition. Degradation of Mb showed that as a result of more TiO2 corporation in the film produced by the fourth sol, the fourth sol is superior in terms of photocatalytic behavior. Also it was found that, degradation of Mb is dependent on the initial concentration; and the higher initial concentration, the lower is the efficiency.

کلمات کلیدی:

Sol-Gel, TiO2, photocatalytic properties, Dip coating, Methylene blue