عنوان مقاله:

Photocatalytic Air Purification of Nanostructure TiO2 Thin FilmsPrepared by RF Magnetron Sputtering in Comparison toImidazolium Ionic Liquid Assisted TiO2 Fabricated via Sol-gelMethod

محل انتشار:

کنفرانس بین المللی مهندسی و علوم کاربردی (سال: 1394)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

Nanostructured TiO2 photocatalysts have extraordinary and appealing properties and have asserted interest in their investigation andpromotion. This report deals with preparation of TiO2 thin films by two different methods, the first one is a sol-gel method using the titanium isopropoxide as TiO2 sol in the presence of imidazolium ionic liquid (IL) and the second one is radio frequency (RF) magnetron sputtering. The films have been characterized by XRD, XPS, TEM, FESEM, UVVis, FTIR and Raman spectroscopy. Characterization andphotocatalytic activity comparisons proved that film preparation method has affected the structure and optical properties of thephotocatalyst. The optical band gap calculated for IL-TiO2 obtained by sol-gel method was 2.77 eV in comparison to 3.03 eV for the TiO2 produced by sputtering. The photocatalytic activities of the films were determined by the measurement of photodecomposition of NOx and CO under UV irradiation. It was observed that TiO2 film prepared by the sol–gel method exhibited higher photocatalytic activity; however TiO2 film prepared by RF magnetron sputtering demonstrated superior properties like .strong adhesion on the surface and further mechanical stability

کلمات کلیدی:

Air purification, nanostructure TiO2, photocatalyst