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Photocatalytic Activity of Sol-Gel Prepared TiO_2 Thin Films Doped with Degussa Nanoparticles

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Titanium dioxide is a n-type semiconductor and due to its wide optical band gap ($E_g \sim 3.3\ eV$) has numerous applications in various scientific areas such as photocatalysis, sensors, energy harvesting, etc. Its photocatalytic properties have been used in a big number of environmental applications. Degussa P25, is a titania photocatalyst in the form of powder with relatively high levels of activity in many photocatalytic reactions.

Sol-gel grown TiO_2 thin films pure or doped with Degussa were deposited on glass substrates by spin-coating under different conditions. The films were thermally treated at 500 °C, to obtain the anatase phase. The film properties were fully characterized. The photocatalytic activity of all films was evaluated by measuring the rate of atrazine decomposition under UV-A irradiation. All films show significant photocatalytic activity but the film doped with Degussa showed more than double decomposition rate.

Keywords: Sol-gel; TiO_2; Degussa; Photocatalysis; Spin coating; Anatase

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