ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF POROUS N-DOPED TiO_2 THIN FILM BY PEROXO SOL-GEL METHOD AS SELF CLEANING MATERIAL APLICATION

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ABSTRACT

The photocatalytic properties of TiO_2 on a surface of a material give an ability of the surface that being cleaned without any manual activity, called self cleaning material. The photocatalytic properties of TiO_2 compound in anatase phase can be activated under visible light by nitrogen doping and its ability can be increased by modifying the surface of TiO_2 thin film with generated porous structure using polietilen glikol (PEG). The porous N-doped TiO_2 thin films were prepared by heating aqueous peroxotitanate thin films by addition of polietilen glikol (PEG) deposited uniformly on superhydrophilic uncoated glass at 500 ^oC for 1 h. The result of X-ray diffraction (XRD) characterization revealed that the phase of all synthesized porous N-doped TiO_2 were anatase. The UV-Vis spectroscopy showed the synthesized porous N-doped TiO_2 thin films exhibit the absorption in the visible range (400-500 nm). Photocatalytic activity of porous N-doped TiO_2 thin films were evaluated by using fourier transform-infrared spectroscopy (FTIR) to determine the ability of this photocatalyst for stearic acid degradation under visible light irradiation. The result showed that N-TiO_2/PEG-2.1 thin film degraded the stearic acid was about 87,86%, which was 1,12 times higher than that of N-doped TiO_2 and 9,9 times higher than that of undoped TiO_2 thin film.

Keyword : anatase, porous, photocatalyst, self-cleaning, superhydrophilic