

## PHOTOCATALYTIC DEGRADATION OF TOLUENE: A VOLATILE ORGANIC COMPOUND IN INDOOR AIR ON NITROGEN DOPED-TiO<sub>2</sub>

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The visible light induced degradation of VOCs on nano TiO<sub>2</sub> coatings has been realised by N-TiO<sub>2</sub> nano-coatings. The physical properties were characterized by XRD, SEM, AFM, TG and UV-Vis techniques. The visible light photocatalytic activity was evaluated using the degradation of toluene as an example for VOCs in the indoor environment. These toluene vapours represent the indoor air pollution gas complexes called BTEX (Benzene, Toluene, Ethyl benzene, Xylene). In comparison to normal TiO<sub>2</sub>, the dramatic enhancement in the visible light photocatalytic performance of the N-TiO<sub>2</sub> could be shown at photodegradation of solid-gas interface. N-TiO<sub>2</sub> was made in sol-gel method and Triethylamine (TEA) was used as N precursor. Modified quartz cell was used for measure the photocatalytic degradation of toluene

The N-TiO<sub>2</sub> photocatalytic degradation activity was fully maintained in the static air upon several cycles of photodegradation. N-TiO<sub>2</sub> thin films were used as gas-solid interface and doctor blade method was used for producing the thin films. The reaction kinetics measured under static air conditions inside a modified quartz cell and the behaviour of thin films when changing their thickness, along with amount of the N-TiO<sub>2</sub> has been studied. Moreover, a possible mechanism for the excellent and efficient photocatalytic activity of N-TiO<sub>2</sub> is also proposed.

Keywords: - N dope TiO<sub>2</sub>; Photocatalytic Nano particles; toluene degradation; gas-solid interface; static indoor air purification.