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REMOVAL OF VOCS WITH PHOTOCATALYTIC OXIDATION METHOD BY USING DOPED TIO_2 PHOTOCATALYST

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Abstract
Organic air pollutants are also known as volatile organic compounds (VOCs). All compounds containing carbon (except for carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate) that are volatile under normal conditions are defined as volatile organic compounds. These compounds may create serious health problems, especially at high dosages. Photocatalytic oxidation is one of the most preferred methods for the removal of VOCs. Of course, it is possible to use photocatalytic oxidation for the removal of both inorganic and organic air pollutants. Studies have shown that more successful results are obtained in the removal of organics. In photocatalytic oxidation hydroxyl radicals and superoxide O_2 ions, usually from the cleavage of water, are used to remove air pollutants. The pollutants in the air stream are passed through a semiconductor material exposed to light at a certain humidity. The semiconductor structures used during the photocatalytic oxidation process are selected based on the chemical properties of the photocatalyst and its light absorption capacity. Semiconductors such as TiO_2, ZnO, WO_3, ZnS and CdS are widely used as photocatalysts. Among these photocatalysts, the most widely used photocatalyst is TiO_2. In recent years, the number of studies in the field of photocatalytic oxidation process and development of new photocatalysts has been increasing. Both morphological design (improvements related to the surface area of the catalyst) and electronic modifications (additions to the photocatalyst to improve its charge transport properties) can be applied in order to spread the photocatalyst activity of photocatalysts to wider wavelengths and to reduce the tendency to carry photogenic charges for recombination. In this study, the removal of VOCs with photocatalytic oxidation was investigated with the help of a doped TiO_2 photocatalyst.

Keywords: Photocatalytic oxidation, VOC, Doped TiO_2