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USAGE OF PHOTOCATALYTIC OXIDATION FOR THE REMOVAL OF AIR POLLUTANTS

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ABSTRACT

Environmental and social damages originating from air pollutants continue to increase day by day. These are formation of fog and smoke, negative effects on human health, acid rain, ozone depletion and global warming. Air pollutants are classified under two main classes such as organic and inorganic. Inorganic pollutants include many pollutants such as sulphur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter (PM) while organic pollutants represent many different pollutants, including permanent toxic organics and volatile organic compounds (VOC). Especially VOC are more dangerous than any other pollutants. The VOC group contains approximately 150 different compounds, the majority of which are considered as harmful and toxic to human health. Therefore, the removal of these compounds is very important. There are several methods which may be used for this purpose such as filtration, scrubbing, adsorption and absorption. However, none of them are capable to remove toxic materials found in air efficiently. Recently, photocatalytic oxidation method emerged for the removal of both toxic VOC compounds and other pollutants. Pollutants are removed by several reactions conversion of pollutants to CO₂ and H₂O with the help of appropriate photocatalyst and light source in photocatalytic oxidation method. In this study, photocatalytic oxidation method was investigated and the effects of the method on different air pollutants were compared.

Keywords: Photocatalytic oxidation, air pollution, VOC, toxic pollutants, photocatalyst