

Photocatalytic Removal of Formaldehyde and Methanol in the Continuous Flow Process

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VOCs, along with particulate matters, are the most lethal air pollutants, and formaldehyde is known to cause diseases such as cancer, SBS(Sick building syndrome) and MSC(Multiple chemical sensitivity). In addition, outdoor activities have been restricted due to COVID-19 pandemic, making it more important to maintain indoor air quality. Among the many removal methods, photocatalytic removal of VOCs is a representative method. In this study, the simultaneous removal of formaldehyde (80ppm) and methanol (400ppm) using a granular photocatalyst was conducted under continuous flow conditions (GHSV: 158hr⁻¹). The formaldehyde and methanol removal efficiency of a commercial TiO₂ catalyst was optimized under various parameters such as oxygen concentration (<30%), light intensity (0-300mW/cm²), wave lengths (UV and Visible light), catalyst amount (150-400mg) and humidity. In addition, to improve the performance of commercial catalysts, the removal performance and potential of various oxides such as BiOX (X=I,Cl,Br), CeO₂, and other metal oxides were also investigated.