

Optimization of manganese oxide impregnation on activated carbon for formaldehyde removal at room temperature

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There is an increasing concern on indoor air pollutants because indoor activities are significantly increased but air pollution often becomes serious.. Formaldehyde, one of the main indoor air pollutants, is widely emitted from buildings and decorative materials. Its hazardous effects on human health and the strict environmental regulations make it essential to remove formaldehyde. Among effective elimination methods widely studied, catalytic oxidation is the most suitable to remove indoor formaldehyde as it can be operated at room temperature and harmless CO₂ and H₂O are produced in the reaction. On the other hand, since it is known as a difficult chemical to remove from air, its removal efficiency highly depends on adsorption and reaction capacity of catalysts. In this study, manganese oxide is selected as a catalyst and impregnated on activated carbon. The impregnation method is controlled to find the optimized method. Physical characteristics of the impregnated activated carbons are analyzed and their removal efficiencies are conducted using 20 ppm of formaldehyde gas both in dry and humid conditions at room temperatures.