

Catalytic oxidation of toluene containing wastewater

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ABSTRACT

Volatile organic compounds (VOCs) are a major reason for air pollution and it contains wide range of spectrum containing one or more hydrogen and carbon atom in the molecule structure. The toluene is widely used VOC in industrial sectors such as pharmaceuticals and tanneries. It is discharged in the wastewater without proper treatment making serious effect on the environment. In this study, the toluene containing water is treated using molybdenum impregnated carbon silica matrix catalyst. The support material carbon silica matrix was prepared by using two stage carbonization processes and molybdenum impregnated carbon silica matrix was synthesized through the incipient wetness impregnation method. The XRD spectrum confirms the formation of Molybdenum oxide and Mo_xC , it was also confirmed with FTIR analysis. The toluene containing water was catalytically oxidized with an efficiency of 96% (in terms of TOC) in 1h. The degradation of toluene was monitored and confirmed with TOC (total organic carbon), HPLC and UV/Visible spectroscopic analysis.

Keywords: Volatile organic compounds, Catalytic oxidation, Toluene, molybdenum impregnated carbon silica matrix, Wastewater treatment

