

Indoor Air Pollution Control Using a Soil Biofilter

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Abstract : Abstract: Biofiltration may be used to control indoor air pollution. In biofiltration, microorganisms break down harmful contaminants in air or water, transforming them into non-toxic substances like carbon dioxide, water, and biomass. In this study, the CO₂ production and the elimination capacity (EC) of toluene at inlet concentrations between 20 and 80 ppm were investigated using three biofilters operated separately with soil as bed material. Results showed soil, with its rich microflora taken to full advantage without inoculants and additional nutrients, biodegraded toluene at removal rates comparable to those in other studies at higher concentrations. The amount of CO₂ generated corresponds to the amount of toluene removed, indicating efficient biodegradation and suggesting stable long-term performance at these low concentrations. Although the concentrations in this study differ from typical indoor toluene levels (ppb), the findings suggest that biofiltration could be effective for indoor air pollution control with appropriate design, taking into account biomass growth or biofilm structure, concentration, and gas flow rate.

Keywords : biofiltration, air pollution control, soil, toluene

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