

Photodegradation of methylcyclohexane in two phases with modified-titania immobilized on pumice

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Abstrak

The photocatalytic degradation of methylcyclohexane (MCH) in two phases (aqueous and vapor) was examined using modified titania that was immobilized on pumice and performed in the system of a specific condition. The photodegradation system that used a particular configuration reactor and modified catalyst could facilitate the two-phase photodegradation of MCH simultaneously. The photocatalyst was prepared by the mechanical mixing of urea and TiO₂ P25 with mass ratios of 1:3 and 2:3, respectively and then calcined at 350 and 450°C. This modified photocatalyst was then immobilized on pumice and finally used for the photodegradation of MCH. The Infrared spectra studies revealed that modified titania with urea successfully incorporated a non-metal dopant within the TiO₂ lattice. The catalyst that spread evenly across the surface of the pumice can be seen from Scanning Electron Microscope (SEM) characterization. The loading of 7.5% mass photocatalyst that immobilized on pumice degraded MCH in two-phases simultaneously during a 120 minute period and can be considered the optimum condition.