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 450oC. 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.