Eliminasi metilsikloheksana dengan proses foto bio degradasi menggunakan katalis dasar titania dan bakteri acinetobacter baumanii = Elimination of methylcyclohexane with photo bio degradation processes using titania based catalyst and bacteria acinetobacter baumanii

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Abstrak

[ABSTRAK
Kombinasi proses fotodegradasi dan biodegradasi untuk eliminasi metilsikloheksana telah diinvestigasi. Komposit batu apung dengan katalis dasar titania serta komposit batu apung dengan biofilm Acinetobacter baumanii digunakan untuk mengeliminasi metilsikloheksana dalam fotobioreaktor. Katalis titania yang didopan C dan N dengan prekursor urea (C-N-TiO2) dikarakterisasi dengan SEM/EDX, FTIR, Raman Spectroskopi, dan UV-Vis DRS sebelum diimobilisasi ke batu apung dengan metode dip coating. Sedangkan karakterisasi untuk batu apung-biofilm Acinetobacter baumanii dilakukan dengan SEM, TPC, Pewarnaan gram, dan FTIR. Hasil karakterisasi menunjukkan bahwa batu apung dengan katalis dasar titania serta komposit batu apung dengan biofilm Acinetobacter baumanii telah berhasil disintesis. Metilsikloheksana yang digunakan adalah senyawa sintetis dengan konsentrasi awal 60 μmol/L (±1500 ppm). Proses foto-bio-degradasi dalam reaktor terintegrasi menunjukkan hasil uji degradasi metilsikloheksana yang lebih baik bila dibandingkan dengan fotodegradasi saja atau biodegradasi saja, yang mampu mendegradasi sebesar 72,7% selama 210 menit dengan loading 7,5% katalis C-N-TiO2 ke batu apung.
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ABSTRACT
The combination of photodegradation and biodegradation processes for elimination methylcyclohexane have been investigated. Composite pumice with titania catalysts and composite pumice with biofilms from Acinetobacter baumanii was used to eliminate methylcyclohexane in photobioreactor. Titania catalyst doped with C and N using urea precursor (C-N-TiO2) is characterized by SEM/EDX, FTIR, Raman Spectroscopy, and UV-Vis DRS before immobilized to pumice with dip coating method. While the characterization of pumice-biofilm from Acinetobacter baumanii performed with SEM, TPC, Gram Staining, and FTIR. The results showed that the pumice with titania catalysts and composite pumice with biofilms have been successfully synthesized. We used methylcyclohexane synthetic compounds with the initial concentration of 60 μmol/L (± 1500 ppm). Photo-bio-degradation results of methylcyclohexane in integrated reactor are better when compared with any photodegradation or biodegradation alone, which is able to degrade at 72,7% during 210 minutes with a loading of 7,5% C-N-TiO2 catalyst to pumice.;The combination of photodegradation and biodegradation processes for elimination methylcyclohexane have been investigated. Composite pumice with titania catalysts and composite pumice with biofilms from Acinetobacter baumanii was used to eliminate methylcyclohexane in photobioreactor. Titania catalyst doped with C and N using urea precursor (C-N-TiO2) is characterized by SEM/EDX, FTIR, Raman Spectroscopy, and UV-Vis DRS before immobilized to pumice with dip coating method. While the characterization of pumice-biofilm from Acinetobacter baumanii performed with SEM, TPC, Gram Staining, and FTIR. The results showed that the pumice with titania catalysts and composite pumice with biofilms have been successfully synthesized. We

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