

Biodegradation of Cyclohexane by *Rhodococcus* sp. EC1

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Cyclohexane is a representative compound of alicyclic hydrocarbons that used mainly as a substituted solvent for benzene as well as fuel and antiseptic. Cyclohexane shows low biodegradability due to its low solubility. In this study, a bacterial consortium displaying cyclohexane biodegradability was successfully enriched in the cyclohexane medium supplemented with surfactant PF68 for increasing cyclohexane solubility, and isolated a *Rhodococcus* sp. strain EC1 capable of biodegrading cyclohexane excellently. The maximum cyclohexane degradation rate (V_{\max}) and saturation constant (K_s) of cyclohexane for strain EC1 were $246.42 \mu\text{mol}\cdot\text{g}\cdot\text{DCW}^{-1}\cdot\text{h}^{-1}$ and 94.66 mM , respectively. Strain EC1 also could degrade hexane, an aliphatic hydrocarbon. The effects of environmental factors such as temperature, pH, and salt concentration for strain EC1 were investigated. The strain EC1 showed the highest activity at $25\sim 35^\circ\text{C}$, about 50% decrease from it at 15°C and inactivation at 40°C . The strain EC1 increased degradation its activity under acidic or basic conditions like pH 4.7 and 8.0 rather than neutral. The hexane mineralization of EC1 was investigated using ^{14}C -hexane. The results revealed that about 40.3% of hexane mineralized into CO_2 and H_2O and about 53% of hexane was used for cell biomass.