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Biooxidation of toluene using peroxidase from *Brassica rapa* (turnips)

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Peroxidase is an oxidative enzyme that has the ability to remediate a large number of organic molecules with a minimal environmental impact. Toluene is considered as a monocyclic aromatic molecule, widely used in industrial chemistry and easily released to water, soils and air streams. Presence of toluene in aquatic medium could cause several damages to fauna and flora. In present work, an investigation of ability of peroxidase extracted from *Brassica rapa* turnips to catalyze the oxidation of toluene is reported. Peroxidase is used immobilized as cross-linked enzyme aggregates (CLEAs). First of all, a kinetic study is realized. Then, effects of several parameters on biooxidation such as pH, toluene and hydrogen peroxide concentration, enzyme activity are also investigated. The results show that maximum biooxidation of toluene is occurred within six hours in pH 7. Optimum toluene and hydrogen peroxide concentrations are 118 mg/L-1 and 62 mM respectively. For CLEAs, optimum activity is 15 UI/mL-1 that leads to a maximum reaction yield of 57%. GC-MS analysis of residual solution revealed the presence of benzyl alcohol and benzoic acid as by-products of biooxidation.

Biography

Tandjaoui Nassima has completed his PhD from Yahia Fares, Medea University. She is a Lecturer at the University of Tiaret, Algeria. She has published four papers in reputed journals.

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