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Covalent immobilization of laccase by one pot three component reaction and its application in the decolorization of textile dyes

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Abstract

In present study, laccase from *Myceliophthora thermophila*, was immobilized on epoxy-functionalized silica via one-pot three component reaction as a novel and efficient method for immobilization. The results revealed immobilization of 50 mg of *M. thermophila* laccase on 1 g of the supports in presence of cyclohexyl isocyanide after 12 hours of incubation. The immobilized enzyme exhibited notable activity (50 U/g) with improved stability towards pH, temperature and organic solvents. Laccase derivative was used for decolorization of five texetile dyes (acid orange 156, acid red 52, coomassie brilliant blue, methyl violet, malachite green) with or without the redox mediators such as 1-hydroxybenzotriazole (HBT), catechol, syringaldehyde and *N*-hydroxyphthalimide (HPT). The results showed that laccase/mediator systems were effective biocatalysts for the treatment of textile dyes.

Keywords

Myceliophthora thermophile laccase, epoxy-functionalized supports, covalent immobilization, isocyanide, decolorization, textile dyes.

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