

Laccase Mechanisms

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The *Trametes villosa* laccase was used in two different approaches - the direct degradation of azo dye effluents and the coupling/polymerization reaction, with catechol, of the aromatic amines from azo dye reduction. In both systems addition of 1-hydroxybenzotriazole (HBT) as mediator improved the catalytic efficiencies of studied reactions. The kinetically Michaelis-Menten apparent constants were calculated by means of amperometric detection.

In the direct decolorization a linear relationship was observed between the redox potential of the azo dyes and the decolourisation efficiency of enzyme and enzyme/mediator. The less positive the anodic peak of the dye, the more easily is degraded oxidatively with laccase.

The copolymerization, between the oxidized anilines and catechol in the effluents, performed by simultaneously nonenzymatic coupling and enzymatic polymerization showed products with low solubility.

This study opens the perspectives of enzymatic and physical removal of these polluting chemicals from the nature and meanwhile the usage of the laccase immobilized onto macro-electrodes in online systems with continuous monitoring of the enzyme efficiency.