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doi:10.1016/j.cej.2010.07.020 | [How to Cite or Link Using DOI](#)
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Kinetics and mechanism on laccase catalyzed synthesis of poly(allylamine)-catechin conjugate

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Received 22 August 2009; revised 7 July 2010; accepted 9 July 2010. Available online 18 July 2010.

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Abstract

The conjugation reaction of catechin with poly(allylamine) has been studied in aqueous methanol using free, immobilized and cross-linked enzyme crystals (CLEC) of laccase from *Trametes versicolor* with particular emphasis on the effect of pertinent variables and kinetic aspects of the reaction. The stability of the CLEC was better than that of the free and immobilized enzymes for practical application. The kinetics of the conjugation reaction conformed to the so-called Substituted-enzyme mechanism with catechin inhibition. In case of immobilized laccase system marginal diffusional limitation could be inferred from the experimental data. The kinetic parameters $K_{m(paa)}$ and $K_{m(cat)}$ estimated by non-linear regression analysis were found to be 0.75, 1.8967, 2.135 and 11.769, 15.1816, 29.489 for free, immobilized and CLEC laccase, respectively.

Keywords: Catechin; Poly(allylamine); Laccase; CLEC; Substituted-enzyme mechanism

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Chemical Engineering Journal

Volume 163, Issues 1-2, 15 September 2010, Pages 86-92

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