

Title: Methyl syringate: An efficient phenolic mediator for bacterial and fungal laccases

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Abstract: The aim of the present work is to provide insight into the mechanism of laccase reactions using syringyl-type mediators. We studied the pH dependence and the kinetics of oxidation of syringyl-type phenolics using the low CotA and the high redox potential TvL laccases. Additionally, the efficiency of these compounds as redox mediators for the oxidation of non-phenolic lignin units was tested at different pH values and increasing mediator/non-phenolic ratios. Finally, the intermediates and products of reactions were identified by LC-MS and H-1 NMR. These approaches allow concluding on the (1) mechanism involved in the oxidation of phenolics by bacterial laccases, (2) importance of the chemical nature and properties of phenolic mediators, (3) apparent independence of the enzyme's properties on the yields of non-phenolics conversion, (4) competitive routes involved in the catalytic cycle of the laccase-mediator system with several new C-O coupling type structures being proposed. (C) 2012 Elsevier Ltd. All rights reserved.

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