

Biossensores Eletroquímicos Baseados em Lacase

Electrochemical Laccase-based Biosensors

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Abstract: Laccase (EC 1.10.3.1, p-benzenediol: oxygen oxidoreductase) belongs to a family of multi-copper oxidases that contains four metal ions classified into three types (e.g., T1, T2, T3) according to their spectral characteristics; its most relevant electrochemical characteristic is the redox potentials of the T1 Cu sites [1-2]. Enzyme's selection and source have a major impact on the biosensor performance. Laccase catalyses the oxidation of a range of inorganic and aromatic compounds (particularly phenols) with the concomitant reduction of molecular oxygen to water. It has been also reported to be inhibited by several compounds such as halides, azide, cyanide, hydroxide, metal ions (e.g. Hg^{2+} , Sn^{2+} , Co^{2+} , Cd^{2+} , etc.), fatty acids, hydroxyglycine, kojic acid, EDTA, l-cysteine, dithiothreitol, glutathione, thiourea, and cationic quaternary ammonium detergents [1]. Thus, laccase-based biosensors measure the catalysis or the inhibition of the enzyme by the target analyte. Laccase immobilization has been attempted by different methods [3-6] such as cross-linking with glutaraldehyde, entrapment into chitosan, encapsulation and adsorption (including electrostatic interactions). The high number of works published in the last five years demonstrates the huge application potential of laccase-based biosensors in food quality and safety, environmental pollution control, but also in other fields such as pharmaceutical and clinical analysis.

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