15th World Congress on
B £C A D B £C I D £ M££
&
2nd International Conference on
E D M £C B
March 20-21, 2017 Rome, Italy

Electroconducting π-conjugated N-nonylaryl oligomers as a matrix in the construction of laccase biosensors

and
Wroclaw University of Technology, Poland

Biosensors found the extensive applications in monitoring of atmospheric pollution and contamination of soil and water, medical diagnostics, analysis of food products. Although, for many years extensive research have been carrying out in the eld of sensors, there is still a great need to develop low-cost and e cient diagnostic equipment, enabling fast and accurate detection of the analyte.

e crucial issues in the design of enzymatic electrodes are: To ensure the e cient charge transfer between the active site of the biocatalyst and the electrode surface and to provide strong and long-lasting binding between the matrix and the enzyme, without a negative impact on the catalytic activity of the protein. Since the use of electroconducting materials in construction of biosensors improves the devices performance, the purpose of the researches was the chemical modi cation of substrates with new π-conjugated oligomers and the e cient immobilization of laccase to the prepared semi-conducting matrices. e thin layers of heterocyclic N-nonylaryl polymers based on 2,5-pyridine were prepared on glassy substrates by spin-coating and visualised by atomic force microscopy. e measurements of the catalytic activity of the immobilized enzyme were carried out using a colorimetric method. e presented studies show prospective application of developed systems with immobilized laccase for biosensing purposes, i.e. for the detection of phenolic compounds in food products or for the environment monitoring.

Ac
e project was nanced by the National Science Centre based on the decision: DEC-2013/11/N/ST5/01365.

Biography

Agnieszka Jedrychowska is pursuing his PhD in Faculty of Chemistry at Wrocław University of Technology. Her research interests include ñProperties of well-ordered, thin ýlms built of a new class of heterocyclic conducting compounds for the construction of simple sensorsò. Her most important scientiýc ýeld concerns the efýcient immobilization of oxidoreductases onto chemically modiýcated substrates and the measurement of the catalytic activity and determination of the stability of the immobilized enzymes in such systems. She is a co-author of 11 publications, six patents and ýve patent declarations.

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