AN AMPEROMETRIC SENSOR USING NON-ENZYMATIC SUBSTRATES FOR THE DETECTION OF HYDROGEN PEROXIDE IN BIOLOGICAL APPLICATIONS

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Reactive oxygen species (ROS) are highly reactive forms of oxygen, and are very critical to understanding the pathway of various neurodegeneration including Alzheimer's and Parkinson's disease. Hydrogen peroxide is one of the major contributors for ROS damage. Amperometric detection of hydrogen peroxide was performed on various platinum and gold electrodes. Platinum electrode show a slight improvement in the current over gold electrode, but a composite of Pt-Au-CeO_2 modified electrodes show the greatest enhancement for the detection of hydrogen peroxide. The kinetics of electron transfer was studied using RDE (rotating disk electrode) and the results show that both modified and unmodified electrodes still have very low heterogeneous electron transfer rate constants. Therefore, an electron transfer mediator, thiol-terminated ferrocene compound, is currently under study in an attempt to improve the kinetics.