

Novel electrode for mediatorless cofactor regeneration

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Cofactor-dependent oxidoreductase is very useful to synthesis high-valued compounds like pharmaceuticals, fine chemicals, perfume, food additives, and so on. Cofactors are essential for enzymatic reaction and have to be regenerated since it is very expensive for stoichiometric use. There are several methods for cofactor regeneration like enzymatic, chemical, electrochemical, and photochemical method. Among all these methods, electrochemical method is promising because the reaction is simple and regenerating enzyme for the cofactors is not required. To increase the reaction efficiency, large surface of electrode is needed. Anodization of tin was performed to get porous structure tin oxide. Through characterization of the tin oxide, redox properties were confirmed. In electrochemical reaction, mediator as an electron transferring agent is needed. Since mediator is usually toxic to enzyme and get immobilized on the electrode in continuous reaction. It was found that this novel electrode of tin oxide did not require the mediator for cofactor regeneration. Details will be presented.