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Synthesis of Self-Assembled Redox-Active-Polymer on Electrode Surface for Biosensor Application

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To develop a stable electrochemical biosensor device, a gold electrode surface was modified with a polymerization initiator by the self-assembled monolayers (SAMs) method for surface polymerization. Poly(vinylferrocen-co-acrylamide) as a redox active polymer was living-radical-polymerized at the electrode surface, avoiding a homogeneous polymerization in a solution and physical adsorption of free polymer on the electrode. The living-radical-polymerized redox active polymer showed stable electrochemical response and catalytic enzyme response. The SAM-based synthesis and immobilization of the redox active polymer was carried out. The redox-active-polymer-modified electrode showed a stable electrochemical response after several potential sweeps. The current value increased with increasing in polymerization time. The surface polymerization can be used to control the polymer chain growth on the electrode surface.

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