PE05

Preparation and Characterization of Glucose Oxidase Monolayer on Mixed Self-Assembled Monolayers

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Immobilized proteins have broad scientific and industrial applications ranging from immunoassays to biosensor developments. We developed the preparation method of protein self-assembled monolayers (SAMs). The dimercaptomethylcalix[4]arene-crown-5 SAMs were served as bases for proteins to be self-assembled on *via* ionic interaction. Protein SAMs were developed to promote the concentration, activity, and orientation compared to the previous method. Here, the concentration means the number of proteins immobilized on defined area and the activity can be improved by minimizing the alteration of proteins. Protein SAMs were applied directly to study the antigen-antibody interaction and showed the nonspecific binding was not observed in significant level without further chemical treatments.

Glucose oxidase (GOx) SAMs were prepared according to the similar self-assembly technique. AFM images clearly showed that entire SAMs surface was covered by GOx molecules and the binding of GOx molecules was strong enough to resist to the repeated AFM scans. The real-time measurement of the protein anchoring was monitored by liquid-phase quartz crystal microbalance (QCM). The response of GOx SAMs to various glucose concentration will be presented in the presence of soluble or immobilized redox mediators. The results will be compared to those of the reported glucose sensors to evaluate the possible application of the protein monolayers as biosensors.