

Sensing capability of molecularly imprinted self-assembled monolayer

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A molecularly imprinted self-assembled monolayer (SAM) was fabricated on a gold plate by forming a monolayer with both 1-hexadecanethiol and the template molecule, and removing the template molecules by solvent extraction. Cholesterol, cholic acid, and deoxycholic acid were used as the template molecules. Cyclic voltammograms were obtained using these imprinted gold plates as a working electrode, with Ag/AgCl reference electrode and Pt counter electrode. Potassium ferricyanide was used as a background material for oxidation and reduction. These imprinted monolayers were capable of discriminating the substrate that had been imprinted. The stability of the imprinted monolayers was estimated precisely and the thickness change of the monolayer was estimated using quartz crystal microbalance (QCM). During repeated detection, 1-hexadecanethiol molecules on the gold plate were tightly adhered to the gold surface. However, the sensing ability was reduced with repeated detection, suggesting that these phenomena were due to the movement of hexadecanethiol molecules on the gold plate.