

Construction of Chiral Selector Modified Surface for Recognition of Chiral Mandelic Acid by Quartz Crystal Microbalance

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The selective detection of individual chiral enantiomers is one of the most challenged analytical tasks. Quartz crystal microbalance (QCM) is a powerful tool for the study of chiral recognition due to its excellent mass sensitivity. The key step for selectively sensing chiral compounds on QCM is to build a chiral surface. In this study, two molecules, namely L-phenylalanine (L-Phe) and L-cysteine (L-Cys), were used as the chiral selectors to fabricate QCM chiral sensor for selective sensing L-mandelic acid (L-MA). The immobilization of these chiral selectors was fulfilled by using the self-assembled monolayers technique. The chiral recognizability of the modified surface to L-MA was investigated using a vapor diffused molecular assembly reaction method, and then determined by QCM detection and atomic force microscope (AFM) analysis. Results showed that L-Phe and L-Cys are good chiral selectors for L-MA. The high chiral recognition ability of the modified surface could be the result of the specific host-guest interactions between L-MA and the immobilized chiral selectors.