Chiral recognition of mandelic acid by L-MA derivatives modified sensor using quartz crystal microbalance in liquid environment

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This study presents a new method for the selective recognition of chiral mandelic acid (MA) using of an L-Mandelic acid (L-MA) derivatives as the selector in liquid environment. The proposed method is based on quartzcrystal microbalance (QCM) detection, integrated with a molecular self-assembly reaction technique in liquid phase. The construction of the L-MA derivatives-modified QCM sensor involved a two-step assembly procedure. The chiral recognizability of L-MA and D-MA on the L-MA derivatives-modified surface was then examined using QCM in liquid phase. The chiral discrimination factor α between L-MA and D-MA detected by QCM was found to be about 6.0. An atomic force microscope (AFM) technique is used to confirm the procedure of the chiral recognizability of L-MA and D-MA on the L-MA derivatives-modified surface. The L-MA derivatives-modified QCM sensor showed good stability and reusability.

The present chiral recognition results suggest that L-MA derivatives from acylation reaction is an excellent resolving agent for the resolution of chiral mandelic acid.