Chiral selectivity of racemic mandelic acid by contact-AFM modified with 4-amino-L-phenylalanine

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In the present study, we have examined the difference in molecular interaction of two enantiomers of racemic Mandelic acid by Contact – AFM with tip modified with 4-amino-L-phenylalanine. The results showed that there is no chiral selectivity of two enantiomers of Mandelic acid with the unmodified tip of contact-AFM. In the case of the modified tip, the interaction of L-mandelic acid and 4-amino-L-phenylalanine with the adhesive force of 159 pN comparing to 90 pN of D-mandelic acid have provided the strong evidence of enantiomeric selectivity of L-phenylalanine with L-mandelic acid over than D-mandelic acid. In the other hand, the heat fusion of crystals representing the host-guest interaction was also agreed with adhesive force data with enthalpy of L-mandelic.L-phenylalanine 167kJ/mol and D-mandelic.L-phenylalanine 117kJ/mol. Consequently, the results indicated that 4-amino-L-phenylalanine could be applied to predict the chiral separation of racemic Mandelic acid.