

Selective resolution of Chiral isomers of D/L-Mandelic acid by diastereomeric crystallization

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Diastereomeric crystallization is a well-known and cost effective optical resolution method to achieve enantiopure. In this method, the most influencing factor governing the efficiency of the resolution is the resolving agent. Up to now, however, behaviors of the resolving agent in chiral separation are not carefully investigated yet. In the present study, therefore, it is attempted to investigate effects of L-phenylalanine as the resolving agent on the chiral separation of mandelic acid by diastereomeric crystallization. The resolving agent L-phenylalanine is selectively crystallized out with L-mandelic acid to form a diastereomeric salt of L-mandelic acid-L-phenylalanine by hydrogen bondings. As a result, the diastereomeric crystals enriched with L-mandelic acid are obtained when the ratio of resolving agent concentration to D/L-mandelic acid concentration is higher than 15%. In other case of the ratio lower than 15%, D-mandelic acid is enriched in the diastereomeric crystals. Consequently, it is found that L-mandelic of product could be selectively separated up to maximum 90% by one step of the diastereomeric crystallization.