Use of Crystallization to the Production of Enantiomerically Pure Amino Acids and Labile Antibiotics

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We describe how crystallization can be combined with chemical reactions in the manufacture of two different types of products. In the first, an enantiomerically pure product is recovered after enriching an initially racemic mixture by chemo-enzymatic stereoinversion. The concept is demonstrated by recovery of an enantiomerically pure amino acid from a solution initially containing a racemic mixture. In the second category, we use crystallization to recover a species that is unstable in the reaction medium used in its synthesis. We use this principle in devising a scheme for enhancing the yield of ampicillin, a beta-lactam antibiotic. During its synthesis, the desired product is subject to hydrolysis, but we show how product loss can be reduced significantly by running the synthesis reaction at conditions where ampicillin is crystallized as it is produced.