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Chapter 29. Asymmetric Synthesis

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Publisher Summary

This article briefly summarizes the best results currently obtainable by asymmetric synthesis using chemical reagents. In an asymmetric synthesis, an achiral substrate is transformed by a chiral reagent to produce an excess of one enantiomer of the chiral product. The effective use of asymmetric synthesis to obtain a chiral substance requires that a suitable substrate be found that can be transformed to a synthetically useful enantiomeric excess (e.e.) of a chiral product that can be fractionated to give pure enantiomer. It is a useful route to alpha-amino acids. Chiral amines and amino acids have been made via additions of nucleophiles to amines. The amino acids can typically be obtained in only 20%-60% e.e. unless it is possible to purify the aminonitrile intermediate by crystallization. Numerous modifications of the basic procedure have been tried. Very useful asymmetric transformations of imine anions, especially anions of oxazoline compound, have been reported in this chapter. These are practical synthetic procedures that generally afford high e.e. products. Some examples of the Î±- and Î²-chiral carboxylic acids prepared by this method are illustrated in this chapter. An exciting new development is the chiral amine catalyzed cyclization of prochiral triones to give

enones.

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