

asymmetric transformation

The conversion of a racemate into a pure *enantiomer* or into a mixture in which one enantiomer is present in excess, or of a *diastereoisomeric* mixture into a single diastereoisomer or into a mixture in which one diastereoisomer predominates. This is sometimes called deracemization.

If the two enantiomers of a *chiral* substrate A are freely interconvertible and if an equal amount or excess of a non-racemizing second enantiomerically pure chemical species, say (*R*)-B, is added to a solution of racemic A, then the resulting equilibrium mixture of adducts A•B will, in general, contain unequal amounts of the diastereoisomers (*R*)-A•(*R*)-B and (*S*)-A•(*R*)-B. The result of this equilibration is called asymmetric transformation of the first kind.

If, in such a system, the two diastereoisomeric adducts differ considerably in solubility so that only one of them, say (*R*)-A•(*R*)-B, crystallizes from the solution, then the equilibration of diastereoisomers in solution and concurrent crystallization will continue so that all (or most) of the substrate A can be isolated as the crystalline diastereoisomer (*R*)-A•(*R*)-B. Such a ‘crystallization-induced asymmetric transformation’ is called an asymmetric transformation of the second kind.

See also *stereoconvergence*.

1996, 68, 2200