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Nota di contenuto	Asymmetric Organocatalysis - From Biomimetic Concepts to Applications in Asymmetric Synthesis; Contents; Preface; Foreword; 1 Introduction: Organocatalysis - From Biomimetic Concepts to Powerful Methods for Asymmetric Synthesis; References; 2 On the Structure of the Book, and a Few General Mechanistic Considerations; 2.1 The Structure of the Book; 2.2 General Mechanistic Considerations; References; 3 Nucleophilic Substitution at Aliphatic Carbon; 3.1 - Alkylation of Cyclic Ketones and Related Compounds; 3.2 -Alkylation of -Amino Acid Derivatives 3.2.1 Development of Highly Efficient Organocatalysts3.2.2 Improving Enantioselectivity During Work-up; 3.2.3 Specific Application in the Synthesis of Non-natural Amino Acids; 3.2.4 Synthesis of ,- Dialkylated Amino Acids; 3.2.5 Enantio- and Diastereoselective Processes - Synthesis of -Amino Acid Derivatives with Two Stereogenic Centers; 3.2.6 Solid-phase Syntheses; 3.3 -Alkylation of Other Acyclic Substrates; 3.4 Fluorination, Chlorination, and Bromination Reactions; 3.4.1 Fluorination Reactions; 3.4.2 Chlorination and Bromination Reactions; References

4 Nucleophilic Addition to Electron-deficient C=C Double Bonds4.1 Intermolecular Michael Addition; 4.1.1 Intermolecular Michael Addition of C-nucleophiles; 4.1.1.1 Chiral Bases and Phase-transfer Catalysis; 4.1.1.2 Activation of Michael Acceptors by Iminium Ion Formation, Activation of Carbonyl Donors by Enamine Formation; 4.1.1.3 Addition of C-nucleophiles to Azodicarboxylates; 4.1.1.4 Cyclopropanation of Enoates with Phenacyl Halides; 4.1.2 Intermolecular Michael Addition of N- and O-nucleophiles; 4.1.3 Intermolecular Michael Addition of S- and Se-nucleophiles
4.2 Intramolecular Michael Addition4.2.1 Intramolecular Michael Addition of C-nucleophiles; 4.2.2 Intramolecular Michael Addition of O-nucleophiles; References; 5 Nucleophilic Addition to C=N Double Bonds; 5.1 Hydrocyanation of Imines (Strecker Reaction); 5.1.1 Chiral Diketopiperazines as Catalysts; 5.1.2 Chiral Guanidines as Catalysts; 5.1.3 Chiral Ureas and Thioureas as Catalysts; 5.1.4 Chiral N-Oxides as "Catalysts"; 5.2 The Mannich Reaction; 5.2.1 Enantioselective Direct Mannich Reaction: Products with One Stereogenic Center
5.2.2 Enantio- and Diastereoselective Direct Mannich Reaction: Products with Two Stereogenic Centers5.2.3 Proline-catalyzed Mannich Reaction: Process Development and Optimization; 5.2.4 Enantioselective Mannich Reaction using Silyl Ketene Acetals; 5.3 - Lactam Synthesis; 5.4 Sulfur Ylide-based Aziridination of Imines; 5.5 Hydrophosphonylation of Imines; References; 6 Nucleophilic Addition to C=O Double Bonds; 6.1 Hydrocyanation; 6.1.1 The Mechanism of the Reaction; 6.2 Aldol Reactions; 6.2.1 Intermolecular Aldol Reactions
6.2.1.1 Intermolecular Aldol Reaction With Formation of One Stereogenic Center

Sommario/riassunto

Asymmetric catalysis represents still one of the major challenges in modern organic chemistry. Besides the well-established asymmetric metal-complex-catalysed syntheses and biocatalysis, the use of "pure" organic catalysts turned out to be an additional efficient tool for the synthesis of chiral building blocks. In this handbook, the experienced authors from academia and industry provide the first overview of the important use of such metal-free organic catalysts in organic chemistry. With its comprehensive description of numerous reaction types, e.g., nucleophilic substitution and addition