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Acceptors; 2.1.2.5 Intramolecular Aldol Reactions; 2.1.2.6 Mechanism and Transition States of Aldol Reactions and Effects of Water on Aldol Reactions; 2.1.2.7 Catalyst Recycling; 2.1.2.8 Catalyst Development Strategies; 2.1.3 Mannich Reactions; 2.1.3.1 Mannich-Type Reactions of Aldehyde Donors with Glyoxylate Imines; 2.1.3.2 Mannich-Type Reactions of Aldehyde Donors with Other Preformed Imines

2.1.3.3 Three-Component Mannich Reactions using Aldehyde Donors2.1.3.4 Mannich-Type Reactions of Ketone Donors; References; 2.2 -Heteroatom Functionalization; 2.2.1 Introduction; 2.2.2 Direct -Amination of Aldehydes and Ketones; 2.2.3 Direct -Amination of -Cyanoacetates and -Dicarbonyl Compounds; 2.2.4 Direct -Oxygenation Reactions of Aldehydes and Ketones; 2.2.5 Direct -Oxygenation Reactions of -Ketoesters; 2.2.6 Direct -Halogenation Reactions of Aldehydes and Ketones; 2.2.6.1 Direct -Fluorination of Aldehydes; 2.2.6.2 Direct -Fluorination of -Ketoesters

2.2.6.3 Direct -Chlorination of Aldehydes and Ketones2.2.6.4 Direct -Chlorination of -Ketoesters; 2.2.6.5 Direct -Bromination of Aldehydes and Ketones; 2.2.7 Direct -Sulfenylation of Aldehydes; 2.2.8 Direct -Sulfenylation of Lactones, Lactams, and -Diketones; 2.2.9 Direct -Selenation of Aldehydes and Ketones; References; 2.3 Direct Conjugate Additions via Enamine Activation; 2.3.1 Introduction; 2.3.2 Factors Determining the Stereoselectivity of the Organocatalytic Conjugate Additions; 2.3.3 Addition of Ketones to Nitroolefins and Alkylidene Malonates; 2.3.3.1 Proline

2.3.3.2 Pyrrolidine Amines and Pyrrolidine Amine Salts as Catalysts for Michael-Type Addition of Ketones to Activated Olefins2.3.3.3 Chiral Primary Amines; 2.3.3.4 Amine/Thiourea Catalysts; 2.3.4 Addition of Aldehydes to Nitroolefins and Alkylidene Malonates; 2.3.4.1 Aminopyrrolidine Catalysts; 2.3.4.2 Addition of Aldehydes and Ketones to Enones; 2.4 Conclusions; References; 3 Iminium Catalysis; 3.1 Introduction; 3.2 The Catalysis Concept of Iminium Activation; 3.3 Development of the "First-Generation" Imidazolidinone Catalysts

3.4 Development of the "Second-Generation" Imidazolidinone Catalysts

Sommario/riassunto

In this reference leaders at the forefront of research provide an insight into one of the hottest topics in organic synthesis, focusing on the most important enantioselective reactions.Clearly structured, each entry begins with a concise introduction, including a mechanistic discussion of the reaction, followed by preparative guidelines for newcomers, such as carefully selected working procedures with critical notes for bench chemists, rules of thumb and tips and tricks.