catalysts

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Enzyme-Mediated Stereoselective Synthesis

Edited by

Stefano Serra

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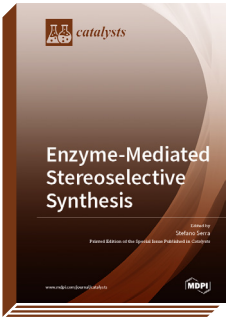

This book is a collection of studies focused on the exploitation of enzyme stereoselectivity for the synthesis of relevant chemicals, such as innovative materials, chiral building blocks, natural products, and flavor and fragrance compounds. Different catalytic approaches are reported. The first study describes a resolution-based process for the stereoselective synthesis of the enantiomeric forms of the flavor compound linaloyl oxide, whereas other enantiomeric enriched aroma compounds were obtained through a novel microbial approach based on solid-state fermentation. Two relevant works exploit the potential of the biocatalyzed reduction reactions. The first of these contributions describes the enantioselective synthesis of β-nitroalcohols by enzyme-mediated reduction of α-nitroketones, whereas a second contribution reports the preparation of chiral 1,4-diaryl-1,4-diols through ADH-catalyzed bioreduction of the corresponding diketones. Concerning enantioenriched alcohol derivatives, natural hydroxy fatty acids are prepared by means of the biocatalytic hydration reaction of natural fatty acids using the probiotic bacterium Lactobacillus rhamnosus as a whole-cell biocatalyst. Further studies describe the use of modified pullulan polysaccharide for lipase immobilization and the recent advances in synthetic applications of ω-transaminases for the production of chiral amines.

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