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Nota di contenuto	Organic Synthesis with Enzymes in Non-Aqueous Media; Contents; Preface; List of Contributors; Part One Biocatalysis in Neat Organic Solvents - Fundamentals; 1 Fundamentals of Biocatalysis in Neat Organic Solvents; 1.1 Introduction; 1.2 Effects of Water on Biocatalytic Reactions; 1.2.1 Quantification of Water in Low-Water Systems; 1.2.2 Water Activity Control; 1.2.2.1 Water Activity Control Using Saturated Salt Solutions; 1.2.2.2 Water Activity Control Using Sensors; 1.2.2.3 Water Activity Control Using Pairs of Salt Hydrates; 1.2.3 Distribution of Water; 1.2.3.1 Hysteresis Effects 1.2.4 Water Effects on Activity 1.2.5 Water Effects on Selectivity; 1.2.6 Water Effects on Stability; 1.3 Solvent Effects; 1.3.1 Solvent Effects on Enzyme Activity; 1.3.2 Solvent Effects on Stability; 1.4 Effects on Equilibria; 1.4.1 Water Effects on Equilibria; 1.4.2 Solvent Effects on Equilibria; 1.5 Effects of pH in Organic Solvents; 1.6 Concluding

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2.5 The Accuracy of E-value Determinations 2.6 Kinetic and Thermodynamic Analysis of the Specificity Constants; 2.7 Solvents Effects on Non-Hydrolytic Enzymes; 2.8 Major Achievements; 2.9 Concluding Remarks; 3 Activating Enzymes for Use in Organic Solvents; 3.1 Introduction; 3.2 Water - A Unique and Necessary Solvent for Enzymatic Catalysis; 3.2.1 Challenges for Enzymatic Catalysis in Water; 3.2.2 Enzymes do Function Without Water as a Bulk Solvent - Lessons from Extreme Halophiles; 3.2.3 Behavior of Enzymes in the Absence of Bulk Water
3.2.4 Removing Water from Enzymes - the Effect of Lyophilization on Enzyme Structure and Function 3.3 Enzyme Activation in Nonaqueous Media; 3.3.1 Addition of Water and Water Mimics; 3.3.2 Immobilization; 3.3.3 Solid-State Buffers; 3.3.4 Lyophilization in the Presence of Excipients; 3.3.4.1 Polymers; 3.3.4.2 Crown Ethers and Cyclodextrins; 3.4 Salt-Activated Enzymes; 3.4.1 Salt Activation is not due to a Relaxation of Diffusional Limitations; 3.4.2 Mechanism of Salt Activation; 3.4.3 The Structural and Molecular Dynamics of Salt Activation; 3.5 Conclusions
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4.2.3 Reaction of Acid Derivatives

Sommario/riassunto

Closing a gap in the literature, this comprehensive book examines and discusses different non-aqueous systems from organic solvents to ionic liquids for synthetic applications, thus opening the door to new successful methods for biocatalytic reactions. It gathers into one handy source the information otherwise widely spread throughout the literature, combining useful background information with a number of synthetic examples, including industrial scale processes for pharmaceutical and fine chemicals. Extremely well structured, the text introduces the fundamentals of non-aqueous enzymology,

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