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Nota di contenuto	Organic Reactions in Water : Principles, Strategies and Applications; Contents; Contributors; Preface; Foreword; 1 A Fifty-Year Perspective on Chemistry in Water; 1.1 Enzyme mimics and models; 1.1.1 Thiamine; 1.1.2 Cyclodextrins; 1.1.3 Cyclodextrins with bound metal ions; 1.1.4 Cyclodextrin dimers; 1.1.5 Ribonuclease mimics; 1.1.6 Transaminase mimics; 1.1.7 Cytochrome P-450 mimics; 1.2 Reactions in water promoted by hydrophobic binding of small molecules; 1.2.1 Diels-Alder reactions; 1.2.2 The benzoin condensation; 1.2.3 Atom transfer reactions 1.3 Quantitative antihydrophobic effects in water and the geometries of transition states 1.4 The importance of water as a reaction solvent; References; 2 Structure and Properties of Water; 2.1 Water, the molecule and the liquid; 2.1.1 The single water molecule; 2.1.2 Liquid water; 2.2 Properties of water; 2.2.1 Solvent properties and parameters; 2.2.2 Thermodynamics of hydration; 2.2.3 Hydrophobic interactions; 2.3 Kinetic solvent effects in aqueous solution; References; 3 Acid

Catalysis in Water; 3.1 Homogeneous catalysis; 3.1.1 Bronsted acid catalysis; 3.1.2 Lewis acid catalysis; 3.1.3 Asymmetric catalysis; 3.2 Heterogeneous catalysis; 3.2.1 Polymer-supported Bronsted catalysis; 3.2.2 Polymer-supported metal catalysis; 3.3 Micellar catalysis; 3.3.1 LASC (Lewis acid-surfactant-combined catalysts); 3.3.2 BASC (Bronsted acid-surfactant-combined catalyst); 3.4 Conclusion; References; 4 Metal-Mediated C-C Bond Formations in Aqueous Media; 4.1 Introduction; 4.2 Reactivity of organometallic compounds with water; 4.2.1 C-M bonding; 4.2.2 C-M hydrolysis; 4.2.3 C-M reactions; 4.2.4 C-C bond formations via C-M reactions in water; 4.3 Allylation of carbonyls and imines; 4.3.1 Allylation of carbonyl compounds; 4.3.2 Allylation of imines and related compounds; 4.4 Propargylation/allenylation of carbonyls, imines, and related compounds; 4.5 Metal-mediated benzylation of carbonyls and imines; 4.6 Arylation and vinylation of carbonyls and imines; 4.6.1 Arylation and vinylation of aldehydes; 4.6.2 Arylation and vinylation of imines and related compounds; 4.7 Alkynylation of carbonyls, imines, and related compounds; 4.7.1 Alkynylation of aldehydes; 4.7.2 Alkynylation of imines and related compounds; 4.7.3 Asymmetric alkynylation; 4.8 Metal-mediated aldol and Reformatsky-type reactions; 4.9 Metal-mediated alkylation of carbonyls and imines; 4.9.1 Alkylation of aldehydes; 4.9.2 Alkylation of imines; 4.10 Metal-mediated conjugate addition reactions; 4.10.1 Addition of alkyl groups; 4.10.2 Addition of vinyl and aryl groups; 4.10.3 Addition of alkynes; 4.11 Metal-mediated coupling reactions; 4.11.1 Pinacol coupling; 4.11.2 Other reductive couplings; 4.11.3 Cross-dehydrogenative coupling; 4.12 Conclusion; References; 5 Pericyclic Reactions in Aqueous Media; 5.1 Diels-Alder cycloaddition reactions; 5.1.1 Carbo Diels-Alder reactions

Sommario/riassunto

Volatile organic solvents are the normal media used in both research scale and industrial scale synthesis of organic chemicals. Their environmental impact is significant, however, and so the development of alternative reaction media has become of great interest. Developments in the use of water as a solvent for organic synthesis have reached the point where it could now be considered a viable solvent for many organic reactions. Organic Reactions in Water demonstrates the underlying principles of using water as a reaction solvent and, by reference to a range of reaction types and systems