1. Record Nr. UNINA9910877657103321 Autore Sheldon Roger A Titolo Green chemistry and catalysis // Roger Arthur Sheldon, Isabel Arends, and Ulf Hanefeld Weinheim,: Wiley-VCH, c2007 Pubbl/distr/stampa **ISBN** 1-280-92171-4 9786610921713 3-527-61100-2 3-527-61101-0 Descrizione fisica 1 online resource (451 p.) Altri autori (Persone) ArendsIsabel HanefeldUlf 660.2995 Disciplina Soggetti Catalysis Green chemistry Sustainable development Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Description based upon print version of record. Note generali Includes bibliographical references and index. Nota di bibliografia Green Chemistry and Catalysis; Contents; Preface; Foreword; 1 Nota di contenuto Introduction: Green Chemistry and Catalysis; 1.1 Introduction; 1.2. E Factors and Atom Efficiency; 1.3 The Role of Catalysis; 1.4 The Development of Organic Synthesis; 1.5 Catalysis by Solid Acids and Bases; 1.6 Catalytic Reduction; 1.7 Catalytic Oxidation; 1.8 Catalytic C-C Bond Formation; 1.9 The Question of Solvents: Alternative Reaction Media; 1.10 Biocatalysis; 1.11 Renewable Raw Materials and White Biotechnology: 1.12 Enantioselective Catalysis: 1.13 Risky Reagents: 1.14 Process Integration and Catalytic Cascades; References 2 Solid Acids and Bases as Catalysts2.1 Introduction; 2.2 Solid Acid Catalysis; 2.2.1 Acidic Clays; 2.2.2 Zeolites and Zeotypes: Synthesis and Structure; 2.2.3 Zeolite-catalyzed Reactions in Organic Synthesis; 2.2.3.1 Electrophilic Aromatic Substitutions; 2.2.3.2 Additions and Eliminations; 2.2.3.3 Rearrangements and Isomerizations: 2.2.3.4

Cyclizations; 2.2.4 Solid Acids Containing Surface SO(3)H Functionality; 2.2.5 Heteropoly Acids; 2.3 Solid Base Catalysis; 2.3.1 Anionic Clays: Hydrotalcites; 2.3.2 Basic Zeolites; 2.3.3 Organic Bases Attached to

Mesoporous Silicas; 2.4 Other Approaches

References Catalytic Reductions: 3.1 Introduction: 3.2 Heterogeneous Reduction Catalysts; 3.2.1 General Properties; 3.2.2 Transfer Hydrogenation Using Heterogeneous Catalysts: 3.2.3 Chiral Heterogeneous Reduction Catalysts; 3.3 Homogeneous Reduction Catalysts; 3.3.1 Wilkinson Catalyst; 3.3.2 Chiral Homogeneous Hydrogenation Catalysts and Reduction of the C= C Double Bond: 3.3.3 Chiral Homogeneous Catalysts and Ketone Hydrogenation; 3.3.4 Imine Hydrogenation; 3.3.5 Transfer Hydrogenation using Homogeneous Catalysts; 3.4 Biocatalytic Reductions; 3.4.1 Introduction 3.4.2 Enzyme Technology in Biocatalytic Reduction 3.4.3 Whole Cell Technology for Biocatalytic Reduction; 3.5 Conclusions; References; 4 Catalytic Oxidations; 4.1 Introduction; 4.2 Mechanisms of Metalcatalyzed Oxidations: General Considerations; 4.2.1 Homolytic Mechanisms; 4.2.1.1 Direct Homolytic Oxidation of Organic Substrates; 4.2.2 Heterolytic Mechanisms; 4.2.2.1 Catalytic Oxygen Transfer; 4.2.3 Ligand Design in Oxidation Catalysis; 4.2.4 Enzyme Catalyzed Oxidations; 4.3 Alkenes; 4.3.1 Epoxidation; 4.3.1.1 Tungsten Catalysts; 4.3.1.2 Rhenium Catalysts; 4.3.1.3 Ruthenium Catalysts 4.3.1.4 Manganese Catalysts4.3.1.5 Iron Catalysts; 4.3.1.6 Selenium and Organocatalysts; 4.3.1.7 Hydrotalcite and Alumina Systems; 4.3.1.8 Biocatalytic Systems; 4.3.2 Vicinal Dihydroxylation; 4.3.3 Oxidative Cleavage of Olefins: 4.3.4 Oxidative Ketonization: 4.3.5 Allylic Oxidations; 4.4 Alkanes and Alkylaromatics; 4.4.1 Oxidation of Alkanes; 4.4.2 Oxidation of Aromatic Side Chains; 4.4.3 Aromatic Ring Oxidation; 4.5 Oxygen-containing Compounds; 4.5.1 Oxidation of Alcohols; 4.5.1.1 Ruthenium Catalysts; 4.5.1.2 Palladium-catalyzed Oxidations with O(2); 4.5.1.3 Gold Catalysts 4.5.1.4 Copper Catalysts

Sommario/riassunto

This first book to focus on catalytic processes from the viewpoint of green chemistry presents every important aspect:? Numerous catalytic reductions and oxidations methods? Solid-acid and solid-base catalysis? C-C bond formation reactions? Biocatalysis? Asymmetric catalysis? Novel reaction media like e.g. ionic liquids, supercritical CO2? Renewable raw materialsWritten by Roger A. Sheldon -- without doubt one of the leaders in the field with much experience in academia and industry -- and his co-workers, the result is a unified whole, an indispensable s