1. Record Nr. UNINA9910877425203321

Titolo	Carbon dioxide as chemical feedstock / / edited by Michele Aresta
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2010
ISBN	9786612491580 9781523155774 1523155779 9781282491588 128249158X 9783527629916 3527629912 9783527629923 3527629920
Descrizione fisica	1 online resource (416 p.)
Altri autori (Persone)	ArestaMichele <1940->
Disciplina	546.6812
Soggetti	Feedstock Carbon dioxide - Industrial applications
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Carbon Dioxide as Chemical Feedstock; Contents; Preface; List of Contributors; 1: Carbon Dioxide: Utilization Options to Reduce its Accumulation in the Atmosphere; 1.1 Carbon Dioxide Emission; 1.2 The Accumulation of CO2 in the Atmosphere, and the Effects that We Fear; 1.3 Technologies to Reduce CO2 Accumulation in the Atmosphere; 1.4 The Utilization of CO2; 1.5 Conditions for Using CO2; 1.6 CO2: Sources and Prices; 1.7 The Potential for CO2 Utilization, and the Content of This Book; 1.8 The Need for Research to Speed an Exploitation of the Utilization Option; References 2: Utilization of Dense Carbon Dioxide as an Inert Solvent for Chemical Syntheses2.1 Introduction; 2.2 Dense Carbon Dioxide as Solvent Medium for Chemical Processes; 2.3 Enzymatic Catalysis in Dense Carbon Dioxide; 2.4 Other Reactions in Dense Carbon Dioxide; 2.5 Polymer Synthesis in Supercritical Carbon Dioxide; 2.5.1 Chain

Polymerizations: Synthesis of Fluoropolymers; 2.5.2 Step Polymerizations: Synthesis of Biodegradable Polymers; 2.6 Conclusions; Acknowledgments; References; 3: Autotrophic Carbon Fixation in Biology: Pathways, Rules, and Speculations; 3.1 Introduction
3.2 The Mechanisms of CO2 Fixation3.2.1 The Calvin-Benson-Bassham (CBB) Cycle; 3.2.2 The Reductive Citric Acid Cycle (Arnon-Buchanan Cycle); 3.2.3 The Reductive Acetyl-CoA Pathway (Wood-Ljungdahl Pathway); 3.2.4 The 3-Hydroxypropionate/Malyl-CoA Cycle; 3.2.5 The 3-Hydroxypropionate/4-Hydroxybutyrate Cycle; 3.2.6 The Dicarboxylate/4-Hydroxybutyrate Cycle; 3.3 Rules to Explain the Diversity; 3.4 Evolutionary Aspects; 3.5 Chemical Aspects of CO2 Fixation; Acknowledgments; References; 4: Carbon Dioxide Coordination Chemistry and Reactivity of Coordinated CO2; 4.1 Introduction
4.2 Carbon Dioxide Bonding to Metals4.3 Synthesis and Structure of CO2 Complexes; 4.3.1 Low-Temperature Matrix Isolation and Theoretical Studies; 4.3.2 Synthesis of Stable Complexes; 4.3.2.1 End-On Complexes; 4.3.2.2 Side-On Complexes; 4.3.2.3 Bridged Complexes; 4.3.2.4 Bridged Complexes Obtained by In-situ Synthesis; 4.4 Reactivity of CO2 Complexes; 4.4.1 C-O Bond Cleavage and O Transfer; 4.4.2 Reactions with Electrophiles; 4.4.3 Reactions with Nucleophiles; 4.5 CO2 Complexes as Reaction Intermediates in CO2 Utilization Processes; 4.5.1 Oxidative Coupling Reactions; 4.5.2 Reduction Reactions
4.5.3 Catalytic Processes4.5.4 Bioinspired Reactions; 4.6 Conclusions; Acknowledgments; References; 5: Main Group Element- and Transition Metal-Promoted Carboxylation of Organic Substrates (Alkanes, Alkenes, Alkynes, Aromatics, and Others); 5.1 Introduction; 5.2 Formation of Aromatic Carboxylic Acids: The Kolbe-Schmitt Synthesis; 5.2.1 Kolbe-Schmitt Synthesis: Generalities; 5.2.2 Reaction Parameters and Mechanistic Studies of the Kolbe-Schmitt Synthesis; 5.2.3 Recent Applications of the Kolbe-Schmitt Carboxylation: Synthesis of 1,3-Dialkylimidazolium-2-Carboxylates
5.2.4 Carboxylation of C-H-Acidic Compounds

Sommario/riassunto

Filling the need for an up-to-date handbook, this ready reference closely investigates the use of CO2 for ureas, enzymes, carbamates, and isocyanates, as well as its use as a solvent, in electrochemistry, biomass utilization and much more.Edited by an internationally renowned and experienced researcher, this is a comprehensive source for every synthetic chemist in academia and industry.