

1. Record Nr.	UNINA9910144297203321
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Titolo	Modern fluoroorganic chemistry [[electronic resource]] : synthesis, reactivity, applications / / Peer Kirsch
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2004
ISBN	1-280-51959-2 9786610519590 3-527-60393-X 3-527-60419-7
Descrizione fisica	1 online resource (322 p.)
Disciplina	547.02 547.6
Soggetti	Organofluorine compounds Electronic books.
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	Modern Fluoroorganic Chemistry; Contents; Preface; List of Abbreviations; 1 Introduction; 1.1 Why Organofluorine Chemistry?; 1.2 History; 1.3 The Basic Materials; 1.3.1 Hydrofluoric Acid; 1.3.2 Fluorine; 1.4 The Unique Properties of Organofluorine Compounds; 1.4.1 Physical Properties; 1.4.2 Chemical Properties; 1.4.3 Ecological Impact; 1.4.3.1 Ozone Depletion by Chlorofluorocarbons; 1.4.3.2 Greenhouse Effect; 1.4.4 Physiological Properties; 1.4.5 Analysis of Fluorochemicals: (19)F NMR Spectroscopy; 2 Synthesis of Complex Organofluorine Compounds; 2.1 Introduction of Fluorine 2.1.1 Perfluorination and Selective Direct Fluorination 2.1.2 Electrochemical Fluorination (ECF); 2.1.3 Nucleophilic Fluorination; 2.1.3.1 Finkelstein Exchange; 2.1.3.2 "Naked" Fluoride; 2.1.3.3 Lewis Acid-assisted Fluorination; 2.1.3.4 The "General Fluorine Effect"; 2.1.3.5 Amine-Hydrogen Fluoride and Ether-Hydrogen Fluoride Reagents; 2.1.3.6 Hydrofluorination, Halofluorination, and Epoxide Ring Opening; 2.1.4 Synthesis and Reactivity of Fluoroaromatic Compounds; 2.1.4.1 Synthesis of Fluoroaromatic Compounds; 2.1.4.2 Reductive Aromatization; 2.1.4.3 The Balz-Schiemann Reaction

2.1.4.4 The Fluoroformate Process; 2.1.4.5 Transition Metal-assisted Oxidative Fluorination; 2.1.4.6 The Halex Process; 2.1.4.7 Think Negative! - "Orthogonal" Reactivity of Perfluoroaromatic and Perfluoroolefinic Systems; 2.1.4.8 The "Special Fluorine Effect"; 2.1.4.9 Aromatic Nucleophilic Substitution; 2.1.4.10 Activation of the Carbon-Fluorine Bond by Transition Metals; 2.1.4.11 Activation of Fluoroaromatic Compounds by ortho-Metalation; 2.1.5 Transformations of Functional Groups; 2.1.5.1 Hydroxy into Fluoro; 2.1.5.2 Conversion of Carbonyl into gem-Difluoromethylene; 2.1.5.3 Carboxyl into Trifluoromethyl; 2.1.5.4 Oxidative Fluorodesulfuration; 2.1.6 "Electrophilic" Fluorination; 2.1.6.1 Xenon Difluoride; 2.1.6.2 Perchloryl Fluoride and Hypofluorides; 2.1.6.3 "NF"-Reagents; 2.2 Perfluoroalkylation; 2.2.1 Radical Perfluoroalkylation; 2.2.1.1 Structure, Properties, and Reactivity of Perfluoroalkyl Radicals; 2.2.1.2 Preparatively Useful Reactions of Perfluoroalkyl Radicals; 2.2.1.3 "Inverse" Radical Addition of Alkyl Radicals to Perfluoroolefins; 2.2.2 Nucleophilic Perfluoroalkylation; 2.2.2.1 Properties, Stability, and Reactivity of Fluorinated Carbanions; 2.2.2.2 Perfluoroalkyl Metal Compounds; 2.2.2.3 Perfluoroalkyl Silanes; 2.2.3 "Electrophilic" Perfluoroalkylation; 2.2.3.1 Properties and Stability of Fluorinated Carbocations; 2.2.3.2 Aryl Perfluoroalkyl Iodonium Salts; 2.2.3.3 Perfluoroalkyl Sulfonium, Selenonium, Telluronium, and Oxonium Salts; 2.2.4 Difluorocarbene and Fluorinated Cyclopropanes; 2.3 Selected Fluorinated Structures and Reaction Types; 2.3.1 Difluoromethylation and Halodifluoromethylation; 2.3.2 The Perfluoroalkoxy Group; 2.3.3 The Perfluoroalkylthio Group and Sulfur-based Super-electron-withdrawing Groups; 2.3.4 The Pentafluorosulfuranyl Group and Related Structures

Sommario/riassunto

In this handbook, Peer Kirsch clearly shows that this exciting field is no longer an exotic area of research. Aimed primarily at synthetic chemists wanting to gain a deeper understanding of the fascinating implications of including the highly unusual element fluorine in organic compounds, the main part of the book presents a wide range of synthetic methodologies and the experimental procedures selected undeniably show that this can be done with standard laboratory equipment. To round off, the author looks at fluorous chemistry and the applications of organofluorine compounds in liquid crystals
