

1. Record Nr.	UNINA9910139131903321
Autore	Ghosh Abhik
Titolo	Arrow pushing in inorganic chemistry : a logical approach to the chemistry of the main group elements // Abhik Ghosh, Steffen Berg
Pubbl/distr/stampa	Hoboken, New Jersey : : John Wiley & Sons, Ltd., , 2014 ©2014
ISBN	1-118-92452-5 1-118-92453-3 1-118-92454-1
Descrizione fisica	1 online resource (347 p.)
Disciplina	540.151
Soggetti	Chemistry, Inorganic - Experiments Chemistry, Inorganic
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	Cover; Title Page; Contents; Foreword; Preface; Acknowledgments; Chapter 1 A Collection of Basic Concepts; 1.1 Nucleophiles and Electrophiles: The SN2 Paradigm; 1.2 What Makes for a Good Nucleophile?; 1.3 Hard and Soft Acids and Bases: The HSAB Principle; 1.4 pKa Values: What Makes for a Good Leaving Group?; 1.5 Redox Potentials; 1.6 Thermodynamic Control: Bond Dissociation Energies (BDEs); 1.7 Bimolecular \beta-Elimination (E2); 1.8 Proton Transfers (PTs); 1.9 Elementary Associative and Dissociative Processes (A and D); 1.10 Two-Step Ionic Mechanisms: The SN2-Si Pathway 1.11 Two-Step Ionic Mechanisms: The SN1 and E1 Pathways 1.12 Electrophilic Addition to Carbon-Carbon Multiple Bonds; 1.13 Electrophilic Substitution on Aromatics: Addition-Elimination; 1.14 Nucleophilic Addition to Carbon-Heteroatom Multiple Bonds; 1.15 Carbanions and Related Synthetic Intermediates; 1.16 Carbenes; 1.17 Oxidative Additions and Reductive Eliminations; 1.18 Migrations; 1.19 Ligand Exchange Reactions; 1.20 Radical Reactions; 1.21 Pericyclic Reactions; 1.22 Arrow Pushing: Organic Paradigms; 1.23 Inorganic Arrow Pushing: Thinking Like a Lone Pair 1.24 Definitions: Valence, Oxidation State, Formal Charge, and

Coordination Number1.25 Elements of Bonding in Hypervalent Compounds; 1.26 The \lambda Convention; 1.27 The Inert Pair Effect; 1.28 Summary; Further Reading; Chapter 2 The s-Block Elements: Alkali and Alkaline Earth Metals; 2.1 Solubility; 2.2 The s-Block Metals as Reducing Agents; 2.3 Reductive Couplings; 2.4 Dissolving Metal Reactions; 2.5 Organolithium and Organomagnesium Compounds; 2.6 Dihydrogen Activation by Frustrated Lewis Pairs (FLPs); 2.7 A MgI-MgI Bond; 2.8 Summary; Further Reading; Chapter 3 Group 13 Elements 3.1 Group 13 Compounds as Lewis Acids3.2 Hydroboration; 3.3 Group 13-Based Reducing Agents; 3.4 From Borazine to Gallium Arsenide: 13-15 Compounds; 3.5 Low-Oxidation-State Compounds; 3.6 The Boryl Anion; 3.7 Indium-Mediated Allylations; 3.8 Thallium Reagents; 3.9 Summary; Further Reading; Chapter 4 Group 14 Elements; 4.1 Silyl Protecting Groups; 4.2 A Case Study: Peterson Olefination; 4.3 Silanes; 4.4 The \beta-Silicon Effect: Allylsilanes; 4.5 Silyl Anions; 4.6 Organostannanes; 4.7 Polystannanes; 4.8\* Carbene and Alkene Analogs; 4.9\* Alkyne Analogs; 4.10 Silyl Cations 4.11 Glycol Cleavage by Lead Tetraacetate4.12 Summary; Further Reading; Chapter 5A Nitrogen; 5A.1 Ammonia and Some Other Common Nitrogen Nucleophiles; 5A.2 Some Common Nitrogen Electrophiles: Oxides, Oxoacids, and Oxoanions; 5A.3 N-N Bonded Molecules: Synthesis of Hydrazine; 5A.4 Multiple Bond Formation: Synthesis of Sodium Azide; 5A.5 Thermal Decomposition of NH<sub>4</sub>NO<sub>2</sub> and NH<sub>4</sub>NO<sub>3</sub>; 5A.6 Diazonium Salts; 5A.7 Azo Compounds and Diazene; 5A.8\* Imines and Related Functional Groups: The Wolff-Kishner Reduction and the Shapiro Reaction; 5A.9 Diazo Compounds 5A.10 Nitrenes and Nitrenoids: The Curtius Rearrangement

---

#### Sommario/riassunto

Involved as it is with 95% of the periodic table, inorganic chemistry is one of the foundational subjects of scientific study. Inorganic catalysts are used in crucial industrial processes and the field, to a significant extent, also forms the basis of nanotechnology. Unfortunately, the subject is not a popular one for undergraduates. This book aims to take a step to change this state of affairs by presenting a mechanistic, logical introduction to the subject. Organic teaching places heavy emphasis on reaction mechanisms - ""arrow-pushing"" - and the authors of this book have found that a me

---