

# Scorpionates

The Coordination Chemistry of  
Polypyrazolylborate Ligands



Swiatoslaw Trofimenko

Imperial College Press

# Scorpionates Polypyrazolylborate Ligands And Their Coordination Chemistry

**Chao-Jun Li, Xihe Bi**



## **Scorpionates Polypyrazolylborate Ligands And Their Coordination Chemistry:**

Scorpionates: The Coordination Chemistry Of Polypyrazolylborate Ligands Swiatoslaw Trofimenko, 1999-08-16 This book deals with polypyrazolylborates scorpionates a class of ligands known since 1966 but becoming rapidly popular with inorganic organometallic and coordination chemists since 1986 because of their versatility and user friendliness They can be readily modified sterically and electronically through appropriate substitution on the pyrazole ring and on boron and have led to a number of firsts in coordination chemistry first stable CuCO complex first monomeric MgR complex and many other such firsts Their denticity can range from two to four their Bite can be adjusted and additional coordinating sites can be added to the pyrazolyl rings Over 170 different scorpionate ligands are known today and some are published for the first time in this book The author Swiatoslaw Trofimenko discovered and developed this ligand system and has written several reviews on the subject The book is intended as a reference work placing at the researcher s command practically all of the over 1500 references on the subject up and into 1999 organized both according to the ligand type and according to the metal or metalloid being coordinated It acquaints the reader with the special features of this ligand system and permits an assessment of what has been done in a given sub area and of which areas remain relatively unexplored It presents procedures for ligand synthesis and also covers their use in catalysis and in the modelling of biologically active substances

*Advances in Organometallic Chemistry*, 2016-05-25 *Advances in Organometallic Chemistry* contains authoritative review articles of world wide known researchers on the field of organometallic chemistry covering topics in organometallic synthesis reactions mechanisms homogeneous catalysis and more The book will benefit a wide range of researchers involved in organometallic chemistry including synthetic protocols mechanistic studies and practical applications Contains contributions from leading authorities in the field of organometallic chemistry Covers topics in organometallic synthesis reactions mechanisms homogeneous catalysis and more Informs and updates readers on all the latest developments in the field Carefully edited to provide easy to read material

Scorpionates II: Chelating Borate Ligands - Dedicated To Swiatoslaw Trofimenko Claudio Pettinari, 2008-05-29 Since their discovery by Swiatoslaw Trofimenko in 1967 poly pyrazol 1 yl borates have been considered as one of the most useful ligands in modern coordination chemistry The term scorpionate has been used to describe the interchange between bidentate and tridentate coordination modes by these ligands that has been employed for the synthesis of complexes with virtually every metal in the periodic table having applications in diverse fields ranging from homogeneous catalysis to bioinorganic chemistry This all inclusive reference book continues where Trofimenko s original work left off It not only includes discussions on all new ligands reported from 1999 to date but also introduces new ligands that have yet to be touched upon in other titles such as scorpionates based on S donors or P donors As such this comprehensive volume is a must have for all researchers who utilize this family of molecules a

Scorpionates II Claudio Pettinari, Swiatoslaw Trofimenko, 2008 This resource continues where Trofimenko s original work left off It not only includes discussions on all new

ligands reported from 1999 to date but also introduces new ligands such as scorpionates based on S donors or P donors As such this volume is a must have for all researchers who use this family of molecules

**Molecules With Silly Or Unusual Names** Paul W May, 2008-08-25 This popular science book shows that chemists do have a sense of humor and this book is a celebration of the quirky side of scientific nomenclature Here some molecules are shown that have unusual rude ridiculous or downright silly names Written in an easy to read style anyone not just scientists can appreciate the content Each molecule is illustrated with a photograph and or image that relates directly or indirectly to its name and molecular structure Thus the book is not only entertaining but also educational a

*Comprehensive Coordination Chemistry II* J. A. McCleverty, T.J. Meyer, 2003-12-03 Comprehensive Coordination Chemistry II CCC II is the sequel to what has become a classic in the field Comprehensive Coordination Chemistry published in 1987 CCC II builds on the first and surveys new developments authoritatively in over 200 newly commissioned chapters with an emphasis on current trends in biology materials science and other areas of contemporary scientific interest

*Homogeneous Oxidation Reactions* Mohammad Reza Rahimpour, Mohammad Amin Makarem, Tayebah Roostaie, Maryam Meshksar, 2024-09-18 Homogeneous Oxidation Reactions a volume in the Advances Homogeneous in Catalysis series covers oxidation and hydrogenation reactions in detail Split into two sections the first is devoted to various homogeneous oxidation processes such as oxidation of olefins phenols and aromatic acids The second presents homogeneous hydrogenation reactions and related processes including hydrogenation of alkenes esters and olefins Relevant reactor design industrial case studies economic analysis and environmental issues of both oxidation and hydrogenation homogeneous reactions are considered This book will be of particular interest and benefit to catalysts users manufacturers and creators Includes fundamentals reactor design and process description of oxidation homogeneous reactions Describes various oxidation homogeneous reactions Explains oxidation economic and environmental challenges

**Vanadium Catalysis** Manas Sutradhar, Armando J L Pombeiro, José Armando L da Silva, 2020-11-05 Vanadium is one of the more abundant elements in the Earth's crust and exhibits a wide range of oxidation states in its compounds making it potentially a more sustainable and more economical choice as a catalyst than the noble metals A wide variety of reactions have been found to be catalysed by homogeneous supported and heterogeneous vanadium complexes and the number of applications is growing fast Bringing together the research on the catalytic uses of this element into one essential resource including theoretical perspectives on proposed mechanisms for vanadium catalysis and an overview of its relevance in biological processes this book is a useful reference for industrial and academic chemists alike

*Advances in Organometallic Chemistry* Robert C. West, Anthony F. Hill, Mark J. Fink, 2011-08-09 Almost all branches of chemistry and material science now interface with organometallic chemistry the study of compounds containing carbon metal bonds This widely acclaimed serial contains authoritative reviews that address all aspects of organometallic chemistry a field which has expanded enormously since the publication of Volume 1 in 1964 Volume 56 comprises Part 1 of a themed collection of papers

on The Organotransition Metal Chemistry of Poly pyrazolyl borates Provides an authoritative definitive review addressing all aspects of organometallic chemistry Useful to researchers within this active field and is a must for every modern library of chemistry High quality research book within this rapidly developing field      **Synthesis And Applications In Chemistry And Materials (In 4 Volumes)** Armando J L Pombeiro,Kamran T Mahmudov,Maria De Fatima Costa Guedes Da Silva,2024-01-16      Molecular Design in Inorganic Biochemistry Daniel Rabinovich,2014-07-01 Chemical structure and bonding The scope of the series spans the entire Periodic Table and addresses structure and bonding issues associated with all of the elements It also focuses attention on new and developing areas of modern structural and theoretical chemistry such as nanostructures molecular electronics designed molecular solids surfaces metal clusters and supramolecular structures Physical and spectroscopic techniques used to determine examine and model structures fall within the purview of Structure and Bonding to the extent that the focus is on the scientific results obtained and not on specialist information concerning the techniques themselves Issues associated with the development of bonding models and generalizations that illuminate the reactivity pathways and rates of chemical processes are also relevant The individual volumes in the series are thematic The goal of each volume is to give the reader whether at a university or in industry a comprehensive overview of an area where new insights are emerging that are of interest to a larger scientific audience Thus each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole The most significant developments of the last 5 to 10 years should be presented using selected examples to illustrate the principles discussed A description of the physical basis of the experimental techniques that have been used to provide the primary data may also be appropriate if it has not been covered in detail elsewhere The coverage need not be exhaustive in data but should rather be conceptual concentrating on the new principles being developed that will allow the reader who is not a specialist in the area covered to understand the data presented Discussion of possible future research directions in the area is welcomed Review articles for the individual volumes are invited by the volume editors      *Comprehensive Coordination Chemistry II* Jon A. McCleverty,Thomas J. Meyer,2004      **Advances in Inorganic Chemistry** Rudi van Eldik,2008-10-06 The Advances in Inorganic Chemistry series present timely and informative summaries of the current progress in a variety of subject areas within inorganic chemistry ranging from bio inorganic to solid state studies This acclaimed serial features reviews written by experts in the field and serves as an indispensable reference to advanced researchers Each volume contains an index and each chapter is fully referenced Features comprehensive reviews on the latest developments Includes contributions from leading experts in the field Serves as an indispensable reference to advanced researchers      *50 Years of Structure and Bonding - The Anniversary Volume* D. Michael P. Mingos,2016-10-06 Chemical structure and bonding The scope of the series spans the entire Periodic Table and addresses structure and bonding issues associated with all of the elements It also focuses attention on new and developing areas of modern structural and theoretical chemistry such as nanostructures molecular

electronics designed molecular solids surfaces metal clusters and supramolecular structures Physical and spectroscopic techniques used to determine examine and model structures fall within the purview of Structure and Bonding to the extent that the focus is on the scientific results obtained and not on specialist information concerning the techniques themselves Issues associated with the development of bonding models and generalizations that illuminate the reactivity pathways and rates of chemical processes are also relevant The individual volumes in the series are thematic The goal of each volume is to give the reader whether at a university or in industry a comprehensive overview of an area where new insights are emerging that are of interest to a larger scientific audience Thus each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole The most significant developments of the last 5 to 10 years should be presented using selected examples to illustrate the principles discussed A description of the physical basis of the experimental techniques that have been used to provide the primary data may also be appropriate if it has not been covered in detail elsewhere The coverage need not be exhaustive in data but should rather be conceptual concentrating on the new principles being developed that will allow the reader who is not a specialist in the area covered to understand the data presented Discussion of possible future research directions in the area is welcomed Review articles for the individual volumes are invited by the volume editors

*Physical and Analytical Electrochemistry (General) - 215th ECS Meeting* P. Trulove, 2009-11 The papers included in this issue of ECS Transactions were originally presented in the symposium Physical and Analytical Electrochemistry General Session held during the 215th meeting of The Electrochemical Society in San Francisco CA from May 24 to 29 2009

**Metal Complexes Containing Boron Based Ligands** Gareth Owen, 2019-10-30 Boron based compounds have been utilized as ligands within transition metal complexes for many decades The diversity of such compounds in terms of varying functional groups is truly exceptional Boron compounds are of high interest due to the great potential to modify the substituents around the boron center and to produce a broad range of structural motifs The many different ways these compounds can coordinate or interact with transition metal centers is astonishing Examples of transition metal complexes containing boron based ligands include scorpionates cluster type borane and carboranes borates and phosphine stabilized borylene ligands This Special Issue brings together a collection of articles focusing on recent developments in the aforementioned boron based ligands The articles reported in this book will provide the reader with an overview of the types of boron based ligands which are currently being researched in groups around the world

*Single Molecular Machines and Motors* Christian Joachim, Gwénaél Rapenne, 2015-01-17 Single Molecular Machines and Motors brings together different approaches and strategies to design synthesize and study single molecular machines and motors in a multidisciplinary way Written by leading international experts this book summarizes the advances in the field through a number of disciplines Some contributions describe molecular chemistry such as organic aromatics and coordination chemistry while others address theoretical chemistry in a predictive way or through post experimental modelling

Experimental physics with extensive use of scanning probe microscopy STM and AFM is discussed for examining one single molecule This book is aimed at those who are interested in the rapidly growing field of molecular machines and motors acting and studied at the single molecule scale The goal of the authors and editors is to provide the reader with an up to date summary while also offering future perspectives on the field

### **Fluxional Organometallic and Coordination**

**Compounds** Marcel Gielen, Rudolph Willem, Bernd Wrackmeyer, 2005-01-28 This series offers leading contributions by well known chemists reviewing the state of the art of this wide research area Physical organometallic chemistry aims to develop new insights and to promote novel interest and investigations applicable to organometallic chemistry This volume focuses on several important topics on fluxionality in organometallic and coordination chemistry reviewed by experts in each of the respective fields It is intended to provide both authoritative concepts and stimulating ideas in order to tackle dynamics from different angles aiming at an interdisciplinary approach The fascinating fluxionality of metal ligand interactions has been in the centre of interest ever since modern coordination and organometallic chemistry started and has expanded towards bioinorganic chemistry catalysis and materials sciences Provides information on some of the most relevant physical methods for studying dynamic processes Presents numerous examples of dynamic behavior demonstrating the efficiency of the respective method and stimulating further applications Connects main group transition metal and solid state chemistry in the question for dynamics

### **Silver Catalysis in Organic Synthesis, 2 Volume Set**

Chao-Jun Li, Xihe Bi, 2019-04-29 Dieses Fachbuch untersucht systematisch die Leistungsfähigkeit der Silberkatalyse behandelt neu entwickelte organische Reaktionen und den Reaktionsmechanismus Der Schwerpunkt liegt auf den Eigenschaften und dem Vergleich der Vorteile dieser Katalyse in der organischen Synthese

### **Molybdenum and Tungsten Enzymes**

Russ Hille, Carola Schulzke, Martin L Kirk, 2016-10-10 There has been enormous progress in our understanding of molybdenum and tungsten enzymes and relevant inorganic complexes of molybdenum and tungsten over the past twenty years This set of three books provides a timely and comprehensive overview of the field and documents the latest research Building on the first volume that focussed on biochemistry aspects the second volume in the set focusses on the inorganic complexes that model the structures and reactivity of the active sites of each major group of molybdenum and tungsten enzymes Special attention is given to synthetic strategies reaction mechanism and chemical kinetics of these systems The introductory chapter provides a useful overview and places the topic of the book into a wider context This text will be a valuable reference to workers both inside and outside the field including graduate students and young investigators interested in developing new research programs in this area

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