



Supramolecular Chemistry Of Anions

**Vladimir M. Mirsky, Anatoly
Yatsimirsky**



Supramolecular Chemistry Of Anions:

Supramolecular Chemistry of Anions Antonio Bianchi, Kristin Bowman-James, Enrique García-España, 1997-01-31 Despite the central role anionic species have been shown to play in both mineralogical and biological processes until now there have been no comprehensive references dealing exclusively with anionic coordination chemistry Written by a group comprising pioneering researchers from the United States and Europe *Supramolecular Chemistry of Anions* covers all theoretical and practical aspects of anion complexation from thermodynamics and structure to catalysis and various applications The authors begin with the 1967 discovery of halide inclusion by bicyclic diammonium receptors and trace the development of anion coordination chemistry through the most recent developments in the field Topics covered in detail include Pre supramolecular anion chemistry Natural and artificial molecules that can act as anion receptors Preorganization and chemical design Structural thermodynamic electrochemical and photochemical aspects of anion coordination Computer methods for receptor design and multiple host guest relations Anion receptor catalysis and molecular recognition and transformation of nucleotides *Supramolecular Chemistry of Anions* is a valuable professional resource for organic and inorganic chemists analytical chemists biotechnologists pharmaceutical scientists and environmental chemists It also serves as an excellent graduate level text for students of molecular recognition catalysis and biomimetic chemistry

Anion Recognition in Supramolecular Chemistry Philip A. Gale, Wim Dehaen, 2011-05-26 Brett M Rambo Eric S Silver Christopher W Bielawski Jonathan L Sessler Covalent Polymers Containing Discrete Heterocyclic Anion Receptors Philip A Gale Chang Hee Lee Calix n pyrroles as Anion and Ion Pair Complexants Wim Dehaen Calix n phyrins Synthesis and Anion Recognition Hiromitsu Maeda Acyclic Oligopyrrolic Anion Receptors Jeffery T Davis Anion Binding and Transport by Prodigiosin and Its Analogs Hemraj Juwarker Jae min Suk Kyu Sung Jeong Indoles and Related Heterocycles Pavel Anzenbacher Jr Pyrrole Based Anion Sensors Part I Colorimetric Sensors Pavel Anzenbacher Jr Pyrrole Based Anion Sensors Part II Fluorescence Luminescence and Electrochemical Sensors Ermitas Alcalde Immaculada Dinar s Neus Mesquida Imidazolium Based Receptors Nathan L Kilah Paul D Beer Pyridine and Pyridinium Based Anion Receptors Kevin P McDonald Yuran Hua Amar H Flood 1 2 3 Triazoles and the Expanding Utility of Charge Neutral CHlllAnion Interactions

Anion Receptor Chemistry Jonathan L. Sessler, Philip A. Gale, Won-Seob Cho, 2006 Anion recognition plays a critical role in a range of biological processes and a variety of receptors and carriers can be found throughout the natural world Chemists working in the area of supramolecular chemistry have created a range of anion receptors drawing inspiration from nature as well as their own inventive processes This book traces the origins of anion recognition chemistry as a unique sub field in supramolecular chemistry while illustrating the basic approaches currently being used to effect receptor design The combination of biological overview and summary of current synthetic approaches provides a coverage that is both comprehensive and comprehensible First the authors detail the key design motifs that have been used to generate synthetic receptors and which are likely to

provide the basis for further developments They also highlight briefly some of the features that are present in naturally occurring anion recognition and transport systems and summarise the applications of anion recognition chemistry Providing as it does a detailed review for practitioners in the field and a concise introduction to the topic for newcomers Anion Receptor Chemistry reflects the current state of the art Fully referenced and illustrated in colour it is a welcome addition to the literature

Anion Coordination Chemistry Kristin Bowman-James, Antonio Bianchi, Enrique García-España, 2012-03-27 Building on the pioneering work in supramolecular chemistry from the last 20 years or so this monograph addresses new and recent approaches to anion coordination chemistry Synthesis of receptors biological receptors and metallareceptors the energetics of anion binding molecular structures of anion complexes sensing devices are presented and computational studies addressed to aid with the understanding of the different driving forces responsible for anion complexation The reader is promised an actual picture of the state of the art for this exciting and constantly evolving field of supramolecular anion coordination chemistry The topics range from ion channels to selective sensors making it attractive to all researchers and PhD students with an interest in supramolecular chemistry

Supramolecular Chemistry of Selective Anion Recognition for Anions of Environmental Relevance Kristin Bowman-James, George S. Wilson, 2003 The original funded project 1996 had as its major goal the design and synthesis of polyammonium macrocyclic receptors for oxoanions of environmental importance particularly those found in high level waste tanks Nitrate was a major ion of focus The project evolved over the last six years to target important and timely problems of critical interest to the EMSP mission Emphasis was shifted from polyammonium receptors to lipophilic amide based receptors more amenable for both separations and sensing applications in the last renewal and significant effort was directed toward selective recognition of sulfate because of its detrimental role in the vitrification process The last three years have been focused on the basic chemical aspects of anion receptor design of functional pH independent systems with the ultimate goal of targeting the selective binding of sulfate as well as design of separations strategies for selective and efficient removal of targeted anions Key findings during these years include 1 among the first synthetic sulfate selective anion binding agents 2 simple structure based methods for modifying the intrinsic anion selectivity of a given class of anion receptors and 3 two new classes of macrocyclic ligands mixed amide quaternary amine thioamide based macrocycles and cryptands

Supramolecular Chemistry Paul D. Beer, Timothy A. Barendt, Jason Y. C. Lim, 2022 The renowned Oxford Chemistry Primers series which provides focused introductions to a range of important topics in chemistry has been refreshed and updated to suit the needs of today's students lecturers and postgraduate researchers The rigorous yet accessible treatment of each subject area is ideal for those wanting a primer in a given topic to prepare them for more advanced study or research Moreover cutting edge examples and applications throughout the texts show the relevance of the chemistry being described to current research and industry The learning features provided including questions at the end of every chapter and online multiple choice questions

encourage active learning and promote understanding Furthermore frequent diagrams margin notes further reading and glossary definitions all help to enhance a student s understanding of these essential areas of chemistry Supramolecular Chemistry provides a concise and fully illustrated introduction to one of the fundamental areas of modern chemical research the concepts of which are essential to understanding interactions between molecules The primer is supported by online resources and is available for students and institutions to purchase in a variety of formats The e book offers a mobile experience and convenient access along with functionality tools navigation features and links that offer extra learning support www.oxfordtextbooks.co.uk/ebooks

Supramolecular Chemistry of Selective Anion Recognition for Anions of Environmental Relevance ,2004 The last three years of this project have focused on the basic chemical aspects of anion receptor design of functional pH independent systems with the ultimate goal of targeting the selective binding of sulfate as well as design of separations strategies for selective and efficient removal of targeted anions Key findings during these years include 1 the first synthetic sulfate selective anion binding agents 2 simple structure based methods for modifying the intrinsic anion selectivity of a given class of anion receptors and 3 the first system capable of extracting sulfate anion from acidic nitrate containing aqueous media Areas probed during the last funding period include 1 Design synthesis and physical and structural characterization of receptors 2 Examination of the technique known as ITIES Interface Between Two Immiscible Electrolyte Solutions as an analytical probe for anion analysis and 3 Investigation of anion and dual ion pair extraction using lipophilic amide receptors for anion binding *Anions in supramolecular chemistry* Salvatore Camiolo,2002

Supramolecular Chemistry Paul D. Beer,Timothy A. Barendt,Jason Y. C. Lim,2022 [The Supramolecular Chemistry of Selective Anion Recognition for Anions of Environmental Relevance](#) ,2005 Work at carried out at ORNL since the inception of the project has served to demonstrate that the calix 4 pyrroles from the co P I s laboratory at the Univ of Texas strongly enhance the extraction of sulfate by tricaprylmethylammonium nitrate or chloride in the presence of excess nitrate and chloride Similar results were found in the case of the tetraamide macrocycles synthesized in the Bowman James laboratory Univ of Kansas Effort at the Univ of Texas thus focused on generating new pyrrole amide macrocycles that might combine the most favorable aspects of the calixpyrroles and the tetraamides This culminated in the synthesis of several new receptors which provided a matched set from whence insights into anion recognition could be inferred As can be inferred from the data summarized in Table 1 small adjustments in the structure allow for a fine tuning of the anion binding properties in favor of sulfate recognition or in the case of injudicious modifications selectivities that favor completely different classes of anionic substrates *The Warrender Papers* ,1931 *Fundamentals and Applications of Anion Separations* Bruce A. Moyer,Raj P. Singh,2011-06-27 This book documents the proceedings of the symposium Fundamentals and Applications of Anion Separations held during American Chemical Society National Meeting in Chicago Illinois August 25 30 2001 Nearly 40 papers devoted to discussions on anion separation related to fundamental research and applications were presented The symposium

sponsored by Osram Sylvania BetzDearbom and the Separation Science Technology Subdivision of the Industrial Engineering Chemistry Division of the American Chemical Society was organized by Bruce A Moyer Chemical Sciences Division Oak Ridge National Laboratory P O Box 2008 Building 4500S Oak Ridge TN 37831 6119 and Raj P Singh Chemicals and Powders R D Osram Sylvania Chemical and Metallurgical Products Division Towanda PA 18848 It drew presenters from Australia the Czech Republic France Germany Japan South Africa Thailand the United Kingdom and the United States Separations constitute an integral part of chemical industry Chemical products typically originate in resources that must be concentrated and purified chemically transformed and subjected to final purification Effluent streams from the processes must be treated to recycle reusable components and to remove environmentally harmful species Some industrial processes are devoted to environmental cleanup after pollution has occurred In addition many analytical methods require a separation for preconcentration or a separation may be an inherent part of the analysis itself Micro separations occurring at membranes or interfaces are also related phenomena employed for ion sensing Many species targeted for separation are naturally anionic Although the standard separations techniques of extraction ion exchange adsorption precipitation etc *Supramolecular Chemistry of Selective Anion Recognition for Anions of Environmental Relevance. 1998 Annual Progress Report ,1998* This project has as its focus the design and synthesis of polyammonium macrocyclic receptors for oxoanions of environmental importance The basic research aspects of this project involve 1 synthesis and the search for improved synthetic methods 2 solid state structure determination and thermodynamics studies to ascertain structural criteria for and strength of anion binding and 3 molecular dynamics simulations to assess solution characteristics of the interactions between anions and their receptors Applications oriented goals include the fabrication of more selective anion selective electrodes and the use of these compounds in liquid liquid separations The latter goal comprises the subcontract with Dr Bruce Moyer at Oak Ridge National Laboratory This report summarizes work after 1 year and 7 months of a 3 year project To date the authors have focussed on the design and synthesis of selective receptors for nitrate and phosphate Supramolecular Chemistry of Selective Anion Recognition for Anions of Environmental Relevance. Progress Report, October 1996-July 1997 ,1997 This project has as its focus the design and synthesis of polyammonium macrocyclic receptors for oxoanions of environmental importance The basic research aspects of this project involve synthesis and the search for improved synthetic methods solid state structure determination and thermodynamics studies to ascertain structural criteria for and strength of anion binding and molecular dynamics simulations to assess solution characteristics of the interactions between anions and their receptors Applications oriented goals include the fabrication of more efficient anion selective electrodes and the use of these compounds in liquid liquid separations The latter goal is the subcontract with Bruce Moyer at Oak Ridge National Laboratory This first year the authors have focused on nitrates and phosphates Considerable progress has been made in the basic areas of synthesis solid state Structure and molecular dynamics Anion selective electrodes have also been made which show promising selectivities for

oxoanions of interest Below are described the major findings and significance in the categories of synthesis structure and molecular dynamics and electrode studies Synthesis The synthesis of polyaza macrocycles which are the focus of these studies is often tedious and time consuming A major breakthrough which the authors have made this year is to identify other polyaza macrocycles which also bind the desired anions but which are simpler to synthesize via a two step Schiff base reduction process with high yields This is truly significant since now the authors can obtain large quantities of the macrocycles and do multiple studies at once crystallizations thermodynamics electrode and eventually separations Most of their studies to date have focused on monocyclic systems but they are now beginning to examine bicyclic macrocycles which can be synthesized by the same method starting with the tetraamine known as tren *Macrocyclic Chemistry* Bernard Dietrich, Paulette Viout, Jean-Marie Lehn, 1993 Based on a series of lectures in macrocyclic chemistry held by Jean Marie Lehn at the College de France This lucid introduction offers extensive coverage of the vast panorama of macrocyclic and macropolycyclic chemistry Interdisciplinary in approach it treats significant aspects of organic inorganic and physical chemistry and touches biological phenomena as well Using this book graduate students and researchers will gain insight into the fascinating concepts of molecular recognition and supramolecular chemistry **Anion Binding and New**

Architectures in Supramolecular Chemistry Simone Pisano, 2019 **Recognition of Anions** Ramon Vilar, 2008-06-12 This book presents critical reviews of the present position and future trends in modern chemical research concerned with chemical structure and bonding The book contains short and concise reports each written by the world's renowned experts

Artificial Receptors for Chemical Sensors Vladimir M. Mirsky, Anatoly Yatsimirsky, 2010-12-20 The first to provide systematically organized information on all three important aspects of artificial receptor design this book brings together knowledge on an exceptionally hot and multidisciplinary field of research Strong emphasis is placed on the methodology for discovering artificial receptors with both definitions for chemosensitivity as well as experimental setups supplied There follows coverage of numerous classes of artificial receptors including synthesis immobilization on surfaces and quantitative data on properties The third part of the book focuses on receptor arrays for artificial nose and tongue applications and the whole is rounded off with an outlook and an appendix with all relevant quantitative data on artificial receptors Anion

Sensing Eric V. Anslyn, 2005-05-06 with contributions by numerous experts Recent Advances in Analytical Techniques Atta-ur-Rahman, Sibel A. Ozkan, 2019-01-12 Recent Advances in Analytical Techniques is a series of updates in techniques used in chemical analysis Each volume presents a selection of chapters that explain different analytical techniques and their use in applied research Readers will find updated information about developments in analytical methods such as chromatography electrochemistry optical sensor arrays for pharmaceutical and biomedical analysis The third volume of the series features seven reviews on a variety of techniques Chiral Analysis of Methamphetamine and Related Controlled Substances in Forensic Science Low cost feedstocks for biofuels and high value added products production Using multi

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