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## **Structure and Bonding**

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## Aims and Scope

The series *Structure and Bonding* publishes critical reviews on topics of research concerned with 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.

In references *Structure and Bonding* is abbreviated *Struct Bond* and is cited as a journal.

More information about this series at <http://www.springer.com/series/430>

D. Michael P. Mingos

Editor

# 50 Years of Structure and Bonding – The Anniversary Volume

With contributions by

Y. Bian · R.D. Chapman · R. Clérac · X. Duan · D.G. Evans ·  
P.A. Gale · A. Hauser · J. Jiang · R.P. Kelly · T.M. Klapötke ·  
P. Köhler · R. Liang · D.M.P. Mingos · K. Prassides ·  
D. Rabinovich · C. Reber · D. Reinen · P.W. Roesky ·  
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 Springer

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ISSN 0081-5993

Structure and Bonding

ISBN 978-3-319-35136-0

DOI 10.1007/978-3-319-35138-4

ISSN 1616-8550 (electronic)

ISBN 978-3-319-35138-4 (eBook)

Library of Congress Control Number: 2016954966

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This Springer imprint is published by Springer Nature

The registered company is Springer International Publishing AG

The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

# Preface

Volume 1 of *Structure and Bonding* was published in 1966 and the Preface suggested that “a valuable service is performed by bringing together up-to-date authoritative reviews from the different fields of modern inorganic chemistry, chemical physics and biochemistry, where the general subject of chemical bonding involves (usually) a metal and a small number of associated atoms. These arrangements are of importance for symmetry considerations by crystallographers, for the application of group theory and molecular orbital theory to chromophores and because of their widespread occurrence in polyatomic molecules, in complex ions in solution, in vitreous materials, in minerals and, not least, in biological materials and organisms. We are especially interested in the role of “the complex metal-ligand” moiety and purposely avoiding the more classical organic chemistry and even organo-metallic chemistry – for which many review journals are already available – and wish to direct attention towards borderline subjects. We are convinced that these borderline areas receive less attention than they justify, academic studies tend too often to be compartmentalized whereas technological interest too often lack sufficient fundamental understanding. We hope that his series may help to bridge the gaps between some of these different fields and perhaps provide in the process some stimulation and scientific profit to the reader”.

Fifty years on and 175 volumes later, *Structure and Bonding* still plays a very important role in presenting authoritative reviews on structural and bonding issues in chemistry. To celebrate this significant landmark, we have invited recent editors and authors, who have contributed highly cited and noteworthy volumes and chapters in recent volumes of the series, to write chapters which highlight important new developments in their chosen area and indicate significant future developments. This volume marking the 50th anniversary starts with a historical introduction by myself, which traces the early days of the series and its social and intellectual context, and a summary of the contributions of the members of the editorial board. This is followed by noteworthy chapters by Philip Gale on anion receptors based on organic frameworks, Richard Winpenny on single molecule magnets, Thomas Klotke on recent progress in the development of high energy

density materials, David Evans and Xue Duan on layered double hydroxide materials. Peter Roesky has contributed a chapter on sigma bonded metathesis and polymerisation of 1,3-dienes by rare earth complexes, Yasuhiro Takabayashi and Kosmas Prassides on fullerene superconductivity and Dan Rabonovich on the role of scorpionates in synthetic bioinorganic chemistry. The important optical properties of transition metal complexes and their theoretical interpretation are covered in chapters by Jianzhuang Jiang and Yongzhong Bian on phthalocyanine based functional materials, and Vivian Yam has contributed a very detailed chapter on photofunctional molecular materials. Andreas Hauser and Christian Reber discuss the spectroscopic properties and chemical bonding in transition metal complexes. Professor Dirk Reinen was a member of the original editorial board of *Structure and Bonding* and we are very lucky that he has contributed with P Kohler a chapter on ligand field theory and discusses the fascinating colours of solid iron(III) oxides, an area which he first analysed in an early volume of *Structure and Bonding*.

I thank all of these authors very much for their timely contributions and hope that their efforts will stimulate the successful launching of future volumes which will mark the next 50 years in the series' distinguished history.

Oxford, UK  
December 2015

D. Michael P. Mingos

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