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ISSN 0081-5993 e-ISSN 1616-8550
ISBN 978-3-642-04751-0 e-ISBN 978-3-642-04752-7
DOI 10.1007/978-3-642-04752-7
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2009939119

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Cover design: KünkelLopka GmbH, Heidelberg, Germany

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

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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.

Impact Factor in 2008: 6.511; Section “Chemistry, Inorganic & Nuclear”:
Rank 2 of 40; Section “Chemistry, Physical”: Rank 7 of 113

Preface

Phthalocyanines exhibit intriguing physic-chemical properties that render them important as a class of molecular functional materials. In addition to their traditional industrial applications as dyes and pigments, more recently their use as the organic semiconductors, photodynamic therapy medicines, non-linear optical materials, catalysts for the photo oxidation, optical recording materials, and gas sensors attracts great research interests in these tetrapyrrole species. As manifested by the rapidly increasing number of related scientific publications in recent years, great progress has been made in the field of advanced phthalocyanine materials.

Tremendous efforts have been paid toward the development of new phthalocyanine molecular materials as well as toward their applications. Recent emphasis in both academic researches and technical field has been put on the design and synthesis of novel phthalocyanine species, the structure–property relationship, self-assembly properties, molecular electronics and opto-electronics, and dye-sensitized solar cells. Although excellent reviews and monographs about phthalocyanines were published several years ago, it is time to provide a survey of a number of new important developments in this fascinating area of phthalocyanine chemistry. The aim of this book is to bring both the academic and industrial researchers an easy way to the new progress of phthalocyanines made lately in related field.

Nine chapters are included in this volume. The fascinating development in the synthesis of novel phthalocyanine derivatives with near-infrared absorbing and photochromic property is presented at the beginning. Emphasis is on the relationship between the electronic structure and the photochemical- or electrochemical-properties. The following chapters deal with the exciting progress made in the supramolecularly assembled nanostructures and applications of phthalocyanines in photodynamic therapy, molecular magnets, dye-sensitized solar cells, and organic field-effect transistors.

Jianzhuang Jiang, Beijing and Jinan, China

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