

University of Groningen

Molecular Switches.

Blunk, Dirk

Published in:
Default journal

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2002

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):
Blunk, D. (2002). Molecular Switches. Default journal.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

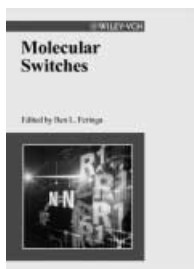
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Not a Turn Off!

Molecular Switches. Edited by *Ben L. Feringa*. Wiley-VCH, Weinheim 2001. 454 pp., hardcover € 139.00.— ISBN 3-527-29965-3

Molecular switches are molecules or aggregates made of a few molecules which can reversibly change their condition by an external stimulus, for example light, electronic, magnetic, or chemical influences. The growing interest in this kind of functional materials is proven by the growing number of publications on this field: whereas a total of 30 publications on this topic were registered at the Science Citation Index in 1993, the total number exceeds 170 in 2001.



Interestingly, within this growth, the publications on nonbiological molecular switches claim a constant share of 40%. It is mainly this theme of nonbiological molecular switches which is—apart from one chapter—the topic of the book “Molecular Switches”.

The editor Ben L. Feringa aims to illuminate the basic principles and various scientific approaches as well as the currently still-limited applications of molecular switches. In his preface he explicitly states that he does not claim to have written a comprehensive treatise of the topic. Instead, he wants to introduce the spectrum of fascinating perspectives and principles, which are elucidated

through the synthesis of new molecules designed as molecular switches.

This concept explains the topical choice of the book's chapters, which at first glance seem to be chosen somewhat arbitrarily and in spotlight fashion. Some of the chapters deal with particular types of switching processes (e.g. the light-induced electron and energy transfer, or chiroptic molecular switches), others take compound classes as their guideline. By this arrangement, thematic repetitions cannot altogether be avoided, but instead of being annoying they serve to underline the importance of particular aspects.

The discussed structures comprise, amongst others, derivatives of porphyrins and fulgides, sterically overcharged alkenes, catenanes and rotaxanes, as well as (synthetic) polypeptides. Types of switches dealt with are based on various optical variants, redox processes, and several complex-chemical or supramolecular principles.

Furthermore, one chapter of the book deals explicitly with the possibilities of interpreting the behavior of various compounds in the sense of binary logical units. The linkage of such logic gates to complex networks, which is extremely important for information technology, still fails in the case of their chemical counterparts because of the incompatibility of the input and output signals of the hitherto presented substances.

Some of the compounds discussed are closely tied to supramolecular processes. In this way, for example, recognition processes on a molecular level serve partly as initiators for the switching operation or, in other examples, molecular receptors can be switched according to their recognition ability. Therefore, the extensive treatment of the theme of such receptors as well as the discussion of the coupling of molecular switches with supramolecular structures, for example, liquid crystals, serves to enrich the book.

Overall, “Molecular Switches” gives a review of a broad thematic variety. In doing so, the authors and the publisher produce an excellently balanced portrayal of physical and chemical contexts.

Up-to-date literary references, a good subject index, as well as a register of abbreviations sorted by chapter round off the extremely positive picture of this first comprehensive compendium on molecular switches.

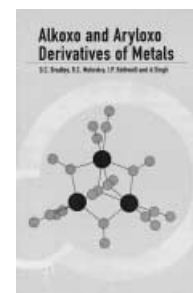
On the whole, “Molecular Switches” by Ben L. Feringa can be highly recommended to the beginner in the field of molecular switches as well the chemist and material scientist working in this field.

Dirk Blunk

Institut für Organische Chemie
Universität Köln (Germany)

Alkoxo and Aryloxo Derivatives of Metals. Edited by *D. C. Bradley, R. C. Mehrotra, I. P. Rothwell* and *A. Singh*. Academic Press, San Diego 2001. 704 pp., hardcover £ 119.95.—ISBN 0-12-124140-8

In their book *Metal Alkoxides*, published in 1978, Bradley, Mehrotra, and Gaur established this interesting class of compounds for the first time as a subject for ongoing treatment in book form. Unfortunately that first version sold out quite rapidly, and surprisingly it could no longer be found in many libraries, a fact that is also mentioned by Malcolm Chisholm in his preface to the present book. About five years ago, during a visit to London, Don Bradley confided to me that he had succeeded in recruiting one of the authors of the



This section contains book reviews and a list of new books received by the editor. Book reviews are written by invitation from the editor. Suggestions for books to be reviewed and for book reviewers are welcome. Publishers should send brochures or (better) books to the Redaktion Angewandte Chemie, Postfach 101161, D-69451 Weinheim, Federal Republic of Germany. The editor reserves the right of selecting which books will be reviewed. Uninvited books not chosen for reviews will not be returned.