

This article was downloaded by: [University of Haifa Library]

On: 08 August 2012, At: 14:23

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Molecular Crystals and Liquid Crystals

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/gmcl20>

### A Review of: "Strained Hydrocarbons. Beyond the van't Hoff and Le Bel Hypothesis with a Foreward by Roald Hoffmann, Helena Dodziuk, ed."

Arthur Greenberg<sup>a</sup>

<sup>a</sup> Department of Chemistry, University of New Hampshire, Durham, NH 03824

Version of record first published: 01 Mar 2010

To cite this article: Arthur Greenberg (2010): A Review of: "Strained Hydrocarbons. Beyond the van't Hoff and Le Bel Hypothesis with a Foreward by Roald Hoffmann, Helena Dodziuk, ed.", Molecular Crystals and Liquid Crystals, 517:1, 184-185

To link to this article: <http://dx.doi.org/10.1080/15421400903483924>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

## Book Review

*Strained Hydrocarbons. Beyond the van't Hoff and Le Bel Hypothesis with a Foreword* by Roald Hoffmann, Helena Dodziuk, ed.; Wiley-VCH, Weinheim, 2009; xxi +471, pages; \$230; ISBN: 978-3-527-31767-7.

This book consists of an introductory chapter (p. 32), followed by: Chapter 2, Distorted Saturated Hydrocarbons (p. 70); Chapter 3, Distorted Alkenes (p. 44); Chapter 4, Strained Aromatic Molecules (p. 57); Chapter 5, Fullerenes (p. 129); Chapter 6, Carbon Nanotubes (p. 39); Chapter 7, Angle-Strained Cycloalkynes (p. 23); Chapter 8, Molecules with Labile Bonds: Selected Annulenes and Bridged Homotropillidenes (p. 26); Chapter 9, Molecules with Nonstandard Topological Properties: Centrohexaindane, Kuratowski's Cyclophane and other Graph-Theoretically Nonplanar Molecules (p. 23); Chapter 10, Short-Lived Species Stabilized in "Molecular or Supramolecular Flasks" (p. 10); and Chapter 11, Concluding Remarks (p. 3). There is a useful index at the end, in the style of the classic, sixties-vintage Cram and Hammond undergraduate textbook, the book's front cover depicts some fascinating known and challenging unknown strained hydrocarbons- further challenges to the chemical community appear in Chapters 1 and 11. The Editor has attracted 42 strong contributing authors. The chapter arrangement is somewhat unconventional in that different sections of an individual chapter are sometimes contributed by different authors. Although there must in a book such as this one be some degree of repetition there appear to be over 2000 literature references, most of these from the past three decades, including some from 2008. In both organization and extent of coverage, it is reminiscent of and a suitable successor to *Strained Organic Molecules* (Greenberg and Liebman, 1978).

*Strained Hydrocarbons* can almost be regarded as a "book within a book" in that about one third of it is devoted to fullerenes and nanotubes, chemical species unrecognized until the 1980s and early 1990s. These chapters do fall logically after chapters on distorted alkenes and strained aromatic molecules. The decision as to whether the balance between the fullerene carbon nanotube chapters and the rest of the volume is appropriate, this reviewer leaves to the reader. One wishes that there were more "cross-cutting" coverage in the book. For example, substituent effects on strained molecules furnish means for extending the range of isolability of molecules through steric effects (tetra-*tert*-butyltetrahedrane is a great example) and/or by electronic effects (trimethylsilyl derivatives of tetrahedranes). There is relatively light systematic discussion of the sources of strain. One very interesting topic given virtually no treatment is the role of calorimetry. One school of thought is that modern *ab initio* calculations have uncertainties comparable to intrinsic experimental uncertainties in calorimetry, thus rendering calorimetry unnecessary. Another school of thought is that excellent calorimetry on unusual chemical species remains necessary in order to validate levels of computation.

The Editor has provided some nice historical background and context to the field as well as to basic chemical research and the derived technological bonuses: cubane (high-density explosives); rotaxanes and catenanes (nano-switches); fullerenes

(nanotechnology); and dodecahedrane (molecular template). Another example is the Bergman rearrangement of enediynes. Who could have imagined that natural products would be discovered during the following decade in which the enediyne linkage produces the 1,4-benzenediyl “bomb” in vivo that destroys tumor cells? The Editor’s statement (p. 12) that “immediate applications should not be the reason for financing research” is certainly borne out by these later applications.

The sheer magnitude of well-referenced, literature-based chapters emphasizing research during the last three decades is reason enough for purchase of this book by any research institution. It will be a welcome addition to the bookshelves of numerous individual researchers. While the book is somewhat expensive, it is not out of line with other books that present well-referenced stores of information.

*Arthur Greenberg*  
*Department of Chemistry,*  
*University of New Hampshire,*  
*Durham, NH 03824*