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### Book Reviews

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## BOOK REVIEW

R. Kh. Freidlina and A. E. Skorova: *Organic Sulfur Chemistry*, Pergamon Press 1981. Vii + 230 p., \$65.00.

This book is a collection of the invited lectures presented at the 9th International Symposium on Organic Sulfur Chemistry in Riga 1980.

One can ask, "What is the idea of publishing such plenary lectures as a book?" The plenary lectures at a congress normally are an outlook to the frontier of science given by specialists in a certain field. The idea of publishing a monograph containing these lectures thus could be to give non-attendants of the congress a chance to share this outlook. A plenary lecture can cover an entire field or only a small part of a greater area. It is up to the lecturer to decide if he prefers to focus on his own contribution to the field and only make a few comments on older literature. The fact that the lectures at this symposium have had different scopes can be seen from the different numbers of references ranging from 13 to 135.

The reviews in this book can therefore not be considered as true reviews. You cannot be sure that they deal with all relevant literature (this is not said to blame the lecturers). Therefore the book only has interest at the present moment as an appetizer. It is not of interest in a library as a reference book. If it is meant to function as an appetizer it is absolutely necessary that the price is low which permits chemists to buy it themselves. With a price of \$65 this requirement is not fulfilled. It is the opinion of the reviewer that if it is not possible to publish such lectures at a much lower price one had better leave it.

The price of this book which is directly reproduced from the lecture manuscripts is extraordinarily high. The lectures from the 6th symposium were published in 1975 at a price of £14.00 for 496 pages (more than double the number of pages of this book) reproduced in the same manner.

The papers in this book fall into four areas: 1. Synthesis and reactions of organosulfur compounds, 2. Determination of structure and properties, 3. Mechanism of action and structure-function relationships of biologically active natural and synthetic organic sulfur compounds, and 4. Identification and investigation of organic sulfur compounds in fossil fuels.

The book consists of 16 lectures.

**1. V. S. Aksenov and V. F. Kamyayov:** Regularities in composition and structure of native sulfur compounds from petroleum. 13 Pages, 62 references.

The main regularities in quantitative and qualitative distribution of various sulfur compounds are discussed on the basis of age and geographic origin of the petroleum.

**2. E. Block:** New sulfine chemistry. 20 Pages, 87 references.

The central topic is the identification of the lachrymatory factor of the onion, propanethial S-oxide. In relation to this aspects of structure, bonding, and physical proper-

ties of sulfines are discussed focussing on application of experimental and theoretical methods to simple alkanethial S-oxides.

**3. E. Fischer:** Chemistry and structure of imidosulfurous diamides. 15 Pages, 21 references.

Structure and bonding is discussed on the basis of physico-chemical data such as ESCA, dynamic NMR, IR, Raman, and X-ray structure data. The bonding in tri-coordinated sulfur-nitrogen compounds is discussed.

**4. P. Hermann:** Chemistry and biochemistry of thia-analogs of amino acids. 17 Pages, 134 references.

Natural amino acids where the  $\gamma$ -methylene group has been substituted by a sulfur atom are discussed. The biochemical properties of these thia-amino acids are discussed in enzyme reactions, as antimetabolites in microorganisms, in protein synthesis and as thia-analogues in biologically active peptides.

**5. R. W. Hoffmann:** Preparative and stereochemical aspects of the allyl sulfoxide/allyl sulfenate rearrangement. 12 Pages, 14 references.

The mechanism for the rearrangement and the influence of substituents on chirality transfer is discussed.

**6. M. Hori:** Several rearrangement reactions based on organo-sulphur compounds. 13 Pages, 25 references.

Ring opening, ring expansion, and ring transformation reactions leading to heterocyclic systems from cyclic sulfur ylids are described. Mechanisms are discussed.

**7. J. L. Kice:** Mechanisms of reactions of oxidized derivatives of disulfides. Alkyl  $\alpha$ -disulfones. 13 Pages, 25 references.

The nucleophilic substitution reactions of alkyl  $\alpha$ -disulfones are described. Sulfenes are discussed as intermediates in an elimination-addition reaction.

**8. A. V. Kirsanov, E. S. Levchenko, and L. N. Markovski:** Oxidative imination of sulfur and sulfur-halogen compounds. 14 Pages, 51 references.

The oxidative imination of sulfur, sulfur monochloride, and sulfur dichloride with dichloroamines and dichloroamides of various acids as well as monochloroamides of carboxylic acids and chloroiminoesters is described.

**9. G. Maccagnani:** Some aspects of the chemistry of episulfoxides and sulfur monoxide. 17 Pages, 35 references.

The reactive nature of episulfoxides is related to their thermal instability which normally results in the formation of sulfur monoxide.

**10. M. Raban:** Central and axial chirality in sulfenamides. 10 Pages, 13 references.

Stereochemical properties of sulfenamides due to the barrier to inversion of the nitrogen pyramid and torsion about the sulfur-nitrogen bond are reviewed.

**11. A. Senning:** Dithiiranes and thiosulfines as reactive intermediates. 8 Pages, 34 references.

On the basis of literature studies and own experiments it is concluded that dithiiranes or their valence tautomers thiosulfines are reactive intermediates in a great number of reactions which in this way can be generalized.

**12. W. A. Smit, N. S. Zefirov, and I. V. Bodrikov:** Chemistry of episulfonium ions and mechanism of  $Ad_E$ -reactions of alkenes with sulfenyl derivatives. 15 Pages, 32 references.

Experimental evidence for the chemical reactivity of episulfonium ions is given. It is shown that these species behave as electrophilic agents.

**13. A. L. Ternay, Jr.:** Stereochemical studies of sulphur-containing heterocycles. 14 Pages, 23 references.

The lecture deals with sulfur-containing analogs of 9,10-dihydroanthracene. The stereochemistry of these compounds is discussed on the basis of x-ray structure determinations,  $^1\text{H}$  NMR-,  $^{13}\text{C}$  NMR- and IR spectra.

**14. C. J. Thompson:** Identification of sulfur compounds in petroleum and alternative fossil fuels. 20 Pages, 26 references.

This lecture is closely related to lecture No. 1. It summarizes a systematic study of the organic sulfur compounds in four different American crude oils. More than 200 individual sulfur compounds have been identified.

**15. M. Tišler:** Sulfur-containing heterocycles from thioamide precursors. 9 Pages, 59 references.

Oxidative cyclization and cycloaddition of nitrogen heterocycles with a thioamide side chain is surveyed. Experimental and theoretical results are discussed.

**16. E. Vilmaier:** The chemistry of vinylogous aminosulfonium salts. 12 Pages, 27 references.

The synthesis of aminosulfonium salts is discussed. The formation of bicycloalkanes from cyclic aminovinylsulfonium salts and various nucleophiles is described.

The monograph gives an impression of some of the problems in modern sulfur chemistry. As a source of inspiration this book is of interest for sulfur chemists and post-graduate students working in sulfur chemistry.

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Specialist Periodical Reports. Nuclear Magnetic Resonance, Volume 10, G. A. Webb, Senior Reporter. The Royal Society of Chemistry, London 1981. 322 pages. £51.00, \$126.00.

Volume 10 of the Specialist Periodical Reports on NMR, which covers the literature published between June 1979 and May 1980, is divided into 12 chapters. "Theoretical and Physical Aspects of Nuclear Shielding" (Chapter 1, 17 pp., by C. J. Jameson), "Applications of Nuclear Shieldings" (Chapter 2, 38 pp., by G. E. Hawkes) includes applications to all NMR-active nuclei, *e.g.*  $^{17}\text{O}$ ,  $^{77}\text{Se}$  and  $^{125}\text{Te}$ . "Theoretical Aspects of Spin-Spin Couplings" (Chapter 3, 18 pp., by K. G. R. Pachler). "Applications of Spin-Spin Couplings" (Chapter 4, 38 pp., by D. F. Ewing) includes applications of a number of couplings involving  $^{17}\text{O}$ ,  $^{77}\text{Se}$  and  $^{125}\text{Te}$  with other nuclei. "Nuclear Spin Relaxation in Fluids" (Chapter 5, 20 pp., by H. Weingärtner) includes references to studies using  $^{33}\text{S}$  and  $^{77}\text{Se}$  NMR. "Solid State NMR" (Chapter 6, 30 pp., by T. Terao and R. Ikeda) in-

cludes semiconducting materials studied by  $^{33}\text{S}$ ,  $^{77}\text{Se}$ , and  $^{125}\text{Te}$  NMR. "Multiple Resonance" (Chapter 7, 26 pp., by W. McFarlane and D. S. Rycroft) includes references to  $^{77}\text{Se}\text{-}\{^1\text{H}\}$  and  $^{125}\text{Te}\text{-}\{^1\text{H}\}$  NOE determinations and  $^{31}\text{P}\text{-}\{^1\text{H}, ^{77}\text{Se}\}$  triple resonance studies. "Natural Macromolecules" (Chapter 8, 17 pp., by D. B. Davies). "Synthetic Macromolecules" (Chapter 9, 17 pp., by F. Heatley). "Conformational Analysis" (Chapter 10, 19 pp., by F. G. Riddell) includes a large number of applications to oxygen- and sulphur-containing rings using  $^1\text{H}$  and  $^{13}\text{C}$  NMR. "NMR of Paramagnetic Molecules" (Chapter 11, 26 pp., by K. G. Orrell). "NMR of Liquid Crystals and Micellar Solutions" (Chapter 12, 28 pp., by G. J. T. Tiddy). In addition this volume contains a valuable list of NMR books and reviews published between June 1978 and May 1980. The high standards of this series which covers NMR methods in all fields of chemistry are unsurpassed. Further, it is impressive how the reviewers seem to be able to accommodate the enormous amount of NMR information published each year into a relatively small book. This series of reports deserves a place in every institution practicing NMR spectroscopy.

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Specialist Periodical Report: Heterocyclic Chemistry Vol. 1, Edited by H. Suschitzky and O. Meth-Cohn. Royal Society of Chemistry 1980, 522 pp. London £ 69.-.

This volume has started a series of annual reviews of heterocyclic chemistry.

It combines material previously reviewed in other series, such as "Organic Compounds of Sulphur, Selenium and Tellurium" and covers the literature July 1978–June 1979. The contents of the eight chapters of the book are arranged such that the material proceeds from small to large heterocyclic rings, with preference to the smaller heterocycle in fused systems. The chapters are; 1: Three-membered ring systems by T. J. Mason, 2: Four-membered ring systems by R. C. Storr, 3: Five-membered ring systems by G. V. Boyd, P. A. Lowe and S. Gronowitz, 4: Six-membered ring systems by G. P. Ellis and R. K. Smalley, 5: Seven-membered ring systems by D. J. Le Count, 6: Eight-membered and larger ring systems by G. M. Brooke, 7: Bridged systems by J. M. Mellor and finally, 8: Conformational analyses by F. G. Riddell. Chapters 7 and 8 have been included because of their relevance to the chemistry of saturated heterocycles. Each chapter has been written by active and well known experts. The editors have succeeded in giving the book a uniform character in each chapter. It seems to include all significant contributions in a selective and concise manner. The references to new reviews in the beginning of each chapter are very useful.

From the sulfur chemist's point of view, the inclusion of sulfur heterocyclic systems into general heterocyclic chemistry seems to be a bargain which will outweigh the loss of this material from new volumes of "Organic Compounds of Sulphur, Selenium and Tellurium".

It is a hope that the annual volumes in this new series can be kept at a similar size as the present one. A minor suggestion for the next volume could be the addition of

an alphabetical subject index. The book is of value to the organic chemist who needs to keep up with the new literature in the large and rapidly expanding field of heterocyclic chemistry. It is with great expectations one is looking forward to the next volume.

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