## Mass Spectrometry and Gas-Phase Chemistry of Non-Covalent Complexes

Supramolecular chemists had to wait for the advent of soft ionization methods before mass spectrometry became a genuinely useful tool for the analysis of weakly-bound complexes. In the 20 years since electrospray ionization (ESI) and matrix-assisted laser desorption ionization (MALDI) instruments first became commercially available the field has developed considerably, and Schalley and Springer's book is a well-timed, well-written, and welcome summary of the state-of-the-art in the study of non-covalent complexes by mass spectrometry. The authors go well beyond the initial transfer of ions to the gas phase to show what techniques and methodologies can be best used to study equilibria, kinetics, stoichiometry, and structures of supramolecular complexes.

The relevant instrumentation is covered succinctly and descriptively without the distractions of an historical perspective, thus avoiding the description of the irrelevant and obsolete. The core concepts of supramolecular chemistry are introduced in a way geared to the novice. All key points and concepts are covered extremely quickly using an organizational scheme that is similar to longer volumes entirely devoted to supramolecular chemistry. The chapters on biomolecules are not given the same introductory treatment (although they could use one), but their content is well laid out for an audience of chemists.

The figures are generally outstanding, with the majority redrawn or created specifically for this text. The effort spent in securing the originals rather than relying on reproduced figures has ensured excellent visual consistency throughout the book, and it is good to see the data presented in a way that matches the quality of the science. Over 1500 references provide comprehensive coverage of the best work in the field.

Numerous tutorials appear throughout the text, ranging in length from a one-page summary of double resonance and $MS^3$ experiments to a seven-page, 40-reference account of the interaction of DNA with cisplatin. Most tutorials provide short primers on a large area (e.g. ion mobility, peptide fragmentation), an introduction to a special topic (e.g. dendrimers, gas-phase thermochemistry), or a definitive answer to a key question (e.g. "Why is the $S_N2$ reaction so much faster in the gas phase?"). The tutorials are particularly well-suited to the task of bringing a reader who is not an expert in a given area up to speed.

The book by Schalley and Springer will be of special value to supramolecular chemists aware of the possibilities for real insight into systems of interest but unfamiliar with the tools and language of mass spectrometry. I highly recommend this excellent book.

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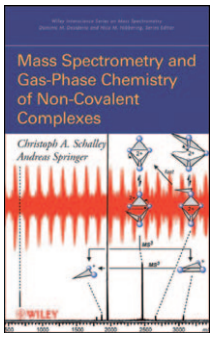



**Mass Spectrometry and Gas-Phase Chemistry of Non-Covalent Complexes**
Supramolecular Chemistry in the Gas Phase. Wiley-Interscience Series on Mass Spectrometry. By Christoph A. Schalley and Andreas Springer. John Wiley & Sons, Hoboken 2009. 571 pp., hardcover € 99.90.—ISBN 978-0470131152

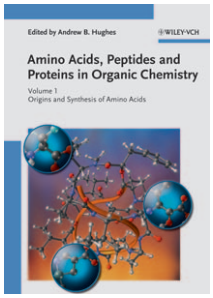
## Amino Acids, Peptides and Proteins in Organic Chemistry

The first volume of this six-volume series edited by Andrew B. Hughes deals with the origins and synthesis of amino acids. In 14 chapters, 30 authors present a range of topics that extends beyond the limits of organic chemistry, by covering aspects of biochemistry, biotechnology, and astrobiology.

The first chapter begins with the search for extra-terrestrial amino acids on asteroids, comets, and meteorites, and in the interstellar medium itself. This astrobiological discussion about the possible occurrence of organic molecules in space is followed by a second chapter that consists of an essay on terrestrial amino acids. Starting from a critical examination of the definition of "canonical amino acids", the author compares theories and research results concerning the origins of amino acids on earth and describes the conditions that led to the development of the 20 terrestrial amino acids. This well-written scientific and philosophical overview concludes the first part of the book, which is entitled "Origins of Amino Acids".

The much longer second part, "Production/Synthesis of Amino Acids", begins with the use of enzymes in the synthesis of amino acids, describing enzymatic procedures for chiral resolution and for generating enantiomerically pure α-amino acids, as used in industry, from achiral precursors. The following chapter is concerned with the biosynthesis of β-amino acids as primary and secondary metabolites and with their occurrence in a variety of natural products. This detailed and well-structured essay is the first concise review of this complex field of research.

The following chapters deal with syntheses of various classes of amino acids, beginning with non-coded amino acids found in natural products and the already well-researched field of N-alkylated amino acids. The authors describe recent developments in the areas of β-amino acids, carbocyclic β-amino acids, α,β-diamino acids, and halogenated

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