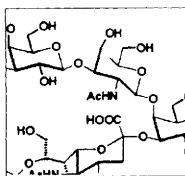


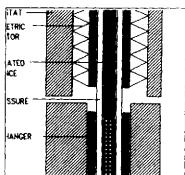
Chemical Society Reviews

Volume 25 Issue 6 Pages 371-457 December 1996



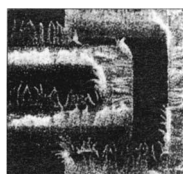
Inhibitors of Glycosphingolipid Biosynthesis By Thomas Kolter and Konrad Sandhoff (pp. 371-382)

Glycosphingolipids are membrane components of eukaryotic cells. They participate in various biological events and can regulate enzymes and receptors within the plasma membrane. Inhibitors of various stages of their biosynthesis have been isolated from natural sources or have been generated by design and chemical synthesis. They serve as valuable tools in the investigation of the physiological function of sphingolipids. Potential applications of these inhibitors are discussed in this article.



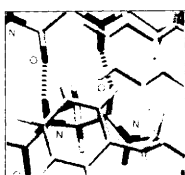
Scanning Transitiometry By Stanisław L. Randzio (pp. 383-392)

Scanning transitiometry is a relatively new technique which is based on inducing a thermodynamic change by scanning at a low rate one of the independent thermodynamic variables (p , V or T) and keeping automatically constant the other independent variable. From the output signals recorded simultaneously (rate of heat exchange and the variations of the mechanical variable, volume or pressure) a respective pair of thermodynamic derivatives is obtained simultaneously as a function of the scanned variable. The actual instruments operate over the temperature range from 200 to 550 K and over the pressure range up to 400 MPa. Typical examples of applications of the technique in investigation of phase transitions in organic substances and liquid crystals under various conditions are presented. Possible future applications in solving various problems in biotechnology and in physics and physical chemistry education are emphasized.



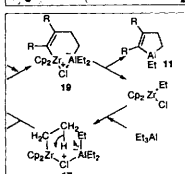
The Chemistry of the Semiconductor Industry By Sean C. O'Brien (pp. 393-400)

The explosive growth of the semiconductor industry can be directly related to inexpensive ultraclean chemical processing which leads to highly controlled films and surfaces. This article concentrates on the field of contamination and film removal using liquid and gas phase chemical reactions. This area more than any other is in desperate need of fundamental chemical study to determine reaction kinetics, and mechanisms.



Artificial β -Sheets By James S. Nowick, Eric M. Smith and Mason Pairish (pp. 401-416)

Within the past decade, several research groups have synthesized and studied compounds that mimic the structures and hydrogen-bonding patterns of β -sheets. In these compounds, rigid molecular templates stabilize β -sheet structure in attached peptides. Through these studies, these researchers hope to gain an enhanced understanding of protein structure and develop useful peptidomimetic building blocks. This review seeks to summarize these studies and explain the growing interest in *artificial β -sheets*.



An Odyssey from Stoichiometric Carbotationation of Alkynes to Zirconium-catalysed Enantioselective Carboalumination of Alkenes By Ei-ichi Negishi and Denis Y. Kondakov (pp. 417-426)

It has recently been found that alkyalane-zirconocene reagent systems can react with alkynes and alkenes *via* at least three different paths, *i.e.*, (i) straightforward carbometallation without involving C-H activation, (ii) cyclic carbometallation *via* β C-H activation, and (iii) hydrometallation. Various factors affecting the courses of such reactions have been delineated. In some cases, it is even possible to steer these reactions in the desired direction. Our recent development of a Zr-catalysed enantioselective alkene carboalumination reaction is an outgrowth of the above-mentioned systematic, exploratory, and mechanistic investigation.

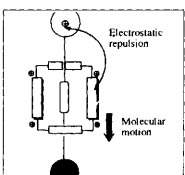
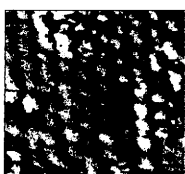


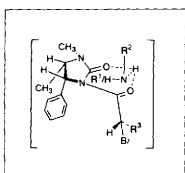
Photo- and Redox-active [2]Rotaxanes and [2]Catenanes By Andrew C. Benniston (pp. 427-436)

One cornerstone of supramolecular science is research into the manufacture and physicochemical properties of [2]rotaxanes and [2]catenanes. Recent synthetic improvements have opened up the opportunity of building into the molecular framework of rotaxanes/catenanes subunits which can be stimulated by photons or redox changes. Accordingly, aspects of the chemistry of rotaxanes and catenanes deemed photoactive and redoxactive are discussed within this review.



The Role of Short-lived Oxygen Transients and Precursor States in the Mechanisms of Surface Reactions; a Different View of Surface Catalysis By M. W. Roberts (pp. 437-446)

It was the search for transients present during the dissociative chemisorption of oxygen and the subsequent formation of the oxide overlayer at single crystal metal surfaces that led to the development of the models for the surface catalysed reactions discussed in this review. The use of probe molecules enabled transitory complexes (transition states) to be recognised and specific reaction pathways delineated. Examples are discussed where molecular and atomic oxygen transients participate in reaction mechanisms with some emphasis given to the oxygenation reactions of ammonia. A common feature of the chemistry is that highly efficient low-energy reaction pathways can be sustained even though the surface complexes are present at immeasurably small concentrations. Recent independent evidence from both STM and theoretical calculations provides support for the models developed over the last decade and the highly specific reactivity of the oxygen implicated in the reactions.



Dynamic Resolutions in Asymmetric Synthesis By S. Caddick and K. Jenkins (pp. 447-456)

Asymmetric synthesis is one of the most important challenges facing synthetic organic chemists. Most methods used for the preparation of enantiomerically enriched chiral organic molecules involve stereocontrolled formation of the new stereogenic centre. An alternative is to effect a resolution of a stereochemical mixture of isomers; however this is generally limited to 50% yield. Dynamic resolution can avoid this fundamental limitation and can be a successful method for producing >50% yield of stereochemically pure material. The success of this approach relies on induced substrate lability and product stability under the reaction conditions.

Articles that will appear in forthcoming issues include

Shining Light on Catalysis **John Evans**

The Science and Humanism of Linus Pauling (1901–1994) **Stephen F. Mason**

Electronic Spectroscopy of Carbon Chains **John P. Maier**

Structure of Water under Subcritical and Supercritical Conditions studied by Solution X-ray Diffraction **Hitoshi Ohtaki, Tamas Radnai and Toshio Yamaguchi**

The World-Wide Web as a Chemical Information Tool **Peter Murray-Rust, Henry S. Rzepa and Benjamin J. Whitaker**

Sulfur–Nitrogen Chains: Rational and Irrational Behaviour **Jeremy M. Rawson and John J. Longridge**

Towards a General Triple Helix-mediated DNA Recognition Scheme **S. O. Doronina and J. P. Behr**

Carbon–Carbon Bond Forming Reactions Mediated by Cerium(IV) Reagents **Vijay Nair, Jessy Mathew and Jaya Prabhakaran**

Modern Tanning Chemistry **Anthony D. Covington**

Developments in Metal–Organic Precursors for Semiconductor Growth from the Vapour Phase **Anthony C. Jones**

Corrigendum

After the Actinides, then what?

Simon A. Cotton

Chem. Soc. Rev., 1996, p. 219

On pages 220, 223, 224, and 226 t_{H} should read $t_{1/2}$, and $t_{<TM}$ should read $t_{3/2}$.