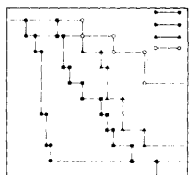


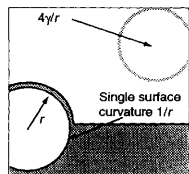
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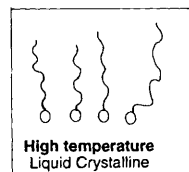
Synthetic Carbohydrate Vaccines Based on Tumour-Associated Antigens by Tatsushi Toyokuni and Anil K. Singhal (pp. 231–242)

The confluence of chemistry and immunology has cultivated a growing number of collaborative studies leading to major advances in both fields. The development of synthetic vaccines is just one of them. This review describes a brief overview of the recent progress in synthetic cancer vaccines based on tumour-associated carbohydrate antigens, especially the blood group related antigens of epithelial cancers including Tn ($\text{GalNAc}1 \rightarrow O\text{-Ser/Thr}$), sialosyl Tn ($\text{NeuAc}2 \rightarrow 6\text{GalNAc}1 \rightarrow O\text{-Ser/Thr}$), and T ($\text{Gal}\beta 1 \rightarrow 3\text{GalNAc}1 \rightarrow O\text{-Ser/Thr}$) antigens.



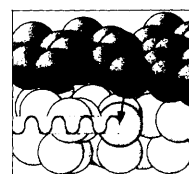
The Fundamentals of Bubble Evolution By S. D. Lubetkin (pp. 243–250)

The five stages of evolution of a bubble are reviewed, from the birth (nucleation) through the growth, detachment, rise and bursting. In each case, the current state of knowledge and the outstanding challenges are presented. The emphasis is placed on bubbles formed from supersaturated gas solutions, where the supersaturation arises either from electrolytically produced gas, or by pressure release. The consequences of the common gases being surface active are explored.



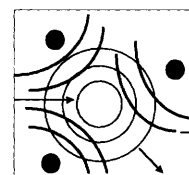
Gel to Liquid-Crystal Transitions in Synthetic Amphiphile Vesicles By Michael J. Blandamer, Barbara Briggs, Paul M. Cullis, and Jan B. F. N. Engberts (pp. 251–257)

Vesicles formed from synthetic amphiphiles in aqueous solution undergo gel to liquid crystal transitions. The melting temperatures depend on alkyl chain length and counter ion. The melting process involves small patches of monomers in the bilayers. DSC experiments highlight the importance of the protocols used in the preparation of the vesicular solutions.



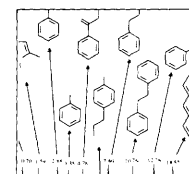
Bimolecular Photophysics By David L. Andrews and Philip Allcock (pp. 259–265)

A large area of photophysics involves pairwise electromagnetic interactions between molecules. A familiar example is intermolecular energy transfer, a process that occurs with high efficiency in photobiological systems. However there are many other condensed phase phenomena involving coupling of the same basic nature – examples include fluorescence migration, induced circular dichroism, cooperative absorption, and two-centre Raman scattering. Recently, a new formulation of intermolecular coupling has allowed both radiative and 'radiationless' energy transfer to be accommodated within a unified framework. This review identifies distinctive aspects of each process – their selection rules, dependence on molecular separation, polarization features, dielectric effects, and resonance behaviour.



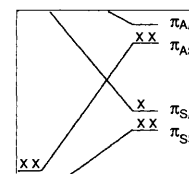
EXAFS Studies of Polymer Electrolytes By R. G. Linford (pp. 267–277)

Polymer electrolytes are very concentrated solutions of metal salts in 'immobile' solvents that resemble crown ethers. They are used in polymer batteries and electrochromic devices, in the form of thin films that are often partially crystalline. Conduction occurs in the amorphous regions and is strongly influenced by local structure, both through cation–polymer interactions and from ion pairing/clustering. Only Extended X-ray Absorption Fine Structures, EXAFS, can probe the amorphous structure directly. This article describes the EXAFS technique and the facilities such as synchrotron rings needed for its implementation, the materials, their history and properties, and the results of EXAFS and related studies on polymer electrolytes.



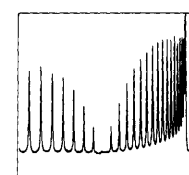
QSPR: The Correlation and Quantitative Prediction of Chemical and Physical Properties from Structure By Alan R. Katritzky, Victor S. Lobanov, and Mati Karelson (pp. 279–287)

Quantitative Structure–Property Relationships (QSPR) are equations which relate a chemical, physical, or technological property with molecular structure. The way in which QSPR are deduced from an initial database of the property and the relevant structures is described. QSPR can predict property values for unmeasured or unknown compounds and can also shed light on the way in which molecular structure affects the property in question: although well known for biological properties, they are useful in a much wider area.



Photoenzymic Repair of UV-Damaged DNA: A Chemist's Perspective By Paul F. Heelis, Rosemarie F. Hartman, and Seth D. Rose (pp. 289–297)

The light utilising DNA repair enzyme known as DNA photolyase induces the reversion of cyclobutane-type pyrimidine dimers in DNA back to pyrimidines thus restoring the DNA function. Either by direct excitation or energy transfer, a noncovalently bound flavin cofactor becomes a powerful reducing agent. Electron transfer to the pyrimidine dimer produces an unstable radical anion and thereby initiates bond cleavage in the dimer. The substrate binding, dimer splitting mechanism, and energetics of the individual steps constitute a fascinating picture of photoenzymic repair of UV damaged DNA.



Spectroscopy and Potential Energy Surfaces By C. M. Western (pp. 299–307)

Potential energy surfaces are fundamental to chemistry, as they allow the prediction of the behaviour of atoms and molecules. This article gives an overview of methods of experimentally determining them using various forms of spectroscopy. Case studies are used to illustrate the information the various experiments can give, such as spectroscopy of weakly bound complexes (to determine intermolecular potentials) and simulated emission pumping (for information covering a wide range of geometries).

Articles that will appear in forthcoming issues include

Phospha-alkynes, $\text{RC}\equiv\text{P}$: New Building Blocks in Inorganic and Organometallic Chemistry **John F. Nixon FRS**

Self-Diffusion in Multicomponent Liquid Systems **Ewa Hawlicka**

From Calorimetry to Equations of State **Stanislaw L. Randzio**

Multidimensional Crystal Engineering of Bifunctional Metal Complexes Containing Complementary Triple Hydrogen Bonds **Andrew D. Burrows, Chin-Wing Chan, Mubarik M. Chowdhry, John E. McGrady, and D. Michael P. Mingos FRS**

Beyond C_{60} : Graphite Structures for the Future **H. Terrones, M. Terrones, and W. K. Hsu**

Combinatorial Chemistry **Gordon Lowe FRS**

The Essentiality of Silicon in Biology **J. D. Birchall FRS**

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