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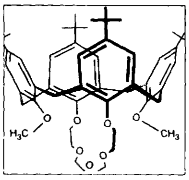
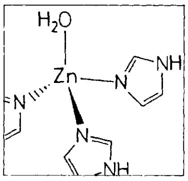


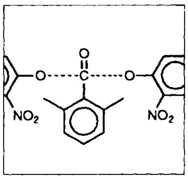
Carrier-mediated Transport through Liquid Membranes *By Herman C. Visser, David N. Reinhoudt, and Feike de Jong* (pp. 75–81)

A review is presented of work on carrier-mediated transport of (organic) salts and neutral molecules through liquid membranes. Attention is focused on recent studies of diffusion-limited transport through BLM's and SLM's, the description of which is guided by simple mathematical equations. Finally, developments in the direction of ultra-thin membranes are outlined.



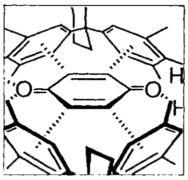
The Colourless 'Chameleon' or the Peculiar Properties of Zn^{2+} in Complexes in Solution *By Helmut Sigel and R. Bruce Martin* (pp. 83–91)

The adaptability of the coordination sphere of Zn^{2+} in biological systems is well known. Less appreciated is the fact that equilibria between Zn^{2+} species with coordination numbers 6 and (5 or) 4 are indeed quite common in solution in the presence of low-molecular-weight ligands. In this essay ways are described that allow a quantification of these equilibria in binary and in ternary (mixed ligand) complexes. For example, the 1:1 and 1:2 complexes formed by Zn^{2+} and ethylenediamine exist in aqueous solution to about 50 and 90%, respectively, as tetrahedral species; the remaining parts being octahedral.



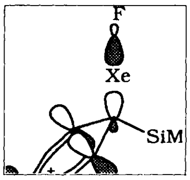
The Diagnosis of Concerted Organic Mechanisms *By A. Williams* (pp. 93–100)

The concept of concertedness is paramount in all discussions of reaction mechanisms. The criterion that a concerted mechanism has a single transition state and hence possesses no intermediates enables the unambiguous diagnosis of these mechanisms. This review describes current experimental techniques which provide unequivocal evidence against processes involving intermediates; such techniques therefore indicate concertedness. Contemporary evidence is discussed for reactions, such as displacements at unsaturated centres, not hitherto regarded as capable of supporting concerted mechanisms.



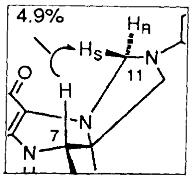
MELDOLA LECTURE. The Role of Aromatic Interactions in Molecular Recognition *By Christopher A. Hunter* (pp. 101–109)

Studies of π–π interactions in covalently linked porphyrin dimers have been used to develop a simple electrostatic model for understanding and computing non-covalent interactions between aromatic molecules. The model has been tested on experimental data from protein *X*-ray crystal structures and by the successful design and synthesis of a molecular receptor for *p*-benzoquinone. Applications of the model to sequence-dependent DNA structure show that ideas derived from simple chemical systems can be useful for understanding more complex molecular assemblies.



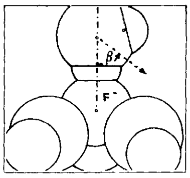
Non-Bonding Molecular Orbitals and the Chemistry of Non-Classical Organic Molecules *By Christopher A. Ramsden* (pp. 111–118)

Professor Ramsden explores common features of the bonding and modes of reaction of a large and diverse family of 'non-classical' organic molecules, which includes 1,3-dipoles, hypervalent compounds, betaines, and ylides, and discusses their relationship to the transition states of S_N2 reactions. All these molecules can be considered to contain three-centre, four-election bonds and the associated non-bonding molecular orbitals influence structure and reactivity. Two common modes of reaction, which are described as *ligand coupling* and *syn-addition*, are recognized and examples of these transformations are discussed.



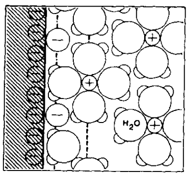
TILDEN LECTURE. Studies on Thymidylate Synthase and Dihydrofolate Reductase – Two Enzymes Involved in the Synthesis of Thymidine *By Douglas W. Young* (pp. 119–128)

The review describes the author's work on thymidylate synthase and dihydrofolate reductase. A chemical model for the synthesis of thymine followed the biological labelling results more closely than expected. Work on the enzyme dihydrofolate reductase showed a difference in docking at the active site of the enzyme between the natural substrate and the drug methotrexate. Synthesis of stereospecifically deuteriated leucine and incorporation into the enzyme allowed assignment of the diastereotopic methyl groups of the leucine residues of the enzyme in the ^1H-NMR spectrum. This will be generally applicable to other proteins.



Structure and Dynamics of Electrolyte Solutions. A NMR Relaxation Approach *By Antonio Sacco* (pp. 129–136)

Investigations on the dynamical and structural properties of electrolyte solutions based on NMR relaxation methods are reported. Using selected examples of electrolytes in pure solvents, the behaviour of the solvent molecules in the first coordination sphere of ions is highlighted. Moreover, by splitting intra- and intermolecular contributions to the relaxation for some electrolytes in DMSO, the influence of the salts on the reorientational and translational properties of the solvent molecules is shown. Finally, NMR relaxation by quadrupolar interactions to probe the preferential solvation of ionic species in binary solvent mixtures is reported.



The Electrophoresis of Semiconductor Particles *By Colin Boxall* (pp. 137–145)

The role of colloidal semiconductor particles as photocatalysts in some environmentally important reactions, and the importance of the nature of the particle surface during such reactions is discussed. A summary of semicondutor particle-related electrochemical concepts is presented and the potential of electrophoresis for *in situ* non-perturbative interrogation of particle surface behaviour is described. The new technique of photoelectrophoresis and its utility in photocolloidal systems is also described. Finally, some recent advances in the field of semiconductor colloid chemistry are presented, with emphasis on those systems for which particle surface charge-related information would prove most useful.

Articles that will appear in forthcoming issues include

Homo- and Hetero-metallic Alkoxides of Groups 1, 2, and 12 Metals **R. C. Mehrotra, A. Singh, and S. Sogani**

Towards a Laboratory Strategy for the Study of Heterogeneous Catalysis in Stratospheric Ozone Depletion **Martin R. S. McCoustra and Andrew B. Horn**

Trimetallic Units as Building Blocks in Cluster Chemistry **D. Imhof and L. M. Venanzi**

Chemistry in Near-critical Fluids **Roberto Fernańdez-Prini and M. Laura Japas**

Polyradicals: Synthesis, Spectroscopy, and Catalysis **Joe A. Crayston, Ahmed Iraqi, and John C. Walton**

Affinity Biosensors **Dónal Leech**

The Hydrides of Aluminium, Gallium, Indium, and Thallium: A Re-evaluation **Anthony J. Downs and Colin R. Pulham**

Electrophoretic NMR **Manfred Holz**

Protein Structure from Linear Dichroism Spectroscopy and Transient Electric Birefringence **Michael Bloemendal**

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