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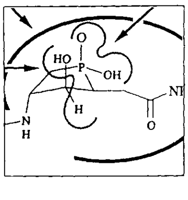
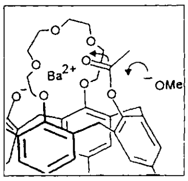


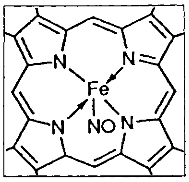
Catalytic Antibodies: Mechanistic and Practical Considerations *By Jon D Stewart and Stephen J Benkovic* (pp 213–219)

Studies of catalytic antibodies have provided examples of mechanisms ranging from simple transition-state stabilization to multi-step pathways involving covalent intermediates This review critically compares catalytic antibodies with other biological catalysts, using amide and ester hydrolysis as examples By means of kinetic simulations, the catalytic efficiencies of many of these antibodies are shown to be limited by a number of factors including relatively weak substrate recognition coupled with relatively strong product binding This analysis also suggests specific methods to improve catalytic antibodies, either through more sophisticated transition-state analogue design or by mutagenesis of existing antibodies



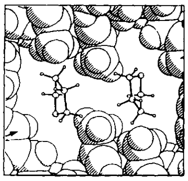
Catalysis by Metal Ions in Reactions of Crown Ether Substrates *By R Cacciapaglia and L Mandolini* (pp 221-231)

It is the purpose of this review article to show that interaction between polyether ligands and metal ions is an effective force for catalysis Rates of methyl transfer and acetyl transfer reactions from functionalized crown ethers to anionic nucleophiles are enhanced – even to surprisingly large extents – by group 1 and group 2 metal ions Discussion is focused on transition state stabilization by metal ions, and on the role played by the additional binding energy rendered available by a polyether chain proximal to the reaction zone A barium (II)-based prototype catalyst with transacylase activity is described



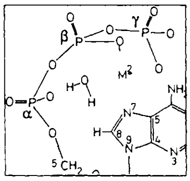
The Physiological Role of Nitric Oxide *By Anthony R Butler and D Lyn H Williams* (pp 233-241)

In the last six years it has become apparent that nitric oxide (NO) has a crucial and extensive role in human physiology It acts as a messenger molecule effecting muscle relaxation, as a cytotoxic agent in the non-specific immune system, as a carcinogen, and as a neurotransmitter in the brain and peripheral nervous system This article explores some of the chemistry of NO in an attempt to understand how such a modest molecule can play so many diverse roles



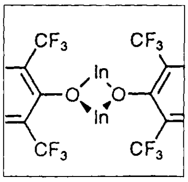
Cholaphanes *et al.*; Steroids as Structural Components in Molecular Engineering *By Anthony P Davis* (pp 243-253)

As a rigid, chiral, and extended structural fragment, the steroid nucleus is an excellent starting point for the design of preorganized molecular frameworks Units derived from cholesterol and cholic acid have been used to provide appendages and spacers, and to organize functional group arrays for studies in biomimetic chemistry Recent work has shown that cholic acid may also be elaborated into macrocycles such as the 'cholaphanes' of the title The inward-directed functional groups in these molecules result in distinctive properties, including the molecular recognition of carbohydrate derivatives in organic media



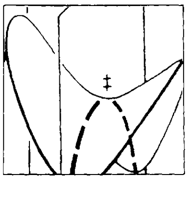
Interactions of Metal Ions with Nucleotides and Nucleic Acids and their Constituents *By Helmut Sigel* (pp 255-267)

Nucleotides, due to their ambivalent properties towards metal ions, are a true challenge to coordination chemists A metal ion may interact with the phosphate group(s), the sugar moiety, and the base residue of a nucleotide Moreover, such a base residue itself is already ambivalent, *e g* , an adenine residue offers to a metal ion the N-1, N-3, and N-7 sites for binding It is the aim of this overview briefly to elucidate the binding properties of the various mentioned constituents and to consider 'recognition reactions' of nucleotides and nucleic acids Which properties govern selectivity in Nature?



The Lower Oxidation States of Indium *By Dennis G Tuck* (pp 269-276)

The inorganic and organometallic chemistry of indium(I) encompasses Lewis acid and base behaviour, metathesis, and oxidation reactions in which one-electron transfer has been identified, indium(II) compounds may be in the form of either ionic dimers or metal–metal bonded species The relation between these structures illustrate the complexity of the chemistry of the lower oxidation states of the Main Group elements



Interplay of Theory and Experiment in the Determination of Transition-state Structure *By Ian H Williams* (pp 277-283)

The idea of a transition state is fundamentally a theoretical one associated with the properties of a saddle-point region of a potential-energy hypersurface describing a chemically reacting system Experimentally, however, a transition state is usually a phenomenological concept associated with a manner of interpretation of kinetic data The two views do not always coincide[1] Some recent attempts to bridge the gap between theory and experiment in the areas of structure–reactivity correlations and kinetic isotope effects are discussed, and it is argued that computational modelling will enable meaningful interpretation of experimental data in terms of transition-state structure

$$= \frac{p\lambda_B}{(x_A + p x_B)}\Delta\Delta H^{\ominus}_{12} + \left\{\frac{p\lambda_B}{(x_A + p x_B)}\right\}(an +$$

Thermodynamics of Solvation in Mixed Solvents *By W Earle Waghorne* (pp 285-292)

Chemists have long recognized that changes in solvent have profound effects on the properties of chemical systems However it is only in the past quarter of a century that theoretical models which will predict these effects have emerged This article outlines the development of one such model and shows how it provides detailed information about the roles of the interactions between solvent and solute molecules in determining the thermodynamics of chemical systems

Articles that will appear in forthcoming issues include

BRUKER LECTURE. The Nuclear Zeeman Interaction in Electron Resonance **N. M. Atherton**

The Electron Paramagnetic Resonance Spectra of Organic Radical Ions **A. G. Davies**

On the Possibility of an Insulator–Metal Transition in Alkali Metal-Doped Zeolites **P. P. Edwards, P. A. Anderson, A. R. Armstrong, M. Slaski, and L. J. Woodall**

Some Aspects of the Electron Paramagnetic Resonance Spectroscopy of *d*-Transition Metal Compounds **F. E. Mabbs**

Progressive Saturation and Saturation Transfer ESR for Measuring Exchange Processes of Spin-labelled Lipids and Proteins in Membranes **D. Marsh**

Why can Transient Free Radicals be observed in Solution using ESR Techniques? **K. A. McLauchlan**

Polarized Positive Muons Probing Free Radicals: A Variant of Magnetic Resonance **E. Roduner**

The Chemistry of Cyclopropylmethyl and Related Radicals **D. C. Nonhebel**

Determination of Molecular Conformation from Large Amplitude Vibrations in Electronic Spectra of Organic Molecules in a Supersonic Jet **J. M. Hollas**

TILDEN LECTURE. Organometallic Intermediates: Ultimate Reagents **R. N. Perutz**

Water Purification by Semiconductor Photocatalysis **A. Mills**

Electrochemistry in Media of Low Dielectric Constant **A. Abbott**

Mechanisms of Solvolytic Alkene-forming Elimination Reactions **A. Thibblin**

The Properties of Organic Liquids that are Relevant to their Use as Solvating Solvents **Y. Marcus**

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