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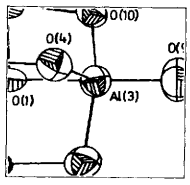
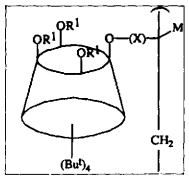


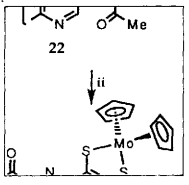
Chemistry of Oxo-Alkoxides of Metals *By Ram C. Mehrotra and Anirudh Singh* (pp. 1–13)

Beginning with the unexpected formation of $Y_5O(OPr^i)_{13}$ in the reaction of yttrium with isopropyl alcohol, the preparation, properties and structural characterization of homo- and hetero-metallic oxo-alkoxides continue to provoke keen interest, revealing considerable diversification in structural features with μ_2- to μ_6-oxo bonding modes. This review highlights developments in the synthetic procedures, structural features, potential applications, future possibilities and mechanistic approaches for the formation of this fascinating and important class of heteroleptic alkoxide complexes.



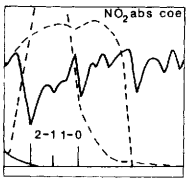
Calixarene-based Sensing Agents *By Dermot Diamond and M. Anthony McKervey* (pp. 15–24)

The use of calixarenes in sensing devices represents an area of rapid advances over the past 10 years. Calixarenes are ideal candidates as sensor materials, providing platforms or templates to which can be attached subunits capable of performing particular sensing roles. Polar groups with predetermined properties can be used for guest recognition, chromophores, fluorophores or electroactive groups for transduction of host–guest interaction, and groups which facilitate immobilisation on a substrate surface or within a polymer chain or membrane.



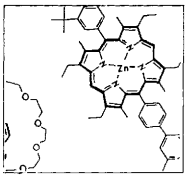
The Structure and Mode of Action of the Cofactor of the Oxomolybdoenzymes *By D. Collison, C. D. Garner and J. A. Joule* (pp. 25–32)

A small molybdenum-containing unit, known as Moco, acts as a cofactor for oxomolybdoenzymes such as sulfite oxidase, nitrate reductase, xanthine dehydrogenase, and dimethyl sulfoxide reductase. This review surveys structural, spectroscopic, and synthetic studies aimed at the elucidation of the structure and mechanism of action of the cofactor.



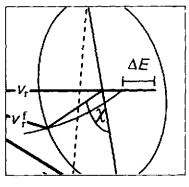
The Excited State in Atmospheric Chemistry *By George Marston* (pp. 33–40)

Atoms, molecules, radicals and ions in excited states have a fundamentally important role to play in the chemistry of our atmosphere. In this article, various aspects of excited-state chemistry in the atmosphere are explored. Areas that are covered include ozone-destruction in the upper atmosphere, radical formation in the lower atmosphere, heating and cooling throughout the atmosphere and the implications of excited state formation for remote sensing of the atmosphere.



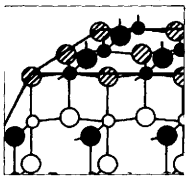
A Strategy for Constructing Photosynthetic Models: Porphyrin-containing Modules Assembled Around Transition Metals *By Anthony Harriman and Jean-Pierre Sauvage* (pp. 41–48)

Transition metal complexes formed from oligopyridino ligands covalently attached to porphyrin modules have been used to assemble well-defined, photoactive multicomponent arrays. Apart from gathering together porphyrinic components, the metal complex plays an essential role by modulating the degree of electronic coupling between the porphyrins or by direct participation in sequential electron-transfer steps. Several such systems have been built and investigated by ultrafast transient spectroscopy, allowing critical comparison with the bacterial photosynthetic reaction centre complex.



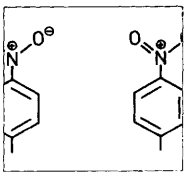
Probing the Intermolecular Potential: Spectroscopy or Molecular Beam Scattering? *By Anthony J. McCaffery* (pp. 49–60)

In molecular collision and reaction dynamics, the quantum state distribution is an essential clue to the intermolecular forces at work in the fundamental processes of chemistry. This task is particularly suited to spectroscopy. Velocity selection is more traditionally associated with molecular beam techniques but here we show that constructive use of the Doppler effect allows both velocity and quantum state determination using narrow line tunable lasers. The result is velocity selected double resonance, in which state-to-state differential cross-sections are obtained from double resonance linewidths.



Surface Chemistry of Titania (Anatase) and Titania-supported Catalysts *By Konstantin I. Hadjiivanov and Dimitar G. Klissurski* (pp. 61–69)

The anatase surface is highly heterogeneous due to the different surroundings of the Ti^{4+} ions situated on the various crystal faces. The surface acidity of TiO_2 is of a Lewis type, but many admixtures and additives generate Brønsted acidity. The crystal structure of anatase (i) determines the lack of centres for dissociation of adsorbed molecules, which affects anatase adsorption and (photo)catalytic properties, and (ii) favours the formation of active VO_x species on V_2O_5/TiO_2 catalysts. Crucial for the catalytic performance of titania-supported metals is their partial coverage by $TiO_x (x < 2)$ moieties after high-temperature reduction.



The Nitro Group as Substituent *By Otto Exner and Tadeusz Marek Krygowski* (pp. 71–75)

Among various groups considered in organic chemistry as 'substituents' the nitro group occupies a particular position since its action is both strong and reasonably predictable. Its effects have been quantitatively evaluated in the form of various substituent constants σ which may be interpreted in terms of inductive, mesomeric and other effects. In the case of the nitro group the inductive effect is dominant. Of particular interest is the long standing problem of conjugation (negligible or appreciable) of the nitro group with the benzene ring in nitrobenzene.

Articles that will appear in forthcoming issues include

Infrared Fourier Transform Emission Spectroscopy **Peter F. Bernath**

Man and the Elements of Groups 3 and 13 **John Burgess**

Nitric Oxide in Biology: Its Role as a Ligand **R. J. P. Williams**

Magnetism of Large Iron-Oxo Clusters **Dante Gatteschi, Andrea Caneschi, Roberta Sessoli and Andrea Cornia**

Varying Resonance Demand in Carbocationic Systems **Yuko Tsuno and Mizue Fujio**

Asymmetric Synthesis of β-Amino Acids and α-Substituted β-Amino Acids **Guiliana Cardillo and Claudia Tomasini**

Charged Cyclodextrin Derivatives as Chiral Selectors in Capillary Electrophoresis **B. Chankvetadze, G. Endresz and G. Blaschke**

New Developments in Making Compounds and Materials by Condensing Gaseous High-temperature Species at Atmospheric or Low Pressure **Peter L. Timms**

Modelling of Solvent Effects on the Diels-Alder Reaction **C. Cativiela, J. I. García, J. A. Mayoral and L. Salvatella**

After the Actinides then what? **Simon A. Cotton**

Chiral Discrimination by Modified Cyclodextrins **Christopher J. Easton and Stephen F. Lincoln**

Solid State Metathesis Reaction for Metal Borides, Silicides, Pnictides and Chalcogenides. Ionic or Elemental Pathway **I. P. Parkin**

Through-bond and Through-space Models for Interpreting Chemical Reactivity in Chemical Reactions **Keith Bowden and Edward J. Grubbs**

Arene-catalysed Lithiation Reactions **Miguel Yus**

Diatomic Molecular Probes for Mid-IR Studies of Zeolites **A. Zecchina and C. Otera Areán**

The Chemistry of Paper Conservation **Vincent D. Daniels**

A Radical Reappraisal of Gif Reactions **M. John Perkins**

On the Mechanism of the Gif Reaction **Derek H. R. Barton**

INGOLD LECTURE: Reactive Intermediates: Carboxylic Acid Enols and Other Unstable Species **A. J. Kresge**

Photoelectron Spectroscopy in a New Light: Zero Kinetic Energy (ZEKE) Photoelectron Spectroscopy with Coherent Vacuum Ultraviolet Light **John W. Hepburn**

The Changing Face of Arene Oxide-Oxepine Chemistry **Derek R. Boyd and Narain D. Sharma**

New Approaches to Chemical Kinetics **Barry Johnson and Stephen K. Scott**