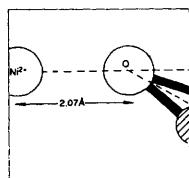


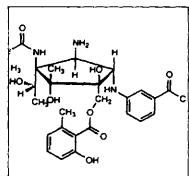
# Chemical Society Reviews

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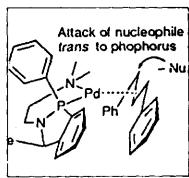
## Ion Solvation via Neutron Scattering By John E. Enderby (pp. 159–168)

The nature of ion solvation has been a central problem in solution science for most of this century. It is argued that neutron scattering has a unique role to play in elucidating in a detailed way the nature of the interaction between ions and the solvents in which they are dissolved. The essential advantage of the neutron method arises from the isotopic dependence of neutron scattering lengths. Thus, by systematically changing the isotopic composition of the solute/solvent, new structural information can be obtained. Examples from a range of systems including  $\text{Li}^+$ ,  $\text{Ni}^{2+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Fe}^{3+}$ , lanthanides, and  $\text{Cl}^-$  will be given.



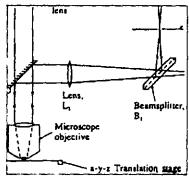
## The Biosynthesis of Carbocyclic Nucleosides By Gareth N. Jenkins and Nicholas J. Turner (pp. 169–176)

Aristeromycin and neplanocin A are two naturally occurring carbocyclic nucleosides isolated from *Streptomyces citricolor*. They belong to a small family of cyclopentane-containing natural products that are derived from carbohydrates, in this case D-glucose, as the ultimate biosynthetic precursor. This review outlines our current understanding of the biosynthesis of aristeromycin and neplanocin and proposes possible mechanisms for the conversion of carbohydrates into 5-membered ring carbocycles.



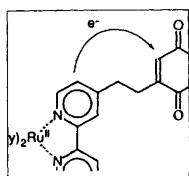
## MELDOLA LECTURE. Recent Developments in Asymmetric Synthesis By Martin Wills (pp. 177–185)

Asymmetric synthesis is of great importance to contemporary organic chemistry. In this article recent progress in the development of new methods for the synthesis of enantiomerically pure molecules is described. The approaches that we have used range from asymmetric catalysis to the manipulation of enantiomerically pure starting materials and resolution.



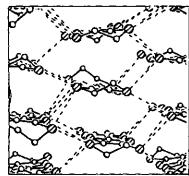
## Raman Microscopy: Application to the Identification of Pigments on Medieval Manuscripts By Robin J. H. Clark (pp. 187–196)

The identification of pigments, in particular the inorganic ones, used to illuminate medieval manuscripts is most effectively carried out by Raman microscopy. The merits of the technique in this context in comparison with others are surveyed; the specificity and sensitivity of a Raman spectrum, the fact that it can be used *in situ*, and the high spatial resolution ( $\sim 0.5\text{--}1.0\ \mu\text{m}$ ) attainable are all important positive features of the technique. The correct identification of pigments is of great importance in art conservation, and may also assist in the dating of a manuscript. Examples are given of manuscripts which have recently been studied and the pigments identified by Raman microscopy.



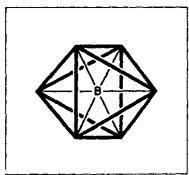
## Sensors and Switches from Supramolecular Chemistry By Luigi Fabbrizzi and Antonio Poggi (pp. 197–202)

Efficient sensors for metal ions can be made by assembling an appropriate receptor with a fluorescent fragment. The occurrence of the receptor/cation interaction is signalled through a sharp change of the fluorescence emission. The situation is especially favourable in the case of transition metal ions, which are typically redox active and provide an electron release to the excited fluorophore (or uptake therefrom), causing fluorescence quenching. Thus, the supramolecular design of fluorescent sensors should consider a ligating subunit able to promote the redox activity of the envisaged metal ion. An identical approach can be used for the synthesis of molecular redox switches, *i.e.* systems in which the distinctive property of a given subunit (e.g. fluorescence) is controlled by an adjacent control subunit, sensitive to the variation of the redox potential. Couples involving metal centres can be conveniently used to switch on/off the fluorescence of the proximate fluorophore through the variation of the redox potential.



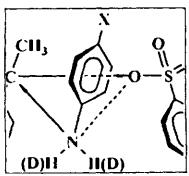
## Structural, Magnetic, and Conductivity Properties of Charge-Transfer Salts Derived From Metallacarboranes By Yaw-Kai Yan and D. Michael P. Mingos (pp. 203–213)

A wide range of charge-transfer salts between metallacarborane sandwich complexes and organic donors and acceptors have been made and structurally characterized. The introduction of charge compensating substituents onto the carborane cages has resulted in both anionic and cationic metallacarborane components in the resultant charge-transfer salts. The DDQ tapes in  $[3,3'\text{-Fe}\{4\text{-}(Me_2S)\text{-}1,2\text{-}C_2B_9H_{10}\}_2]^{+} [DDQ]^{-}$  (13) and the unusual sheet structure in the mixed valence TTF salt  $[TTF]_2[Fe(C_2B_9H_{10}C_4H_3S)_2]_2$  (5) are particularly novel.



## Denuding the Boron Atom of B–H Interactions in Transition Metal–Boron Clusters By Catherine E. Housecroft (pp. 215–222)

Over the past decade, a new class of molecular species has been recognized in which the boron atom is in an interstitial or a semi-interstitial site within a transition metal cluster. This review considers synthetic strategies used to transform B–H into B–M interactions, thereby converting a metallaborane into a metallaboride cluster: ligand exchange and competitive boron-abstraction, deprotonation, the ‘building-block’ approach to form  $M_n$  cages ( $n \geq 4$ ), the effects of changing the heterometal fragment, reactions with group 11 electrophiles, and cluster fusion.



## Secondary Kinetic Isotope Effects Involving Deuterated Nucleophiles By Ikchoon Lee (pp. 223–229)

The secondary  $\alpha$ -deuterium kinetic isotope effects ( $k_H/k_D$  involving deuterated nucleophiles) are shown to be useful in determining variations of  $S_N2$  transition states with substituents in the nucleophile, substrate, and leaving group, and in providing experimental evidence in support of the mechanistic interpretation based on the sign and magnitude of cross-interaction constants,  $\rho_{ij}$ .

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Spectroscopy and Potential Energy Surfaces **C. M. Western**

Photoenzymic Repair of UV-Damaged DNA: A Chemist's Perspective **P. F. Heelis, R. F. Hartman, and S. D. Rose**

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