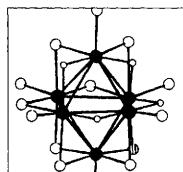


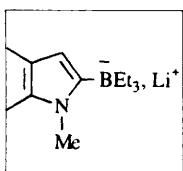
# Chemical Society Reviews

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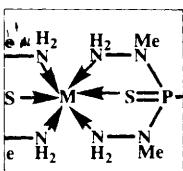
## The Emerging Chemistry of Polynuclear Metal Hydrido Alkoxides: $H_xM_y(OR)_z$ By Malcolm H. Chisholm (pp. 79–87)

Compounds of general formula  $H_xM_y(OR)_z$  have been reported for  $M = Ti, Ta, Mo, W$ , and  $Re$  although no concerted effort towards their synthesis has as yet been made. The synthetic routes to this new class of compounds include reduction, hydrogenolysis, addition of hydride (from  $KH$ ), and  $\beta$ -H atom abstraction from a secondary alkoxide. Preliminary studies of the reactivities of these compounds are fascinating with respect to activation and reduction of unsaturated small molecules and C–X multiple bonds.  $\alpha$ -Olefins may be selectively hydrogenated.



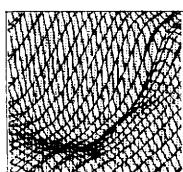
## Synthesis of Diarylketones through Carbonylative Coupling By J.-J. Brunet and R. Chauvin (pp. 89–95)

Carbonylative coupling reactions leading to diarylketones using a carbon monoxide source and aryl halides or aryl metals are reviewed. Palladium-catalysed reactions between an aryl halide (or pseudohalide) and an aryl metal of group IIB, IIA, or IVA can be carried out under mild conditions, in particular using low carbon monoxide pressure. However, many challenges remain and significant new results (the design of more efficient systems) and applications (the synthesis of important target molecules) are to be expected in the near future.



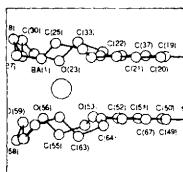
## Coordination Chemistry of Phosphorus(III) and Phosphorus(V) Hydrazides By Kattesh V. Katti, V. Sreenivasa Reddy, and Prahlad R. Singh (pp. 97–107)

The main group chemistry of phosphorus(III) and phosphorus(V) hydrazides is described. Specifically, the synthesis and characterization of several phosphorus(III) hydrazides of the general formula:  $R_3P-N(R')-N(R')-PR_2$  and phosphorus(V) hydrazides of the type:  $R_2P(E)(NMeNH_2)$ ,  $RP(E)(NMeNH_2)_2$ , and  $P(E)(NMeNH_2)_3$  ( $E = S, O$ ) and their Schiff base adducts are summarized. The transition metal chemistry of phosphorus(III) hydrazides with the early and late transition metals (e.g.  $Mo^0, W^0, Rh^1, Pd^{II}$ , and  $Pt^{II}$ ) reveal mononuclear coordination interaction of the two phosphine centres with the metal centres. The coordination chemistry of phosphorus(V) hydrazides demonstrates the versatility of their bonding with the transition metals.



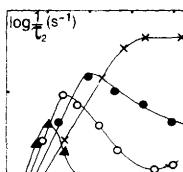
## New Strategies for Probing Crystal Dissolution Kinetics at the Microscopic Level By Patrick R. Unwin and Julie V. Macpherson (pp. 109–119)

Dissolution is a fundamental process which plays a key role in a number of areas of chemistry and its borders with physics, biology, and environmental science. We highlight some of the important recent developments which have occurred in the study of crystal dissolution kinetics and mechanisms at the microscopic level, through the application of hydrodynamic, electrochemical, and scanned probe techniques.



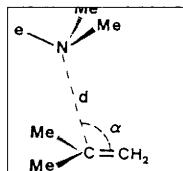
## Metal–Metal Interactions in Binuclear Complexes Exhibiting Mixed Valency: Molecular Wires and Switches By Michael D. Ward (pp. 121–134)

Since the discovery of the Creutz–Taube ion, the study of mixed valency has been extended to a wide variety of metal fragments and bridging ligands. This review presents a survey of some recent developments in the area of mixed-valent complexes, from the areas of both coordination and organometallic chemistry, and then discusses mechanisms by which metal–metal interactions in such compounds may be reversibly controlled to provide prototypical ‘molecular switches’.



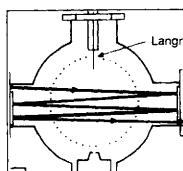
## Kinetic Studies of Alcohol–Surfactant Mixed Micelles By R. E. Verrall (pp. 135–142)

This review article discusses chemical relaxation studies of equilibria in mixed micelles. The study of fast kinetic processes in mixed alcohol–surfactant aggregates is an important aspect of understanding the factors that govern the creation, growth, and dissolution of these systems. The observed trends of the rate constants with the varying hydrocarbon chain length of the alcohol are discussed in terms of attractive and repulsive forces operative within the core and head group regions of the mixed micelles.



## Transannular Interactions in Difunctional Medium Rings: Modelling Bimolecular Reactions By Paul Rademacher (pp. 143–150)

Transannular interactions in difunctional medium rings have been studied by spectroscopic and theoretical methods. The investigations centred on studying electronic interactions (through space) as a function of the transannular distance. These interactions and the implications for the characteristic molecular orbitals of the functional groups were determined by photoelectron spectroscopy and theoretical methods. The results were applied to bimolecular reactions of analogous type to describe the reacting system close to the transition state.



## Infrared Laser and Microwave Spectroscopy of Electric Discharges By P. B. Davies (pp. 151–157)

Several types of electric discharge have been developed for high resolution spectroscopy with infrared lasers or microwaves. This article describes how the design of discharges and spectrometers suitable for generating and detecting short-lived molecules has been guided by requirements for high sensitivity and selectivity. The former requirement is necessary to detect species with concentrations as low as  $10^9 \text{ cm}^{-3}$ , and the latter for identifying molecular ion absorptions in the presence of much more intense spectra of neutral species. Representative spectroscopic results for novel species detected in discharges are described.

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Raman Microscopy: Application to the Identification of Pigments on Medieval Manuscripts **R. J. H. Clark**

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Structural, Magnetic, and Conductivity Properties of Charge-Transfer Salts Derived from Metallacarboranes **Y.-K. Yan and D. M. P. Mingos**

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