Contemporary Platinum Chemistry

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As part of its policy of publishing themed volumes on selected topics, *Inorganica Chimica Acta* has devoted volumes 264 and 265 to platinum chemistry. These include 60 articles, plus communications and notes, giving effective coverage of the current state of platinum co-ordination chemistry research as reported by those most active in this field.

The continuing interest in platinum-amine co-ordination chemistry resulting from the anti-cancer use of cisplatin is evident in several papers, including those by Clark, Buncel, Gust, Krebs and Gibson {Pt(II) compounds}, Lippert {Pt(III)} and Beck and Keppler {Pt(IV)}. The possibility of combining the anti-tumour effects of platinum with photodynamic therapy is investigated by Brunner through the synthesis of platinum porphyrin conjugates. The acidity of water and ammonia bound to platinum(IV) plays an important role in the substitution chemistry of these complexes and a study of the deprotonation reactions of amido-ammineplatinum(IV) species is described by Frank. The syntheses and structures of bipyridyl platinum(II/IV) phenoxide complexes are reported by van Koten.

Sulfoxide complexes of platinum form useful starting materials for many reactions. Fanizzi and Rochon discuss different aspects of the structure and reactivity of such compounds.

The co-ordination and bonding of phosphorus-donor ligands continues to prove a rich field for study. The preparation and structure of the secondary phosphine complex $[Pt(PBu^t_2H)_3]$ is described by Leoni. The bonding of bidentate P-donor ligands is discussed in papers by Tanase and Roddick, co-ordination of tetradentate P_2S_2 ligands is described by Reid and of multidentate P/N-donors is reported by Feringa.

NMR has long been used to study the co-ordination of phosphorus-donor ligands to metals and this method has now been used by Pringle to examine the roles of σ- and π-bonding in the co-ordination of these ligands in Pt(0) and Pt(II) complexes. The effect of the electronic and steric properties of phosphines on substitution of platinum (II) complexes is discussed by Romeo, while the bonding of a phosphite ligand to the cluster compound $[Pt_6(\mu_2\text{-}CO)_6(\mu_2\text{-}Ph_2PCH_2PPh_2)_3]$ is reported by Puddephatt. Oxidative addition reactions of this cluster are described in a further paper by Puddephatt.

Many papers deal with the chemistry of multinuclear molecules. Aspects of the structure of homonuclear dimeric compounds are discussed by Cotton (metal-metal bonding) and by Venanzi and Fryzuk (hydrogen-bridged compounds) while the chemistry of a number of heteronuclear dimeric complexes is described by other authors. The application of NMR to the study of fluxional behaviour is illustrated by the work of González-Duarte on dinuclear sulfur-bridged complexes. The structures of other dinuclear sulfur-bridged platinum and palladium compounds are described by Albinati. A discussion of the influence of stereochemical and electronic factors leading to the formation of icosahedral clusters is given by Teo.

The organometallic chemistry of platinum is represented by papers from Ogoshi, Casey (propargyl complexes), Jennings (metallacyclobutanes), Takahashi (carbene compounds) and Young (neopentyl derivatives) among others. The rearrangement of 5-co-ordinate platinum(II) olefin complexes is discussed by Albano, while the stabilisation of otherwise unstable olefins by co-ordination in such complexes is described by Panunzi.

Of necessity, when dealing with such a large number of articles, the papers highlighted here reflect the personal interests of the reviewer and each reader will no doubt find other papers to interest him or her. These volumes provide an interesting snapshot on current work on platinum chemistry with the emphasis on co-ordination and structure. C. F. J. BARNARD