

formed by impregnation using chloroplatinic acid. F. Le Normand, D. Bazin, H. Dexpert and P. Lagarde (Univ. de Paris Sud, France) and J. P. Bournonville (IFP, France) obtained Pt-Pt, Pt-Cl and Pt-O bond lengths using EXAFS every 15 minutes during slow isothermal decomposition/reduction of the catalyst precursor.

The Wacker process normally uses aqueous palladium dichloride to convert alkenes to aldehydes. The palladium is reduced to the metal but this is immediately reoxidised using a Cu(I)/Cu(II) couple which in turn is reoxidised by air. E. van der Heide, M. de Wind, A. W. Gerritsen and J. J. F. Scholten (Delft University, Netherlands) described a stable, heterogenised Wacker catalyst which operated in the same manner as the homogeneous catalyst system except that the Cu(I)/Cu(II) couple was replaced by a monolayer of vanadia applied to either alumina, titania or zirconia. Another example of a heterogenised, homogeneous catalyst used a monomeric palladium complex coordinated to the interlayer support of an aminated lithium hectorite. S. Shimazu, T. Ishida and T. Uematsu of Chiba University, Japan, claimed that the intercalated palladium catalysts showed higher activity and selectivity than the unsupported palladium complex for the liquid phase hydrogenation of isoprene. S. B. Ziemecki (DuPont, U.S.A.) used palladium to enhance the redox properties of phosphorus-vanadium-molybdenum heteropolyacids.

Two papers from the Polish Academy of Sciences concerned the catalytic properties of

palladium compounds. Work by W. Juszczyk, Z. Karpinski, J. Pielaszek, I. Ratajczykowa and Z. Stanasiuk on the reaction between neopentene and hydrogen suggested that high temperature reduction of palladium/silica led to the formation of palladium silicide, which was less active than pure palladium but more selective toward isomerisation. Palladium black catalysts prepared by borohydride reduction are known to contain boron; W. Palczewska, M. Cretti-Bujnowska, J. Pielaszek, J. Sobczak and J. Stachurski described the effects of segregation of boron to the surface under the influence of various pretreatments. Enrichment of the surface with palladium boride was found to increase the stereoselectivity during the hydrogenation of acetylenic groups.

Concluding Remarks

This was a fascinating meeting. Platinum group metals are used in a wide range of catalysts from platinum bimetallics for reforming petroleum products to carbon-supported systems for the synthesis of fine chemicals and drugs; and platinum metal technology is contributing significantly to the prevention of further deterioration of the environment. Already widely used, it is clear that in future years the platinum group metals can increase the role that they play in catalysis. The high interest in platinum group metal catalysts will, undoubtedly, lead to continuing study and further discussions at the Tenth International Congress on Catalysis to be held in Hungary in 1992.

N.J.G., R.R.R.

Geology and Geochemistry of the Platinum Metals

Platinum-Group Element Exploration, Developments in Economic Geology

BY D. L. BUCHANAN, Elsevier, Amsterdam, 1988, 185 pages, U.S.\$79/Dfl. 150

The price of platinum over the past decade, supported by increasing demand for the metal for industrial, investment and decorative purposes, has helped to stimulate worldwide interest in exploration for the platinum group elements; the publication of this book is therefore timely. It presents a set of guidelines for implementing an exploration programme and assessing the economic potential of an ore

body, and is supplemented by a bibliography of some 130 items. As well as providing mining geologists with a wealth of practical information, much of which is based upon the author's experience of the rocks of the Bushveld Igneous Complex, the book contains information that will be of interest to users of the platinum metals who wish to know of the geological factors that govern their availability.