Wells and D. W. Gray, of the University of Hull, studied the gas-phase hydrogenation of 2-butyne using platinum, rhodium and iridium supported on alumina, and discussed reaction mechanisms in detail.

Miscellaneous Processes

Two interesting papers concerned the mechanism of the hydrogen-oxygen reaction. V. Ponec, Z. Knor and S. Černý (Czechoslovak Academy of Science) followed the chemisorption of hydrogen and of oxygen, and their interaction, on films of rhodium, palladium, nickel and molybdenum by electrical conductivity changes. S. Z. Roginsky (Institute for Chemical Physics, Moscow) summarised a great deal of published work, chiefly concerning the isotope effect in this reaction.

J. R. Anderson and N. J. Clark, of the University of Melbourne, studied the reactions of hydrogen cyanide on evaporated films of platinum, palladium and a number of other metals. Kobozev, Krilova and Shashkov, of the Moscow State University, investigated the exo-electron emission of platinum on several supports: this novel and simple technique merits further application.

Conclusions

The limitations imposed by the organisers of the Congress on its scope resulted in an overall impression of a strong 'academic' flavour: only the general lecture by Professor Boreskov on the theoretical bases of selection, preparation and use of industrial catalysts served partially to restore the balance. In the papers reviewed here, there were two recurrent themes, first, the detection and description of reaction intermediates, using a variety of techniques and approaches, and secondly the role of the support, with particular reference to the possible activation of the support by the metal, for which concept there is now much indirect evidence. It remains to be seen to what extent these issues are clarified before the next Congress, which it is hoped will be held in the Soviet Union in 1968.

G. C. B.

Effect of Rhodium on the Gold-Platinum System

Those gold-platinum alloys used for the manufacture of spinning jets in the production of viscose rayon have for many years been modified by small additions of rhodium, which appeared to broaden the miscibility gap and assist age-hardening. A recent X-ray study by Raub and Falkenburg (1) has shown that approximately 2 atomic per cent of rhodium completely eliminates the gold rich solid solution which normally contains 20 per cent or more of platinum. Although rhodium also reduces the solubility of gold in platinum, the effect is not so pronounced, and platinum rich solid solutions extend right across to the rhodium corner of the diagram.

Although Raub had earlier predicted the basic instability of the rhodium-platinum solid solutions it was found that heat treatments extending up to four years at 600°C failed to produce any evidence of separation. The binary gold-rhodium system was also examined. At the peritectic temperature of 1068°C saturation concentrations of the terminal solid solutions were found to be 1.5 atomic per cent of rhodium and 0.3 atomic per cent of gold.

In 1951, Grube, Schneider and Esch (2) attributed some additional lines on the diffraction pattern of a gold rich gold-platinum solid solution to an ordering reaction based on the Au-Pt composition. No other workers have hitherto detected these lines. Raub and Falkenburg, however, developed similar "sideband" structures simply by annealing the alloys for 1,000 hours in the solid solution region. The lattice parameter of this additional face-centred cubic phase increased rapidly with platinum content. This behaviour cannot easily be explained by an ordering reaction and will require further investigation.

A. S. D.

References

1 E. Raub and Günter Falkenburg, *Z. Metallkunde*, 1964, **55**, (7), 392–397

2 G. Grube, A. Schneider and M. Esch, *Heraeus Festschrift*, 1951, 20