former increases the rate of hydrogenolysis of n-pentane by two orders of magnitude compared to pure nickel, and the latter significantly increases the rate of n-pentane isomerisation compared to pure platinum. The results are explained in terms of electronic modifications of the metals at these compositions. J. R. Bernard and J. L. Bousquet, of the Societé Nationale Elf Aquitaine, and P. Turlier, Institut de Recherches sur la Catalyse, investigated the selective hydrogenolysis of alkanes to ethane over platinum-iridium catalysts. The subsequent steam cracking of ethane to ethylene is thought to result in much higher yields than conventional pyrolysis of the same alkane feedstock would produce.

Methanation/Fischer-Tropsch Synthesis

An increased interest in alternative energy sources and the expected shortage of natural gas has led to a renewal of interest in methanation and the Fischer-Tropsch synthesis. The distribution of products in this synthesis over cobalt, iron and ruthenium catalysts has been studied by R. B. Pannell, C. L. Kibby and T. P. Kobylinski of Gulf Research and Development, U.S.A. The turnover number on ruthenium was found to be substantially higher than on cobalt and both catalyst systems produced decreased olefin content, lower average carbon number and increased chain branching with increasing hydrogen:carbon monoxide ratio. The methanation of carbon dioxide over rhodium on alumina catalysts revealed that this reaction proceeds eight times faster on this catalyst than the methanation of carbon monoxide and the activation energy is also lower. The influence of support was examined by F. Solymosi and A. Erdöhelyi of The University, Szeged, Hungary, and titania was identified as the most, and silica the least, effective.

The individual steps occurring in the methanation of carbon monoxide have been analysed by D. L. Trimm and E. R. Karal of the Technical University of Norway with the aim of designing catalysts to accelerate the reactions involved. A large number of catalysts were tested and several were found to be superior to a commercial methanation catalyst. One of the best catalysts was a nickel-chromium system promoted with rhodium and platinum.

Conclusion

The outstanding importance of the platinum metals in catalysis was once again confirmed by the number of papers which described their use. There is a growing awareness regarding the interaction of noble metals with support materials which can modify the activity and selectivity of catalysts. Interest remains high in catalysts for hydrogenation, hydrogenolysis and isomerisation reactions in the petrochemical industry where bimetallic catalysts are now well established. There is also a growing interest in catalysts for the production of synthetic petrochemicals. One of the major growth areas in catalysis is in the anti-pollution area, especially with regard to automobiles, and this was reflected by the presentation of several papers on this topic. B.H.

The Niobium-Palladium System

The production of accurate alloy constitution data is not generally considered to be a popular pursuit at present. It is therefore all the more commendable to see that the extended collaborative study under way on alloys of the Group V transition metals with some of the platinum group is continuing to produce valuable information. The latest phase diagram published (B. C. Giessen, N. J. Grant, D. P. Parker, R. C. Manuszewski and R. M. Waterstrat, *Metall. Trans.*, 1980, **11A**, (5), 709–715) is concerned with the niobium-palladium system over the full range of compositions. Terminal solubilities are reported to be high, with a maximum of 36 atomic per cent palladium in α-niobium at 1520°C and 31 atomic per cent niobium in α-palladium at 1610°C. The presence of three intermediate phases is confirmed in the system, $NbPd_2$, α-$NbPd_3$ and β-$NbPd_3$. Full crystallographic and lattice spacing data are given for these phases. A further phase NbPd was found at high temperatures only, and is possibly an extension of the α-palladium cubic solid solution. Discrepancies between this and previous work on the intermediate phases in the system are now largely resolved.