potassium hydroxide solutions in their experiments. Measurements made by this group indicated that below 80°C non-precious metals did not work very well, while of the platinum group metals platinum, palladium, palladium-platinum alloys and platinum-rhodium alloys were the most active at ambient temperatures.

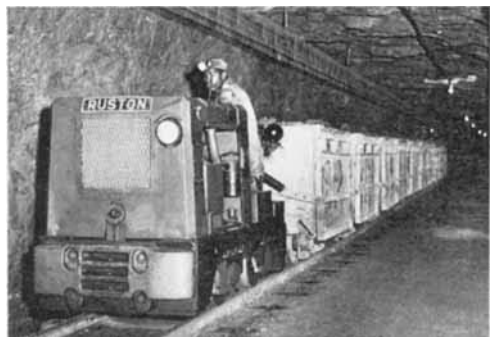
The study of alloys of the platinum group metals for fuel cell applications continues to attract interest. Thus J. H. Fishman of Leesona Moos Laboratories had investigated the use of palladium-gold alloys for oxygen reduction in alkaline media. When a foil was used, a maximum in the activity versus composition plot was obtained with alloys containing 35 to 40 atomic per cent gold, and a sharp decrease in activity was observed in alloys containing greater than 80 atomic per cent gold. Similar behaviour was found when finely divided alloy powders were used, the activity maximum now occuring at 50 atomic per cent gold, sharply declining at 60 atomic per cent gold, irrespective of the method of preparation of the alloy.

J. Bersier of Siemens has investigated the diffusion of hydrogen through silver-palladium alloys, since the use of such alloys in the construction of non-porous diffusion electrodes avoids the difficulties arising from the brittleness and cracking experienced with pure palladium. Measurements of the diffusion coefficient of hydrogen as a function of hydrogen concentration and temperature in the range 30 to 300°C show that it is largely governed by the concentration of occluded hydrogen, and that for the 23 per cent silver-palladium alloy a definite minimum occurs in the concentration range 0.1 to 0.2 H/Me not explicable by the existence of a two-phase zone in the alloy.

D. E. W.

Further Expansion in Platinum Production

A NEW REFINERY IN SOUTH AFRICA



Although a further increase in the output of platinum to 750,000 ounces a year was announced by Rustenburg Platinum Mines as recently as October of last year, yet another step in the expansion programme has been decided upon. Plans to increase mining capacity to an annual equivalent of about 850,000 ounces of platinum – with corresponding amounts of the other platinum metals – have been put in hand and are expected to begin yielding these additional amounts of metal by the end of 1969. The capital expenditure involved in the complete expansion programme over the years 1967 to 1971 will exceed £15 million.

Extensions to the smelting and refining facilities are also in hand both at Matte Smelters (jointly owned by Rustenburg and Johnson Matthey) and at the Johnson Matthey plants in the United Kingdom.

In addition, Johnson Matthey have decided, subject to the necessary Government authority being granted, to build a platinum refinery as an extension to the operations already carried out at Wadeville by Johnson Matthey & Co South Africa (Pty) Limited. This new refinery will be constructed and equipped during 1968 and will come into operation in the early part of 1969. It will take partially refined material treated by Matte Smelters at Rustenburg and produce pure platinum, palladium, rhodium, iridium, ruthenium and osmium as well as their compounds. The new Johnson Matthey refinery at Wadeville will complete the plans for handling Rustenburg's increased output and will, for the first time, make platinum metals available in marketable forms in South Africa.