iridium ions; deposition rates were about 10 μm (0.4 mil) per hour. However, in one group of experiments 2.5 μm (0.1 mil) deposits were made on nickel discs with cathode current efficiencies up to 66 per cent. Apparent anode current efficiencies were sometimes less than 100 per cent, but more often they were 120 to 150 per cent. The best deposits of iridium were made when the cathode was rotated at 120 rpm. Deposits made on stationary cathodes were often cracked and non-adherent; deposits on cathodes rotating at 30 rpm were better, but even these had some loose material.

Electroforming

Platinum and iridium crucibles were electroformed from molten cyanide baths by the electrodeposition methods previously described, using mandrels of copper for platinum and of molybdenum for iridium. The general procedure was to electroplate the platinum group metal on the mandrel to the desired thickness in a series of successive deposits, with careful grinding and polishing of the surface between deposition periods. The initial deposit of platinum or iridium was always made over the entire surface of the mandrel, including the top. Later deposits were made on enough of the mandrel surface to give a crucible of the desired depth. When the deposit reached the desired thickness the top of the piece was cut away and the mandrel was dissolved away with nitric acid.

Crucibles electroformed in this way are shown in Figure 4. Crucible (A), made of ridium, is 0.75 inch deep and has a 1 inch inside diameter with a 5 mil wall thickness. The crucible (B) is of platinum; it is 1 inch deep, the inside diameter is $\frac{3}{4}$ inch, and the wall thickness is 5 mils. Crucible (C) is also made of platinum and has a thermocouple well for differential thermal analysis work. This crucible is $\frac{5}{8}$ inch deep with a $\frac{1}{2}$ inch inside diameter and a wall thickness of 15 mils.

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Catalysts for Removing Oxygen from Stack Gases

A number of processes have been developed for the removal of air pollutants such as nitric oxide and sulphur dioxide from stack gases and one of these catalytically reduces the pollutants with carbon monoxide. Stack gases generally contain 1 to 3 per cent oxygen and there are a number of reasons why it is necessary to remove this prior to the gas entering the main catalytic reactor.

Ajay Sood, C. W. Quinlan and J. R. Kittrell of the University of Massachusetts have reported a comparison of the activities of several catalysts for the reduction of oxygen with carbon monoxide, both in the presence and in the absence of sulphur dioxide (*Ind. Eng. Chem., Prod. Res. Dev.*, 1976, **15**, (3), 176–179). Although initial testing of the catalysts was done using dry cylinder gas, three catalysts were also evaluated using wet flue gas.

The results demonstrated that in the presence of sulphur dioxide, of which 2500 ppm are typically present in stack gases, supported platinum and palladium catalysts were superior to the others tested. It is concluded that both alumina supported platinum and palladium have potential for the removal of oxygen from stack gases. The relative activity of these two was difficult to compare because of the experimental conditions; the platinum being supported on monolithic alumina while the palladium was on pellets.