wire can be repeatedly subject to thermal cycling without degradation of mechanical and electrical properties. The conductor can be used up to the melting point of 50 per cent silver-palladium, which is above 1200°C.

The high temperature electric motor is an hysteritic shaded-pole synchronous a.c. motor with four principal components: the field windings, the field pole-pieces, the armature, and the shading elements. It is the field windings which consist of a 24-turn coil made from 0.030 in. NiO-clad 50 per cent silver-palladium wire.

Field pole-pieces consist of laminated 6 per cent silicon-iron. The armature incorporates 6 per cent tungsten steel laminations with shaft and bearings of Lucalox and housing of sintered alumina. The shading elements are made of silver.

Cycling of the motor to 400°C presented no difficulty and subsequent sustained operation at 575°C was also successful. The motor proved to be synchronous and self-starting up to the Curie temperature of the silicon-iron field laminations at about 725°C. Above this temperature the motor would stop but it restarted on cooling through the Curie point. There were some lubrication difficulties with the motor but the efficacy of the NiO-clad silver-palladium conductor at high temperatures was proved without a doubt.

General Electric claim that this "red hot" motor has operated at the highest-ever temperature for an electric motor. They also claim that the alloy on which the device was based exhibits excellent consistency in its electrical and mechanical characteristics over relatively long periods. The electrical resistance, for example, remained unaltered during eight months' testing at high temperature.

While there is no obvious demand for an electric motor operating in such conditions, it is clear that the excellent properties of the platinum metals at high temperatures make them prime candidates for consideration in other devices for severe environments.

Platinised Platinum Electrodes

PROPERTIES AND METHODS OF PREPARATION

Although it is more than 75 years ago that the idea of electrodepositing platinum black on to a platinum electrode was first proposed by Lummer and Kurlbaum working at the Physikalisch-Technische Reichanstalt in Charlottenberg, and then adopted by Kohlrausch, a certain vagueness seems always to have characterised the procedure.

The platinised platinum electrode has of course become thoroughly established, not only as the basis of hydrogen reference electrode, but also as an electrocatalyst in much of the work that has contributed to the development of the fuel cell. The primary object is to attain the maximum possible surface area combined with good adhesion, and it was for the latter purpose that the original workers hit upon the idea of adding a small concentration of lead acetate to the plating solution. This recipe has indeed stood the test of time, but more modern methods of investigation have naturally increased our knowledge of the mechanism involved and of the structure and properties of the deposit, as well as its reproducibility. None the less, a variety of procedures is still recommended in laboratory textbooks.

An excellent and comprehensive survey of the whole subject has now fortunately been prepared by two workers in the Department of Chemistry at Imperial College, London, A. M. Feltham and M. Spiro (*Chem. Rev.*, 1971, **71**, (2), 177–193). This reviews the quite extensive literature (there are no less than 107 references) and provides in one convenient form a permanent record of all the many investigations on various aspects of the subject. Electrode kinetics and mechanism are fully covered, the methods of electrodeposition and the mechanism of nucleation and growth of the deposit are reviewed, and finally a survey is provided of the numerous procedures recommended over the years, with final recommendations based upon the authors' investigations.

L. B. H.