The ability to quantify the free energy of formation of the surface reaction intermediates by means of the half wave reduction potential presents us with a powerful tool for comparing catalysts of different metals and the effects of alloying and multimetallic composite catalysts.

Finally, there is much useful background information in this area contained in a recent review (8) and in the results obtained by Russian workers who originated and developed the electrochemical technique that has been publicised by D. V. Sokolskii (3, 4). Particularly we would refer the reader to the latter for information on how different metals affect the half wave reduction potential and for some of the linear free energy correlations between half wave reduction potentials and activation energy on the one hand and the effects of electrophilic benzene substituents in hydrogenation substrates on the other.

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Glassy Alloys Containing Platinum Group Metals

Amorphous Metallic Alloys, EDITED BY F. E. LUBORSKY
Butterworth & Co. (Publishers) Limited, London, 1983, 534 pages, £35

Amorphous metallic alloys have great scientific and technological importance in the field of materials science. The above-named book, one of the Butterworth's Monographs in Materials series, brings together much of our basic knowledge and understanding of the atomic, electronic and structural behaviour of such materials with emphasis on magnetic, superconducting, thermal and chemical properties and techniques of production.

In the section dealing with chemical properties of amorphous metallic systems, a series of palladium-phosphorus alloys are mentioned which have been specifically designed as anode materials for the electrolysis of sodium chloride solutions. These materials have shown high catalytic activity for chlorine evolution with low activity for oxygen evolution while maintaining good corrosion resistance in the hot aqueous environment. Surface-activated amorphous palladium-phosphorus alloys for use as fuel cell electrodes are also described where it has been observed that these systems show higher catalytic activity for the oxidation of methanol and its derivatives than either platinised platinum or surface-activated crystalline palladium.

Refractory metal-metalloid superconducting glasses, particularly those of molybdenum-ruthenium-phosphorus and molybdenum-rhodium-phosphorus, show unusually high transition temperatures compared with their crystalline counterparts which is in contrast to normally expected behaviour. In the readily formed glass systems of the early transition-late transition alloys where the late transition metal is one of the platinum group elements, eutectic temperatures are generally high (>1500°C). However, with devitrification temperatures in excess of 725°C it is surprising that few systems have been investigated; those reported include 55 niobium–45 iridium and 55 tantalum–45 rhodium.

The book contains references to 193 amorphous metallic alloys of which 39 involve one or more of the platinum group metals. It is evident, however, that glassy alloys which contain a platinum group metal are still at the level of scientific interest with few systems being examined for technological application.

With the knowledge that a great deal of work is continuing in this field, our increasing understanding of amorphous alloy behaviour should lead to novel products. I.R.M.