the chemistry of the environment varies much more widely in the ground application.

Conclusion

In twenty-five years, the platinised titanium electrode has grown steadily in stature. Of the many lessons that can be learnt from its successful applications two that come particularly to mind are: the need to make bold decisions when the first steps are taken to launch a new product, and the fact that much more knowledge has been amassed on the chemical/electrochemical behaviour of platinum, providing academics with a wealth of phenomena to investigate over the coming years.

Platinum is indeed a technically fascinating metal, no doubt still hiding many more secrets.

Acknowledgement

Loresco® is a proprietary product of the Cathodic Engineering Equipment Co. Inc., Hattiesburg, U.S.A.

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Hydrogen Detector Uses Silver-Palladium Probe

Embrittlement caused by hydrogen inclusions is a well known phenomenon which affects many metals and alloys including steel, titanium, zirconium and uranium. The mechanism by which embrittlement occurs varies with the metal or alloy under attack, and in certain alloys failure can result from the incorporation of less than 10 ppb of hydrogen. This can happen at any stage in the initial manufacture or subsequent processing, or by corrosion during service. Its effects could be catastrophic in the case of high strength steels and titanium alloys used in the nuclear, petrochemical, power generation and aircraft industries. Clearly, there is an industrial requirement for probes able to detect minute traces of hydrogen.

A recent development by the Lawrence Electronics Company of Seattle, Washington, has resulted in a probe which utilises the unique properties of the platinum group metals, particularly palladium and its alloys, to rapidly dissociate and absorb hydrogen (G. M. Lawrenson and J. F. Lawrence, Proc. 18th Annu. Airline Plat. Met. Finish. Forum, Orlando, Florida, March 16th–18th, 1982; reprinted as SAE 820604; see also T. Archbold, J. Sukalac and J. C. Picard, Third Int. Cong. Hydrogen Mater., Paris, June 1982).

The probe, which may for example be used to measure the hydrogen gas given off during the corrosion of steel or present in steel as a result of cadmium plating, incorporates a glass encapsulated ion gauge with a 25 weight per cent silver-palladium capillary needle which acts as diffusion membrane between the sampling environment and the detector. A tungsten filament inside the capillary heats the silver-palladium to a temperature at which hydrogen has high diffusivity. Therefore the hydrogen enters the test chamber where it is ionised by the electron current flowing between the electron emitter and the electron collector. The H^+ ions are attracted to the hydrogen collector where an electric current proportional to the hydrogen pressure is generated. The high sensitivity and short response time of the detector enables it to be an effective means of measuring hydrogen present in parts per billion. D.J.A.