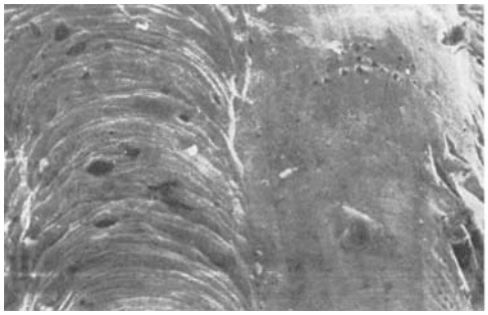

Fig. 15 This arc track across a platinum clad electrode surface, as seen under the scanning electron microscope, indicates melting of the platinum; the evidence suggests that melting and vaporisation are the major causes of platinum loss. The directions of plasma flow and arc movement are from top to bottom on the micrograph, which is reproduced here at a magnification of ×600 approximately. Reprinted from Reference (5)

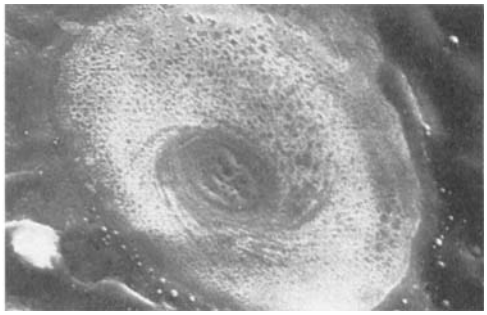

Fig. 16 An arc termination point on a platinum clad electrode surface again shows melting of the platinum, indicating that this is a cause of platinum loss during power generation. The magnification here is approximately ×1200. Reprinted from Reference (5)

electrodes or captured in the slag. However the amount is difficult to estimate, and therefore zero platinum recovery has been assumed. Thus neither the cost nor the availability would prevent the use of platinum for this potentially important application.

Testing anodes clad with platinum and with platinum plus stainless steel continues, with the objective to demonstrate 2000 operating hours. To date the electrodes have accumulated about 1300 hours. Basic studies of arcing and arc erosion on platinum electrodes are proceeding concurrently.

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Light-Assisted Oxidation of Cyanide Wastes

Many industrial processes including the case hardening of steel, electroplating and ore refining can result in waste waters that contain toxic concentrations of cyanide. These may be destroyed by alkaline chlorination or direct electrolytic oxidation, but the former produces considerable volumes of sludge for disposal while the latter incurs high energy costs.

However, recent work by C. E. Byvik of the National Aeronautics and Space Administration's Langley Research Center and A. Miles of Southern University has demonstrated another oxidation technique, and this is effective in reducing cyanide concentrations to levels which are significantly below those achieved by established methods ("Solar-Assisted Oxidation of Toxic Cyanide", LAR-13171/TN, *NTIS Tech. Notes*, October 1985).

In their solar-assisted oxidation technique, oxygen-containing air is bubbled through the waste cyanide solution, in which platinised titania powder is suspended, while it is subjected to either artificial or natural sunlight. The platinised semiconducting powders can be recovered and reused, and the results suggest that the process could become an effective and inexpensive method of treating cyanide-containing industrial waste water.