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## Activity of Platinum-Containing Electrodes Enhanced

The extraction of zinc from its ores by electrolysis in aqueous solution provides a high purity product and is the method used for winning a substantial proportion of world zinc output. The process is energy intensive, but energy efficiency was not a consideration in the design of existing electrowinning plants, which are generally sited close to sources of cheap hydroelectricity. Now, however, various attempts are being made to develop more efficient processes.

In conventional electrowinning of zinc oxygen gas is evolved in the cell, as an unnecessary by-product, and this accounts for a substantial part of the cell voltage. In a new process this oxygen evolution is replaced by the anodic oxidation of sulphur dioxide produced during the smelting process, or by the anodic oxidation of hydrogen. For this new process to be feasible the anode has to have high electrocatalytic activity for the oxidation of sulphurous acid. Previous work has demonstrated that after suitable activation amorphous nickel-valve metal

alloys containing 1 per cent platinum group metal, and other elements, display enhanced activity for anodic sulphite oxidation in a neutral borate buffer solution. Now the same investigators at the Institute for Materials Research at Tohoku University, Sendai, Japan, have reported on their evaluation of the effect of cathodic reduction on the catalytic activity for anodic oxidation of sulphite on electrodes prepared from amorphous nickel-valve metal-platinum group metal alloys (T. Mori, A. Kawashima, E. Akiyama, H. Habazaki, K. Asami and K. Hashimoto, *J. Appl. Electrochem.*, 1995, **25**, (10), 953-961).

After immersion in hydrofluoric acid and subsequent cyclic voltammetry in sulphuric acid, their electrodes were subjected to galvanostatic cathodic reduction before assessment. Addition of platinum, together with rhodium, iridium or ruthenium, to amorphous nickel-40 niobium was found to be particularly effective in improving the catalytic activity for sulphite oxidation.