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—Note—

# PREPARATION OF IRIDIZED ELECTRODE BY REDUCTION METHOD

By

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OBRUCHEVA *et al.*[1] were the first who tried to obtain an iridized electrode of large surface area by electrolytic processes. Recently PETRII and NGUEN van TUE[2] have successfully obtained an iridized electrode of large surface area on a platinum net (roughness factor 100-200) by the electrolysis of aqueous solution of sodium hexachloroiridiidate ($Na_2IrCl_6$). The present author has developed a variant of this method by reducing the aqueous $Na_2IrCl_6$ solutions by hydrogen without employing an electrolytic current. The experimental procedures of this reduction method are reported in this note.

A platinum net of 80 mesh, geometry 4 cm × 9 cm, and apparent area ca. 90 $cm^2$, was used as a base metal. After the pretreatment of the platinum net as described in the work of PETRII and NGUEN VAN TUE[2], the net was hung on a platinum hook in the cell, in which the solution of 0.1 N HCl containing 2 wt. % of $Na_2IrCl_6$ was introduced a few tens m$\ell$ in volume. This net electrode showed an open circuit potential of 0.9 V (*vs.* R.H.E.) in the air or nitrogen atmosphere. When the air or nitrogen gas was replaced by hydrogen, the electrode potential decreased gradually and reached a value less than 100 mV after a few hours. It was found that hydrogen is consumed in the course of the potential decay.

The platinum net was kept under the hydrogen bubbling for about 20 hours until the dark red-brown color of the iridium complex ion in the solution disappeared completely. Then almost all of iridium in the solution was precipitated on the platinum net whose color was changed to charcoal-grey. The amount of the iridium precipitates increased by repeating the procedures described above with new fresh solution.

The surface area of this iridized electrode is determined from the amount of the adsorbed hydrogen atoms in the hydrogen region of the charging curve.[3] The values of the surface area determined in this way are plotted against the amount of iridium in the solution in the Figure. As seen from this Figure, the surface area of the iridium black of 2 $m^2$ is obtained from 5 g of iridium in the solution, and the roughness factor of this iridium black reachs about 200 which equals nearly that obtained by the

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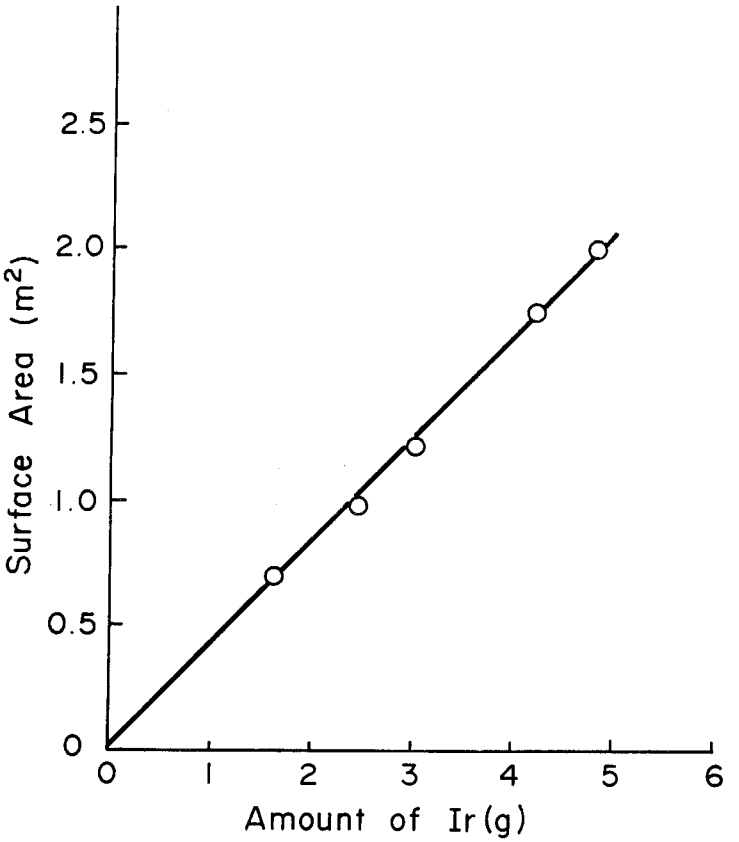


Relation between surface area of iridized electrode and amount of iridium precipitated on a platinum net.

electrolysis method.[2]

The deposition of iridium on the glass wall of the cell or the precipitation in the solution was hardly detected during the course of the reduction processes. The rate of the decrease of the surface area by the recrystallization of the iridium black prepared in this way was so slow that the surface area of 2 $m^2$ diminished to 1.4 $m^2$ after one year in the air. The adsorption characteristics of the iridium black thus prepared have been reported elsewhere.[4]

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## References

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3) A. D. SEMËNOVA, A. I. PLETJUSHKINA and G. D. VOVCHENKO, Vestn. Mosk. Univ., Series Khim., 1968, 45.
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## Erratum

To correct our unfortunate oversight, the year of publication which appears in the reference at the head of each article in Vol. 24, No. 3 of this Journal should be changed to 1976. For example, the first line of p. 149 should read

J. Res. Inst. Catalysis, Hokkaido Univ., Vol. 24, No. 3, pp. 149 to 158 (1976)

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