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NOTE

Preparation of Supported Noble Metal Blacks by Wet Hydrogen Reduction

A new method has been found for supporting platinum metals on certain supports. If hydrogen is bubbled through an aqueous solution of noble metal chloride (e.g., chloroplatinic acid) in which a wetable support is suspended, the salt is reduced to give a metal black that is totally supported.

Skita and Meyer (*1*) reported that bubbling hydrogen through a solution of chloroplatinic acid will result in the reduction of the salt to give colloidal platinum black. When this was tried, no reaction occurred. When, however, a small amount of a wetable support, e.g., asbestos or silica, was present in the reaction vessel, the formation of platinum black proceeded readily. Electron micrographs revealed that the platinum black was entirely adhered to the support.

Five grams of platinized asbestos was prepared as follows: A solution of 1.25 g of chloroplatinic acid (from Engelhardt Industries, 40% platinum) in 50 ml of water was prepared in a 100-ml conical test tube and 4.55 g of asbestos was added to the solution. Electrolytic hydrogen was vigorously bubbled through the reaction vessel to accomplish mixing and reduction. Hydrogen bubbling was continued for 15 min after the yellow color of the chloroplatinic acid disappeared (total time 30–45 min). The reaction was carried out at room temperature.

Asbestos- and silica-supported platinum, ruthenium, rhodium, palladium, and iridium blacks were prepared by room temperature, wet hydrogen reductions from aqueous solutions of the respective chlorides.

A number of materials other than asbestos and silica were tried as supports, and it was found that only those which were wet by water would promote wet hydrogen reduction. It is thought that the presence of the wetable support promotes the reduction by providing a surface on which the reaction can take place. Electron micrographs show that the noble metal blacks were deposited on the surface of the supports.

REFERENCE

1. SKITA, A., AND MEYER, W. A., *Ber.* **45**, 3580 (1912).

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