Anode (der Platinelektrode) abscheidenden Niederschlags entspricht der Formel PbO₂ (F = 0,8662). Kleine Bleimengen (bis 17 mg) scheiden sich innerhalb 30 min vollständig ab.

Literatur


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2-Mercaptobenzimidazol (2-Benzimidazolethiol) as a Colorimetric Reagent for Palladium

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With 3 Figures in the Text

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The use of 2-mercaptobenzimidazole, HN—C—SH, as an analytical reagent was introduced by Kuraz. He prepared a number of salts of the reagent with certain heavy metals and also evolved methods for the gravimetric estimation of copper, cadmium and lead, the last two elements being determined by direct weighing of their compounds. Pyrolysis curves of cadmium and lead compounds have been later studied by Duval. According to Dubsky, the bismuth and copper precipitates are of the inner metallic complex type, but this assumption is not favoured for lack of conclusive data.
2-Mercaptobenzimidazole as a Reagent for Palladium

Steigman has reported that 2-mercaptobenzimidazole yields an orange-yellow precipitate with palladium solutions and it could be employed as a specific reagent for the detection of palladium. An attempt was made in this laboratory to determine the composition of the palladium compound precipitated from acid solutions. The palladium and the sulphur contents of the precipitates, obtained under different conditions of acidity (hydrochloric acid), was, however, found to vary. The composition, Pd (C₇H₆N₂S)₂, is reported by Majumdar and Chakrabarty, who precipitated the compound at pH 5.0—10.1. They also estimated palladium with this reagent in presence of many cations, using EDTA as a masking agent. Dutta has recently employed the reagent for the gravimetric determination of silver in ammoniacal medium.

An outline of the method for the spectrophotometric determination of palladium using the reagent was reported earlier in a note. This communication presents the full details and description of the method. The optical density of the orange-yellow colour, developed in aqueous medium at pH 1.0—2.6 by the addition of an alcoholic solution of 2-mercaptobenzimidazole to very dilute palladium solutions, was measured at 380 m\(\mu\). The colour system was found to obey Beer's law.

The orange-red precipitate of palladium-mercaptobenzimidazole (from hydrochloric acid solutions) is soluble in iso-amyl alcohol. But spectrophotometric determination of palladium after extracting the compound by iso-amyl alcohol was not possible, as the colour intensity of the extract was found to diminish with time.

Experimental

Apparatus. All the absorption measurements were carried out with a Unicam SP 600 spectrophotometer using glass cells of suitable thickness, 5 mm, 10 mm, or 20 mm.

Measurements of pH were made with a Cambridge pH meter (Bench type) using glass and saturated calomel electrodes.

Solutions. Standard palladium solution: A stock solution of palladium was prepared by dissolving palladous chloride (Johnson Matthey & Sons) in concentrated hydrochloric acid (G. R. — E. Merck) and diluting with distilled water. This solution was standardised by the dimethylglyoxime method.

Reagent solution: 1% (w/v) solution of 2-mercaptobenzimidazole in 95% ethyl alcohol. 2-Mercaptobenzimidazole was prepared according to the method of Van Allan and Deacon, from o-phenylenediamine and potassium ethyl xanthate.

Solutions of foreign ions: Prepared from reagent grade chemicals.

Absorption Curves

The absorption maxima of the orange-yellow solution and of the reagent solution were found to lie in the ultra violet region (cf. Fig. 1, p. 252). The most suitable wave length for measurements of optical density was chosen as 380 m\(\mu\).