Summary

A rapid and simple method for the preparation of antimony-free arsenious oxide has been described, and also an application of this method to the qualitative detection and rough quantitative estimation of minute amounts of antimony in arsenious oxide.

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NOTE

An Inexpensive Pyrex Conductivity Cell.—Because of its small thermal expansion and its chemical resistance, pyrex glass is most suitable for the construction of conductivity cells, hydrogen electrodes and similar apparatus. Unfortunately there is considerable difficulty in making satisfactory seals of platinum to pyrex. The writer recently required a conductivity cell which would be gas tight at five atmospheres' pressure and withstand the action of solutions of sulfur dioxide, so that a pyrex cell seemed advisable if it could be constructed. The makers of pyrex were not able to recommend any suitable method of construction but eventually by making use of the suggestions of Housekeeper[1] a suitable cell was made. As the cell is easily and cheaply made and as the construction may be readily modified for other uses, it is described herewith.

The essential point in the construction is that platinum foil, *if sufficiently thin*, may be fused firmly onto the surface of any glass. The cell used by the writer was in the form of a tube about one centimeter in inside diameter with electrodes about six by twenty millimeters spaced about ten centimeters apart. The platinum foil used was a piece recovered as salvage from a platinum resistance furnace and was in the form of a ribbon 6 mm. wide by 0.7×10^{-3} mm. thick. Somewhat heavier foil would probably be satisfactory but was not tried. A piece of this foil was cut approximately as shown at A and the 1-cm. pyrex tube had a three-millimeter side tube attached, as shown at B. The piece of foil was then put in so that the narrow tail extended into the side tube while the wider portion was bent around the inside of the large tube as shown by the dotted line in B and C. The wide tube was then heated to softening and the foil gently pressed into contact with the softened glass, a heavy piece of platinum wire being used to do the pressing. After this portion of the foil had been attached, the side tube was heated at the junction with the large one until it fell in on the foil. A gentle pinch with the tongs when the glass was soft ensured a tight joint. Enough of the tail projected

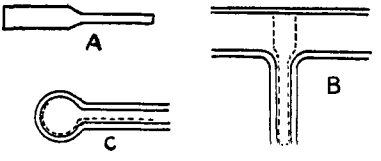

Fig. 1.

[1] Housekeeper, *J. Am. Inst. Elec. Eng.*, **42**, 954 (1923).

beyond the seal to make contact with mercury in the side tube, which could be lengthened and bent in any convenient way. All work was done in an ordinary blast lamp using gas and air. The foil adheres firmly to the large tube and forms an electrode which is definitely fixed. No difficulty was found when the platinum black was deposited and the cell with two such electrodes was used repeatedly at temperatures between 0 and 115° without change in constant. The lead-in seal was definitely gas tight. Although a cell of this kind might be rather difficult to make with electrodes of large area, this difficulty is readily avoided since the modern vacuum tube amplifier renders large electrodes unnecessary. The total weight of the electrode in this case was only about four milligrams, a point not without interest where cost is concerned.

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THE CHEMISTRY OF LIGNIN. III. THE DESTRUCTIVE DISTILLATION OF LIGNIN FROM CORN COBS

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During the past few years a number of papers have appeared on the destructive distillation of lignin. All of the work thus far published has been confined to the lignin isolated from wood. Heuser and Skiölde, brand[1] destructively distilled lignin isolated from spruce sawdust by the method of Willstätter and Zechmeister.[2] Their results calculated on the ash-free lignin were as follows: carbon residue, 50.64%; oil, 13.00%; acetone, 0.19%; methanol, 0.90%; acetic acid, 1.09%.

Hägglund[3] distilled lignin isolated from pine wood by the hydrochloric acid method of Willstätter and Zechmeister and obtained 45% carbon residue, 9.6% oil, 0.10% acetone, 0.67% methanol and 0.64% acetic acid.

Fischer and Schrader[4] distilled Willstätter lignin and obtained 13.2% aqueous distillate, 12.5% oil, 57.2% carbon residue and 17.0% gas (obtained by difference). It was found that 16.4% of the oil dissolved in sodium carbonate and 33.9% in sodium hydroxide solution.

[2] Canadian Pulp and Paper Association Research Fellow.

[1] Heuser and Skiöldebrand, *Z. angew. Chem.*, I, **32**, 41 (1919).

[2] Willstätter and Zechmeister, *Ber.*, **46**, 2401 (1913).

[3] Hägglund, *Arkiv. för Kemi, Min. och Geol.*, **7**, 1 (1918); *Chem. Zentr.*, **90**, III, 186 (1919).

[4] Fischer and Schrader, *Abhand. Kohle*, **5**, 106 (1920).