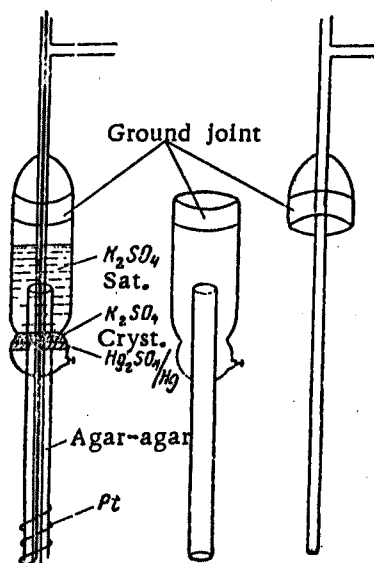


A COMBINED ELECTRODE FOR POTENTIOMETRIC MICROTITRATION

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We have improved the combined microelectrode suggested by B. I. Frid [1]. The presence of a ground joint between the two tubes in the lower part of the microelectrode leads to, according to our observations, such a high resistance in the circuit, that movement of the rheocord handle in the MOSKIP potentiometer 2-4 divisions to the right or left of the compensation point does not lead to any appreciable deviation in the galvanometer needle. This excludes the possibility of establishing the compensation point, and, consequently, the exact value of the e.m.f. in the circuit.



Improved microelectrode for potentiometric titration.

Moreover, on keeping the combined electrode in the operating state for a long time, as a result of evaporation of water, crystals of KCl or K_2SO_4 start to grow. When this occurs the lower ground joint seizes up.

In order to eliminate these drawbacks we suggest that a number of alterations be made to the constructional details of the apparatus, while still retaining the basic features and dimensions suggested by B. I. Frid for the combined electrode. The simplest method of increasing the sensitivity of the apparatus, and avoiding seizing of the ground joint is to wind the fine tube at the ground joint with a layer of filter paper and seal the vessel with a rubber stopper so as to prevent evaporation of water.

It is also possible (see the diagram) to do away altogether with a ground joint in the lower part of the tube and to switch it over to the upper part, ensuring thereby that the apparatus is hermetically sealed at the same time.

The space between the inner and outer tubes is then filled with agar-agar containing potassium chloride, which does not flow out even when hot solutions are titrated.

Such a modification of the combined microelectrode possesses the sensitivity characteristic of a circuit made up in the usual way from two separate half-elements. It is possible to keep it for a very long time by immersing the lower part of the electrode in a solution of electrolyte which contains agar-agar.

These constructional modifications have justified themselves in practice during the titration of small volumes by various potentiometric methods.

LITERATURE CITED

- [1] B. I. Frid, Trans. Commission on Anal. Chem. AN SSSR 7, 170-173 (1956).