layer, according to which the rate of migration of solid particles suspended in water should be independent of the size and shape of the particles, and should be of the same order of magnitude as the rate of migration of the ions.

(22) The charge on the colloidal particles is probably due to associated ions, which determine the migration, diffusion and permanent suspensibility of the particles.

This investigation will be continued during the following year.

NOTE.

A Contact Process for the Preparation of Ammonia-free Water. —The preparation of ammonia-free water in chemical and water laboratories has usually been limited to one or two tedious processes. Although otherwise inexpensive, the time required and the necessary strict attention to sources of ammonia from corks and joints, as well as the continual testing of the product, have made this chemical a decided luxury. Difficulty in getting certain rather poor waters absolutely satisfactory by the usual distillation induced the author to try the contact process which is described in this article.

A standard method for the preparation of ammonia-free water is tersely described in Richards and Woodman's "Water, Food and Air," as follows: "The ammonia-free water used in this laboratory is made by redistilling distilled water from a solution of alkaline permanganate in a steam-heated copper still..... only the middle portion of the distillate is collected." Modifications of this method are the only procedures described in the literature on water analysis for ammonia-free water, one exception being the method of Weems, Gray and Myers,[1] *using* sodium peroxide.

It is sufficient to say that either process is inefficient and troublesome, even if the final product is satisfactory, which, indeed, is not always the case.

I will now describe a process by which waters containing any ordinary amount of carbonaceous or nitrogenous material can be rendered perfectly free from the same, and the whole done by a process extremely simple in outline.

[1] *Proc. Iowa Acad. Sciences*, **10**, 112, and abstract *J. Soc. Chem. Ind.*, **22**, 1016.

The method is based on the catalytic powers of finely divided platinum, hence it may be called a catalytic contact process. The steam from the water-boiler is made to pass through a mass of platinized asbestos which is heated to redness. On contact with this reagent any organic or nitrogenous material, or even ammonia itself, is completely broken up and the distillate collected will be found perfectly ammonia-free. Other contact substances are more or less sufficient, but usually require the presence of air, which is not necessary with platinum.

This process requires one distillation only and no chemical whatever; every bit of the distillate is satisfactory, if the contact was at the right temperature before starting the steam through. The apparatus required is, of course, quite simple. The precautions to be observed are chiefly the following:

The contact substance must be porous so as to offer no hindrance to the passage of the steam.

The contact should be held firmly so that sudden puffs of steam do not dislodge and pack the material.

The contact material ought to be heated to redness and kept at this temperature during the distillation.

The distillate will be very hot and the tin condenser used should be thoroughly cooled where it joins the contact tube. Of course, the water will collect in the front end of the contact tube unless it is kept hot, also, if a glass tube is used and any packing of the contact occurs, the tube yields to the pressure and soon bursts. To obviate cracking and bursting, metal tubes should be used. The tube can be joined directly to the condenser tube by soldering, while a litharge-glycerine joint will serve admirably at the boiling-end.

By properly observing these precautions the process works successfully and from the poorest water will furnish quickly and easily a most satisfactory product. H. B. PULSIFER.

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