As to the time required for the action to complete itself, the same results were obtained after a few minutes and after several days, showing that the equilibrium is very quickly established.

A similar series of experiments carried out with potassium chloride and filter paper gave analogous results, the adsorption, however, beginning at twentieth-normal, and only rising to something over 5 per cent. of that present at five-hundredth-normal concentration.

The work is being continued and promises further interesting results.

The Determination of Manganese in Iron and Steel.

W. A. Noyes and G. H. Clay.

The process proposed involves no new principle, but is a combination of several old methods.

REAGENTS.

Ferrous ammonium sulphate.—Dissolve 8.56 g. crystallized ferrous ammonium sulphate in water containing 40 cc. of dilute sulphuric acid (25 per cent.) and make up to one liter.

Potassium permanganate.—A standard solution of such strength that 1 cc. is equivalent to about 0.001 g. Fe. The manganese equivalent for the present method is found by multiplying the iron equivalent by $\frac{55}{112}$

Sodium acetate.—Thirty grams of crystallized sodium acetate, 30 cc. of acetic acid (30 per cent.) and 170 cc. of water.

Bromine water.—A saturated solution.

PROCESS.

Dissolve 1.5 grams of the sample in 20 cc. of nitric acid (1.20) and 5 cc. of hydrochloric acid (1.12). Heat till dissolved, transfer to a 300 cc. flask, add a solution of sodium carbonate till nearly neutral and then zinc oxide slowly till the precipitate of ferric hydroxide forms. After two minutes add an excess of zinc oxide.

Make up the volume to 300 cc., mix by pouring back and forth into a dry beaker and filter through a dry filter. Take 200 cc. of the filtrate, add 20 cc. of the sodium acetate solution and 40 cc. of bromine water.

Heat nearly to boiling, stirring occasionally and adding more bromine water, if necessary, till the precipitate of manganese dioxide separates. Filter and wash. The precipitate adhering to the beaker need not be removed, but the beaker must be rinsed thoroughly. Place the beaker under the funnel containing the precipitate and drop upon the latter, from a burette, the solution of ferrous ammonium sulphate till solution is complete, breaking up the precipitate occasionally with a fine stream of water from a wash bottle. Unless the manganese exceeds 0.4 per cent., not more than 20 cc. of the solution need be used. Wash out the filter and titrate the filtrate with the standard permanganate solution. The difference between the number of cc. of permanganate used and the amount which would have been employed if no manganese dioxide had been dissolved in the ferrous ammonium sulphate, multiplied by the manganese equivalent of the solution, will give the amount of manganese in one gram of iron.

The method was tested with solutions containing known amounts of manganese and gave accurate results. The method avoids the evaporation to dryness required by Volhard's method and also gives a very sharp end reaction, while the end reaction of Volhard's method is very difficult to see.

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A New Hydroxy-dihydro-alpha-Campholytic Acid.

W. A. Noyes and A. M. Patterson.

Dihydro-alpha-campholytic acid was prepared by W. M. Blanchard and one of us last year. From this the alpha-brom. derivative, $C_8H_{14}\begin{smallmatrix}-CO_2H\\-Br.\end{smallmatrix}$ and the corresponding hydroxy acid, $C_8H_{14}\begin{smallmatrix}-CO_2H\\-OH\end{smallmatrix}$, have been prepared. When the latter is warmed with lead peroxide and dilute sulphuric acid a ketone is formed which should be identical with the 2–3.3 trimethyl cyclopentanone, prepared synthetically by one of us, if the Perkin-Bouveault formula for camphor is correct. From the melting point of the oximes the two ketones appear to be different, and the formula for camphor referred to seems to be no longer tenable. The rejection of that formula, however, compels us to suppose a transfer of a methyl group from one carbon atom to another in reactions which take place readily at ordinary temperatures under the influence of sulphuric or hydrobromic acid.