manganese sulphate takes up hydrochloric acid, becoming manganese chloride, and the phosphoric acid present was supposed simply to decolorize the ferric iron and keep the solution colorless. But we see now that the phosphoric acid really plays a double rôle, and the addition of manganese sulphate and sulphuric acid is not at all necessary.

As the titration of iron solutions by potassium permanganate is much the preferable method in technical work, owing not only to its rapidity and ease of execution, but also to the sharpness of the end reaction, it seems to me that any suggestion that will tend to improve the method and make it more general of application cannot fail to be of great value to technical chemists generally. GEORGE J. HOUGH.

The Action of Coke on Solutions of Ferric Chloride.—In a previous communication[1] the author gave some data showing the extent to which iron is removed from a solution of ferric chloride by filtration through coke.

The opinion was then expressed that this action was largely due to sulphur compounds which had not been wholly removed from the coke. A new series of experiments has been made to test this view, such precautions to eliminate sulphides from the coke being taken as the author's slender laboratory equipment would permit, and the results have confirmed the author in his opinion. The conclusion is, in brief, that no iron was taken up by coke so treated, from an approximately decinormal solution of ferric chloride under a variety of conditions, though a part of the salt was reduced to the ferrous condition. Coke similarly prepared did not abstract any copper from an approximately decinormal solution of cupric chloride. This last is in accord with the statement of W. O. de Coninck,[2] who, however, originally stated that the iron was abstracted from ferric chloride solution.

The following are the details of the new experiments:

Preparation of Coke.—Ordinary coke was ground and passed through a sieve of 100 meshes to the inch. It was then treated with hydrochloric acid, and after that with a mixture of concentrated hydrochloric and nitric acids. After standing a few days the acids were decanted off and the coke washed repeatedly with water, dried in the air and on the steam bath. Any higher temperature was avoided lest by local superheating residual sulphates should be converted into sulphides. The coke so treated, when heated with hydrochloric acid, gave no fumes capable of darkening lead test-paper.

Ferric Chloride Solution.—To a concentrated and acid solution of ferric chloride, sodium carbonate was added in such quantity that, though

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[1] THIS JOURNAL, 31, 461.

[2] *Compt. rend.*, 130, 1551.

still acid to litmus, the color became essentially that characteristic of basic chloride. The solution was then diluted to the desired strength. Titration with standard potassium dichromate showed 1 cc. = 0.0053017 gram iron.

In each experiment 40 grams of coke and 100 cc. of ferric chloride were used.

Experiment 1.—The solution was percolated, with the help of a filter pump, through the coke contained in a "Jones reductor" tube. The percolated liquid was then passed through a dry filter paper.

Experiment 2.—Coke was placed in a flask and ferric chloride solution was added to it. The flask was stoppered and allowed to stand 24 hours; its contents were then filtered through a dry paper.

Experiment 3.—Similar to Experiment 2, but that the time was 1 hour only.

Experiment 4.—Similar to Experiment 3, but that a portion of the mixture was removed and filtered after standing only 15 minutes, while the remainder was allowed to stand for a whole hour, so that two separate filtrates were obtained.

Each of the filtrates from the foregoing experiments was titrated with potassium dichromate after treatment with stannous and mercuric chloride in succession. It was found that, as before being in contact with the coke, 1 cc. in each case contained 0.0053017 gram iron. Under the conditions of each experiment it was found that a part of this iron had been reduced to the ferrous state, but the amount of this reduction was in no case determined.

Experiment 5.—A solution (as nearly as possible neutral) of cupric chloride was substituted for that of ferric chloride, but the conditions were otherwise as in Exp. 3. The concentration of the cupric chloride solution was such that 1 cc. = 0.006301 g. Cu. It was unaffected by the addition of the coke, as proved by subsequent titration with sodium thiosulphate.

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Note on the Paper Entitled "Some Organic Tungstates."—In the June number of the JOURNAL I published a brief paper entitled "Some Organic Tungstates." The paper described and identified a number of tungstates of aliphatic amines. I have since received a letter from Dr. Lederer, of the Westinghouse Metallfaden-Gluhlampenfabrik, claiming priority and enclosing a copy of English patent No. 27,002, 1906, in which the following statement occurs:

"For this purpose advantage is taken of the fact that the trioxides and acid hydrates of the said metals (tungsten and molybdenum) combine with ammonia or with mono- and polyamines to form salts, and these salts, either alone or mixed together, with or without the addition of other tungsten or molybdenum compounds or of the metals themselves, are formed into a paste by the addition of an agglutinant, which paste is formed into filaments which are then heated."