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."

From the above it is evident that Dr. Lederer experimented with compounds of tungsten, similar to those described in my paper, with a view to their use in the incandescent lamp industry, but did not isolate the compounds nor determine their composition by analysis. This was the main purpose of my paper. JOHN B. EKELEY.

PARIS, January 10, 1910.

THE BASIC PROPERTIES OF OXYGEN: COMPOUNDS OF DIMETHYLPYRONE AND THE HALOGEN HYDRIDES.

BY D. McINTOSH.

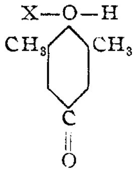
Received February 12, 1910.

In 1899 Collie and Tickle[1] produced crystalline compounds by the addition of various acids to dimethylpyrone. They showed that neither water nor carbonic acid was eliminated by this treatment and that a simple ratio existed between the molecular quantities of the two reacting substances. To explain their results in terms of the current valency theory, they advanced the view suggested many years earlier by Friedel, that in certain compounds oxygen may act as a tetravalent element (the oxonium theory).

Since Collie and Tickle's paper appeared, additive complexes of substances containing oxygen have been widely studied by Baeyer and Villiger, Kehrmann, Hantzsch, Werner and many others.

The salts of dimethylpyrone have naturally undergone careful investigation. Collie and Steele[2] have produced compounds with iodine and hydriodic acid, Weinland and Reischle[3] combinations with hydrofluoric acid, while Plotnikov[4] has described basic and acid salts with chloro- and bromo-acetic acids. The constitutions of these compounds are explained by the assumption of a tetravalent oxygen atom or by the subsidiary bonds according to Werner's theory.

In Collie's first paper dimethylpyrone was represented as a ring containing two divalent oxygen atoms, which for discussion may be termed the ethereal and the carbonyl oxygen atoms. The salts of dimethylpyrone were supposed to have the acid attached to the ethereal oxygen atom, although no reason for its selection was given; and the compounds were represented as



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[1] *J. Chem. Soc.*, **75**, 710.

[2] *Ibid.*, **77**, 1114 (1900).

[3] *Ber.*, 41, 3671 (1908).

[4] *Ibid.*, 42, 1154 (1909).