

A check determination on the amount of dust collecting in the platinum dish during the time for evaporation, showed it to be 0.0002 gram after ignition.

These results would show that as far as purity of the product is concerned, aluminum possesses about the same advantages over glass as tin, in connection with the distillation of water. In lightness and conductivity it exhibits marked superiority to the tin.

For use with neutral organic liquids it is well adapted, more especially in the distillation of low boiling substances such as ether. Here also the high thermal conductivity, as well as the absence of brittleness, are factors in its favor as compared with glass.

Mr. R. W. Hochstetter rendered valuable assistance in the determination of the above data.

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[CONTRIBUTIONS FROM THE CHEMICAL LABORATORY OF THE UNIVERSITY OF CINCINNATI.]

## LII. ON THE VOLATILITY OF CERTAIN INORGANIC SALTS.

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IN connection with some experiments on the volatility of sodium borate and sodium fluoride, carried on in this laboratory, it was thought advisable to make use of the method employed for certain salts by Bunsen nearly thirty years ago, but, as far as we can find from the literature, not used since then. This method consists in noting the time required for the volatilization of 0.01 gram of the substance under examination, in the form of a bead in a loop at the end of a platinum wire, after introduction into the hottest part of the Bunsen flame.<sup>1</sup> The disappearance of color when the substance is completely volatilized is marked and sudden. Naturally, great care must be observed in assuring, for purposes of comparison, identical conditions of location in the flame, temperature of the flame, etc. The method is of course applicable to such compounds only as impart color to the flame. Following Bunsen's example, the time required for the volatilization of 0.01 gram of sodium chloride was taken as unity. In this connection the volatility of most of the

<sup>1</sup> *Ann. Chem.* (Liebig), 138, 263.

salts studied by Bunsen was redetermined and the following additional salts were examined for the first time: Borax, sodium fluoride, potassium fluoride, and barium chloride. The results of all determinations are tabulated below. Bunsen's published figures are given in a separate column. Slight variations from his results are to be noticed in most cases. The material employed was the purest obtainable. Duplicate determinations always gave concordant results:

Salt.	Seconds.	Time of volatilization of 0.01 gram.	
		Sodium chloride as unity. N. and R.	Bunsen.
Sodium chloride.....	13	1.00	1.00
Sodium sulphate.....	130	10.00	15.04
Lithium carbonate.....	130	10.00	8.74
Potassium sulphate ....	87.5	6.73	7.89
Sodium carbonate.....	95.5	7.38	7.50
Potassium carbonate ...	47	3.61	3.23
“ chloride.....	12	0.923	0.776
“ bromide.....	7	0.538	0.487
“ iodide .....	5.5	0.423	0.352
Sodium borate .....	215.5	16.54	....
“ fluoride .....	104.5	8.04	....
Potassium fluoride .....	39.5	3.04	....
Barium chloride.....	1560.0	120.00	....

Tests were also made with calcium chloride, strontium chloride, and magnesium chloride. All three underwent decomposition, leaving a non-volatile, alkaline residue. Calcium sulphate and calcium fluoride were likewise tested. In both cases, although a slight coloration was imparted to the flame, there was no loss of material capable of detection by the balance.

## COLOR REACTIONS OF NITRIC AND CHLORIC ACIDS WITH CERTAIN AROMATIC BODIES.<sup>1</sup>

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THE object of this research was to find some new practical tests for nitric and chloric acids, more especially tests that would differentiate the two both in mixtures and separately. The latter object has been attained several times over. The former is more difficult for several reasons. In general, chloric

<sup>1</sup> A thesis presented for the degree of Master of Science to the Council of the Graduate School of the University of Michigan, June, 1896. Communicated by O. C. Johnson.