

XLVII.—*Note on the Specific Gravity and Boiling Point of Chromyl Dichloride.*

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IN the course of an investigation, the results of which will shortly be made public, I had occasion to prepare a considerable quantity of pure chromyl dichloride, $\text{CrO}_2 \begin{Bmatrix} \text{Cl} \\ \text{Cl} \end{Bmatrix}$, and consequently took the opportunity of repeating the determination of the boiling point and specific gravity of this substance. To the best of my knowledge, the only determinations hitherto published were made some years ago by Walter.* The following results but incompletely confirm those obtained by that chemist.

The chromyl dichloride employed in these experiments was prepared by distilling an intimate fused mixture of 10 parts sodium chloride and 12 parts potassium dichromate, with 30 parts strong sulphuric acid. In order to ensure the expulsion of the free chlorine, the liquid was repeatedly distilled in a current of dry carbonic acid, and on the fifth distillation it was received in a flask provided with a long, narrow neck into the side of which, near its upper extremity, a tube had been fused in order to convey the vapours into Liebig's condenser. The determination of the boiling point was made in this flask, the thermometer being so disposed that the entire length of the mercurial column was within the vapour. The weight of the liquid employed was about 60 grammes. Under a barometric pressure of 733 millimetres it began to boil at 114°C ., the height of the column quickly rose to 116°C ., and remained perfectly constant at $116^\circ.8 \text{C}$., the quantity distilling over at this latter point being about five-sixths of the whole. Walter observed 118°C . under a pressure of 760 millimetres. When the necessary allowance is made for the difference in the pressures, the two determinations may be said to agree completely. It appears, however, not to be possible to distil chromyl dichloride without slight decomposition.

To determine its specific gravity, a portion of the distillate

* Ann. Chim. Phys. [2], lxxvi, 387; Pogg. Ann. xlv, 154.

obtained during the observation of the boiling point was transferred to a small weighed bulb, the neck of which was narrowed and provided with an accurately fitting stopper, to prevent the decomposition of the liquid by atmospheric moisture.

The following are the results of the various weighings:—

Weight of specific gravity bottle	3.5312	grms.
Bottle and water. Temp. 25° C.	7.6549	„
Weight of bottle after emptying and drying it, and before the introduction of the chromyl- dichloride	3.5311	„
Bottle and chromyl dichloride. Temp. 25° C. . .	11.4692	„

On calculation, these numbers give 1.920 as the specific gravity of chromyl dichloride at a temperature of 25° C. At 21° C., Walter observed 1.71. I may state, as some confirmation of the former number, that the accidental observation that this body immediately sinks on being dropped into strong sulphuric acid, originally led me to re-determine its specific gravity. It is worthy of remark that the atomic volume of this compound, calculated from the corrected number, agrees perfectly with that of its analogue, sulphuryl dichloride.

		At. wt.	Sp. gr.	At. vol.
Sulphuryl Dichloride, SO_2	$\left\{ \begin{array}{l} \text{Cl} \\ \text{Cl} \end{array} \right.$	135.0	1.66	81.8
Chromyl Dichloride, CrO_2	$\left\{ \begin{array}{l} \text{Cl} \\ \text{Cl} \end{array} \right.$	155.5	1.92	81.2

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