provided with a pinch-cock. The short glass tube to which reference was just made passes through a stopper inserted into the mouth of an ordinary test-tube. Through a hole blown in the side of this tube another glass tube, bent to form a siphon, is inserted and fastened in place by a piece of rubber tubing of the proper size, slipped on over the tube. The leg of the siphon inside the test-tube is of such a length that when the pinch-cock above is opened and the liquid allowed to enter the test-tube, five cc. will be automatically discharged when the level of the liquid has reached a mark on a line with the top of the bend in the siphon tube.

The apparatus can be constructed in a few moments in any laboratory, and for purposes to which it is adapted, it will, I am sure, be found satisfactory. It may be asked, what is the advantage of the form suggested over the ordinary burette with supply tubes? The answer is, it does away with the necessarily oft-repeated filling of the burette, and there is but one mark to watch in making the measurement—that previously mentioned, on the test-tube. The tubing used is of such size that a rapid discharge is insured, the time required being less than would be the case were a burette employed.

MERCURIC CHLOROTHIOCYANATE.

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IT has been shown by one of us[1] that the so-called compound lead iodochloride, PbICl, is not a true chemical compound, but a mixture of lead iodide and lead chloride.

It has seemed advisable, therefore, to study more fully the nature of the compound mercuric chlorothiocyanate, HgCl(CNS), described by McMurtry.[2] To this end a series of solutions was prepared, in one of which was used the exact proportions of mercuric thiocyanate and mercuric chloride given by McMurtry for the preparation of mercuric chlorothiocyanate; in the other members of the series, arbitrarily taken quantities of the one salt were replaced by equivalent quantities of the other. The

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[1] *Am. Chem. J.*, **18**, 290.

[2] *J. chem. Soc.*, *1889*, 50.

mixed salts were completely dissolved in hot water and the solutions allowed to cool and crystallize. The quantities actually used were :

Name.	Mercuric thiocyanate. Grams.	Mercuric chloride. Grams.	Water. cc.
A	9.5000	3.1439	2000
B	6.7500	65.5004	750
C	5.5000	6.5715	550
D (McMurtry)	5.0000	7.0000	450
E	4.5000	7.4285	350
F	3.5000	8.2853	300
G	1.0000	10.4296	200

On cooling, crystals separated from all of the solutions except *G*. The crystals from *A*, *B*, *C*, and *D* were fern-shaped, while those from *E* and *F* were prismatic.

By evaporating the solution *G* one-half, quite a good crop of prismatic crystals was obtained. The crystals from all of the solutions were separated from the mother-liquor by filtration and rapid pressing between folds of drying paper.

From the mother-liquor of *D* two crops of prismatic crystals were obtained by evaporating to one-half and then to three-fourths of original volume. These were designated D' and D''.

The character of the various crops of crystals was determined by estimating the mercury present in each. This was done by reducing the compounds with sodium peroxide, as recommended by Schuyten,[1] and weighing the mercury. Analysis showed :

		Mercury calculated for		
	Mercury found, per cent.	Mercuric thiocyanate, per cent.	Mercuric chlorothiocyanate, per cent.	Mercuric chloride, per cent.
A	62.72	63.28	68.12	73.85
B	62.76	....	....	....
C	62.74	....	....	....
D	63.91	....	....	....
E	68.24	....	....	....
F	68.67	....	....	....
G	72.59	....	....	....
D'	....	68.45	....	....
D''	....	....	72.41	....

These results show that the various crops of crystals fall into three classes, mercuric thiocyanate, mercuric chlorothiocyanate, and mercuric chloride. This was confirmed by inspection with

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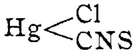
[1] *Chem. Ztg.*, 20, 239.

the microscope. Further, the three successive crops of crystals from solution *D* are seen to be the first mercuric thiocyanate, slightly contaminated by mercuric thiocyanate, as proved both by the high analytical result and by microscopic inspection, the second crop is mercuric chlorothiocyanate, and the third mercuric chloride.

The low results in the case of the pure salts is undoubtedly due to the fact that the filters containing the reduced mercury were dried at the ordinary temperature with consequent slight volatilization of mercury.

The effect of crystallization upon the salt mercuric chlorothiocyanate was next tried. A portion of the salt was dissolved in hot water just sufficient for complete solution. On cooling crystals separated, which, under the microscope, were seen to be only mercuric thiocyanate. The mother-liquor from these, on evaporating one-half, yielded only mercuric chlorothiocyanate. On evaporating the mother-liquor from this last two-thirds the crystals formed are seen to be a mixture of crystals of mercuric chlorothiocyanate and mercuric chloride. Finally, on evaporating this mother-liquor to dryness spontaneously, only crystals of mercuric chloride were obtained. The substance therefore undergoes dissociation when dissolved in water.

From all of the above it would seem that mercuric chlorothiocyanate is a true chemical compound, and further, that the only compound which can be prepared from solutions of mercuric chloride and mercuric thiocyanate is that represented by the formula  $Hg\begin{smallmatrix}\diagup Cl \\ \diagdown CNS\end{smallmatrix}$ or $HgCl_2.Hg(CNS)_2$.

These results varying so widely from those obtained in the case of lead iodochloride suggest the question: is the difference due to the fact that in the one case we have the more closely related groups, iodine and chlorine, while in the other we have the more different groups, thiocyanogen and chlorine, or is the difference due to the fact that in the one case we have a lead compound while in the other a mercury salt? To test this point work will be begun at once on mixtures of lead chloride and lead thiocyanate.

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