

of rapid percolations is produced, exhausting the substance in a most effective manner.

With a boiling flask of a litre capacity, a receiver of four hundred c. c. capacity, and a condenser of five litres capacity, the extracting fluid being alcohol, the syphonings should follow each other at intervals of about twenty minutes.

The nearly horizontal portion of glass tube to the left of *A* should pitch downwards towards the receiver. This is very important, as otherwise the condensed fluid would partly run back into the flask.

Where alcohol or ether is used, a water bath should be employed to boil it.

All the tube connections should be as large as possible to insure rapidity of working.

ON BISULPHIDE OF CARBON.

BY L. H. FRIEDBURG, PH. D.

Several years ago I published some notes on bisulphide of carbon* to which I shall add to day a few more observations. Then and there I showed how to clean the bisulphide by means of fuming nitric acid, and that the vapors of nitrous acid, of nitrogen dioxyde, of sulphurous acid, etc., etc., were taken up and invariably retained by the bisulphide. Dry bisulphide of carbon serves as a very good conveyance for the reaction of such gases and vapors in a dry state on each other and on other substances. The only disagreeable feature in this regard is that carbon bisulphide in most cases also enters the reaction, forming very undesirable products, and sometimes, only such, sulphur containing, products are formed, in any notable quantity. The following reactions are the only three I wish to mention, as they may prove germs for further investigations.

1. Bisulphide of carbon charged with the vapors of nitrogen dioxyde and then mixed with pure benzol, forms amongst other products large, broad crystals of dinitro-benzol, melting at $+86^{\circ}\text{C}$. These crystals are formed after standing a considerable time, and after the partial evaporation of the mixed liquids at summer heat.

2. I think that great interest is attached to the reaction of the aforesaid liquids in direct sunlight. The brown vapors begin to disappear without escaping from the narrow neck of the very large flask, in which such experiments take place, and in proportion as they disappear, small white crystals begin to cover the sides of the

* Berichte d. d. ch. Ges. VIII., 1616.

flask within. This covering principally takes place above the edge of the liquid on the bare glass. The crystals could not be analyzed, because they decomposed when brought in contact with air, yielding then NO_2 and benzol. It is not entirely out of the way to suppose, that in this case addition products formed, analogous to benzol-hexachloride = $\text{C}_6\text{H}_6\text{Cl}_6$, so that the white crystals in this case, might be either $\text{C}_6\text{H}_6(\text{NO}_2)_4$ or $\text{C}_6\text{H}_6(\text{NO}_2)_6$, which of course needs further investigation.

3. A very pretty reaction takes place, when bisulphide of carbon charged with dry sulphurous acid gas, and the same medium charged with nitrogen dioxide (which was not free from nitrous acid) are brought together. This reaction might be used as a lecture experiment. Keeping the vessels cool and dry (I generally use a spacious beaker) white crystals very readily form in considerable quantity, which, in fact, are nothing but lead chamber crystals. This reaction treated analytically may some day throw new light on the formation and composition of lead chamber crystals.

The bisulphide of carbon cleaned by means of fuming nitric acid is the only chemically pure I came across, and I therefore proceeded to determine its specific gravity as well as boiling point, without finding though any differences from former determinations.

The spec.-gravity at $+15^\circ.2$ C. is 1,266 and the boiling point is $+47.4$ C., at 0.760m pressure.

The pure bisulphide shows materially no other so-called physical properties than those known heretofore.

Finally I want to state, that in treating raw bisulphide of carbon, coming from the retorts of manufacture, with fuming nitric acid, I could invariably detect mononitrobenzol in the residue of evaporation, which leads me to believe that amongst the numerous products formed in the red hot retorts, particularly if the charcoal was not dry enough, there is also benzol.

2. The purifying influence of a non-colored and inodorous fat, for instance such as the oil of African palm kernels* good as it is for the bisulphide of carbon, becomes a nuisance, when this latter is used as a means of extraction of the former. I advise, therefore, from long experience, all those who extract fats (particularly if it is for soap manufacturing) by means of CS_2 never to use an excess of this latter, and never to let a new mixture of oil and bisulphide run into the still in which oil already freed from bisulphide is retained. This latter will else be rendered impure.

* See foot note page 252.