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XVI. *Observations upon the two Preparations of Acetic Ether.* By M. HENRY, Professor of Pharmacy in the Pharmaceutical School of Paris*.

HAVING been directed by the society to ascertain the difference which exists between acetic ethers prepared immediately, or by the intermedium of the sulphuric acid, I have now to communicate the experiments made with that view.

M. Gehlen, in a letter addressed to M. Guyton, lately published in the *Annales de Chimie*†, insists that, according to the assertion of Scheele, it is proved that the acetic acid, without the intervention of a mineral acid, is not capable of forming ether.

The author does not tell us what acetic acid he employed; he merely asserts the fact, recommends very pure acetic acid to be used, and adds, that “a *minimum* of sulphurous acid is sufficient to form ether.”

I know that in a great part of Germany they extract the acetic acid from acetate of soda by the intervention of sulphuric acid: in place of that pointed out by Pelletier, acetate of copper is made use of. It was the latter I employed, it did not contain an atom of mineral acid.

But, without entering upon the discussion of a point long ago decided by constant facts, I return to the present object of my inquiries.

We are indebted to Pelletier for the process of obtaining acetic ether, which consists in making a mixture of equal parts of rectified alcohol and acetic acid, in re-cohobating three times the produce of the distillation upon the residue, and rectifying the ether over potash.

I followed this process, with this difference, that I re-cohobated the produce of the distillation six times.

From a mixture of 500 grammes of rectified alcohol, at 36 degrees, and an equal quantity of acetic acid at 11 degrees, I obtained 495 grammes of ether at 24 degrees, im-

* From *Annales de Chimie*, tome lviii. p. 199.

† See the preceding article.

miscible in water, of an agreeable smell, reddening strongly the blue vegetable colours. No particular gas was liberated during the operation, merely atmospheric air displaced by the ethereal gas. I rectified this ether over pure alcohol (concentrated by potash): it did not redden any longer the blue vegetable colours; it marked 25 degrees in the areometer, and weighed 420 grammes.

As to the process by the intermedium of the sulphuric acid, indicated by our fellow member Durosier, it consists in introducing 500 grammes of the acetate of copper, in powder, into a tubulated retort, to which the apparatus of Woulff is adapted. A mixture is afterwards made of equal parts (500 grammes of each) of rectified alcohol and sulphuric acid, which is introduced, when it is cooled, by the tubulure of the retort; it is gradually heated, and 640 grammes of acetic ether are obtained, mixed with sulphurous acid in a small quantity, marking in the areometer 25 degrees and a half, reddening strongly the blue vegetable colours, forming a precipitate with water of barytes and lime-water. During the operation a small quantity of an elastic fluid is liberated, which I ascertained was sulphurous acid gas.

I rectified this ether with 50 grammes of alcohol (purified by potash); and in order to ascertain if any sulphuric ether existed in this ether, I divided the produce of the rectification into portions of 50 grammes each.

The first produce marked 31 degrees in the areometer; the second, 28 degrees; the third, $27\frac{1}{4}$ degrees; the fourth, $26\frac{1}{4}$ degrees. These different products marked 28 degrees, and weighed 535 grammes.

In order to ascertain if it was easy, by dividing the products into portions, to ascertain the presence of sulphuric ether in acetic ether, I made a mixture of 50 grammes of the former at 56 degrees, the thermometer at 0, (32° Fahr.), and a mixture of 200 grammes of the second, at 25 degrees. The two ethers, thus mixed, yielded, after two days, 30 degrees.

I distilled about 70 grammes of ether; it marked 39 degrees, and had a very decided smell of sulphuric ether;

whence I concluded, that the method I employed was the only one for separating these two ethers.

I afterwards submitted the acetic ethers to the following examination :

1. Both of them have an agreeable smell.
2. Their specific weight does not differ more than four or five degrees.
3. They boil at almost equal temperatures ; the former at 50° of Reaumur, (122° of Fahr.), the latter at 46°.(114.8 Fahr.).
4. Exposed to the air they slowly evaporate.
5. Both of them are equally soluble in eight parts and a half of water.
6. The sulphuric acid has but very little action upon these ethers : it colours them slightly : one part of ether and one part of acid mixed very exactly, disengage some heat, about 30° (86° Fahr.).
7. Nitric acid, at 46 degrees, is strongly decomposed by these ethers : there is a considerable liberation of nitrous gas : the residue is oxalic acid.

It results from these different facts, that these two ethers are nearly the same ; that they only differ in some slender shades, which do not change their intimate nature.

Thus the process proposed by M. Parmentier is preferable to that of M. Pelletier, in so far as it is less expensive, shorter, and the product more abundant. But, in giving the preference to this last process, I am far from subscribing to the assertion of M. Gehlen, who admits the necessity of a mineral acid for the formation of acetic ether.

XVII. *Proceedings of Learned Societies.*

SOCIETY OF ARTS AND SCIENCES AT UTRECHT.

THIS society has offered a gold medal, or thirty ducats in money, for the best answer to the following question :

1. “ As the two hemispheres of our earth, the north and south, are in some measure different from each other in shape