Anhydrous phosphoric acid

M. Marchand

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Cubebin is white, insipid, inodorous. It occurs in groups of small acicular crystals. At 392° *in vacuo*, it loses no weight. It is not volatile, and is scarcely soluble in water; cold alcohol dissolves but a small quantity of it; at 53° , 100 parts of absolute alcohol dissolved but 1.31 part: alcohol of 82° dissolved 0.70, but when boiling both dissolved so much that on cooling the liquor became a mass. At 53° , 100 parts of æther dissolve 3.73 of cubebin; it is more soluble in it when hot; it is also soluble in acetic acid, in the volatile and fixed oils.

Concentrated sulphuric acid renders it of a deep red colour. This substance was analysed by means of oxide of copper, it being previously dried in a dry vacuum at 322° ; it was found to consist of

Hydrogen	5.56
Carbon.....	68.29
Oxygen	26.25—100.

which are equivalent to nearly

Eight equivalents of hydrogen	8	or	5.33
Seventeen „ carbon..	102		6.8
Five „ oxygen..	40		26.67
	<hr/>		<hr/>
	150		100.

Cubebin is neutral, and does not appear susceptible of forming any compound from which its true atomic constitution can be inferred. In this respect it is a substance of little interest; but the following two consequences result from its composition: first, that it differs essentially from the crystalline matter of black pepper in several respects, and especially in its composition, since it contains no azote; that it is not derived from the volatile oil of cubebs, this, according to our experiments, containing hydrogen and carbon in the atomic relation of 5 to 8, as the oil of turpentine does.—*Journal de Pharm., Juillet 1839.*

ANHYDROUS PHOSPHORIC ACID. BY M. MARCHAND,

A small porcelain capsule is to be placed on a stand, in a large porcelain vessel; some pieces of dry phosphorus are to be put into the small capsule, and a tubulated glass receiver is to be placed over it; a cork containing two glass tubes is to be inserted into the tubature; of those tubes, one is large and almost reaches the small capsule, and it is to be fitted with a cork; the other tube is narrow, and is to be bent at an angle externally. The narrow tube is to be connected with an apparatus, from which dry oxygen gas is disengaged; a retort in which chlorate of potash is heated is to be preferred. It is more convenient to convey a current of gas from a gasometer, and to dry it perfectly by chloride of calcium and sulphuric acid in the potash apparatus of Liebig. At first oxygen is to be passed through the receiver to expel the atmospheric air from it; the phosphorus is then to be inflamed with hot iron rod passed through the larger straight glass tube. When all the phosphorus is burnt, more is passed through this tube into the small capsule. The retort may also be readily changed when all the chlorate of

potash is decomposed. When the glass receiver becomes too hot, the operation is to be discontinued for some time to cool it, otherwise it will infallibly be broken. In this manner a considerable quantity of nearly pure anhydrous phosphoric acid may be prepared in a short time, with a quarter of a pound of phosphorus. M. Marchand obtained more than half a pound of the anhydrous acid. When the combustion is properly conducted, scarcely any vapour escapes. The flocks of phosphoric acid which attach to the receiver and the capsule are to be speedily removed, and preserved in well-stopped bottles.—*Journal de Pharm., Juillet 1839.*

CINNAMIC AND FORMIC ÆTHERS. BY M. MARCHAND.

Cinnamic æther is very readily obtained by distilling a mixture of 4 parts of absolute alcohol, 2 parts of cinnamic and 1 part of hydrochloric acid. As its boiling point is very high, that which first comes over may be recohobated several times; there remains an oily liquid in the retort after about three-fourths of the liquor have been distilled; this is to be shaken with water, and after decantation it is to be distilled on oxide of lead. The pure æther distils when the temperature reaches 500°. It is limpid, with a slightly yellowish tint, and its specific gravity is 1.13 at about 54°; its smell and taste are aromatic and æthereal, and resemble those of cinnamon; it boils at 500°; it is very little soluble in water, but very soluble in æther and in alcohol. In contact with potash, it decomposes very readily into æther and cinnamic acid, which combines with the potash. It appears to form a peculiar compound with ammonia. Fuming nitric acid does not act, or acts but very feebly upon it. It yielded by analysis

Hydrogen 6.711

Carbon 75.362

Oxygen 17.927

and according to M. Marchand its atomic constitution is

Twenty-one equivalents of hydrogen 149.754

Twenty-two „ carbon 1681.570

Four „ oxygen 400.000

2231.324

Whence it follows, says M. Marchand, that cinnamic æther is formed of 1 atom of anhydrous cinnamic acid $H^{14}C^{15}O^3$, and 1 atom of oxide of æthule. It is stated that similar results had previously been obtained by M. Herzog.

Formic Æther.—The preparation and properties of this substance are well known. That which M. Marchand analysed had been perfectly dried over chloride of calcium; its boiling point was about 130°. The specific gravity of its vapour according to M. Liebig is 2.57. By analysis it appeared to consist of

Twelve equivalents of hydrogen 74.877 or 8.02

Six „ carbon 458.622 49.13

Four „ oxygen 400.000 42.85

933.499 100.