



iodide; the first fraction was about three times as large as the second. This butyl iodide was treated with lead oxide and water, and a small quantity of an alcohol distilling between  $95^{\circ}$  and  $100^{\circ}$  was obtained. This was oxidised with chromic mixture, and on distillation gave nothing but acetic acid. At the commencement of the distillation, a slight odour, as of a ketone—doubtless methyl ethyl ketone—was also observed. The author concludes that if any secondary butyl alcohol is formed in the reaction described, the quantity is so small that it must be derived from acetaldehyde, which is unavoidably formed from paraldehyde under the conditions of the reaction; and consequently that zinc and ethyl iodide have no action on paraldehyde itself. It had already been shown that neither zinc-ethyl nor a mixture of allyl iodide and zinc has any action on paraldehyde. C. F. B.

**Symmetrical Tetrachloracetone.** By T. ZINCKE and O. KEGEL (*Ber.*, 22, 1478—1482; compare Levy and Jedlicka, *Abstr.*, 1888, 443).—A yellow, crystalline compound,  $C_{15}H_{12}N_4$ , melting at  $126^{\circ}$ , is obtained when tetrachloracetone is treated with phenylhydrazine in acetic acid solution. This substance is identical with the compound (m. p.  $122^{\circ}$ ) prepared by Pechmann and Wehsarg (this vol., p. 34) by treating dinitrosoacetone with phenylhydrazine. When warmed with stannous chloride and concentrated hydrochloric acid, it yields considerable quantities of aniline, but the largest portion is converted into two other basic compounds. One of these bases forms a *hydrochloride*,  $C_{15}H_{14}N_4.HCl$ , which is only sparingly soluble in the cold, and separates from the solution in colourless plates, readily soluble in hot water. The *sulphate*,  $(C_{15}H_{14}N_4)_2.H_2SO_4$ , is much more sparingly soluble in water, and crystallises in thin, colourless plates. The free base crystallises from light petroleum in small, colourless plates, melts at  $75$ — $77^{\circ}$ , and turns dark-green on exposure to light. The other base,  $C_{15}H_{14}N_4$ , is obtained, together with aniline, when the filtrate from the preceding compound is treated with hydrogen sulphide, the filtered solution evaporated, and the residue dissolved in water, and carefully decomposed with sodium carbonate. It crystallises in colourless, rhombic plates, melts at  $192$ — $193^{\circ}$ , and turns reddish on keeping. The *hydrochloride* and the sulphate are readily soluble. F. S. K.

**Preparation of Concentrated Formic Acid.** By MAQUENNE (*Bull. Soc. Chim.*, 50, 662—664).—A mixture of crystalline formic acid and the glacial monohydrate of sulphuric acid does not evolve carbon monoxide until heated to  $60^{\circ}$ . The author makes use of this observation and of the fact that under reduced pressure formic acid may be made to boil at temperatures below  $60^{\circ}$ , to concentrate aqueous formic acid. The only precautions necessary are that the sulphuric acid should be added in quantity less than sufficient to form with the water present in the aqueous solution the hydrate  $H_2SO_4.H_2O$ , and that the distillation take place below  $75^{\circ}$ .

When commercial formic acid containing 45—50 per cent. of water is treated with an equal weight of sulphuric acid and distilled under reduced pressure at  $66^{\circ}$ , a distillate containing 84—85 per cent. of real formic acid is obtained, and this distillate when distilled under

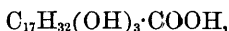
reduced pressure at 65° with one-half its weight of sulphuric acid will yield a solution containing 98 per cent. of real formic acid. The loss is small.

T. G. N.

**Drying Oils.** By K. HAZURA (*Monatsh.*, **10**, 190—195; compare Abstr., 1887, 357, 799, 913; and 1888, 816, 817, 1270).—The author has examined pure sunflower oil, obtained from the firm of Röder, of Vienna, and finds it has an iodine number 134.5, and a saponification number 191.6. The liquid fatty acids contained in it are shown by their behaviour on oxidation and bromination to consist almost entirely of linoleic acid,  $C_{18}H_{32}O_2$ , mixed with a small quantity of oleic acid.

G. T. M.

**Oxidation of Unsaturated Fatty Acids.** By A. GRÜSSNER and K. HAZURA (*Monatsh.*, **10**, 196—199; compare Abstr., 1888, 1270).—Brassic and ricinelaidic acids, on oxidation with alkaline potassium permanganate, behave in conformity with the rule laid down by Hazura. The former is converted into *isodihydroxybehenic acid*,  $C_{21}H_{41}(OH)_2 \cdot COOH$ , which is insoluble in water and light petroleum, dissolves readily in hot alcohol and acetic acid, and crystallises from a dilute alcoholic solution in microscopic rhombic plates melting at 98—99°; the latter into  *$\beta$ -isotrihydroxystearic acid*,



which is insoluble in cold water, crystallises from hot benzene in short, rhombic prisms, and from dilute alcohol in gleaming scales which melt at 114—115°.

G. T. M.

**Derivatives of Myristic Acid.** By C. HELL and S. TWERDOMEDOFF (*Ber.*, **22**, 1745—1748).—*Bromomyristic acid*,  $C_{14}H_{27}BrO_2$ , is easily obtained by gradually adding bromine (1 mol.) to an intimate mixture of myristic acid (1 mol.) and a little amorphous phosphorus, and then heating for 3—4 hours on the water-bath. The product is repeatedly washed with hot water, cooled, pressed between paper, and recrystallised from benzene or alcohol. It crystallises in colourless, waxy, microscopic needles, melts at 31°, and is soluble in all ordinary solvents except water.

*Hydroxymyristic acid* is prepared by boiling the bromo-derivative with excess of soda for 20—24 hours and decomposing the resulting sparingly soluble sodium salt with dilute sulphuric acid. When the acid is boiled with water, it becomes almost solid and opaque, but on cooling it liquefies and becomes more transparent. It crystallises from ether or benzene, melts at 51—51.5°, and is insoluble in hot or cold water, but is readily soluble in other solvents. This acid seems to be identical with the compound obtained by Müller (Abstr., 1882, 496) from the ethereal oil of the fruit of *angelica archangelica*. The *barium* salt,  $(C_{14}H_{27}O_3)_2Ba$ , is more readily soluble in cold than in hot water. The *silver* salt,  $C_{14}H_{27}O_3Ag$ , prepared by precipitating a hot, alcoholic solution of the acid with silver nitrate, is colourless, but blackens on exposure to light.

*Amidomyristic acid*,  $C_{14}H_{27}O_2 \cdot NH_2$ , prepared by heating bromomyristic acid with hot alcoholic ammonia for 5—6 hours at 100°, and