

solved in soda, re-precipitated by acid, and then washed until free from sodium chloride. The composition and reaction of this product proved it to be ellagic acid,  $C_{14}H_6O_8 + 2 \text{ aq.}$ , the yield being about one-fourth of the tannic acid employed. The filtrate from the crystals, which deposited much gallic acid on standing in the flask, was evaporated to a small bulk, and the remaining liquid decanted from the gallic acid which had separated. In order to prove the presence of sugar and hydriodic acid, which it was probable were also products of the reaction, an excess of a stiff starch-paste was added to a portion, to remove free iodine, and the whole allowed to stand an hour or two, the supernatant liquid being then removed by a syphon. The addition of a crystal of potassium nitrite to this liquid at once produced a deep blue coloration, proving the presence of hydriodic acid. In testing for sugar, the iodine, hydriodic acid and gallic acid were removed by basic lead acetate, the filtrate saturated with hydrogen sulphide, evaporated somewhat, and finally Fehling's solution added, when, on warming, cuprous oxide was deposited. The products of the action of iodine on tannic acid are therefore ellagic, gallic, and hydriodic acids and sugar. Doubtless the tannin is first split up into gallic acid and sugar, the gallic acid afterwards yielding ellagic acid, in proof of which the following experiment was made. 10 grms. gallic acid, 10 grms. iodine, and 160 c.c. water were digested together for several days on the water-bath; the same characteristic black crystals as above were obtained, and proved to be ellagic acid; after adding an excess of basic lead acetate to the filtrate, &c., no sugar could be detected. The reaction is probably



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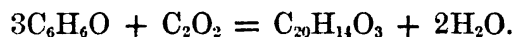
**On Aurine.** By R. S. DALE and C. SCHORLEMMER (Proc. Lit. Phil. Soc., vol. xi, No. 2).

A SHORT note on this subject has already appeared in the number of this Journal for July, 1871 (p. 446).

To obtain the pure colouring matter from the commercial product, the latter is dissolved in alcohol and treated with ammonia. A crystalline precipitate, a compound of aurine with ammonia, separates out, whilst the other bodies present remain in solution. The ammonia-compound, after being washed with alcohol by means of Bunsen's filter pump, is decomposed by dilute acetic acid and further purified by repeated crystallisation from strong acetic acid. The specimens thus obtained retain most obstinately varying quantities of water and acetic acid; a fact which has also been observed by Fresenius, who has lately published a note on the same subject.\* From concentrated hydrochloric acid, aurine crystallises in fine hair-like, red needles, which when dried at  $110^\circ$ , contain a large quantity of hydrochloric acid. To obtain pure aurine, a dilute alkaline solution was precipitated with dilute hydrochloric acid, and the precipitate washed by the filter-pump, but this product also contains hydrochloric acid, which is only given off above  $110^\circ$ . By spontaneous evaporation of an alcoholic solution,

\* J. pr. Chem., No. x, 1871.

aurine is obtained in dull red crystals with a green metallic lustre. Dried at  $110^{\circ}$  they contain no alcohol, but still 5.4 per cent. of water, which escapes only between  $140^{\circ}$ — $180^{\circ}$ , the crystals not changing their appearance at all; they may also be heated to  $200^{\circ}$  without any further alteration, which fact does not agree with Fresenius's observation, that aurine crystallised from alcohol or acetic acid melts at  $150^{\circ}$ . Aurine, dried at  $200^{\circ}$ , appears to have the composition  $C_{20}H_{14}O_3$ ; if this formula is correct, its mode of formation may be expressed by the equation—



The compound dried at  $110^{\circ}$ , is  $C_{20}H_{14}O_3 + H_2O$ . Caro and Wanklyn obtained, by the action of nitrous acid upon rosaniline, a body which they believe to be identical with aurine, and to which they give the formula  $C_{20}H_{16}O_3$ ,\* differing from that above given only by two atoms of hydrogen.

Nascent hydrogen converts aurine into *leuco-aurine*,  $C_{20}H_{18}O_3$ ; this reduction is best effected by acting with zinc-dust on a solution of aurine in acetic acid; it is thus obtained quite colourless, whilst by reducing it in an alkaline solution at the same time, a dark resinous body is formed, from which the leuco-aurine cannot be easily freed.

By passing sulphur dioxide into a hot alcoholic solution of aurine, brick-red crystals are separated, a compound of aurine with sulphur dioxide, which undergo no change when exposed to the air, and are decomposed only above  $100^{\circ}$ , when they split up into aurine and sulphur dioxide. With the bisulphites of the alkali-metals, aurine forms colourless compounds, which are soluble in water and alcohol, and can be obtained in fine crystals. They are decomposed by acids as well as by alkalis.

By heating aurine with alcoholic ammonia to  $140^{\circ}$ ,† the so-called *red coralline* is obtained, a body resembling aurine, but dyeing a redder shade. This body has also been obtained in fine crystals.

C. S.

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**On some Derivatives of Phthalic Acid.** By A. FAUST (Ann. Chem. Pharm. clx, 57—65).

**NITROPHTHALIC acid;**  $C_6H_3NO_2(CO_2H)_2$ , is obtained by digesting phthalic acid with a mixture of equal parts of sulphuric and nitric acid, and diluting with water after 24 hours. It crystallises from ether in pale yellow prisms, which melt at  $208^{\circ}$ — $210^{\circ}$ , the anhydride being formed. This acid appears to be identical with that which Laurent obtained by boiling naphthalene with nitric acid.  $C_6H_3(NO_2)_2O_4K_2$ , crystallises from hot alcohol without water of crystallisation; by precipitating its aqueous solution with alcohol, yellow needles containing one molecule of water are obtained.  $C_6H_4(NO_2)_2O_4K$  is precipitated in form of white needles by mixing a concentrated solution of the acid and the neutral potassium salt.  $C_6H_3(NO_2)_2O_4(NH_4)_2$  is obtained in large orthorhombic prisms by dissolving the acid in strong aqueous ammonia and adding

\* Proc. Roy. Soc., xv, 210.

† The original paper gives  $110^{\circ}$  by misprint.—C. S.