

PART II.

PREPARATIONS AND COMPOUNDS.

TESTS.

THE following tests are employed in ascertaining the nature or purity of chemical bodies.

ACIDUM HYDROSULPHURICUM (Hydrosulphuric Acid, or Sulphuretted Hydrogen, HS) is obtained by *heating* sulphuret of antimony with hydrochloric acid, or by acting upon sulphuret of iron with dilute sulphuric acid, without the aid of heat. It is used as a test for the presence of metallic substances.

With a solution of

<i>Arsenic</i> (acid or neutral)	it produces a <i>yellow</i> precipitate.
<i>Antimony</i> (alk. or neut.)	” <i>orange</i>
Bismuth, copper, lead,	” brown or black
Mercury, silver	” ”
Tin	” ”
Iron	” no effect
Zinc (alk. or neut.)	” white
Alkaline and earthy metals	” no effect.

AMMONIÆ HYDROSULPHURETUM or AMMONII SULPHURETUM (Hydrosulphuret of Ammonia, or Sulphuret of Ammonium; Am HS, or NH³,HS; or NH⁴,S) is obtained by passing sulphuretted hydrogen into a solution of ammonia. It has at first, a pale-yellow or brownish colour which becomes darker on keeping. It soon spoils. It is used for the same purposes as sulphuretted hydrogen; but, in the case of arsenic, the solution must be *acid* before a precipitate is formed; and in the case of iron, a white precipitate is formed.

AMMONIÆ OXALAS (Oxalate of Ammonia); obtained by neutralising carbonate of ammonia by oxalic acid, and evaporating the solution. It forms colourless silky needle-shaped crystals, which are easily soluble in water. Used chiefly as a test for *lime*, in a *neutral* solution of which it produces a *white* precipitate, soluble in nitric or hydrochloric acid.

ARGENTI AMMONIATI SOLUTIO, E. (Solution of Ammoniated Silver, or Ammonio-nitrate of Silver) is prepared by adding liq. ammonia to a solution of nitrate of silver in distilled water (gr. 44 in one fluid ounce) until the precipitate at first formed is nearly, but not quite, re-dissolved. It is used as a test for arsenious acid, with which it forms a yellow precipitate, soluble in nitric acid.

ARGENTI NITRAS (Nitrate of Silver). A solution of one drachm of *freshly prepared* nitrate in an ounce of distilled water, *L.* (gr. 40 in 1600, *E.*) is used as a test of chlorine and all soluble chlorides, with which it forms a *white curdy* precipitate, soluble in solution of ammonia, but insoluble in nitric or any other acid. It is also used as a test for hydrocyanic acid.

ARGENTUM (Silver Leaf) is used as a test for nitric acid in vinegar.

AURUM (Gold Leaf) is used as a test for hydrochloric acid in nitric acid, which dissolves it.

BARII CHLORIDUM (NITRAS, *E.*), Nitrate, or Chloride of Barium, obtained by dissolving carbonate of barytes in nitric or hydrochloric acid, and evaporating the solution till slender colourless crystals are left. A solution of a drachm in an ounce (*L.*) of distilled water (gr. 40 in 800, *E.*) is used as a test for sulphuric acid or sulphates, with which it produces a white precipitate, insoluble in any known menstruum.

CUPRUM (Copper) is used as a test of the presence of nitric acid or a nitrate.

CUPRI AMMONIO-SULPHAS (Ammonio-sulphate of Copper). A solution made by dropping liq. ammonia into a solution of sulphate of copper in distilled water, until the precipitate first formed is just re-dissolved, is used as a test for arsenious acid, in a colourless neutral solution of which, it produces a *green* precipitate, soluble in nitric acid.

CURCUMA (Turmeric) is obtained from the rhizome of the *Curcuma Longa*, which is a species of ginger. It is generally seen in pieces one or two inches long, somewhat cylindrical, and without root fibres. Its taste is aromatic, and its colour yellow, which it readily imparts to spirit or water.

Composition — It contains volatile oil, curcumin (resin) or the yellow colouring matter, and gum.

Properties. — Aromatic, and used on this account as well as for its colour, in curry powder. It is only introduced into the pharmacopœia as a test for alkalis, which bodies change the yellow colour to a reddish-brown. This is not, however, quite distinctive of alkalis, for the vapour of hydrochloric acid, or a drop of strong sulphuric acid produces a similar effect. When boracic acid is added to tincture of turmeric, and evaporated to dryness, it also converts the yellow colour into a brown.

Turmeric paper is prepared by dipping unsized or bibulous paper into a decoction or tincture of turmeric. When dry, it has a bright yellow colour, which is changed to brown by alkalis.

ICHTHYOCOLLA (Isinglass) is the dried and prepared swimming

bladder of the sturgeon and several other kinds of fish. It is prepared in many ways, being sometimes cut into thin narrow curled fibres, at other times, into flat or curled ribands, and at others, not being cut at all, but resembling a dried bladder in appearance. It consists of *gelatine*, which is characterised by being soluble in boiling water and forming a solid jelly on cooling. It forms a precipitate (leather) with tannic acid, but not with gallic acid, and it is introduced into the Tests by the London College, in order to distinguish these two acids. Under the name of *blanc-mange*, &c., it forms favourite articles of diet. A solution of it laid upon silk, forms "court plaster."

LACMUS (*Litmus*) is obtained from the lichen, *Roccella Tinctoria*, which grows principally in the Azores. The exact method of preparing it is kept secret; but the general principle depends upon the combination of an ammoniacal compound (sometimes stale urine) with the colouring matter of the lichen. *Litmus* is sold in small cubical cakes, of a dirty blue colour.

Composition. — Very complicated. According to Kane, it consists of three, or sometimes four, principles, of which the most important are termed *erythrolitmite*, and *azolitmite*. These are combined with lime, potash, and ammonia.

Properties. — The blue colouring matter of litmus is soluble in both water and alcohol. Acids change the colour to red, which is the natural colour of litmus, by combining with the ammonia by which it had been previously converted to blue. The blue colour is restored by alkalies.

Litmus paper. — *Litmus* is only introduced into the pharmacopœia, as a test for acids. The paper is made by dipping unsized or bibulous paper into an infusion of litmus, made with an ounce and a half of litmus, to a pint of water. When dry, the paper has a blue colour which is changed to red by acids.

LIQUOR CHLORINII (*recens preparatum*). Freshly prepared Solution of Chlorine. This is simply a solution of chlorine prepared by transmitting the gas into cold water, which dissolves most of it as it passes. It is used as a test for the presence of the salts of morphia.

LIQUOR INDIGO SULPHATIS (Solution of Sulphate of Indigo) is prepared by boiling powdered indigo in strong sulphuric acid. It forms a deep blue solution, which, when diluted with water, is used as a test for the presence of free chlorine in solution, the blue colour being removed by it.

PLATINI BICHLORIDUM (Bichloride of Platinum) is prepared by dissolving platinum in mixed nitric and hydrochloric acid (**AQUA REGIA**); with the aid of heat. It is a light brown or reddish solution, and is used as a test for potash and ammonia, either of which produces a precipitate with it.

POTASSII ET HYDRARGYRI IODO-CYANIDUM (Iodo-cyanide of Potassium and Mercury) is prepared by adding a concentrated solution of bicyanide of mercury to a solution of iodide of potassium, when beautiful white pearly crystals are deposited. When these

are dissolved in water, and added to a solution of any acid *except* the *hydrocyanic*, they are decomposed and the red biniodide of mercury is set free. This test is used in the pharmacopœia to prove the absence of any other acid in the dilute hydrocyanic acid, which, if pure, produces no change upon the test.

SODÆ PHOSPHATIS SOLUTIO, E. Phosphate of Soda (free of efflorescence), 175 grains; distilled water, 8 fluid ounces. This solution is used as a test for the purity of litharge and sulphate of magnesia, which, if pure, give precipitates of a certain weight mentioned under these respective heads.

STANNI PROTOCHLORIDUM (Protochloride of Tin) is a colourless solution obtained by digesting pure grain tin with heat, in hydrochloric acid; and is used as a test of the presence of bichloride of mercury, with which it causes first a white, and then a black precipitate.