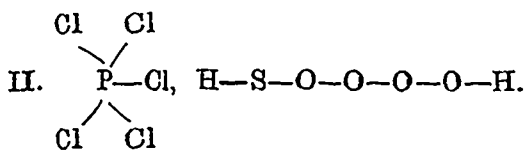


and 4O united to form a compound.

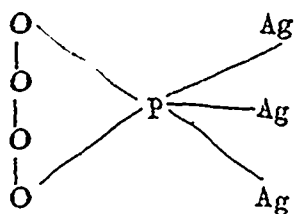
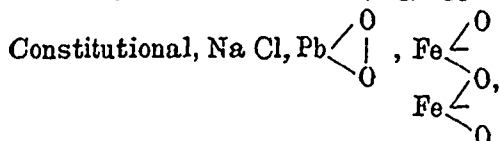
The Constitutional or Rational formulæ of a substance shews (as the name indicates) the constitution or structure of the compound, as H_2SO_4 , to shew its structure we write $SO_3 = H_2O$, as it can be formed by a union of these two.

The Graphic formulæ treats more especially of the valency of bodies; it shews the chemical attraction which binds the structure together, as H_2SO_4 graphically would be represented $H-S-O-O-O-O-H$.

The first H extends one arm (being a monad) which is satisfied by one arm of the dyad S; the other arm is satisfied by one arm of the first O, and each succeeding O satisfies the arm left uncombined by preceding one till last one is reached, and H meeting with that, binds the substance together.



III.—Simple, $NaCl, PbO_2, Fe_2O_3, Ag_3PO_4$



IX.

I.—Give an example of a Monobasic, a Dibasic and a Tribasic acid.

II.—What is the nature of the decomposition which takes place when a solution of Silver Nitrate is added to one of common Sodium Phosphate?

I.—A Monobasic acid has one replaceable atom of Hydrogen, HNO_3, HCl, H_3HO_2 .

A Dibasic has two, $H_2SO_4, H_2SeF_6, H_3PO_4$.

A Tribasic has three, H_3AsO_4, H_3PO_4 .

II.— $3AgNO_3 + HNa_2PN_4 = 2NaNO_3 + HNO_3$ when the solution is added, a bright yellow precipitate is thrown down consisting of Ag_3PO_4 that is, the Silver changes place with the H and the Na, owing to the fact that Silver replaces all the replaceable H in a Hydrogen Salt if it replaces any.

The remaining liquid will give an acid reaction, owing to the formation of HNO_3 . As the Nitric formed holds some of Ag_3PO_4 in solution, it will be necessary to neutralize the liquid if we wish to precipitate all Ag_3PO_4 .

Calculate the most probable formula for a substance containing no other elements but C, O and H, of which .243 grain yielded on combustion .693 grain of Carbonic Dioxide and .162 grain H_2O .

44 grs. CO_2 contains	12 grs. C.
1 " " "	$\frac{3}{11}$ " C.
.001 " " "	$\frac{3}{11000}$ " C.
.693 " " "	$\frac{189}{1000}$ or .189 grs. C.
18 grs- H_2O contains	2 grs. H.
1 " " "	$\frac{1}{9}$ " H.
.001 " " "	$\frac{1}{9000}$ " H.
.162 " " "	$\frac{18}{1000}$ or .018 grs. H.

There are .189 grs. C and .018 grs. H, therefore, remainder or .243 — (.189 + .018) or .036 grs. O.

Weight of substances are as

C H O
189 18 36 divide by atomic weight and we have the number of atoms, as

$15\frac{3}{4}$ C, 12 H and $2\frac{1}{2}$ O, or

63 C, 72 H and 9 O, or

7 C. 8 H and 1 O.

Formula is most probably C_7H_8O or $C_7H_7(OH)$ or cresol.