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Chapter:- 3. ATOMS AND MOLECULES.

CLASS:- IXth

SUBTEACHER:-VIKASH KR. RAJAK

SUBJECT:-CHEMISTRY

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Topic:- Chemical Formulae

➤ **Chemical Formulae:-** A chemical formula represents the composition of a molecule of the substance in terms of the symbols of the elements present in the molecule. A chemical formula is also known as a molecular formula. The formula can be of an element or of a compound.

➤ **Formulae of Elements:-** The chemical formula of an element is a statement of the composition of its molecule in which symbol tells us the element and the subscript (lower figure) tells us how many atoms are present in one molecule. One molecule of hydrogen element contains two atoms of hydrogen, therefore, the formula of hydrogen is H_2 . The figure 2 in the formula H_2 indicates that one molecule of hydrogen element contains 2 atoms of hydrogen. Please note that $2H$ represents 2 separate atoms of hydrogen; H_2 represents 1 molecule of hydrogen, and $2H_2$ represents 2 molecules of hydrogen. Similarly, the molecular formula of oxygen element is O_2 , nitrogen is N_2 , and chlorine is Cl_2 . The inert gases like helium, neon and argon are monoatomic, so their symbols and formulae are just the same. All the metals are represented by their symbols; they do not have any separate formulae.

Molecular Formulae of Some Common Elements

<i>Element</i>	<i>Formula</i>	<i>Element</i>	<i>Formula</i>
Hydrogen	H_2	Bromine	Br_2
Nitrogen	N_2	Iodine	I_2
Oxygen	O_2	Phosphorus	P_4
Chlorine	Cl_2	Sulphur	S_8

➤ Formulae of Compounds:-

The chemical formula of a compound is a statement of its composition in which the chemical symbols tell us which elements are present and the subscripts (lower figures) tell us how many atoms of each element are present in one molecule of the compound. Water is a compound whose molecule contains 2 atoms of hydrogen and 1 atom of oxygen. So, the formula of water is H_2O . In the formula H_2O , the symbol H_2 indicates 2 atoms of hydrogen (and not a molecule of hydrogen), and O represents 1 atom of oxygen. The figure in front of a formula shows the number of molecules. For example, $2H_2O$ means 2 molecules of water. The figure 2 multiplies the whole formula H_2O and not just the first element. That is, $2H_2O$ contains 4 atoms of hydrogen and two atoms of oxygen.

Formulae of Some Molecular Compounds

Name	Formula	Elements present
1. Water	H_2O	H and O
2. Carbon dioxide	CO_2	C and O
3. Sulphur dioxide	SO_2	S and O
4. Ammonia	NH_3	N and H
5. Methane	CH_4	C and H
6. Ethanol (Alcohol)	C_2H_5OH	C, H and O
7. Hydrogen chloride	HCl	H and Cl
8. Carbon tetrachloride (Tetrachloromethane)	CCl_4	C and Cl
9. Hydrogen sulphide	H_2S	H and S
10. Carbon disulphide	CS_2	C and S

✍ Home Work (Based on study material of 04-06-20)

Answer the following questions:-

1. What is Monoatomic element?
2. What is Diatomic element?
3. What is Molecule?
4. What is Molecular Compound?