Vidya Bhawan Balika Vidyapith

Shakti Utthan Ashram, Lakhisarai – 811311 (Bihar)

Chapter:- 3. ATOMS AND MOLECULES.

CLASS:- IXth **SUBTEACHER:- VIKASH KR. RAJAK**

SUBJECT:-CHEMISTRY **DATE :-27/05/2020**

📖 **Topic:- Law of Constant Proportion, Dalton's Atomic Theory.**

➢ Law of Constant Proportion:-

The law of constant proportions was given by Proust in 1779. He analysed the chemical composition (type of elements present and percentage of elements present) of a large number of compounds and came to the conclusion that the proportion of each element in a compound is constant (or fixed).

- According to the law of constant proportions: A chemical compound always consists of the same elements combined together in the same proportion by mass. This law means that whatever be the source from which it is obtained (or the method by which it is prepared), a pure chemical compound is always made up of the same elements in the same mass percentage.

☞ **Example:-** Water is a compound which always consists of the same two elements, hydrogen and oxygen, combined together in the same constant proportion of 1 : 8 by mass (1 part by mass of hydrogen and 8 parts by mass of oxygen).

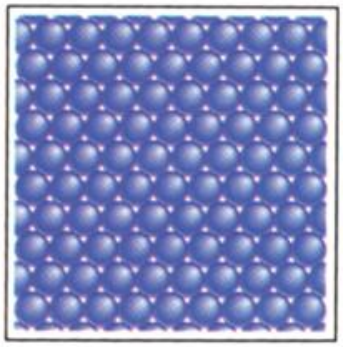
➢ Dalton's Atomic Theory:-

The theory that 'all matter is made up of very tiny indivisible particles (atoms)' is called atomic theory of matter. Dalton put forward his atomic theory of matter in 1808. The various postulates (or assumptions) of Dalton's atomic theory of matter are as follows:-

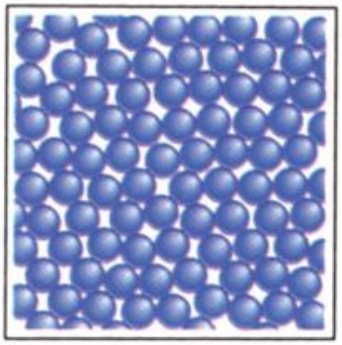
1. All the matter is made up of very small particles called 'atoms'.
2. Atoms cannot be divided.
3. Atoms can neither be created nor destroyed.
4. Atoms are of various kinds. There are as many kinds of atoms as are elements.
5. All the atoms of a given element are identical in every respect, having the same

mass, size and chemical properties.

6. **Atoms of different elements differ in mass, size and chemical properties.**
7. **Chemical combination between two (or more) elements consists in the joining together of atoms of these elements to form molecules of compounds.**
8. **The 'number' and 'kind' of atoms in a given compound is fixed.**
9. **During chemical combination, atoms of different elements combine in small whole numbers to form compounds.**
10. **Atoms of the same elements can combine in more than one ratio to form more than one compound.**



(*a*) Particles in a solid



(*b*) Particles in a liquid

(*b*) Particles in a gas

✍ **Sample Problem 1. When 3 g of carbon is burnt in 8 g of oxygen, 11 g of carbon dioxide is produced. What mass of carbon dioxide will be formed when 3 g of carbon is burnt in 50 g of oxygen? Which law of chemical combination will govern your answer?**

✍ **Sample Problem 2. A 0.24 g sample of compound of oxygen and boron was found by analysis to contain 0.096 g of boron and 0.144 g of oxygen. Calculate the percentage composition of the compound by mass.**