

Chemistry Study Materials for Class 9 (NCERT Based notes of Chapter -03)

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Date:- 09/06/2021

Atoms and Molecules

LAW OF CONSTANT PROPORTIONS

Law of Constant Proportion states that a **chemical compound always contains exactly the same proportion of elements by mass.**

This law is also known as Law of definite proportions. Joseph Louis Proust gave this law hence, this law is also known as Proust's Law.

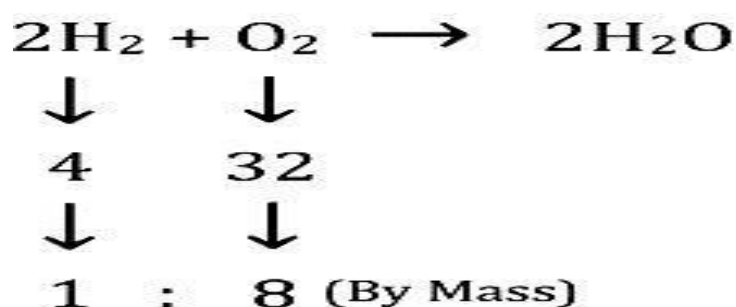
Explanation of the law:-

Compounds are formed by the combination of two or more elements. In a compound the ratio of the atoms or element by mass remains always same irrespective of the source of compound. This means a certain compound always formed by the combination of atoms in same ratio by mass. If the ratio of mass of constituent atoms will be altered the new compound is formed.

Examples:-

Water is formed by the combination of hydrogen and oxygen. The ratio of masses of hydrogen and oxygen is always in 1:8 in water irrespective of source of water.

Whether you collect the water from a well, river, pond or from anywhere the ratio of their constituent atoms by mass will always same.



Nitrogen dioxide is a compound, which is formed by the combination of nitrogen and oxygen. The ratio of nitrogen and oxygen by mass in nitrogen dioxide is in 7:16.

Nitrous oxide is a compound which is also formed by the combination of nitrogen and oxygen. The ratio of nitrogen and oxygen in nitrous oxide is in 28:16.

Nitric oxide is a compound, which is also formed by the combination of nitrogen and oxygen. The ratio of nitrogen and oxygen in nitric oxide is in 7:8.

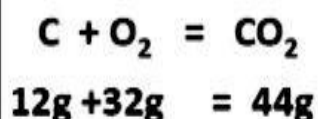
From the above three examples it is clear that if the ratio of the atoms by mass is altered then the new compound is formed, such as in the case of nitrogen dioxide, nitrous oxide, nitric oxide. These three compounds are formed by the combination of same atoms but because of combination of the constituent atoms in different ratios by mass new compound is formed.

Law of Conservation of mass:
proposed by the French chemist
Antoine Lavoisier (1774)

Mass can neither be
created nor destroyed in a
chemical reaction.

OR

For any chemical process in
a closed system, the mass
of the reactants must be
equal the mass of the
products.

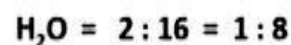


Law of definite proportion:
proposed by Louis Proust
(1799)

'A chemical compound
always consists of the
same elements combined
together in the same ratio,

irrespective of the method
of preparation or the
source from where it is
taken'.

One molecule of a compound
water always contains same ratio
of Hydrogen and Oxygen by mass
i.e.



DALTON'S ATOMIC THEORY

John Dalton, a British Chemists and scientists gave the Atomic Theory in 1808. This theory is popularly known as Dalton's Atomic Theory in the honour of John Dalton. He gave the theory on the basis of Laws of Chemical Combination and explains them properly. In his theory he explains about atom.

Main postulates of Dalton's atomic theory

1. Elements are made of extremely small particles called atoms.
2. Atoms of a given element are identical in size, mass, and other properties;

3. Atoms of different elements differ in size, mass, and other properties.
4. Atoms cannot be subdivided, created, or destroyed.
5. Atoms of different elements combine in simple whole-number ratios to form chemical compounds.
6. In chemical reactions, atoms are combined, separated, or rearranged.

Dalton's Atomic Theory

1. Each element is composed of extremely small particles called atoms.



2. All atoms of a given element are identical, but the atoms of one element are different from the atoms of all other elements.



3. Atoms of one element cannot be changed into atoms of a different element by chemical reactions; atoms are neither created nor destroyed in chemical reactions.



4. Compounds are formed when atoms of more than one element combine; a given compound always has the same relative number and kind of atoms.

