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Chapter:- 3. ATOMS AND MOLECULES.

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

SUBJECT:-CHEMISTRY **DATE :-28/05/2020**

📖 **Topic:- Conservation of Mass, Drawback of Dalton's Atomic Theory.**

➢ ***Explanation of Law of Constant Proportions*:-**

According to Dalton's atomic theory, every element consists of small particles called atoms, each having a fixed mass. It also says that atoms of different elements combine to form compounds, and that the ''number'' and ''kind'' of atoms of each element in a compound is fixed. Now, since the ''number of atoms'', the "kind of atoms'', and the ''mass of atoms'' of each element in a given compound is fixed, therefore, a compound will always have the same elements combined together in the same proportion by mass. And this is the law of constant proportions.

➢ ***Explanation of Conservation of Mass*:-**

According to Dalton's atomic theory, atoms can neither be created nor destroyed. Now, since an atom cannot be created or destroyed, therefore, the number of various types of atoms in the products of a chemical reaction is the same as the number of all those atoms in the reactants. The same number of various atoms in products and reactants will have the same mass. So, the total mass of products is equal to the total mass of reactants. The mass remains the same (or conserved) in a chemical reaction. And this is the law of conservation of mass.

☞ ***Experiment*:-** **Calcium carbonate ($CaCO_3$) is made up of 1 calcium atom, 1 carbon atom and 3 oxygen atoms. The products of its decomposition, calcium oxide (CaO) and carbon dioxide (CO_2), taken together, also contain 1 calcium atom, 1 carbon atom and 3 oxygen atoms. Now, since the number of various types of atoms in the products (CaO and CO) and reactant ($CaCO_3$) remains the same, therefore, the mass of products and reactants also remains the same in this reaction. There is no change in mass during the decomposition of calcium carbonate to form calcium oxide and carbon dioxide. The mass remains conserved.**

➢ *Drawbacks of Dalton's Atomic Theory:-*

It is now known that some of the statements of Dalton's atomic theory of matter are not exactly correct. Some of the drawbacks of the Dalton's atomic theory of matter are given below:

1. **One of the major drawbacks of Dalton's atomic theory of matter is that atoms were thought to be indivisible (which cannot be divided). We now know that under special circumstances, atoms can be further divided into still smaller particles called electrons, protons and neutrons. So, atoms are themselves made up of three particles: electrons, protons and neutrons.**
2. **Dalton's atomic theory says that all the atoms of an element have exactly the same mass. It is, however, now known that atoms of the same element can have slightly different masses.**
3. **Dalton's atomic theory said that atoms of different elements have different masses. It is, however, now known that even atoms of different elements can have the same mass.**

✍ *Home Work*

Answer the following questions:-

1. **What is Law of Constant Proportion?**
2. **Define Dalton Atomic Theory.**
3. **Write the Assumption of Dalton Atomic Theory.**
4. **Define the term:-**

   (i) Latent Heat (ii) Latent heat of fusion (iii) Latent heat of Vaporisation.