

CHEMISTRY STUDY MATERIALS FOR CLASS 9

(BASED ON CHAPTER 3: ATOMS AND MOLECULES)

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Laws of Chemical Combination

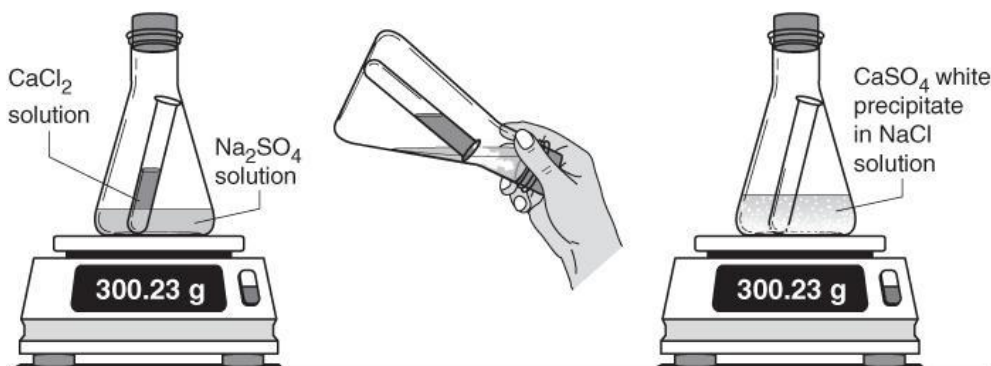
1. LAW OF CONSERVATION OF MASS

PRINCIPLE: The Law of Conservation of Mass states that mass can neither be created nor destroyed in a chemical reaction.

Total Mass of the Reactant = Total Mass of the Product

According to law of conservation of mass, "in a balanced chemical reaction, the total mass of reactants is equal to the total mass of products"

Example Diagram:



TECHNIQUE:

- Take a solution of calcium chloride in a flask labelled A and a solution of sodium sulphate in a test tube labelled B.
- Tie a thread to the test tube and carefully lower it into the flask. Seal the flask with a cork to make it airtight.
- Weigh the flask on a balance. It weighs around 300.23 grams.

- Tilt and swirl the flask and allow the contents of the test tube to come in contact with the contents of the flask.
- Calcium chloride reacts with sodium sulphate to form a white precipitate of calcium sulphate and a solution of sodium chloride.
- Weigh the flask again. There will be no change in the weight of the flask. It is found to weigh 300.23 grams.
- Scientists noticed that if chemical reactions were carried out in a closed container, there was no change in the mass.
- The total mass of the reactants was equal to the total mass of the products.

2.LAW OF CONSTANT PROPORTION

- According to the Law of Constant Proportion, in a chemical substance, elements are always present in a definite proportion by mass.
- For example, water obtained from any source will have the same two elements, namely hydrogen and oxygen present in it.
- 2 grams of hydrogen and 16 grams of oxygen form a molecule of water. The proportion of hydrogen and oxygen is 1 : 8 by mass. This proportion will always remain the same, irrespective of the source of water.
- Similarly, carbon dioxide obtained from any source will contain the same two elements, carbon and oxygen.
- 12 grams of carbon and 32 grams of oxygen form a molecule of carbon dioxide. Carbon dioxide obtained from any source will always have the proportion of masses of carbon and oxygen as 3 : 8.
