



IMPORTANT QUESTIONS

1 MARK QUESTIONS

Question.1 Name the scientist who laid the foundation of chemical sciences. How?

Answer Antoine Laurent Lavoisier, by establishing two important laws of chemical combination.

Question.2. Define law of conservation of mass.

Answer. It states that, 'Mass is neither created nor destroyed in a chemical reaction.' In other-words, the mass of the reactants must be equal to the mass of products.

Question.3 Define law of constant proportion.

Answer. It states that, 'In a pure chemical substance, the elements are always present in definite proportions by masses.

Question.4. which organization approves the names of elements all over the world? Write the symbol of gold.

Answer. International Union of Pure and Applied Chemistry (IUPAC).and Symbol of gold is Au.

Question.5. Write the symbols of tungsten and iron.

Answer. (i) Tungsten (W) (ii) Iron (Fe).

Question.6. Name the element which is used as the reference for atomic mass.

Answer. Carbon

Question.7. 'Atoms of most elements are not able to exist independently'. Name two atoms which exist as independent atoms.

Answer. Noble gases such as argon (Ar), helium (He) exist as independent atoms.

Question.8. What is the number of electrons in Mg atom and Mg^{2+} ion?

Answer. Mg: $12e^-$: Mg^{2+} : $10e^-$

2 MARKS QUESTIONS

Question.9. Name the scientists whose experimentation established laws of chemical combination.

Name the laws also.

Answer. Experimentation done by Antoine Laurent Lavoisier and Joseph L Broust established two laws of chemical combination. These laws are :(i) Law of conservation of mass.

(ii) Law of constant proportions.

Question.10. Give two drawbacks of Dalton's atomic theory.

Answer. Drawbacks of Dalton's Atomic Theory

(i) According to modern theory, atom is not the ultimate indivisible particle of matter. Today, we know that atoms are divisible, i.e., they are themselves made-up of particles (protons, electrons, neutrons, etc.).

(ii) In case of isotopes of an element, the assumption that the atoms of the same element have same mass does not hold good.

Question.11. How would you differentiate between a molecule of element and a molecule of compound? Write one example of each type.

Answer. Molecule of an element is made-up of only one kind of atoms, e.g., $O_2, N_2, F_2, O_3, P_4, S_8$ etc.

Molecule of a compound is made-up of two or more different kinds of atoms in a fixed ratio,

e.g., $H_2O, CS_2, H_2S, NH_3, CH_4$.

Question.12. what is meant by a chemical formula? Give examples.

Answer. A chemical formula of a compound shows its constituent elements and the number of atoms of each combining element.

e.g., Chemical formula of ammonia is NH_3 , water is H_2O , and carbon dioxide is CO_2

Question.13. What is meant by a molecule? Give examples.

Answer. A molecule is the smallest particle of an element or a compound capable of independent existence under ordinary conditions. It shows all the properties of the substance. e.g., molecule of oxygen is O₂, ozone is O₃, phosphorus is P₄, sulphur is S₈, etc.

Question.14. Define one mole, illustrate its relationship with Avogadro constant.

Answer. One mole of any species (atoms, molecules, ions or particles) is that quantity in number having a mass equal to its atomic or molecular mass in grams.

The number of particles (atoms, molecules or ions) present in 1 mole of any substance is fixed, with a value of 6.022×10^{23} . This number is called Avogadro constant or Avogadro number.

Question.15. Hydrogen and oxygen combine in the ratio of 1:8 by mass to form water. What mass of oxygen gas would be required to react completely with 3 g of hydrogen gas?

Answer. 1 g of hydrogen reacts with oxygen = 8 g

3 g of hydrogen reacts with oxygen

= $8 \times 3 \text{ g} = 24 \text{ g}$

3 MARKS QUESTIONS

Question.16. Write the chemical symbols of two elements:

(i) Which are formed from the first letter of the elements' name ?

(ii) Whose names have been taken from the names of the elements in Latin?

(iii) Which are formed from the first two letters of the elements' name?

Answer. (i) N (Nitrogen), F (Fluorine), I (Iodine), O (Oxygen) (any two)

(ii) Fe (Ferrum), Cu (Cuprum), Ag (Argentum), Au (Aurum) (any two)

(iii) Ca (Calcium), He (Helium), Al (Aluminum), Si (Silicon) (any two)

Question.17. Write the correct symbols of the following elements which are written incorrectly. (i) FE (Iron) (ii) AL (Aluminum) (iii) CO (Cobalt) (iv) AG (silver) (v) NA (sodium) (vi) AR (Argon)

Answer. (i) Fe (ii) Al (iii) Co (iv) Ag (v) Na (vi) Ar

Question.18. State what are ions. Write the formulae of two divalent cations and anions each.

Answer. Ions are charged particles of atoms or group of atoms Cations Ba²⁺, Mg²⁺, Ca²⁺

Anions : O²⁻, S²⁻

Question.19. Classify the following compounds diatomic, triatomic and polyatomic molecules:

HCl, H₂, H₂O, NH₃, CH₃OH, PCl₅

Answer. Diatomic: HCl, H₂

Tri atomic : H₂O

Polyatomic : NH₃, CH₃OH, PCl₅

Question.20. In a reaction, 5.3 g of sodium carbonate reacted with 6 g of ethanoic acid. The products were 2.2 g of carbon dioxide, 0.9 g water and 8.2 g of sodium ethanoate. Show that these observations are in agreement with the law of conservation of mass,

Sodium carbonate + ethanoic acid → sodium ethanoate + carbon dioxide + water.

Answer. Mass of reactants before experiment

= Mass of sodium carbonate + Mass of ethanoic acid

= 5.3 g + 6g = 11.3 g

Mass of products after experiment

= Mass of sodium ethanoate + Mass of carbon dioxide + Mass of water

= 8.2 g + 2.2 g + 0.9 g = 11.3 g

The mass of reactants is equal to the mass of products, therefore, it proves law of conservation of mass.

APPLICATION BASED QUESTIONS

Question.21. When 3.0 g of magnesium is burnt in 2.00 g of oxygen, 5.00 g of magnesium oxide is produced. What mass of magnesium oxide will be formed when 3.00 g magnesium is burnt in 5.00 g of oxygen? Which law of chemical combination will govern your answer? State the law.

Answer. When 3.0 g of magnesium is burnt in 2.00 g of oxygen, 5.00 g of magnesium oxide is produced. It means magnesium and oxygen are combined in the ratio of 3 : 2 to form magnesium oxide.

Thus, when 3.00 g of magnesium is burnt in 5.00 g of oxygen, 5.00 g of magnesium oxide will be formed and the remaining oxygen will be left unused.

It is governed by law of definite proportion.

It states that in a chemical substance, the elements are always present in definite proportions by mass.

Question. 22. What are ionic and molecular compounds? Give examples.

Answer. Atoms of different elements join together in definite proportions to form molecules of compounds.

Examples: water, ammonia, carbon dioxide. Compounds composed of metals and non-metals contain charged species.

The charged species are known as ions. An ion is a charged particle and can be negatively or positively charged. A negatively charged ion is called an anion and the positively charged ion is called cation. Examples: sodium chloride, calcium oxide.

Reasoning Questions

Question.23.(a) Why does not atomic mass of an element represent the actual mass of its atom?

(b) “The atomic mass of an element is in fraction.” What does it mean?

Answer. (a) Atoms of different elements are very small and their actual masses are extremely small. To solve this problem we consider the relative atomic mass of the element. The relative atomic mass of hydrogen is 1 u and its corresponding gram atomic mass is 1 g.

(b) If the atomic mass of an element is in fraction this means that it exists in the form of isotopes. The atomic mass of such element is the average of atomic masses of its isotopes and is generally in fraction.

Question.24. Explain why the number of atoms in one mole of hydrogen gas is double the number of atoms in one mole of Helium gas ?

Answer. The number of atoms in one mole of hydrogen gas is double the number of atoms in one mole of helium gas because hydrogen molecule is diatomic i.e., a molecule of hydrogen consists of two atoms of hydrogen, whereas helium is monoatomic.

Question.25. why atoms form ions?

Answer. In order to become stable by acquiring the stable electronic configuration of nearest noble gas