

Class 9 CBSE Test paper Solved Chapter 3: Atoms and Molecules-3

Q1. State law of conservation of mass.

Ans The mass can neither be created nor destroyed in a chemical reaction.

Q2 . State law of constant proportion.

Ans A pure chemical compound always consists of the same elements that are combined together in a fixed proportion by mass.

Q3 . What are molecules?

Ans Molecules represents a group of two or more atoms(same or different) chemically bonded to each other and held tightly by strong attractive forces. Molecules are of two types

(a) Molecules of elements (b) Molecules of compound

Q4 Write the relationship between number of moles and atomic mass.

Ans Number of moles=given mass/gram atomic mass

Q5. Why are chemical reactions occur according to law of conservation of mass?

Ans In all chemical reactions, there is only exchange of reactants taking place when products are formed. Since there is no loss or gain of mass, the chemical reactions are according to law of conservation of mass.

Q6. What is basic difference between atoms and molecules?

Ans Atoms except those of noble or inert gas elements cannot exist of their own. However , all molecules can have independent existence.

Q7. The atomic mass of an element is in fraction .What does it mean?

Ans If the atomic mass of an element is in fraction, this mean that it exists in the form of isotopes. The atomic mass is the average atomic mass and is generally fractional.

Q8. What is the difference between the mass of molecule and molecular mass?

Ans: Mass of a molecule is that of a single molecule also known as its actual mass. But molecular mass is the mass of Avogadro's number of molecules.

Q9. Where do we use the words mole and mol?

Ans In the text part we use the word mole while as a unit ,we call it mol.

Q10.How many moles are present in 11.5 g of sodium?

Ans Gram atomic mass of Na =23g

11.5g of Na represents= $(1\text{mol}) \times (11.5\text{g}) / 23.5\text{g} = 0.5\text{ mol}$

Q11. Explain why the number of atoms in one mole of hydrogen gas is double the number of atoms in one mole of helium gas?

Ans Hydrogen gas is a diatomic in nature (H_2) while helium gas is monoatomic (He). As a result, the number of atoms in one mole of hydrogen ($2 \times N_A$) are expected to be double as compared to number of atoms in one mole of helium (N_A)

Q12. An element Z forms an oxide with formula Z_2O_3 . What is its valency?

Ans Valency of Z = 3

Q13. The valency of an element A is 4. Write the formula of its oxide.

Ans The formula of its oxide is A_2O_4 or AO_2 .

Q14. An element X has valency 3 while the element Y has valency 2. Write the formula of the compound between X and Y.

Ans X_2Y_3

Q15. What are ions?

Ans Ions are of two types (a) cations - positively charged (b) anions - negatively charged

Q16. Which postulate of Dalton's Atomic theory is the basis of law of conservation of mass?

Ans "Atoms can neither be created nor destroyed during a physical or a chemical change"

Q17.0 Write the formulae of sodium oxide and aluminium chloride

Ans Sodium oxide = Na_2O Aluminium chloride = $AlCl_3$

Q18. Find out the ratio by mass of the combining elements in the following compounds

(a) $MgCO_3$ (b) CH_3OH (c) $CaCl_2$

Ans 21 (a) $MgCO_3$ ----- Mg : C : O = 24 : 12 : 48 = 2 : 1 : 4

(b) CH_3OH ----- C : H : O = 12 : 4 : 16 = 3 : 1 : 4

(c) $CaCl_2$ ----- Ca : Cl = 40 : 71

Q19. What is the atomicity of oxygen, ozone, neon and sulphur?

Ans Oxygen $O_2 = 2$ Ozone $O_3 = 3$ Neon Ne = 1 Sulphur $S_8 = 8$

Q20. What is wrong with the statement '1 mol of hydrogen'?

Ans The statement is not correct. We must always write whether hydrogen is in atomic form or molecular form. The correct statement is : 1 mole of hydrogen atoms or one mole of hydrogen molecules.

Q21. The atomic mass of an element is in fraction. What does it mean?

Ans If the atomic mass of an element is in fraction, this means that it exists in the form of isotopes. The atomic mass is the average atomic mass and is generally fractional.