

# Chapter 3: Atoms and Molecules Quiz

## Introduction to Atoms and Molecules

### 1. Who postulated the term 'Parmanu'?

- Maharishi Kanad
- Democritus
- Lavoisier
- Dalton

**Answer: Maharishi Kanad**

### 2. What does the Greek word 'atom' mean?

- Indivisible
- Invisible
- Tiny
- Hard

**Answer: Indivisible**

### 3. Who laid the foundation of chemical sciences?

- Antoine L. Lavoisier
- John Dalton
- Proust
- Kanad

**Answer: Antoine L. Lavoisier**

### 4. When was the idea of divisibility of matter considered in India?

- Around 500 BC
- Around 1800 AD
- Around 100 AD
- Around 2000 BC

**Answer: Around 500 BC**

### 5. Who suggested that particles normally exist in a combined form?

- Pakudha Katyayama
- Democritus
- Lavoisier
- Proust

**Answer: Pakudha Katyayama**

## Law of Conservation of Mass

**1. The Law of Conservation of Mass states that mass can?**

- Neither be created nor destroyed
- Be created but not destroyed
- Be destroyed but not created
- Be created and destroyed

**Answer: Neither be created nor destroyed**

**2. Who established the Law of Conservation of Mass?**

- Lavoisier
- Dalton
- Proust
- Bohr

**Answer: Lavoisier**

**3. In a chemical reaction, the total mass of reactants is?**

- Equal to total mass of products
- Greater than products
- Less than products
- Variable

**Answer: Equal to total mass of products**

**4. If 10g of A reacts with 5g of B to give C and D, the total mass of C and D is?**

- 15g
- 10g
- 5g
- 20g

**Answer: 15g**

**5. Why is a cork put on the flask during the experiment?**

- To prevent matter from escaping
- To keep it warm
- To look good
- To mix solutions

**Answer: To prevent matter from escaping**

## Law of Constant Proportions

**1. This law is also known as?**

- Law of Definite Proportions
- Law of Mass Action
- Law of Multiple Proportions
- Law of Conservation

**Answer: Law of Definite Proportions**

**2. In water, the ratio of Hydrogen to Oxygen by mass is?**

- 1:8
- 1:2
- 2:1
- 8:1

**Answer: 1:8**

**3. Who stated the Law of Constant Proportions?**

- Proust
- Lavoisier
- Dalton
- Kanad

**Answer: Proust**

**4. In Ammonia ( $\text{NH}_3$ ), Nitrogen and Hydrogen are in ratio?**

- 14:3
- 1:3
- 3:14
- 14:1

**Answer: 14:3**

**5. If 9g of water is decomposed, we get?**

- 1g Hydrogen and 8g Oxygen
- 2g Hydrogen and 16g Oxygen
- 8g Hydrogen and 1g Oxygen
- 4.5g each

**Answer: 1g Hydrogen and 8g Oxygen**

## Dalton's Atomic Theory

**1. Dalton's theory was based on?**

- Laws of chemical combination
- Law of gravity
- Atomic structure
- Electrons

**Answer: Laws of chemical combination**

**2. According to Dalton, all matter is made of?**

- Tiny particles called atoms
- Molecules
- Compounds
- Mixtures

**Answer: Tiny particles called atoms**

**3. Which postulate explains the Law of Conservation of Mass?**

- Atoms are indivisible and cannot be created/destroyed
- Atoms combine in whole numbers
- Atoms of different elements differ
- Atoms of same element are identical

**Answer: Atoms are indivisible and cannot be created/destroyed**

**4. Atoms of a given element are identical in?**

- Mass and chemical properties
- Size only
- Shape only
- Nothing

**Answer: Mass and chemical properties**

**5. Atoms combine in the ratio of?**

- Small whole numbers
- Large fractions
- Decimals
- Random numbers

**Answer: Small whole numbers**

## What is an Atom?

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**1. The building blocks of all matter are?**

- Atoms
- Cells
- Bricks
- Sand

**Answer: Atoms**

**2. Atomic radius is measured in?**

- Nanometres
- Metres
- Centimetres
- Kilometres

**Answer: Nanometres**

**3. 1 nanometre is equal to?**

- $10^{-9}$  m
- $10^{-6}$  m
- $10^{-3}$  m
- $10^{-12}$  m

**Answer:  $10^{-9}$  m**

**4. Can we see atoms with naked eyes?**

- No
- Yes
- Sometimes
- Only large ones

**Answer: No**

**5. Which of these is the smallest?**

- Atom of hydrogen
- Molecule of water
- Grain of sand
- Ant

**Answer: Atom of hydrogen**

## Modern Day Symbols of Elements

**1. Who was the first scientist to use symbols for elements?**

- Dalton
- Lavoisier
- Bohr
- Newton

**Answer: Dalton**

**2. Who approves names of elements?**

- IUPAC
- NASA
- WHO
- UN

**Answer: IUPAC**

**3. The symbol for Iron is derived from?**

- Ferrum
- Iron
- Ferrous
- Fe

**Answer: Ferrum**

**4. What is the symbol for Sodium?**

- Na
- So
- S
- Nu

**Answer: Na**

**5. The symbol for Gold is?**

- Au
- Go
- Gd
- Ag

**Answer: Au**

## Atomic Mass

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**1. The reference atom for atomic mass is?**

- Carbon-12
- Oxygen-16
- Hydrogen-1
- Nitrogen-14

**Answer: Carbon-12**

**2. One atomic mass unit (u) is equal to?**

- 1/12th the mass of one C-12 atom
- Mass of one C-12 atom
- Mass of one H atom
- 1/16th mass of O atom

**Answer: 1/12th the mass of one C-12 atom**

**3. What is the atomic mass of Oxygen?**

- 16 u
- 8 u
- 12 u
- 14 u

**Answer: 16 u**

**4. What is the atomic mass of Hydrogen?**

- 1 u
- 2 u
- 12 u
- 16 u

**Answer: 1 u**

**5. Relative atomic mass is defined as?**

- Average mass of the atom compared to C-12
- Absolute mass
- Weight of atom
- Mass of nucleus

**Answer: Average mass of the atom compared to C-12**

## How Do Atoms Exist?

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**1. Can atoms of most elements exist independently?**

- No
- Yes
- Always
- Only noble gases

**Answer: No**

**2. Atoms form?**

- Molecules and ions
- Only molecules
- Only ions
- Nothing

**Answer: Molecules and ions**

**3. Molecules and ions aggregate to form?**

- Matter
- Energy
- Space
- Time

**Answer: Matter**

**4. Which atoms can exist independently?**

- Noble gases (e.g., Helium)
- Oxygen
- Hydrogen
- Nitrogen

**Answer: Noble gases (e.g., Helium)**

**5. Why do atoms form molecules?**

- To become stable
- To become unstable
- To increase mass
- To decrease size

**Answer: To become stable**

## What is a Molecule?

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**1. A molecule is a group of atoms held together by?**

- Chemical bonds
- Gravity
- Magnetism
- Glue

**Answer: Chemical bonds**

**2. A molecule is capable of?**

- Independent existence
- Breathing
- Moving
- Dividing

**Answer: Independent existence**

**3. Can a molecule contain atoms of different elements?**

- Yes
- No
- Never
- Only if heated

**Answer: Yes**

**4. What is the smallest particle of a compound?**

- Molecule
- Atom
- Ion
- Electron

**Answer: Molecule**

**5. Does a molecule show properties of the substance?**

- Yes
- No
- Sometimes
- Only in gas

**Answer: Yes**

## Molecules of Elements

**1. Molecules of elements contain?**

- Same type of atoms
- Different atoms
- Ions
- Mixtures

**Answer: Same type of atoms**

**2. The number of atoms in a molecule is called?**

- Atomicity
- Valency
- Atomic mass
- Molecular weight

**Answer: Atomicity**

**3. What is the atomicity of Oxygen?**

- Diatomic
- Monoatomic
- Triatomic
- Polyatomic

**Answer: Diatomic**

**4. Ozone ( $O_3$ ) is?**

- Triatomic
- Diatomic
- Monoatomic
- Tetra-atomic

**Answer: Triatomic**

**5. Phosphorus ( $P_4$ ) is?**

- Tetra-atomic
- Diatomic
- Monoatomic
- Polyatomic

**Answer: Tetra-atomic**

## Molecules of Compounds

**1. Molecules of compounds contain?**

- Atoms of different elements
- Atoms of same element
- Only ions
- Only metals

**Answer: Atoms of different elements**

**2. In NH<sub>3</sub> (Ammonia), the elements are?**

- Nitrogen and Hydrogen
- Nitrogen and Helium
- Nickel and Hydrogen
- Neon and Hydrogen

**Answer: Nitrogen and Hydrogen**

**3. The ratio by mass in CO<sub>2</sub> is?**

- 3:8
- 1:2
- 12:16
- 1:1

**Answer: 3:8**

**4. Water is a molecule of?**

- Compound
- Element
- Mixture
- Ion

**Answer: Compound**

**5. Atoms in a compound are combined in?**

- Definite proportions
- Random proportions
- Variable proportions
- No proportions

**Answer: Definite proportions**

## What is an ion?

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**1. An ion is a?**

- Charged species
- Neutral atom
- Molecule
- Compound

**Answer: Charged species**

**2. A positively charged ion is called?**

- Cation
- Anion
- Atom
- Molecule

**Answer: Cation**

**3. A negatively charged ion is called?**

- Anion
- Cation
- Positron
- Electron

**Answer: Anion**

**4. A group of atoms carrying a charge is?**

- Polyatomic ion
- Monoatomic ion
- Molecule
- Compound

**Answer: Polyatomic ion**

**5. In NaCl, the cation is?**

- Sodium (Na<sup>+</sup>)
- Chloride (Cl<sup>-</sup>)
- Both
- None

**Answer: Sodium (Na<sup>+</sup>)**

## Writing Chemical Formulae

**1. Combining power of an element is called?**

- Valency
- Atomicity
- Atomic number
- Mass

**Answer: Valency**

**2. In a formula, valencies must?**

- Balance
- Be equal
- Be zero
- Be negative

**Answer: Balance**

**3. When writing formula for metal and non-metal, which comes first?**

- Metal
- Non-metal
- Any
- Heavier one

**Answer: Metal**

**4. Polyatomic ions are enclosed in?**

- Brackets
- Quotes
- Commas
- Spaces

**Answer: Brackets**

**5. The formula for Magnesium Hydroxide is?**

- Mg(OH)2
- MgOH2
- Mg2OH
- MgO2H2

**Answer: Mg(OH)2**

## Formulae of Simple Compounds

**1. Formula of Hydrogen Chloride is?**

- HCl
- H<sub>2</sub>Cl
- HCl<sub>2</sub>
- HCL

**Answer: HCl**

**2. Formula of Aluminium Oxide is?**

- Al<sub>2</sub>O<sub>3</sub>
- AlO
- Al<sub>3</sub>O<sub>2</sub>
- AlO<sub>3</sub>

**Answer: Al<sub>2</sub>O<sub>3</sub>**

**3. Formula of Sodium Nitrate is?**

- NaNO<sub>3</sub>
- Na<sub>2</sub>NO<sub>3</sub>
- Na(NO<sub>3</sub>)<sub>2</sub>
- Na<sub>3</sub>N

**Answer: NaNO<sub>3</sub>**

**4. Formula of Calcium Oxide is?**

- CaO
- Ca<sub>2</sub>O<sub>2</sub>
- Ca<sub>2</sub>O
- CaO<sub>2</sub>

**Answer: CaO**

**5. In MgCl<sub>2</sub>, the valency of Mg is?**

- 2
- 1
- 3
- 0

**Answer: 2**

## Molecular Mass

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**1. Molecular mass is the sum of?**

- Atomic masses of all atoms
- Atomic numbers
- Valencies
- Electrons

**Answer: Atomic masses of all atoms**

**2. Molecular mass of H<sub>2</sub>O is?**

- 18 u
- 16 u
- 20 u
- 10 u

**Answer: 18 u**

**3. Formula unit mass is used for?**

- Ionic compounds
- Elements
- Gases
- Liquids

**Answer: Ionic compounds**

**4. Mass of one mole of a substance is called?**

- Molar mass
- Atomic mass
- Molecular mass
- Unit mass

**Answer: Molar mass**

**5. Molecular mass of NaCl (Na=23, Cl=35.5) is?**

- 58.5 u
- 58 u
- 23 u
- 35.5 u

**Answer: 58.5 u**