

# Chapter 3: Atoms and Molecules Quiz

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## Introduction to Atoms and Molecules

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**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 Katayama
- ☐ Democritus
- ☐ Lavoisier
- ☐ Proust

**Answer: Pakudha Katayama**

# Law of Conservation of Mass

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**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

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**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 (NH<sub>3</sub>), 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

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**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

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**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

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**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<sub>3</sub>) is?**

- ☐ Triatomic
- ☐ Diatomic
- ☐ Monoatomic
- ☐ Tetra-atomic

**Answer: Triatomic**

**5. Phosphorus (P<sub>4</sub>) is?**

- ☐ Tetra-atomic
- ☐ Diatomic
- ☐ Monoatomic
- ☐ Polyatomic

**Answer: Tetra-atomic**

## Molecules of Compounds

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**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

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**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?**

- ☐  $\text{Mg(OH)}_2$
- ☐  $\text{MgOH}_2$
- ☐  $\text{Mg}_2\text{OH}$
- ☐  $\text{MgO}_2\text{H}_2$

**Answer:  $\text{Mg(OH)}_2$**

## Formulae of Simple Compounds

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**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**