

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 (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?

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

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?

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?

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 (O₃) is?

- Triatomic
- Diatomic
- Monoatomic
- Tetra-atomic

Answer: Triatomic

5. Phosphorus (P₄) 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 NH₃ (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 CO₂ 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?

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⁺)
- Chloride (Cl⁻)
- Both
- None

Answer: Sodium (Na⁺)

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
- H₂Cl
- HCl₂
- HCL

Answer: HCl

2. Formula of Aluminium Oxide is?

- Al₂O₃
- AlO
- Al₃O₂
- AlO₃

Answer: Al₂O₃

3. Formula of Sodium Nitrate is?

- NaNO₃
- Na₂NO₃
- Na(NO₃)₂
- Na₃N

Answer: NaNO₃

4. Formula of Calcium Oxide is?

- CaO
- Ca₂O₂
- Ca₂O
- CaO₂

Answer: CaO

5. In MgCl₂, the valency of Mg is?

- 2
- 1
- 3
- 0

Answer: 2

Molecular Mass

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 H₂O 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