

Written in accordance with the latest MHT-CET Paper Pattern which includes topics based on Std. XII Sc. and relevant chapters of Std. XI Sc. (Maharashtra State Board)

MHT-CET TRIUMPH CHEMISTRY MULTIPLE CHOICE QUESTIONS

Based on Std. XI & XII Syllabus of MHT-CET

Salient Features

- Includes chapters of Std. XII and relevant chapters of Std. XI as per latest MHT-CET Syllabus
- Exhaustive subtopic wise coverage of MCQs
- Quick Review provided for all the chapters
- Important Formulae and Shortcuts provided for relevant chapters
- Exhaustive coverage of various competitive exam questions
- Includes MCQs from JEE (Main), NEET (UG) 2015, 2016 and 2017
- Includes MCQs upto MHT-CET 2018
- Evaluation Test provided at the end of each chapter
- Two Model Question Papers with answers provided at the end of the book

Scan the adjacent QR code or visit www.targetpublications.org/tp12760 to download Hints for relevant questions and Evaluation Test in PDF format.



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01 Some Basic Concepts of Chemistry

Subtopics

- 1.0 Introduction
- 1.1 Importance and scope of chemistry
- 1.2 Historical approach to particulate nature of matter
- 1.3 Laws of chemical combination
- 1.4 Dalton's atomic theory
- 1.5 Concepts of elements, atoms and molecules
- 1.6 Atomic and molecular masses
- 1.7 Avogadro's law, Avogadro's number and mole concept
- 1.8 Percentage composition and empirical and molecular formula
- 1.9 Chemical reactions and stoichiometry

Platinum alloy as an International Prototype of the Kilogram

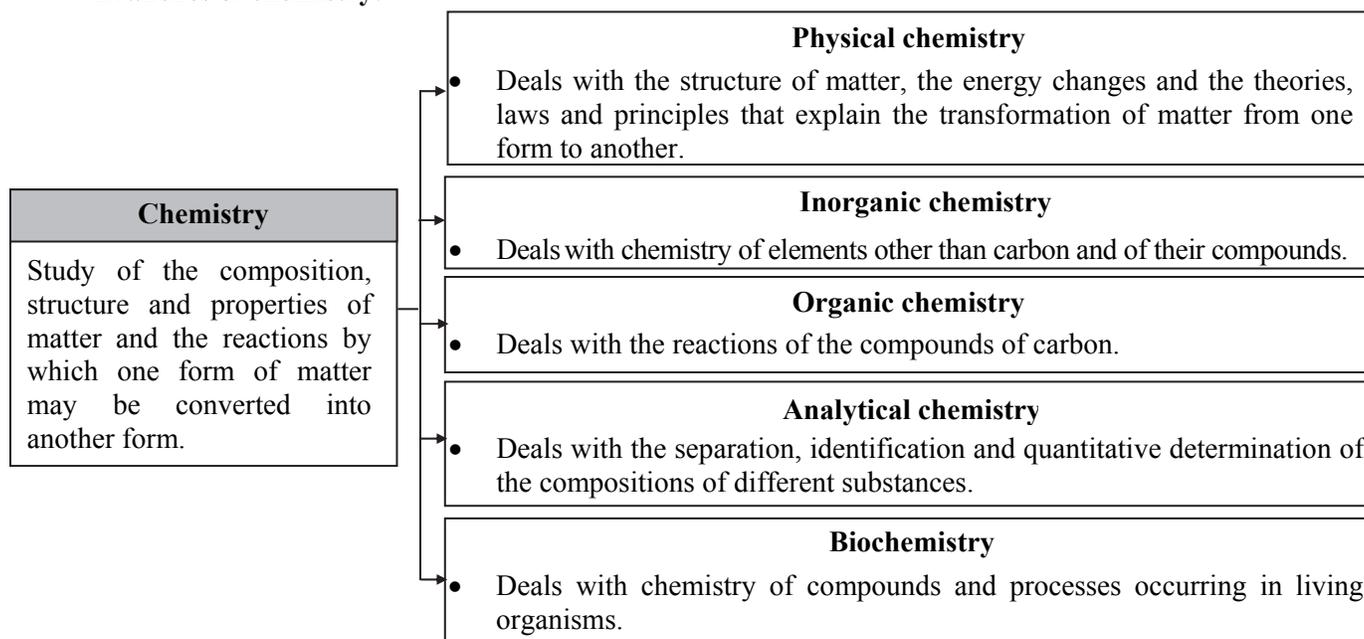


Have you ever wondered what is the reference for 1 kilogram???? It has been defined as the mass of the International Prototype of the Kilogram. The prototype is made of platinum-iridium (Pt-Ir) cylinder that is stored in an airtight jar at International Bureau of Weights and Measures in France. Pt-Ir was chosen because its mass remains constant for an extremely long time and it is resistant to the attack of different chemicals. This reference standard is used to calibrate or standardize different measuring devices such as analytical balances.



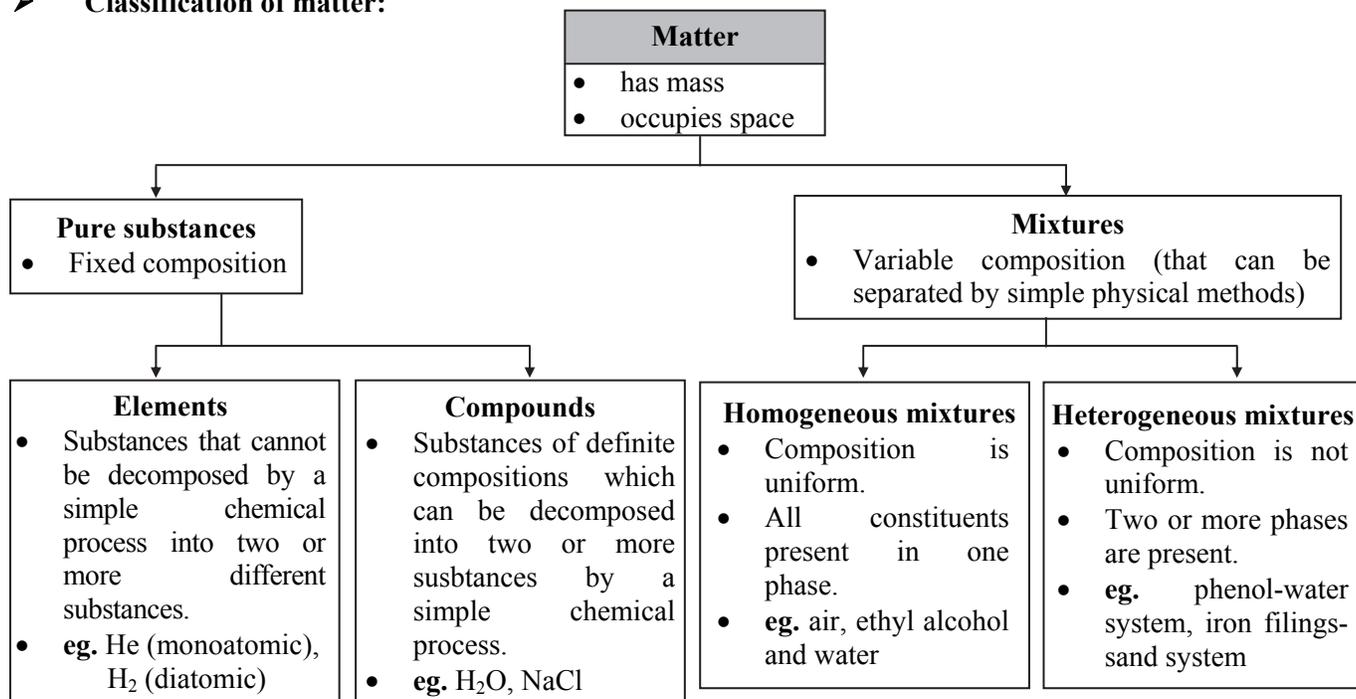
Quick Review

➤ Branches of chemistry:

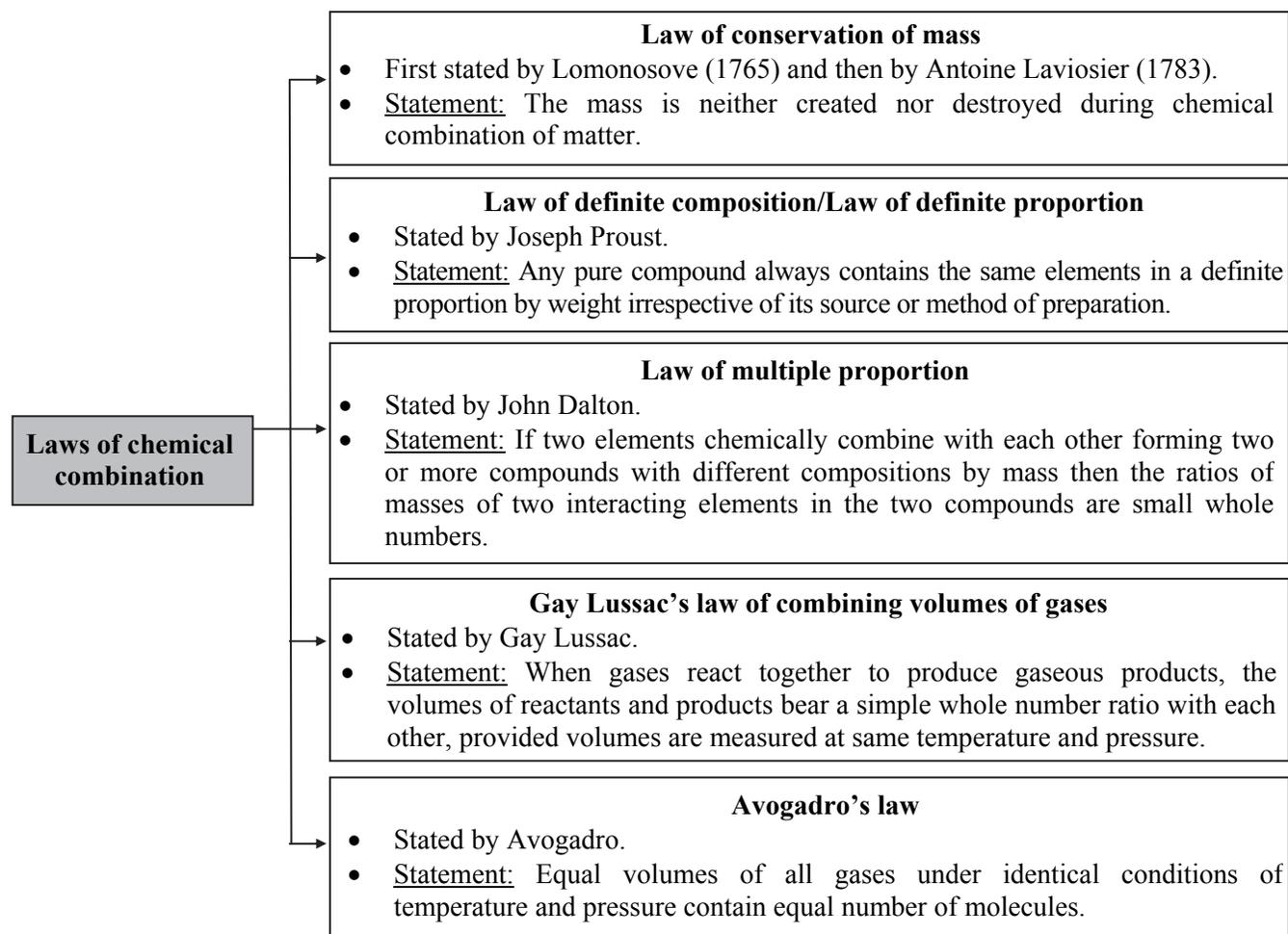




➤ **Classification of matter:**



➤ **Laws of chemical combination:**



**Formulae**

- Atomic mass unit (1 amu) = $\frac{1}{12}$ th of a ^{12}C -atom
= 1.66×10^{-27} kg
- 1 Mole = 6.022×10^{23} particles
(atoms/molecules/ions/electrons)
- Number of moles (n)
= $\frac{\text{Mass of the substance}}{\text{Molar mass of the substance}}$
- Mass of an atom = $\frac{\text{Atomic mass}}{6.022 \times 10^{23}}$
- Mass of a molecule = $\frac{\text{Molecular mass}}{6.022 \times 10^{23}}$
- Number of molecules
= $n \times \text{Avogadro number } (N_A)$
- Atomicity = number of atoms in a molecule
- Total number of atoms in molecule
= $n \times N_A \times \text{Atomicity}$
- Volume occupied by one mole of a gas at STP
= $22.4 \text{ L} = 22.4 \text{ dm}^3$
- Molecular formula = $r \times \text{Empirical formula}$
- $r = \frac{\text{Molecular mass}}{\text{Empirical mass}}$
- Average atomic mass
= $\frac{\text{Sum of (Isotopic mass} \times \text{its \% abundance)}}{100}$
- Avogadro's law, $V \propto n$ (At constant T and P)

**Classical Thinking****1.0 Introduction**

- _____ chemistry deals with the chemistry of elements other than carbon and of their compounds.
(A) Organic (B) Physical
(C) Inorganic (D) Bio
- The branch of chemistry, which deals with the separation, identification and quantitative determination of the composition of different substances, is called _____ chemistry.
(A) organic (B) inorganic
(C) analytical (D) bio

**1.1 Importance and scope of chemistry**

- Solar energy can be converted into electrical energy using _____ cell.
(A) Daniel (B) lithium ion
(C) photovoltaic (D) nickel cadmium
- In computers, _____ chips are used as microprocessors.
(A) carbon (B) phosphorus
(C) titanium (D) silicon

**1.2 Historical approach to particulate nature of matter**

- Which one of the following is NOT a mixture?
(A) Iodized table salt
(B) Gasoline
(C) Liquefied Petroleum Gas (L.P.G.)
(D) Distilled water
- Which of the following is NOT a homogeneous mixture?
(A) Ethanol + water
(B) Oxygen gas + nitrogen gas
(C) Phenol + water
(D) Acetic acid + water
- The phlogiston theory was suggested for _____ reaction.
(A) neutralisation (B) oxidation
(C) reduction (D) combustion
- Substances, which CANNOT be decomposed into two or more different substances by chemical process, are called _____.
(A) alloys (B) molecules
(C) elements (D) compounds
- The arbitrarily decided and universally accepted standards are called _____.
(A) fundamentals (B) units
(C) measures (D) symbols
- There are _____ fundamental SI units.
(A) 3 (B) 5
(C) 6 (D) 7
- SI unit of velocity is _____.
(A) km s^{-1} (B) km hr^{-1}
(C) m s^{-2} (D) m s^{-1}
- Electrochemical equivalent has unit _____.
(A) kg m s^{-1} (B) $\text{kg m}^2 \text{ s}^{-1}$
(C) kg C^{-1} (D) $\text{kg m}^{-1} \text{ s}^{-2}$



13. Magnitude of 'pico-' is _____.
 (A) 10^{-12} (B) 10^{-15}
 (C) 10^{12} (D) 10^{-9}
- 1.3 Laws of chemical combination**
14. After a chemical reaction, the total mass of reactants and products _____.
 (A) always increases
 (B) always decreases
 (C) does not change
 (D) either increases or decreases
15. The sum of the masses of reactants and products is equal in any physical or chemical reaction. This is in accordance with law of _____.
 (A) multiple proportion
 (B) definite composition
 (C) conservation of mass
 (D) reciprocal proportion
16. If the law of conservation of mass was to hold true, then 20.8 g of BaCl_2 , on reaction with 9.8 g of H_2SO_4 will produce 7.3 g of HCl and _____ of BaSO_4 .
 (A) 11.65 g (B) 23.3 g
 (C) 25.5 g (D) 30.6 g
17. Pure water can be obtained from various sources, but it always contains hydrogen and oxygen, combined in a ratio of 1:8 by weight. This is an example of _____.
 (A) law of conservation of mass
 (B) Avogadro's law
 (C) law of definite composition
 (D) Gay Lussac's law
18. Two containers of the same size are filled separately with H_2 gas and CO_2 gas. Both the containers under the same T and P will contain the same _____.
 (A) number of atoms
 (B) weight of gas
 (C) number of molecules
 (D) number of electrons
19. In SO_2 and SO_3 , the ratio of the masses of oxygen that combine with a fixed mass of sulphur is 2:3. This is an example of the law of _____.
 (A) constant proportion
 (B) multiple proportion
 (C) reciprocal proportion
 (D) conservation of mass

20. Which of the following reactions has the ratio of volumes of reacting gases and the product as 1:2:2?
 (A) $2\text{CO}_{(g)} + \text{O}_{2(g)} \longrightarrow 2\text{CO}_{2(g)}$
 (B) $\text{O}_{2(g)} + 2\text{H}_{2(g)} \longrightarrow 2\text{H}_2\text{O}_{(g)}$
 (C) $\text{H}_{2(g)} + \text{F}_{2(g)} \longrightarrow 2\text{HF}_{(g)}$
 (D) $\text{N}_{2(g)} + 3\text{H}_{2(g)} \longrightarrow 2\text{NH}_{3(g)}$
21. The volume of oxygen required for complete combustion of 0.25 cm^3 of CH_4 at S.T.P is _____ cm^3 .
 (A) 0.25 (B) 0.5
 (C) 0.75 (D) 1

1.4 Dalton's atomic theory

22. Dalton assumed that _____ are the smallest particles of compound.
 (A) atoms (B) molecules
 (C) ions (D) elements

1.5 Concepts of elements, atoms and molecules

23. Atoms have a mass of the order _____.
 (A) 10^{-26} kg (B) 10^{-15} kg
 (C) 10^{-26} g (D) 10^{-15} g
24. Atoms have a radius of the order _____.
 (A) 10^{-26} m (B) $10^{-15} \mu\text{m}$
 (C) 10^{-15} mm (D) 10^{-15} m
25. A/an _____ is an aggregate of two or more atoms in definite composition, which are held together by chemical bonds.
 (A) ion (B) molecule
 (C) compound (D) mixture

1.6 Atomic and molecular masses

26. The unit of atomic mass 'amu' is replaced by _____.
 (A) u (B) mol (C) g (D) kg
27. Mole is the SI unit of _____.
 (A) volume
 (B) pressure
 (C) amount of substance
 (D) density
28. 1 amu is equal to _____.
 (A) $\frac{1}{12}$ of C-12 (B) $\frac{1}{14}$ of O-16
 (C) 1 g of H_2 (D) $1.66 \times 10^{-23} \text{ kg}$



29. _____ is the sum of the atomic mass of all the atoms as given in the molecular formula of the substance.

- (A) Molecular mass
- (B) Atomic weight
- (C) Percentage weight
- (D) Percentage volume

 **1.7 Avogadro's law, Avogadro's number and mole concept**

30. $N_A =$ _____ atoms mol^{-1} .

- (A) 6.021×10^{21}
- (B) 6.024×10^{24}
- (C) 6.051×10^{15}
- (D) 6.022×10^{23}

31. One _____ is the collection of 6.022×10^{23} atoms /molecules/ions.

- (A) kg
- (B) g
- (C) mole
- (D) cm

32. Avogadro's number is _____.

- (A) number of atoms in one gram of element
- (B) number of millilitres which one mole of a gaseous substance occupies at N.T.P.
- (C) number of molecules present in one gram molar mass of a substance
- (D) number of elements in one gram of compounds

33. Which of the following law states that equal volumes of all gases under identical conditions of temperature and pressure contain equal number of molecules?

- (A) Boyle's law
- (B) Charles' law
- (C) Avogadro's law
- (D) Gay Lussac's law

34. Volume occupied by 1 g molecular weight of any gas is called _____.

- (A) gram molecular volume
- (B) gram atomic volume
- (C) gram molecular weight
- (D) gram atomic weight

35. The number of atoms present in a molecule of a substance is called its _____.

- (A) atomicity
- (B) volume
- (C) density
- (D) mass

36. How many molecules are present in one gram of hydrogen gas?

- (A) 6×10^{23}
- (B) 3×10^{23}
- (C) 2.5×10^{23}
- (D) 1.5×10^{23}

37. One mole of CO_2 contains _____.

- (A) 6.022×10^{23} atoms of C
- (B) 6.022×10^{23} atoms of O
- (C) 18.1×10^{23} molecules of CO_2
- (D) 3 g atoms of CO_2

38. One mole of H_2O corresponds to _____.

- (A) 22.4 litres at 1 atm and 25°C
- (B) 6.022×10^{23} atoms of hydrogen and 6.022×10^{23} atoms of oxygen
- (C) 18 g of H_2O
- (D) 1 g of H_2O

39. The gram molecule of benzene is equal to _____ g C_6H_6 .

- (A) 70
- (B) 72
- (C) 10
- (D) 78

40. 1 atom of an element weighs 1.792×10^{-22} g. The atomic mass of the element is _____.

- (A) 1.192
- (B) 17.92
- (C) 64
- (D) 108

41. What is the mass of 0.5 mole of ozone molecule?

- (A) 8 g
- (B) 16 g
- (C) 24 g
- (D) 48 g

42. The number of molecules in 16 g of oxygen gas is _____.

- (A) 6.022×10^{23}
- (B) 3.011×10^{23}
- (C) 3.011×10^{22}
- (D) 1.5×10^{23}

43. Which of the following weighs the least?

- (A) 2.0 gram mole of CO_2
- (B) 0.1 mole of sucrose ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$)
- (C) 1 gram atom of calcium
- (D) 1.5 mole of water

44. Which one of the following pairs of gases contains the same number of molecules?

- (A) 16 g of O_2 and 14 g of N_2
- (B) 8 g of O_2 and 22 g of CO_2
- (C) 28 g of N_2 and 22 g of CO_2
- (D) 32 g of O_2 and 32 g of N_2

45. One mole of oxygen gas weighs _____.

- (A) 1 g
- (B) 8 g
- (C) 32 g
- (D) 6.022×10^{23} g

46. Under similar conditions, same mass of oxygen and nitrogen is taken. The ratio of their volumes will be _____.

- (A) 7 : 8
- (B) 3 : 5
- (C) 6 : 5
- (D) 9 : 2

 **1.8 Percentage composition and empirical and molecular formula**

47. The mass percentage of each constituent element present in 100 g of a compound is called its _____.

- (A) molecular composition
- (B) atomic composition
- (C) percentage composition
- (D) mass composition