

MODERN'S
abc
OF

Objective CHEMISTRY

For **CET/COMED-K** (Karnataka)



Dr. S.P. Jauhar
Dr. Sheenu Jauhar

SPECIAL FEATURES

- ❖ Comprehensive, precise and exclusively written for Karnataka
- ❖ Includes previous years' AIEEE/JEE and Karnataka CET/COMED-K questions
- ❖ Review Section emphasizes important definitions, terms, facts, formulae, principles, theories, etc.
- ❖ Large variety and number of Multiple Choice Questions covering all aspects of each chapter/concept
- ❖ Questions arranged in increasing order of difficulty –
 - Level 1 (basic conceptual questions)
 - Level 2 (application-based questions)
- ❖ Five mock tests based on recent years' competitive examination questions

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All Questions
of
CET/COMED-K,
2015
Included

OBJECTIVE CHEMISTRY

For

CET/COMED-K

Karnataka Common Entrance Test
Consortium of Medical, Engineering and
Dental Colleges of Karnataka

By

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NEW EDITION—2016

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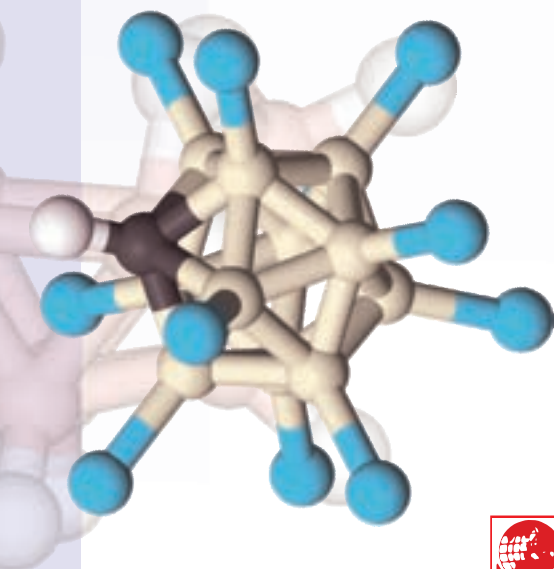


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We are committed to serve students with best of our knowledge and resources. We have taken utmost care and attention while editing and printing this book but we would beg to state that Authors and Publishers should not be held responsible for unintentional mistakes that might have crept in. However, errors brought to our notice, shall be gratefully acknowledged and attended to.

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Published by : **MODERN PUBLISHERS**
MBD House, Railway Road, Jalandhar City.

Printed at : **HOLY FAITH INTERNATIONAL (P) LTD.**
B-9 & 10, Site IV, Industrial Area, Sahibabad (U.P.)

PREFACE

We feel pleasure in presenting the book 'Modern's abc of Objective Chemistry' for students appearing in Karnataka-CET and COMED K's examinations and other board examinations for entrance to different engineering and other professional colleges. The book has been thoroughly revised in accordance with the changing trends of different examinations and suggestions of worthy teachers and all my dear students.

REVISION NOTES

This provides thorough discussion on the chapter emphasising all the important formulae, facts and terms. This can serve as quick revision of the chapter before the examination. This part has been revised and enriched with new materials, Key points, Learning Plus, Facts to Memorise, In Focus etc.

QUESTIONS

These include a variety of questions in the form of multiple choice questions. This part has also been completely revised and restructured. These questions are graded according to degree of difficulty. These are: Level I (Basic Conceptual Questions), Level II (Comprehensive Questions) and Level III (Questions from AIEEE/JEE examinations). Recent examination questions from 2008 to 2015 are given separately at the end of each chapter.

ANSWERS

The book provides answers to all relevant questions. This is an important feature of this revised edition. Some of the difficult questions have been solved where as hints to many other questions are given.

REVISION TESTS, SELF-EVALUATION TESTS AND MODEL PAPERS

This is yet another new feature of this revised edition. Revision tests are given at the end of each chapter. These will help students to check their performance after they have gone through the chapters. Eight unit evaluation tests are given at the end of each unit. Five mock test papers covering the complete syllabus are also given at the end of the book. All these will provide sufficient materials to students for practice during their preparation.

APPENDICES AND QUESTION BANK

This is another new feature of the book which will be very useful for students. In addition to these, questions of General Chemistry and other topics are included which are commonly asked in the examinations. The Appendices include.

- A. Principle Related to Practical Chemistry.
- B. Nuclear Chemistry

ACKNOWLEDGEMENT

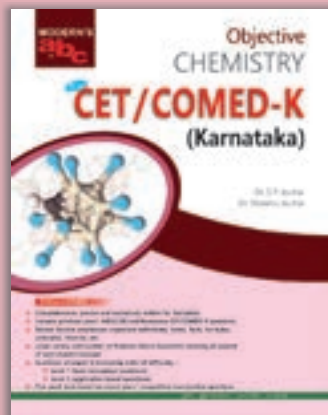
We express my sincere thanks to my friends, colleagues and dear students who have been helping me in different ways during the revision of this book.

We acknowledge with thanks the untiring efforts of our publisher, Shri Balwant Sharma General Manager, Modern Publishers and his efficient staff in bringing out this book. I am also indebted to Mr. S.K. Sikka, Mr. Ravinder Pathania and Mr. B.S. Rawat for their valuable help.

We hope the book will be well-received by all aspirants and will induce confidence in them and prepare them for the challenges ahead.

Suggestions for the improvement of the book will be gratefully acknowledged.

– Dr. S. P. Jauhar
– Dr. Sheenu Jauhar



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For **CET/COMED-K**

KARNATAKA COMMON ENTRANCE TEST

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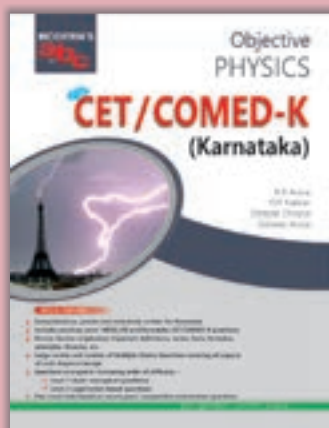
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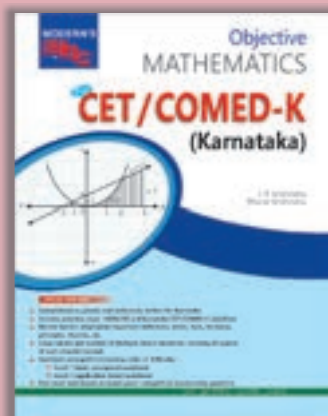
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OBJECTIVE MATHEMATICS

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ABOUT THE BOOK

I feel pleasure in presenting the thoroughly revised and updated edition of the book **“Modern’s abc of Objective Mathematics”** for the students aspiring to compete for Karnataka **CET/COMED-K**. The book is strictly in accordance with the changing trends of different examinations.

The salient features of the revised book are :

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OBJECTIVE BIOLOGY

For **CET/COMED-K**

KARNATAKA COMMON ENTRANCE TEST

ABOUT THE BOOK

The presentation in your hands of **“Modern’s abc of Objective Biology”** provides a complete review of the material covered in two year course in Biology at +2 stage.

This book has been prepared strictly in accordance with syllabus and guidelines for Karnataka **CET/COMED-K**. It fulfils the needs of the students aspiring for selection in competitive examinations.

SPECIAL FEATURES

- ❖ Comprehensive, precise and exclusively written for Karnataka
- ❖ Includes previous years' AIPMT and Karnataka CET/COMED-K questions
- ❖ Review Section emphasizes important definitions, terms, facts, formulae, principles, theories, etc.
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- ❖ Questions arranged in increasing order of difficulty –
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 - Level 2 (application-based questions)
- ❖ Five mock tests based on recent years' competitive examination questions



For Class XI & XII

School Textbooks

MODERN'S abc+ OF **PHYSICS**

About the Book

The present book is being brought out to present the subject matter and depth of content of Physics in full conformity with the latest syllabi prescribed by the NCERT/CBSE, New Delhi and other State Education Boards. In order to keep pace with the recent trends in education at the national level, the whole textual material has been arranged and presented in a sequential manner, following the NCERT pattern. Special emphasis has been laid on skill development in the problem solving approach for providing better basic conceptual understanding and deep insight of the subject matter in numerical problem solving as well.

A unique feature-**Illustrative Investigation** has been introduced in the book, as a part of much-needed experimentation cum technology-based aspect, to seek for practical applications of the concepts in day-to-day life of the learners. This aspect is expected to enhance their motivational level in the form of thought process for better and correct learning of Physics, with a view to eradicate misconceptions in Physics.

The textual material of the book has been presented in a systematic and sequential manner, easily comprehensible by the learners to make it learner-friendly. In addition to full coverage of the content, each chapter of the book includes **Illustrative Investigation**, **Summary** (content revision at a glance), **Solved NCERT Textbook Exercises, Examples** and **Additional Exercises** (to cover HOTS), **Solved NCERT Exemplar Problems**, specially designed **Practice Exercises** (with Hints and Solutions) and **Additional Practice Exercises** (with answers for self-practice), covering most of the previous years' questions from various State Education Boards and Competitive Examinations. Conceptual numerical problems and Short Answer Type, Multiple Choice Type Questions, Assertion and Reason Type Questions, set in different competitive Examinations (CBSE, AIEEE, IIT, CPMT, MNR, AFMC, AIIMS, etc) have been covered thoroughly in the present book.

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KEY FEATURES OF THE BOOK ARE

- Simple language and easily reproducible diagrams.
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- REVISION EXERCISES in the form of 'Very Short Answer Type', 'Short Answer Type' and 'Long Answer Type Questions' with HINTS and SOLUTIONS to some questions is also included.
- CONCEPTUAL QUESTIONS are solved at the end of each chapter.
- Additional information is given under 'Learning Plus', 'Key Note' and 'Watch Out'.
- For Quick Revision of the chapter objective type questions in the form of 'True or False', 'Complete the Missing Links' and 'Choose the Correct Alternative', under the heading Memory Test along with their answers, are given at the end of each unit.
- COMPETITION FILE which includes 'Additional Information', 'Higher Order Thinking Skills' (HOTS), 'Brain-Twisting Questions' (with answers) and 'Multiple Choice Questions', is also given. This will prepare students for various competitive entrance examinations for entry to Medical, IIT and other Engineering colleges.
- COMPLETE coverage of previous years' questions from all the board examinations and competitive examinations such as AIPMT, JEE(Main), JEE (Advance) and other State Boards.

In a **NUTSHELL** the book provides **Excellent Guidance to students for Boards' examinations as well as for competitive examinations for entrance to professional colleges.**

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MODERN'S abc+ OF **MATHEMATICS**

About the Book

Modern's abc + of Mathematics for Class-XII – has been especially designed to inculcate in students the basic concepts, methods and logic of Mathematics easily. For better practice and keeping in line with the recent modifications, this edition has been revised, updated and graded with the latest syllabus, curriculum and guidelines laid down by different boards in India.

The wide coverage makes this book essential for aspirants of IIT and other premier engineering colleges of our country.

KEY FEATURES OF THE BOOK ARE

- Solved examples and unsolved problems have been selected very carefully and graded properly.
- Keeping in view with the latest trends, the exercises have been divided into four categories viz., 'Fast Track Answer Type Questions', 'Very Short Answer Type Questions', 'Short Answer Type Questions' and 'Long Answer Type Questions'.
- Value Based Questions (VBQ) to enthuse ethical skills have also been added in the text.
- HOTS (Higher Order Thinking Skills) questions based on analytical skills have also been included.
- Questions from different boards of the country have also been incorporated.

MODERN'S abc+ OF **BIOLOGY**

About the Book

Modern's abc + of Biology for class XII, written by very well-known authors of the subject, is a comprehensive book written in simple language with lucid presentation of subject matter. It meets the requirements of senior secondary/pre-degree students appearing for their Board examination and also fulfils the requirement of students preparing for different competitive examinations.

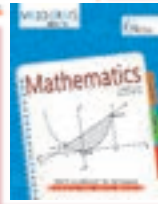
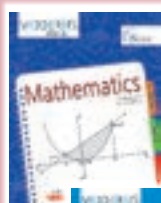
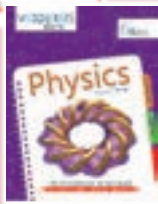
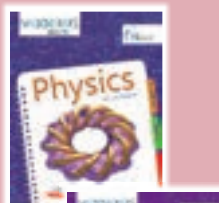
In this book, all possible efforts have been made to overcome the practical difficulties which students generally face during the preparation.

Keeping in view the importance of diagrams in Biology all the chapters have been profusely illustrated with eye-catching diagrams which make the subject matter easily comprehensible for the students. The book has also been written keeping the latest trends in mind.

An important feature of this book is the inclusion of some interesting facts for competitive examinations, new terms, objective type questions, very short answer, short answer and long answer questions.

With all these exclusive features, the book is bound to be a 'Bible' for the students, all over India, appearing for Board Examinations and various competitive examinations.

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CONTENTS

Chapter	Pages
1. Some Basic Concepts of Chemistry	1—37
2. Structure of Atom	38—72
3. Classification of Elements and Periodicity in Properties	73—90
4. Chemical Bonding and Molecular Structure	91—118
5. States of Matter	119—151
UNIT TEST PAPER-1	152—155
6. Thermodynamics	156—190
7. Equilibrium	191—230
UNIT TEST PAPER-2	231—235
8. Redox Reactions	236—251
9. Hydrogen	252—270
10. Chemistry of s-block Elements	271—288
UNIT TEST PAPER-3	289—292
11. Organic Chemistry : Some Basic Principles	293—312
12. Isomerism in Organic Compounds	313—325
13. Purification and Characterisation of Organic Compounds	326—340
14. Hydrocarbons	341—376
15. Environmental Pollution	377—386
UNIT TEST PAPER-4	387—390

16. The Solid State	391—409
17. Solutions	410—436
18. Electrochemistry	437—467
19. Chemical Kinetics	468—496
20. Surface Chemistry	497—516

UNIT TEST PAPER-5

517—521

21. General Principles and Processes of Isolation of Elements	522—537
22. Chemistry of p-Block Elements	538—577
23. Chemistry of d- and f-Block Elements	578—596
24. Coordination Compounds	597—617

UNIT TEST PAPER-6

618—621

25. Haloalkanes and Haloarenes	622—650
26. Alcohols, Phenols and Ethers	651—682
27. Aldehydes, Ketones and Carboxylic Acids	683—729

UNIT TEST PAPER-7

730—733

28. Organic Compounds Containing Nitrogen	734—759
29. Biomolecules	760—781
30. Polymers	782—795
31. Chemistry in Everyday Life	796—806

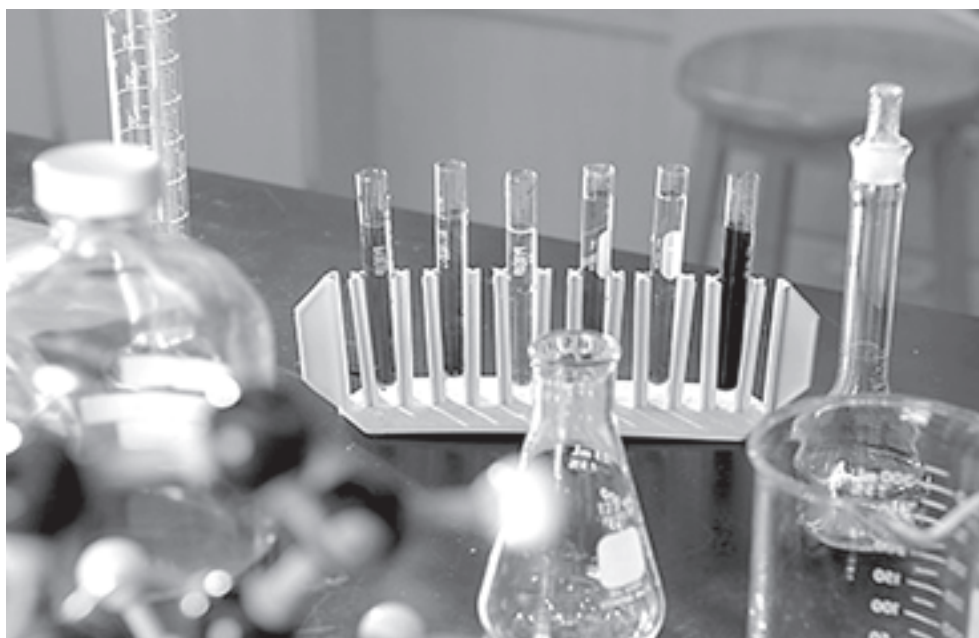
UNIT TEST PAPER-8

807—810

Mock Test Papers (1–5)	811—832
Appendices	1—53
Logarithm-Anti Logarithm Tables	(i)—(iv)

CHAPTER

1



SOME BASIC CONCEPTS OF CHEMISTRY

QUICK CHAPTER REVISION

IMPORTANT FORMULAE, FACTS AND TERMS

The measurement of a physical quantity is based upon certain fixed standards. It is guided by skill and accuracy of the observer as well as by the limitation of the measuring scale. The accuracy of the measured quantity is generally expressed in terms of significant figures.

SIGNIFICANT FIGURES

The significant figures in a number are all the certain digits plus one doubtful digit.

Rules for Counting Significant Figures

1. All non-zero digits are significant.
2. The zeros at the beginning of a number are not significant.
3. The zeros appearing in the middle of a number are significant.
4. All zeros placed at the end or to the right of a number are significant provided they are on the right side of the decimal point.
5. Zeros at the end of a number without a decimal point are ambiguous. For example, 2600 may have two, three or four significant figures depending upon whether the precision in measurements is 100, 10 or 1 respectively. Therefore, if no uncertainty is mentioned, the zeros at the end are regarded as non-significant. But in 2600., the zeros are significant (four significant figures) because the number includes decimal point.

SCIENTIFIC NOTATION

Very large and very small numbers are generally expressed in exponential form known as scientific notation. In this notation, a number is written as

MEMORISE

To count the significant digits in a number, start counting from left to right with first non-zero digit and ending with the digit that has uncertain value.

$N \times 10^n$, where N is a number with a single non-zero digit to the left of the decimal point and n is an integer called **exponent**.

The numerical portion in scientific notation i.e. N represents the number of significant figures.

The results obtained by counting are **exact numbers** i.e. numbers without any uncertainty.

ILLUSTRATING SIGNIFICANT FIGURES

$123 \leftarrow$ Significant $0.000 \overbrace{260}$ \uparrow Not significant	3 Significant digits
123 0.0300 $12 \ 345$ 25.000 1 0.000005	3 Significant figures 5 Significant figures 1 Significant figure
12 2600 2 or more significant figures 0.00000362	1234 $2600.$ 4 Significant figures 3 Significant figures
560000000000	3.62×10^{-6} Scientific notation 5.6×10^{11} Scientific notation 2 Significant figures

Rounding off to 4 significant figures

2.1267 → 2.127	
2.1264 → 2.126	
2.1245 → 2.124	(preceding digit is even)
2.1275 → 2.128	(preceding digit is odd)

Key Note

It may be noted that in calculations, the exact numbers will not have any effect on the number of significant figures. The number of significant figures in a calculation result, depends only on the number of significant figures in quantities having uncertainties.

1 2
e.g. $3.0 \times 8 = 24$
(upto two significant figures as in 3.0)

Before adding or subtracting scientific numbers, it is important to make both numbers to the same power of 10.

ROUNDING OFF FIGURES

To retain the required number of significant digits, rounding off procedure is applied.

Rules for Rounding Off Digits

1. If the digit coming after the desired number of significant figures happens to be more than 5, the preceding digit is increased by one.
2. If the digit coming after the desired number of significant figures happens to be less than 5, the preceding digit is not changed.
3. If the digit coming after the desired number of significant figures happens to be 5, the preceding digit is increased by 1 if it is odd and the preceding digit is not changed if it is even.

ARITHMETICS USING SIGNIFICANT FIGURES

Addition and subtraction

When addition or subtraction is to be carried out in the numbers having different precisions, the final result should be reported upto the same number of decimal places as are present in the number having the least number of decimal places.

Multiplication and division

In multiplication and division, the final result should be reported up to the number of significant figures equal to the minimum significant figures present in the numbers multiplied or divided.

PRECISION AND ACCURACY

The term precision refers to the closeness of the set of values obtained from identical measurements of a quantity. It is expressed as the difference

between a measured value and the arithmetic mean value for a series of measurements.

i.e., Precision = Individual value – Arithmetic mean value.

Accuracy refers to the closeness of a single measurement to its true value. It is a measure of the difference between the experimental value or the mean value of a set of measurements and the true value.

i.e., Accuracy = Mean value – True value.

Smaller the difference between the mean value and the true value, the larger is the accuracy.

UNITS

The value of a physical quantity is expressed as its *mathematical value* and a *unit*. There are three basic units of **mass, length** and **time**. These are called **fundamental units**. The units of other quantities can be derived from these units and hence are called **derived units**.

In recent years, scientists have agreed to use **SI units**. The designation comes from its French name **Systeme Internationale**.

The SI system has **seven basic units** from which all other units are derived.

These are given below :

Table 1.1. Seven Basic S.I. Units.

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Temperature	kelvin	K
Amount of substance	mole	mol
Electric current	ampere	A
Luminous intensity	candela	cd

It may be noted that the unit of temperature according to S.I. system is Kelvin but still celsius scale ($^{\circ}\text{C}$) of temperature is commonly used in our daily life. These two units are related as :

$$\text{Kelvin temperature (K)} \\ = ^{\circ}\text{C} + 273.15$$

PREFIXES

The SI units of some of the physical quantities are either too small or too large. To change the order of magnitude, these are expressed by using prefixes before the name of the units.

Derived Units

The units of different physical quantities can be derived from the basic seven systems. These are called **derived units**. For example,

Area is equal to

$$\text{Area} = \text{Length} \times \text{Breadth} = \text{m} \times \text{m} = \mathbf{m^2}$$

Density is mass per unit volume

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}} = \frac{\text{kg}}{\text{m}^3} = \text{kg m}^{-3}$$

Velocity is change in distance per unit time

$$\text{Velocity} = \frac{\text{Distance}}{\text{Time}} = \frac{\text{m}}{\text{s}} = \mathbf{m s^{-1}}$$

Acceleration is change in velocity per unit time

$$\text{Acceleration} = \frac{\text{Velocity}}{\text{Time}} = \frac{\text{m s}^{-1}}{\text{s}} = \mathbf{m s^{-2}}$$

Force is mass multiplied by acceleration.

$$\text{Force} = \text{Mass} \times \text{Acceleration} = (\text{kg}) \times (\text{m s}^{-2}) = \mathbf{kg m s^{-2}}$$

Different scales of temperature

$$^{\circ}\text{F} = \frac{9}{5}(^{\circ}\text{C}) + 32$$

$$^{\circ}\text{C} = \frac{5}{9}[^{\circ}\text{F} - 32]$$

Also, $\text{K} = ^{\circ}\text{C} + 273.15$

$$^{\circ}\text{C} = \text{K} - 273.15$$

e.g.

- Room temperature
 $25^{\circ}\text{C} = 77^{\circ}\text{F} = 298.15 \text{ K}$
- Human body temperature
 $37^{\circ}\text{C} = 98.6^{\circ}\text{F} = 310.15 \text{ K}$

Some common derived units are given below :

Table 1.2. Some common derived units.

Physical quantity	Relation with other basic quantities	S.I. units
Area	Length square	m^2
Volume	Length cube	m^3
Density	Mass per unit volume	kg/m^3 or $kg\ m^{-3}$
Speed	Distance travelled per unit time	m/s or $m\ s^{-1}$
Acceleration	Speed change per unit time	$m/s \times 1/s$ or $m\ s^{-2}$
Force	Mass \times acceleration	$kg\ m/s^2$ or $kg\ m\ s^{-2}$ (= newton, N)
Pressure	Force per unit area	$kg\ m^{-1}\ s^{-2}$ (= pascal, Pa)
Energy	Force \times distance travelled	$kg\ m\ s^{-2} \times m$ or $kg\ m^2\ s^{-2}$ (= Joule, J)

Matter & Its Classification

All the objects around us are composed of matter. Matter is defined as *anything that occupies space and has mass*. The matter can be felt by one or more of our senses. The study of matter is the fundamental study of science.

CLASSIFICATION OF MATTER

According to physical classification, matter may be classified into three states : *solid, liquid and gaseous state*.

On the basis of chemical composition, matter may be classified as *elements, compounds or mixtures*.

Element. The simplest pure form of matter which cannot be decomposed by ordinary chemical means nor it can be formed by the combination of other substances.

Compound. A substance made up of two or more elements chemically combined in a fixed proportion by weight.

Mixture. A material obtained by mixing two or more substances (elements or compounds) in any proportion is called a mixture.

LAWS OF CHEMICAL COMBINATION

1. Law of conservation of mass. This law states that *during any physical or chemical change, the total mass of the products is equal to the total mass of the reactants*. This law is also known as law of indestructibility of matter.

2. Law of constant composition. This law states that *a pure chemical compound always contains the same elements combined together in the same proportion by weight*.

3. Law of multiple proportions. According to this law, *when two elements combine to form two or more than two compounds, then the weights of one of these elements which combine with the fixed weight of other element bear a simple ratio to one another*.

4. Law of reciprocal proportions. This law states that *weights of two elements A and B, which separately combine with a third element C, are either the same or simple multiple of the weights of A and B which combine with each other*. This is also called **law of equivalent proportion**.

5. Gay Lussac's law of combining volumes. This law states that *under similar conditions of temperature and pressure, whenever gases react together, the volumes of the reacting gases as well as products (if gases) bear a simple whole number ratio*.

MEMORISE

- Law of conservation of mass was proposed by **Lavoisier**.
- Law of definite proportions was proposed by **Joseph Proust**.
- Law of multiple proportions was proposed by **Dalton**.
- Law of reciprocal proportions was proposed by **Richter**.

SOME BASIC CONCEPTS OF CHEMISTRY

DALTON'S ATOMIC THEORY

The main postulates of Dalton's atomic theory are :

- (i) All matter is made up of very tiny particles which cannot be further broken. These tiny particles are called atoms.
- (ii) Atoms can neither be created nor destroyed during chemical reactions.
- (iii) Atoms of a particular element are identical in all respects, *i.e.*, have the same size, mass and other properties.
- (iv) Atoms of different elements are different.
- (v) Atoms combine to form molecules.
- (vi) Atom is the smallest unit that takes part in chemical combination.

BERZELIUS HYPOTHESIS AND AVOGADRO'S LAW

- According to Berzelius hypothesis *equal volumes of all gases contain equal number of atoms under similar conditions of temperature and pressure.*

- Avogadro's law states as :

Under similar conditions of temperature and pressure, equal volumes of all gases contain equal number of molecules.

Mathematically, we can say $V \propto N$

where N is the number of molecules.

Avogadro's law helped to explain :

- (i) **Atomicity of elementary gases.** The number of atoms present in one molecule of the substance is called atomicity.

e.g. atomicity of oxygen is 2

atomicity of ozone is 3

- (ii) **Relationship between vapour density and molar mass of a gas.** These are related as :

$$\text{Molar mass} = 2 \times \text{Vapour density}$$

- (iii) **Relationship between mass and volume of gas.** 22.4 L of any gas at S.T.P. weigh equal to molar mass expressed in grams *i.e.* gram molecular mass.

ATOMS AND MOLECULES

Atom. The smallest particle of an element which may or may not have independent existence is called an atom.

Molecule. The smallest particle of a substance (element or compound) which is capable of independent existence is called a molecule.

ATOMIC AND MOLECULAR MASSES

Atomic mass. *The average relative mass of an atom of the element as compared to an atom of carbon (C^{12}) taken as 12.*

In other words, atomic mass expresses as to how many times an atom of the element is heavier than a carbon atom taken as 12 or $\frac{1}{12}$ th of the mass of a carbon atom. Therefore,

$$\text{Atomic mass} = \frac{\text{Mass of an atom}}{\frac{1}{12} \text{th mass of a carbon atom } (C^{12})}$$

This scale of relative masses of atoms is called *atomic mass unit scale* and is abbreviated as *a.m.u.* However, the new symbol used is *u* (unified mass) in place of *amu*. The quantity of mass equal to $\frac{1}{12}$ of the mass of an atom of carbon (C^{12}) is *atomic mass unit*.

LEARNING PLUS

For a universally accepted atomic mass unit in 1961, carbon - 12 isotope was selected as standard. Today, this scale depends on the measurement of atomic mass by a **mass spectrometer**. We can make accurate measurement of mass on this instrument by comparing mass of an atom with the mass of a particular atom selected as standard. On the present atomic mass scale, the carbon - 12 is chosen as the standard and is arbitrarily assigned a mass of exactly 12 atomic mass unit. One atomic unit (*amu*) is thus the mass equal to exactly 1/12th of the mass of a carbon - 12 atom.

Mass of 1 a.m.u is
 $1.66056 \times 10^{-24} \text{ g}$

Gram atomic mass. The quantity of an element whose mass in grams is numerically equal to its atomic mass is called **gram atomic mass** or **gram atom**. In simple words, atomic mass of an element expressed in grams is the gram atomic mass.

e.g. Atomic mass of oxygen = 16 u

Gram atomic mass of oxygen = 16 g

Molar mass. Like atomic masses, molar masses are also expressed relative to the stable isotope of carbon (C^{12}) having mass number 12. Thus, molar mass may be defined as *the average relative mass of its molecule as compared to the mass of an atom of carbon (C^{12}) taken as 12.*

$$\text{Molecular mass} = \frac{\text{Mass of a molecule}}{\frac{1}{12} \text{ th mass of a carbon atom } (C^{12})}$$

Gram molecular mass. The quantity of substance whose mass in grams is numerically equal to its molecular mass is called **gram molecular mass**. In other words, molecular mass of a substance expressed in grams is called gram molecular mass. It is also called **gram molecule**.

e.g. Molecular mass of CO_2 = 44 u

Gram molecular mass of CO_2 = 44 g.

MOLE CONCEPT

A **mole** is a collection of 6.022×10^{23} particles. It may also be defined as the amount of substance which contains the same number of elementary units (atoms, molecules or ions) as the number of atoms present in 12 g of carbon (C^{12}).

Mole and Gram atomic mass.

Mass of one mole of atoms (6.022×10^{23} atoms) of any element in grams is equal to its gram atomic mass.

$$\begin{aligned} \text{One mole atoms} &\equiv 6.022 \times 10^{23} \text{ atoms} \\ &\equiv \text{Gram atomic mass of element} \end{aligned}$$

Mole and molar mass.

Mass of one mole molecules (6.022×10^{23} molecules) of a substance in grams is called **molar mass**

$$\begin{aligned} \text{One mole molecules} &\equiv \mathbf{6.022 \times 10^{23} \text{ molecules}} \\ &\equiv \text{Molar mass} \end{aligned}$$

Mole in terms of volume.

The volume occupied by one mole of a gas at N.T.P. is known as **gram molar volume**. It is equal to 22.4 litres.

e.g. 1 mole of O_2 gas at N.T.P. occupies = 22.4 L

1 mole of SO_2 gas at N.T.P. occupies = 22.4 L

LEARNING PLUS

Loschmidt number : The number of molecules present in 1 ml of a gas at N.T.P. is called Loschmidt number

$$= \frac{6.022 \times 10^{23}}{22400} = \mathbf{2.688 \times 10^{19}}$$

In case of ionic compounds, the mass of 1 mole of formula units (6.022×10^{23} formula units) of any ionic substance in grams is equal to its **gram formula mass**.

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Publisher : MBD Group
Publishers

ISBN : 9789351845119

Author : Dr. S. P. Jauhar,
Dr. Sheenu Jauhar

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