Chapter: Structure Of Atom

(15 April- 15 May)

Objective –

The main objective to study chapter Atomic Structure is to inculcate knowledge of: -

- Wave Nature of Electromagnetic Radiations
- Photoelectric Effect
- Black Body Radiation
- Quantum Numbers
- To learn to write Electronic Configuration of the Elements

Previous Knowledge Testing –

Students should have the knowledge of: -

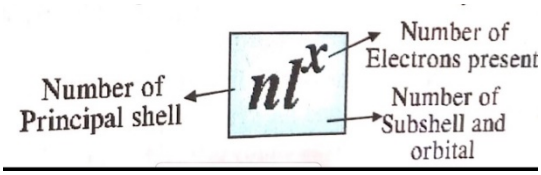
- Mole
- Atomic Numbers
- Mass Number
- Symbol of Elements etc

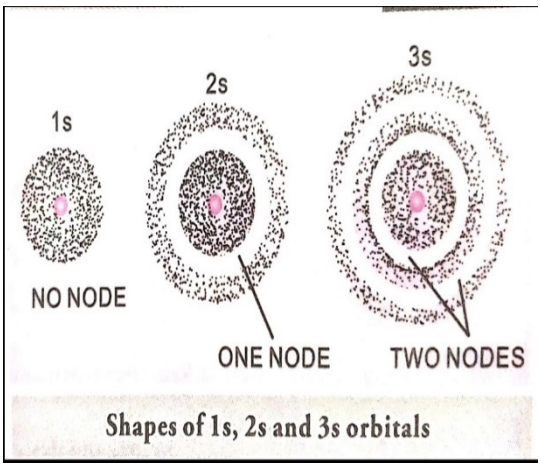
Vocabulary and Important Spellings –

- Electromagnetic Spectrum
- Wave Number
- Velocity
- Wavelength
- Nano
- Picometer
- Planck's Quantum Theory
- Quantum Numbers
- Aufbau Principle
- Hund's Rule

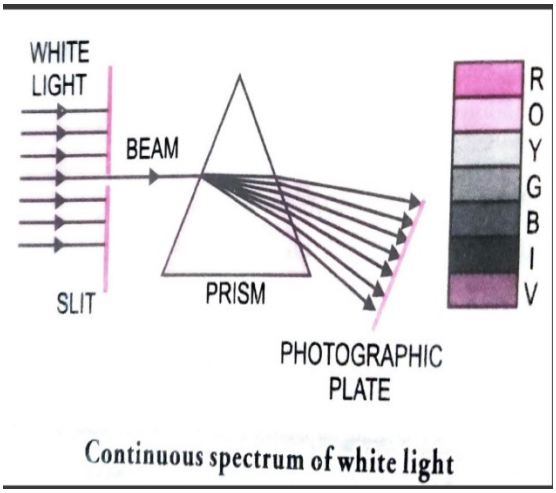
Innovative Methods –

- NCERT Book
- Smart Board
- Periodic Table

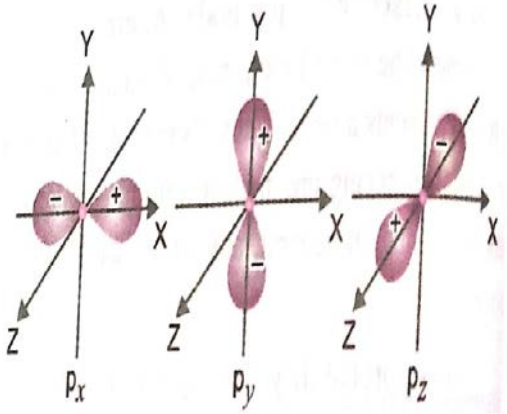




Shapes of 1s, 2s and 3s orbitals



Continuous spectrum of white light



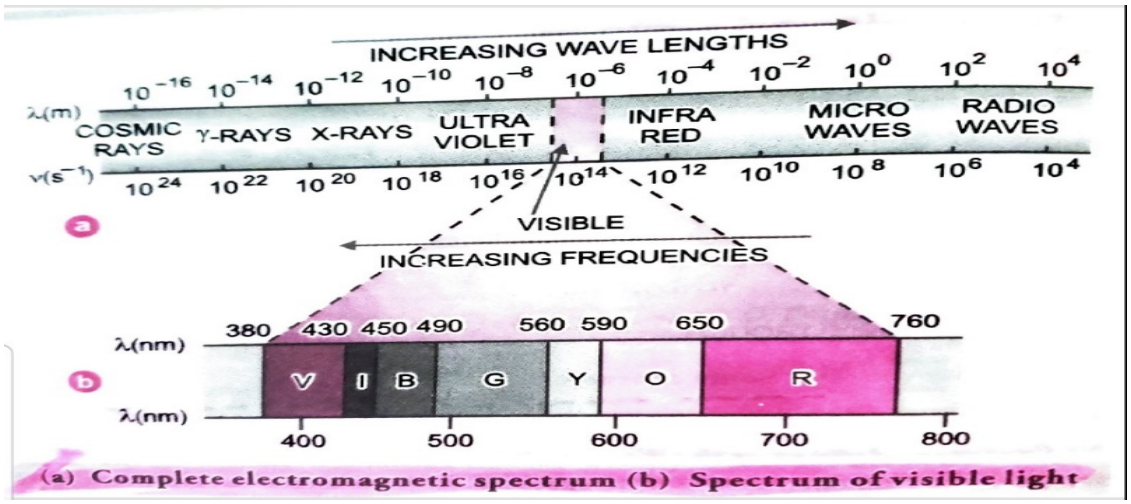
Different orientations of p-orbitals

Procedure –

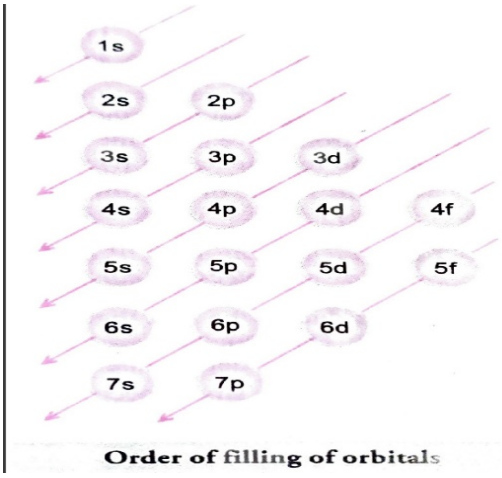
Students would be told about the following topics: -

- Electrical Nature of Matter
- J.J Thompson, Rutherford and Bohr Model of an Atom
- Atomic Number and Mass Number
- Wave Nature of Electromagnetic Radiations
- Particle Nature of Electromagnetic Radiations
- Photoelectric Effect and Black Body Radiations

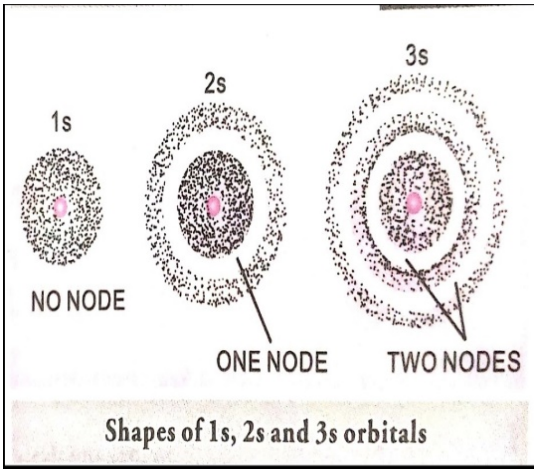
- Atomic Spectra
- Dual behaviour of Matter
- Heisenberg's Uncertainty Principle
- Quantum Mechanics and Quantum Numbers



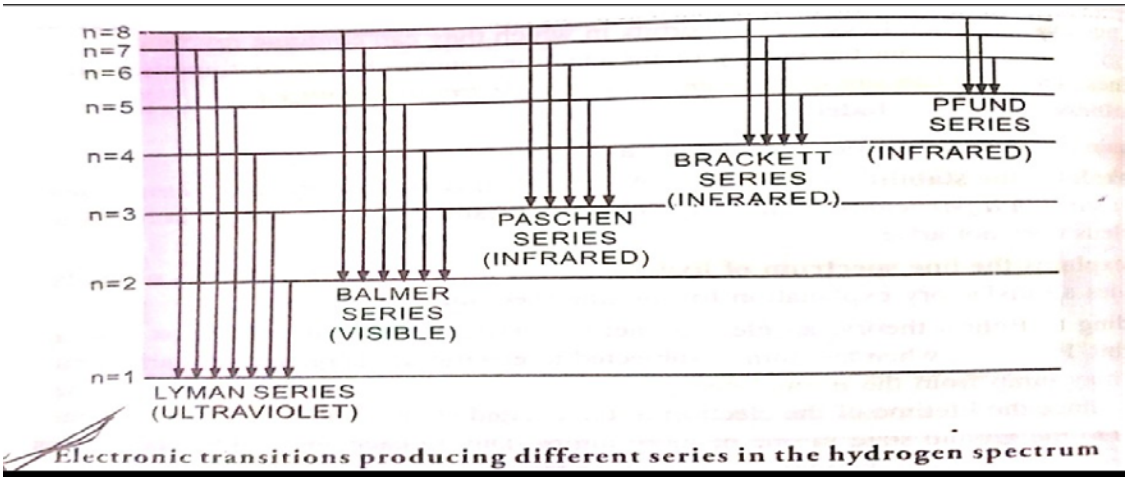
(a) Complete electromagnetic spectrum (b) Spectrum of visible light



Order of filling of orbitals



Shapes of 1s, 2s and 3s orbitals



Electronic transitions producing different series in the hydrogen spectrum

Students Participation –

Students would be able to explain: -

- Phenomenon like Photoelectric Effect $h\nu = h\nu^{o} + \frac{1}{2}mv$
- Writing of Electronic Configuration in terms of S, P, d, f Orbits
- Students would be able to numerical of [$C = \nu \times \lambda$, $\bar{V} = \frac{1}{\lambda}$, etc
- students would be able to explain and draw the shape of S , P , d , f orbitals

Recapitulations –

Students will be able to tell Symbols and formulae of: -

- Like Energy Wavenumber, Photoelectric Effect, Quantum Nos
- And apply on Questions given from NCERT and Assignment

Integration with other Domains –

The chapter Atomic Structure is integrated with: -

- Language
- Mathematics to solve Numerical
- Art for drawing shapes of orbitals

Co – Scholastic Activities –

With the knowledge of this chapter student will be able to perform following activities: -

- To study Line emission spectra of some Elements like Na^{+} , Ca^{+2} , Sr^{+2} , etc
- To study Periodic Table in detail
- S, p, d, f block Elements and their Electronic Configuration

Chapter : Periodic Classification
(15 May-30 May)

Objective –

With the knowledge of this chapter students will be able to study Modern Periodic Table in detail

Previous Knowledge Testing –

Students will be asked about: -

- S, p , d ,f blocks and their general Electronic Configuration
- Symbols and Atomic No's of Common Elements

Vocabulary / Important Spellings –

- Group
- Period
- Atomic Size
- Ionization Energy
- Electron Gain Enthalpy
- Valency
- Electronegativity
- Mendeleev, etc

Innovative Method –

- Chart of Modern Periodic Table
- Smart Class
- NCERT Book

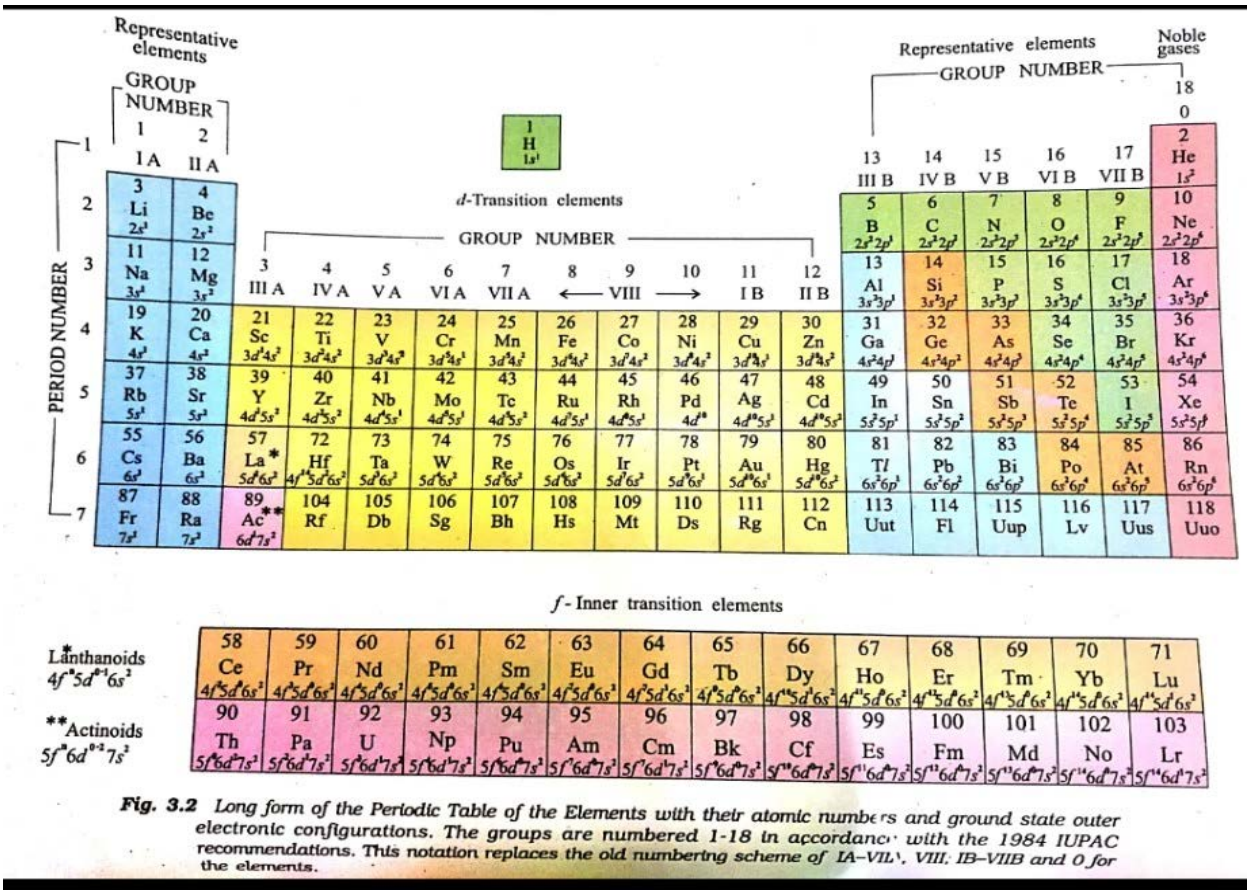


Fig. 3.2 *Long form of the Periodic Table of the Elements with their atomic numbers and ground state outer electronic configurations. The groups are numbered 1-18 in accordance with the 1984 IUPAC recommendations. This notation replaces the old numbering scheme of IA–VIIA, VIII, IB–VIIB and 0 for the elements.*

Procedure –

Students would be told about the following topics: -

- Earlier Classification of Elements
- Dobereiner's, Mendeleev's Periodic Table
- Need of Modern Periodic Table
- Study of Modern Periodic Table in detail
- Periodic Properties like Atomic Size, Ionization Energy, Electron Gain Enthalpy, Electronegativity
- Diagonal Relationship
- Valency and Oxidation State

Table 3.1 Dobereiner's Triads

Element	Atomic weight	Element	Atomic weight	Element	Atomic weight
Li	7	Ca	40	Cl	35.5
Na	23	Sr	88	Br	80
K	39	Ba	137	I	127

Students Participation –

Students will participate in: -

- Writing Symbols
- Atomic Numbers
- Electronic Configuration in terms of S, P, d, and f Quantum Numbers
- Discussing Periodic Properties and Exceptional Behaviour of Certain Elements

Recapitulation and Assignments –

- After discussing chapter, Students will Recapitulate all important points of Modern Periodic Table
- They will be able to answer exceptional behaviour of Cl and F, O and S regarding Electron Gain Enthalpy

Integration with other Domains –

The chapter Periodic Classification is integrated with: -

- Language (English)
- Maths

Learning Outcomes –

Students would be able to tell: -

- Position of any Elements (In terms of Group, Period and Block)
- Variation in Atomic and Ionic State
- Conceptual questions related to all Periodic Properties

Ch : Basic Concepts Of Chemistry

(1 July – 15 July)

Objective:

To introduce the students to the field of chemistry, its basic concepts which help in understanding the text.

Previous knowledge testing:

Students will be asked about atom, molecule, mole, laws and various chemical formulae of some common substances.

Vocabulary used:

Multiple, reciprocal, empirical, limiting reagent, percentage.

Important spellings:

Scientific notation, significant figures, reciprocal, Avogadro, precision, empirical, accuracy.

Explanation with innovative methods/ Aids used:

Smart class,examples of various chemicals to explain laws of chemical combination,quiz, MCQ, practise problems, student teacher interaction, flow chart(atomic masses and chemical formulae), peer assessment. Roleplay activity by assigning the role of mole to each peer in class.

Table 1.1 Base Physical Quantities and their Units

Base Physical Quantity	Symbol for Quantity	Name of SI Unit	Symbol for SI Unit
Length	l	metre	m
Mass	m	kilogram	kg
Time	t	second	s
Electric current	I	ampere	A
Thermodynamic temperature	T	kelvin	K
Amount of substance	n	mole	mol
Luminous intensity	I_v	candela	cd

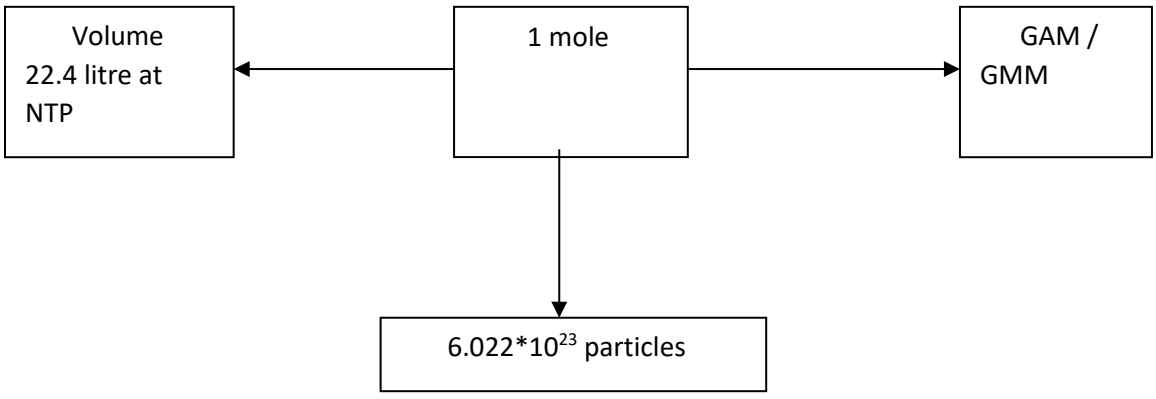
Symbols of Common Elements

Element	Symbol	Element	Symbol	Element	Symbol
Aluminum	Al	Gold	Au	Platinum	Pt
Antimony	Sb	Helium	He	Plutonium	Pu
Argon	Ar	Hydrogen	H	Potassium	K
Arsenic	As	Iodine	I	Radium	Ra
Barium	Ba	Iron	Fe	Silicon	Si
Bismuth	Bi	Lead	Pb	Silver	Ag
Boron	B	Lithium	Li	Sodium	Na
Bromine	Br	Magnesium	Mg	Strontium	Sr
Cadmium	Cd	Manganese	Mn	Sulfur	S
Calcium	Ca	Mercury	Hg	Tin	Sn
Carbon	C	Neon	Ne	Titanium	Ti
Chlorine	Cl	Nickel	Ni	Tungsten	W
Chromium	Cr	Nitrogen	N	Uranium	U
Cobalt	Co	Oxygen	O	Xenon	Xe
Copper	Cu	Palladium	Pd	Zinc	Zn
Fluorine	F	Phosphorus	P		

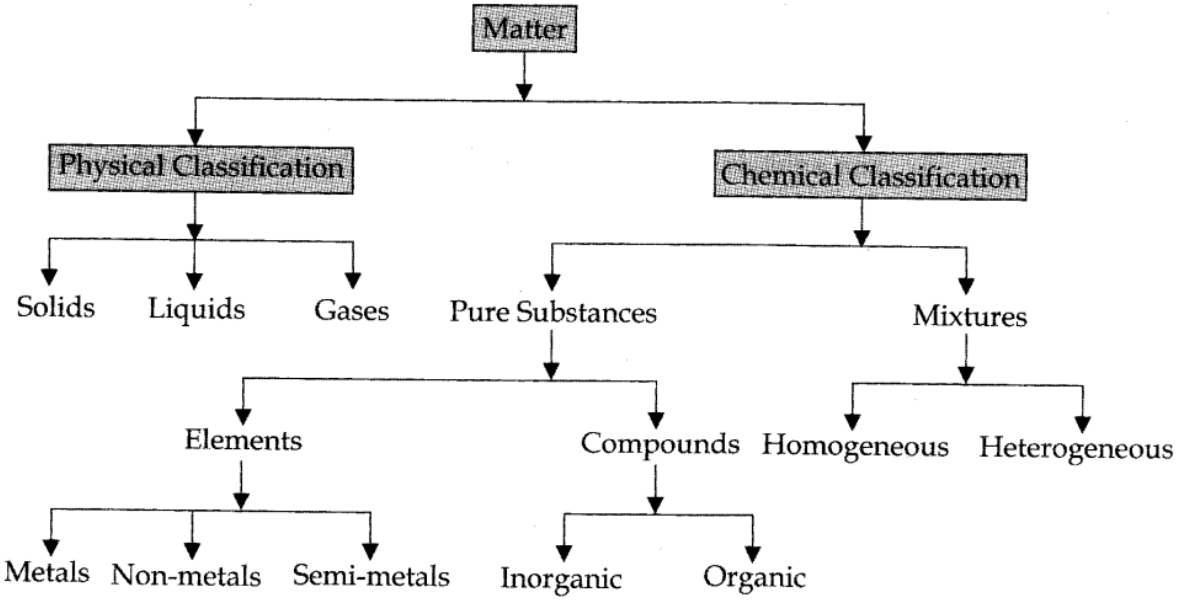
Element name	Atomic number	Atomic mass	Element name	Atomic number	Atomic mass
Hydrogen	1	1	Sodium	11	23
Helium	2	4	Magnesium	12	24
Lithium	3	7	Aluminium	13	27
Beryllium	4	9	Silicon	14	28
Boron	5	11	Phosphorus	15	31
Carbon	6	12	Sulphur	16	32
Nitrogen	7	14	Chlorine	17	35.5
Oxygen	8	16	Argon	18	40
Fluorine	9	19	Potassium	19	39
Neon	10	20	Calcium	20	40

Procedure- challenges:

- Precision and accuracy will be introduced as closeness to the measurements.
- Significant figures will be explained with suitable numerical problems.
- Mole will be introduced.



- Definition and explanation about atom, molecule, atomic mass, molecular mass will be done by taking C-12 as reference.
- Isotopes, isotones, isobars will be described
- Empirical and molecular formula will be defined with examples
- Stoichiometric relations(m/m, m/v, v/v) in chemical equations will be told.
- Limiting reagent will be explained along numerical problems.



Participation of students:

- While doing this topic students will be able to tell about various formulae of different elements like hydrogen, oxygen, nitrogen etc.
- They will do numericals on given formula.

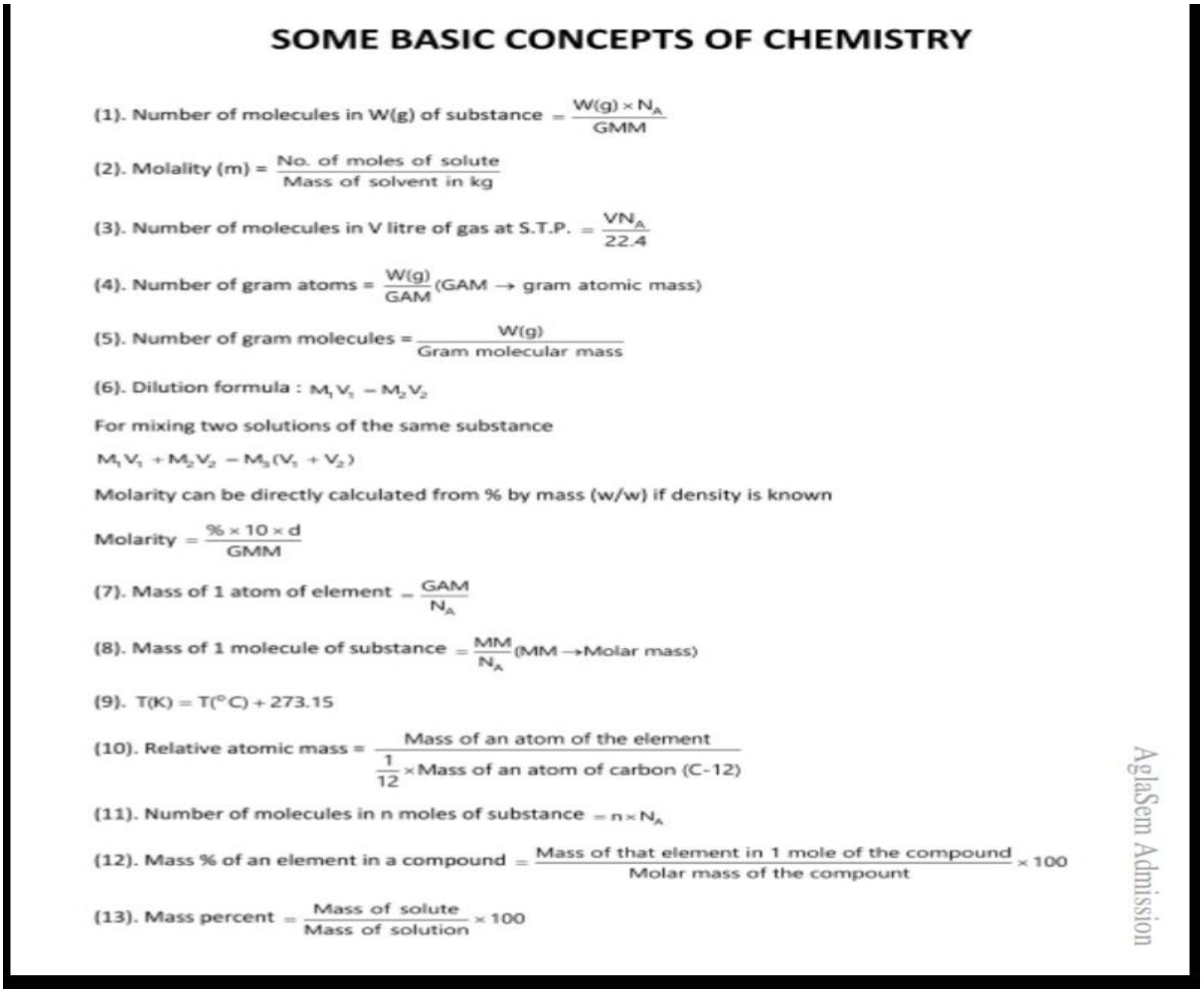
n=mass/ molar mass	$n=N/N_0$

- They will classify matter on physical and chemical basis.
- They will respond to explain about element, compound and mixture and solids, liquids and gases.

Recapitulation:

After explaining this topic students will be able to review.

- Importance of chemistry in daily life
- Statement of laws of chemical combination- law of constant proportion, multiple proportion, reciprocal proportionand apply them.
- Learn to solve numerical problems based on significant figures and rules applied on them.
- Define molecular and empirical formula.
- Understand stoichiometry in chemical equations.



SOME BASIC CONCEPTS OF CHEMISTRY

(1). Number of molecules in W(g) of substance $= \frac{W(g) \times N_A}{GMM}$

(2). Molality (m) = $\frac{\text{No. of moles of solute}}{\text{Mass of solvent in kg}}$

(3). Number of molecules in V litre of gas at S.T.P. $= \frac{VN_A}{22.4}$

(4). Number of gram atoms = $\frac{W(g)}{GAM}$ (GAM → gram atomic mass)

(5). Number of gram molecules = $\frac{W(g)}{\text{Gram molecular mass}}$

(6). Dilution formula : $M_1V_1 - M_2V_2$

For mixing two solutions of the same substance

$M_1V_1 + M_2V_2 - M_3(V_1 + V_2)$

Molarity can be directly calculated from % by mass (w/w) if density is known

Molarity $= \frac{\% \times 10 \times d}{GMM}$

(7). Mass of 1 atom of element $= \frac{GAM}{N_A}$

(8). Mass of 1 molecule of substance $= \frac{MM}{N_A}$ (MM → Molar mass)

(9). $T(K) = T(^\circ C) + 273.15$

(10). Relative atomic mass = $\frac{\text{Mass of an atom of the element}}{\frac{1}{12} \times \text{Mass of an atom of carbon (C-12)}}$

(11). Number of molecules in n moles of substance $= n \times N_A$

(12). Mass % of an element in a compound $= \frac{\text{Mass of that element in 1 mole of the compound}}{\text{Molar mass of the compound}} \times 100$

(13). Mass percent $= \frac{\text{Mass of solute}}{\text{Mass of solution}} \times 100$

(14). $\frac{X_B}{1 - X_B} = \frac{\text{molality} \times M_A}{1000}$ where M_A - mass of solvent

(15). Molarity (M) = $\frac{\text{No. of moles of solute}}{\text{Volume of solution in litres}}$ mole / L

(16). Avogadro's No. $N_A = 6.022 \times 10^{23}$

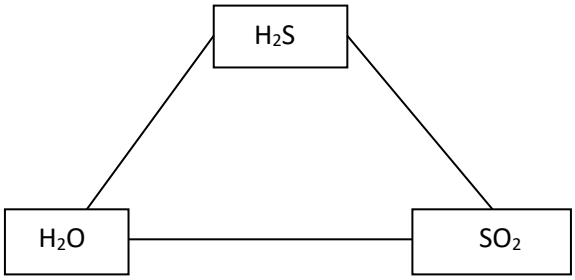
(17). $T(^\circ F) = \frac{9}{5} T(^\circ C) + 32$

(18). Molecular mass $= 2 \times$ vapour density

(19). Mole fraction of A = $\frac{\text{No. of moles of A}}{\text{No. of moles of solution}}$

Integration with other domains:

This topic is integrated with skills of physical measurements and mathematical skills.eg- law of reciprocal proportion can be made to understand with rectangular shape representation.



Resource: NCERT book, reference book: modern abc, www.askilitians.com, youtube- play chemistry.

Learning outcome:

After doing this topic students will be able to

- Explain importance and scope of chemistry.
- Understood, inspect and analyse the application of principles of chemistry in other fields of life.
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- Understand and explain la of chemical combination, Daltons atomic theory.
- Know concept of atoms, molecule and elements, atomic and molecular pass.
- Understand and apply mole concept, empirical and molecular mass.
- Understand and apply mole concept,empirical and molecular formula and stoichiometric relationships m/m, m/v, v/v in chemical equations.
- They will be able to realise importance and application of principles of chemistry in various areas/fields of life.
- Critical thinking ill be developed with the laws of chemical combustion by analysing relations existing between different compounds.
- They will be able to apply established principles to justify and observation.
- Team work and collaboration skill will be inculcated.

Assignment:

- NCERT intext exercise and back exercise.
- Numerical problems for practise.
- Statement and explanation of las of chemical combinations

- MCQs, SA, VSA questions.
- Definitions of atom, molecule, atomic mass, atomic mass unit, molecular mass, mole, limiting reagent.

Chapter : States of Matter

(15 July to 30 July)

Objective –

The objective to study this chapter is that it helps to include the knowledge of:

- States of matter (Liquid and Gaseous)
- Physical Characteristics of Gaseous state
- Properties of Liquids etc

Previous Knowledge Testing –

Students should know about: -

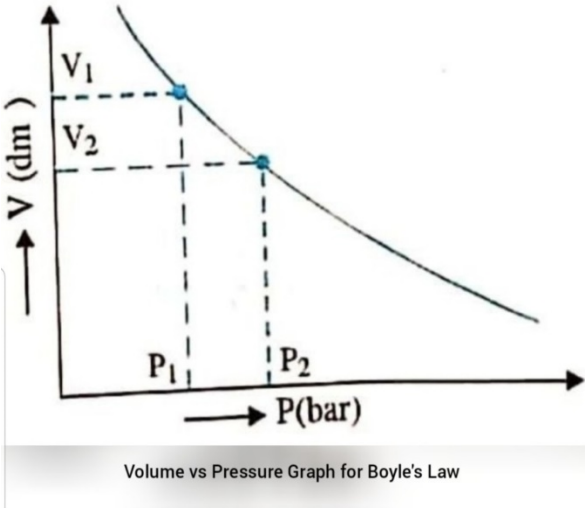
- Hydrogen Bonding
- Intermolecular Forces
- General Characteristics of Liquid and Gaseous States

Vocabulary / Important Spellings –

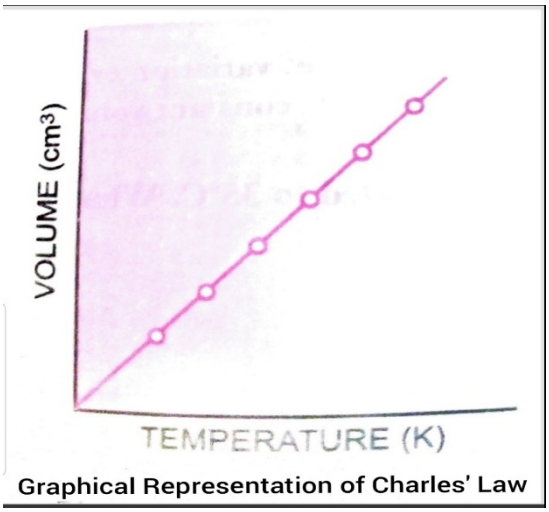
- Boyle's Law
- Charles' Law
- Partial Pressure
- Liquification
- Van Der Waals Equation, etc

Innovative Method –

- Smart Class
- Lecture Method
- NCERT Book



Volume vs Pressure Graph for Boyle's Law



Graphical Representation of Charles' Law

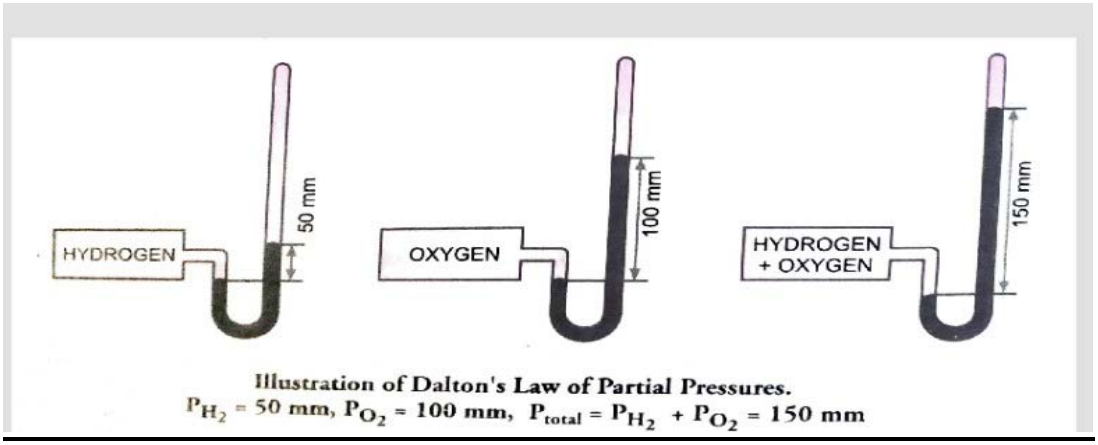


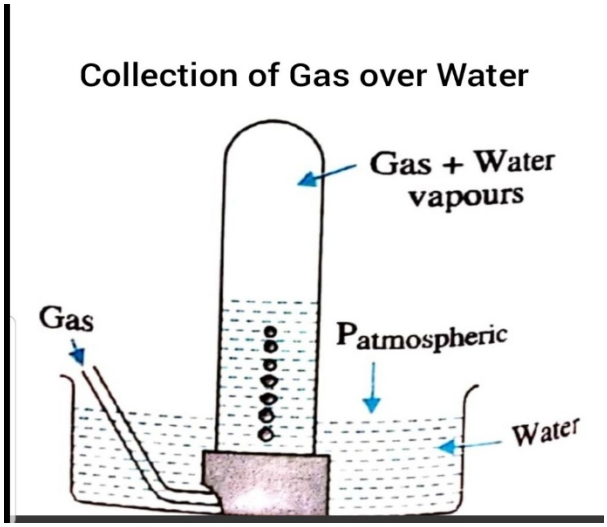
Illustration of Dalton's Law of Partial Pressures.
P_{H_2} = 50 mm, P_{O_2} = 100 mm, $P_{total} = P_{H_2} + P_{O_2}$ = 150 mm

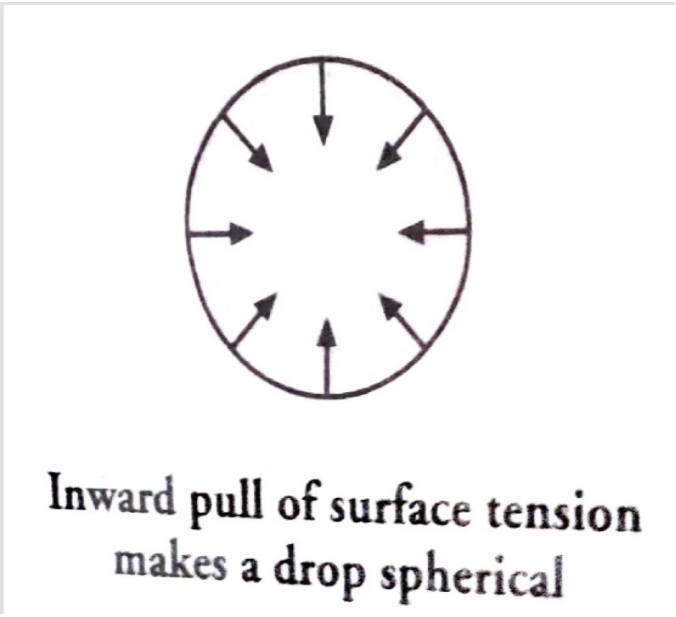
Procedure –

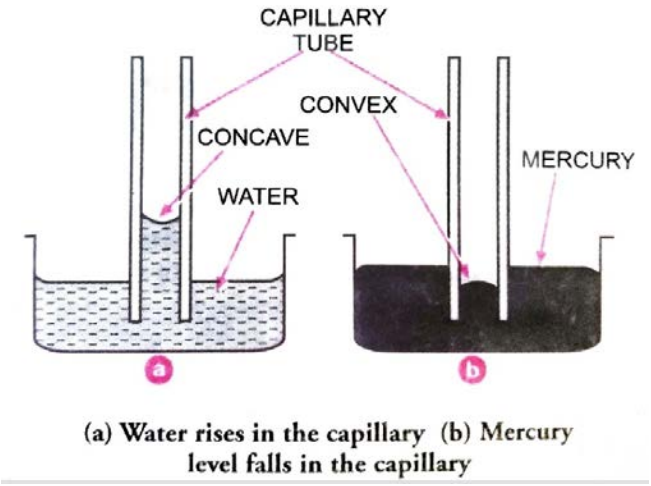
Students will be told about: -

- Gas Law, Boyle's Law, Charles' Law, Avogadro's Law
- Combined Gas Law or Ideal Gas Equation
- Dalton's Law of Partial Pressure
- Diffusion of Gases
- Kinetic Molecular Theory

- Deviation of Gases from Ideal Gas Behaviour
- Liquification of Gases
- Properties of Liquids

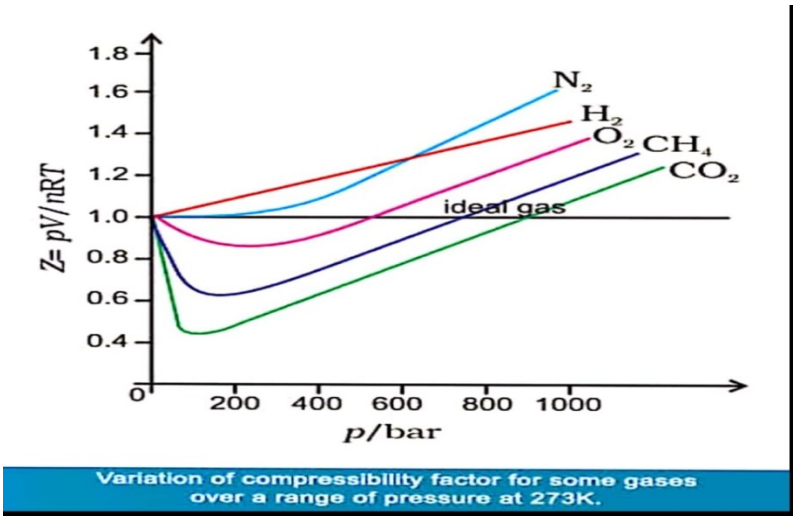






(a) Water rises in the capillary (b) Mercury level falls in the capillary

Surface tension of a liquid



Variation of compressibility factor for some gases over a range of pressure at 273K.

Students Participation –

After having knowledge of all topics students will be able to solve: -

- Numerical based on Gas laws
- $P_1V_1 = P_2V_2$
- $\frac{V1}{T1} = \frac{V2}{T2}$
- PV = nRT
- $\frac{P1V1}{T1} = \frac{P2V2}{T2}$
- And Conceptual Questions

Recapitulations / Assignments –

- Students will Recapitulate properties of Liquids (Viscosity, Surface Tension)
- Van Der Waals Equation and their Constants
- Recapitulation of all Formulas would be done

Integration with Other Domains –

The chapter States of Matter is integrated with: -

- Language
- Mathematics (To solve Numerical problems)
- It is also integrated with Physics for topics like Maxwell Distribution of Speeds, Viscosity, Surface Tension, etc

Learning Outcome –

Students would be able to solve: -

- All Conceptual Problems given in NCERT Book
- Reasoning Questions
- Derivation of Ideal Gas Equation (PV=nRT), Boyle's Law ($V \alpha \frac{1}{P}$),

  Charles' Law (VαT), Compressibility Factor ($Z=\frac{PV}{nRT}$),

  Daltons Law of Partial Pressure ($P= P_1 + P_2 + P_3 + \_ \_ \_ \_ P_n$)

Co – Scholastic Activities –

With The knowledge of this chapter (States of Matter) students can perform Activities like: -

- Comparing rate of evaporation of different liquids
- Measurements of Surface Tension by Stalagmometer
- Capillary action of liquids
- To study the Boiling Point of Different liquids
- Diffusion of Gases

Chapter : Chemical bonding (August)

Objective:

To give insight picture of concept of cause, types and forces which exist in a chemical bond and resulting shapes acquired due to bonding.

pK testing:

Students will be asked following question

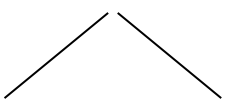
- Why do atoms combine?
- What is the nature of forces which hold the atoms together?
- Why do atoms have fixed combining capacity?
- How is electronic configuration related with bonding?

Vocabulary used:

Octet, paramagnetic, diamagnetic, lattice, electro-negativity, lewis, coordinate, polarity, resonance, distorted, sew saw, ionisation, pyramidal, octahedral, tetrahedral, trigonal.

Explanation with innovative methods/ aids used:

Student-teacher interaction, smart class, quiz, group discussion, MCQ, practise problems, activities. Ball and stick models, group activity etc.



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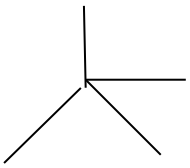
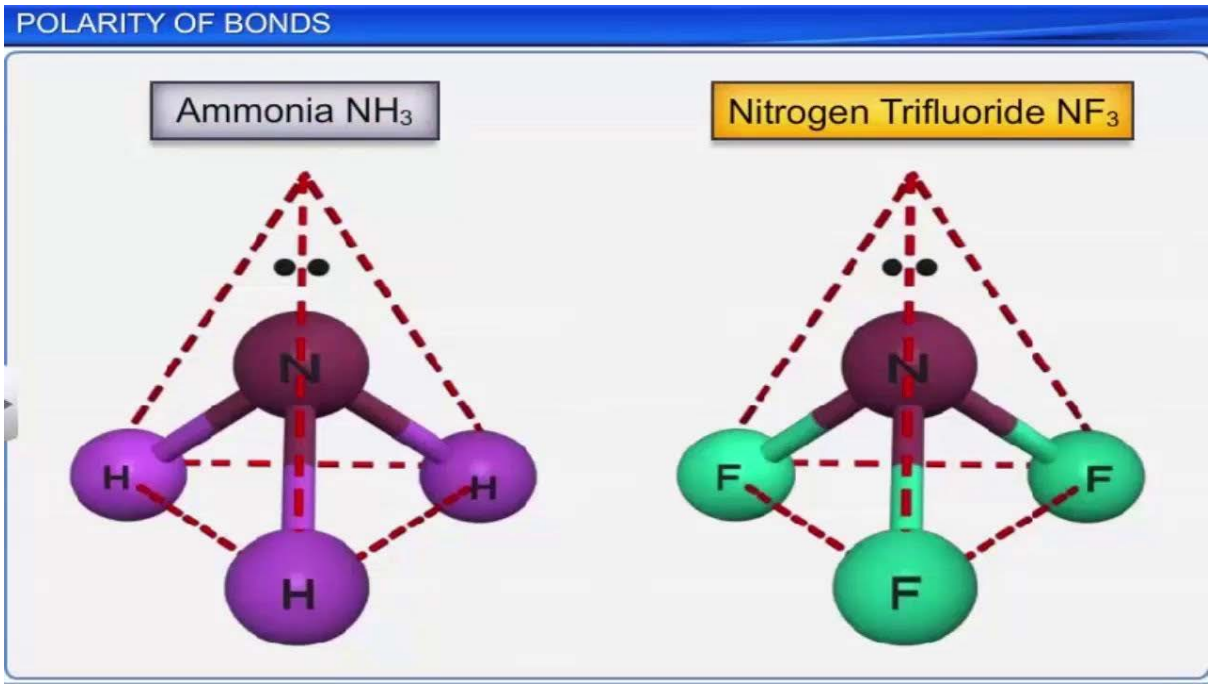
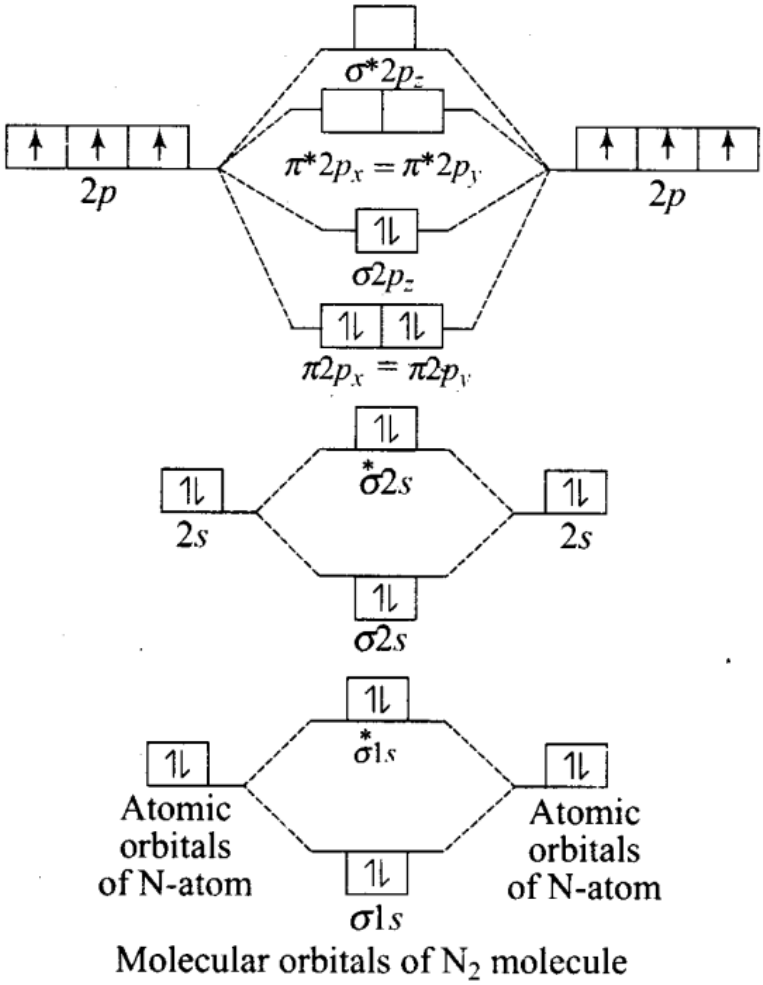


tetrahedral



Procedure:

- Children will be told about chemical bond as a force of attraction which help to bind the atoms together.
- Definition and and formation of ionic and covalent bonds will be discussed along with example.
- Definition and examples of coordinate bond will be taken.
- Importance and meaning of lattice enthalpy will be discussed.
- Dipole moment will be explained along with its significance.
- Concept of hybridisation will be explained, types- sp, sp^2, sp^3, sp^3d, sp^3d^2 etc. will be explained with the help of examples and models.
- Phenomenon of resonance will be discussed as delocalisation of e^{-1}.
- Different theories like VBT, VSEPR, MOT will be introduced to explain bonding and their role in describing characteristics of molecules.
- Special case of hydrogen bonding, its types and significance will be explained.



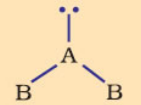
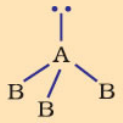
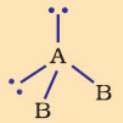
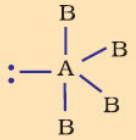
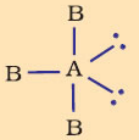
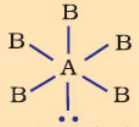
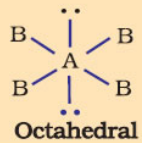
Molecular orbitals of N_2 molecule

Participation of children:

- After knowing lewis concept, children will be able to write various lewis structures of elements and molecules to predict bonding.
- They will try to find out polarity of molecules
- They will draw presentation of various molecules based on concept of hybridisation.
- They will be told to draw molecular energy levels diagram themselves for N_2, O_2, He and their ions and calculate B.O to find their stability and magnetic nature.

Recapitulation:

- Small written test will be conducted to judge their learning of shapes and molecular orbital diagrams of various molecules.
- They will be briefed about ionic bond, covalent bond, dipole moment, resonance, bond parameters.
- They will be depicted about difference in sigma and pi bond, BMO and AMO, MO and AO.
- VBT, VSEPR, MO theory will be summarised.

Molecule type	No. of bonding pairs	No. of lone pairs	Arrangement of electron pairs	Shape	Examples
AB_2E	2	1	 Trigonal planar	Bent	SO_2, O_3
AB_3E	3	1	 Tetrahedral	Trogonal pyramidal	NH_3
AB_2E_2	2	2	 Tetrahedral	Bent	H_2O
AB_4E	4	1	 Trigonal bi-pyramidal	See saw	SF_4
AB_3E_2	3	2	 Trigonal bi-pyramidal	T-shape	ClF_3
AB_5E	5	1	 Octahedral	Square pyramid	BrF_5
AB_4E_2	4	2	 Octahedral	Square planar	XeF_4

Shape of Some Simple Molecules

Type of molecule	No. of electron pairs	No. of bond pairs	No. of lone pairs	Type of hybridisation involved	Geometry of molecule	Examples
AB_2	2	2	0	sp	Linear	BeF_2, $[Ag(NH_3)_2]^+$
AB_3	3	3	0	sp^2	Trigonal planar	BF_3, $AlCl_3$
AB_2L	3	2	1	sp^2	V-shaped	$SnCl_2$, $PbCl_2$
AB_4	4	4	0	sp^3	Tetrahedral	CH_4, SiF_4, CCl_4
AB_3L	4	3	1	sp^3	Trigonal pyramidal	NH_3, PX_3 (X = F, Cl, Br, I)
AB_2L_2	4	2	2	sp^3	V-shaped	H_2O, OF_2, SCl_2
AB_5	5	5	0	sp^3d	Trigonal bipyramidal	PF_5, PCl_5, $SbCl_5$
AB_4L	5	4	1	sp^3d	See saw	SF_4, $TeBr_4$
AB_3L_2	5	3	2	sp^3d	T-shaped	ClF_3, $XeOF_2$
AB_2L_3	5	2	3	sp^3d	Linear	XeF_2, ICl_2^-, I_3^-
AB_6	6	6	0	sp^3d^2	Octahedral	SF_6
AB_5L	6	5	1	sp^3d^2	Square pyramidal	IF_5, ClF_5, BrF_5
AB_4L_2	6	4	2	sp^3d^2	Square planar	XeF_4, ICl_4^-
AB_7	7	7	0	sp^3d^3	Pentagonal bipyramidal	IF_7, XeF_6

Species	Total electrons	Configuration	Bond order	Magnetic character
O_2	16	$KK\sigma(2s)^2\,\sigma^*(2s)^2$ $\sigma(2p_z)^2\,\pi(2p_x)^2 = \pi(2p_y)^2$ $\pi^*(2p_x)^1 = \pi^*(2p_y)^1$	$\frac{(8-4)}{2} = 2.0$	Paramagnetic
O_2^+	15	$KK\sigma(2s)^2\,\sigma^*(2s)^2$ $\sigma(2p_z)^2\,\pi(2p_x)^2 = \pi(2p_y)^2$ $\pi^*(2p_x)^1$	$\frac{(8-3)}{2} = 2.5$	Paramagnetic
O_2^-	17	$KK\sigma(2s)^2\,\sigma^*(2s)^2$ $\sigma(2p_z)^2\,\pi(2p_x)^2 = \pi(2p_y)^2$ $\pi^*(2p_x)^2 = \pi^*(2p_y)^1$	$\frac{(8-5)}{2} = 1.5$	Paramagnetic
O_2^{2-}	18	$KK\sigma(2s)^2\,\sigma^*(2s)^2$ $\sigma(2p_z)^2\,\pi(2p_x)^2 = \pi(2p_y)^2$ $\pi^*(2p_x)^2 = \pi^*(2p_y)^2$	$\frac{(8-6)}{2} = 1.0$	Diamagnetic

$\therefore$ Relative order of stability is $O_2^+ > O_2 > O_2^- > O_2^{2-}$.

Integration with other domains:

- This topic will be primarily indicated with geometry to represent shapes of molecules by act of cutting and pasting.
- Ball and stick models will be told to prepare.
- Statue project of molecular orbital diagram for H_2, O_2, He etc. will be told to prepare.

Resources:

- NCERT book of XI chemistry
- Modern abc of XI chemistry
- Periodic table
- Youtube-shiksha house
- www.learncbse.in/chemicalbonding

Learning outcomes: scholastic knowledge

After doing this topic students will come to know about:

- Definition, types, causes and examples of chemical bonding.
- Representation of formation of ionic bond in NaCl, $MgCl_2$, CaO etc.
- Representation of covalent bonding in various molecules like CH_4, C_2H_4, H_2O, NH_3, S.
- Calculate formal charge.
- Explain dipole moment and its significance.
- Concept of VSEPR theory LP:LP > LP:BP > BP:BP.
- Shapes of molecules with regular and distorted geometry.

- Concept of hybridisation and its applications.
- Relevance of molecular orbital theory and hydrogen bonding.

Co-scholastic

- They will develop skill and competence.
- They will be able to realise importance and application of this topic in various fields of life.
- Critical thinking will be developed by analysing different cases.
- Team work and collaboration will be developed.

Assignment:

NCERT exercise, MCQ, reason-assertion type questions, SA, VSA, shapes of molecules of regular and irregular geometry, molecular orbital diagrams.

Chapter : Hydrogen
(1 September – 15 September)

Objective:

To make children acquitted with uniqueness of hydrogen, its preparation, properties, position and uses, along with an insight of water, H_2O_2 etc.

Previous Knowledge testing:

Children will be asked:

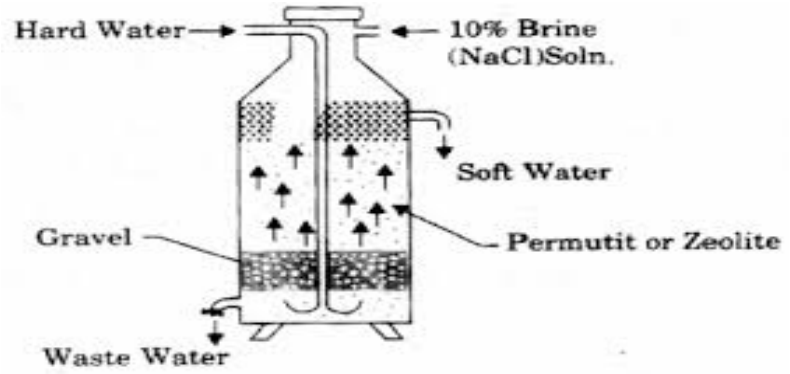
Formula of hydrogen? Occurrence and isotopes of hydrogen? Important compounds of hydrogen?

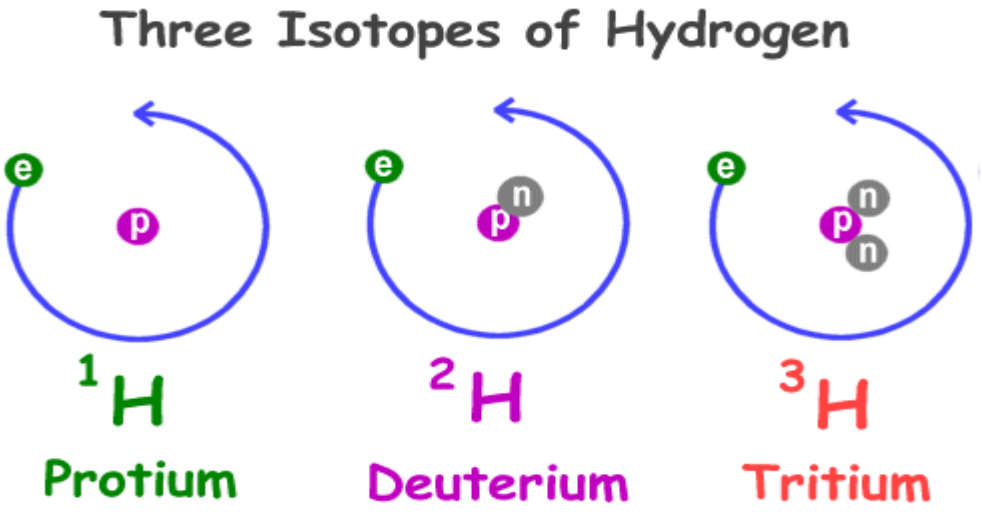
Vocabulary:

Protium, deuterium, tritium, electropositive, electronegative, electrolysis, gasification, saline, interstitial, stoichiometric

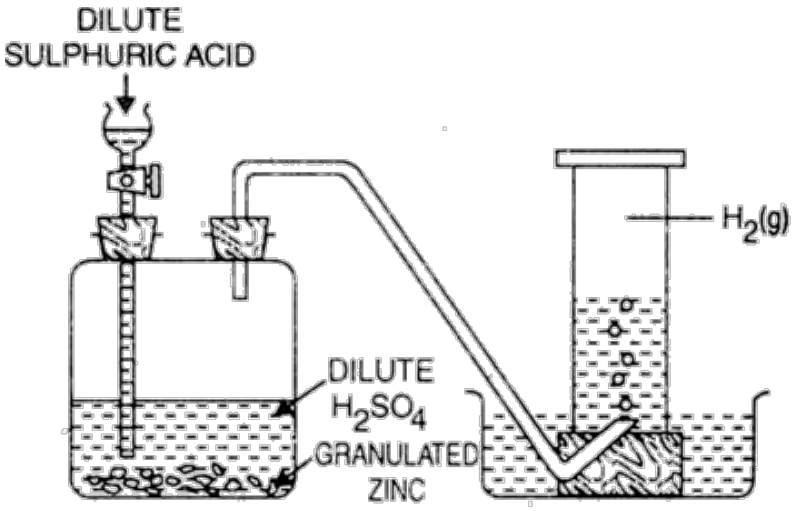
Explanation with innovative methods/Aids used:

Student-teacher interaction, smart class, quiz, group discussion, MCQ, practise problems, activities in lab to identify hard water and soft water. Soft water will form lather easily as compared to hard water. Chemical equations, diagrams, periodic table, group activity.



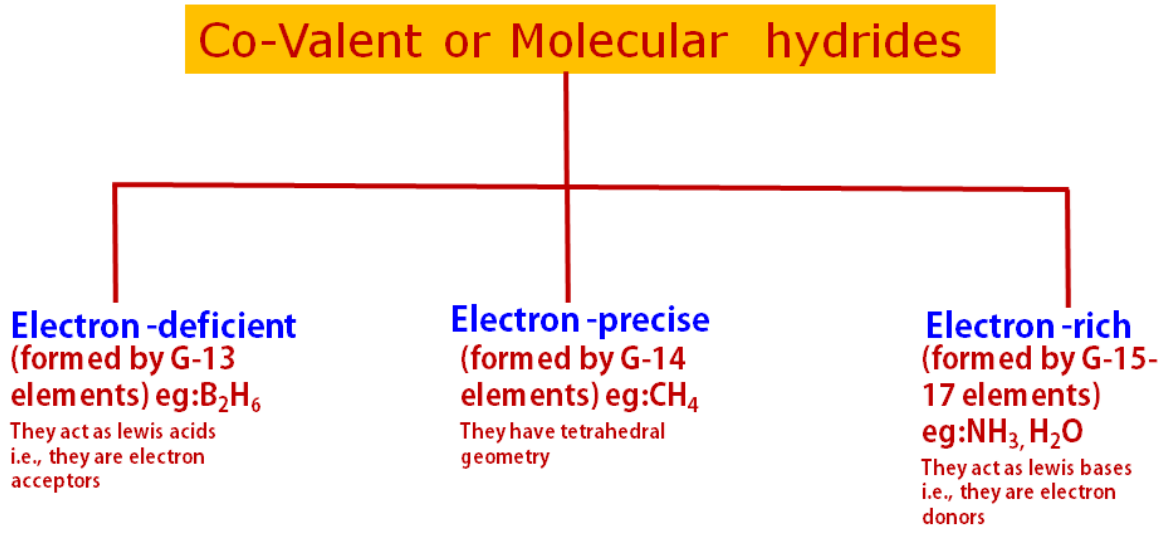


ACTIVITY:



Procedure:

- Children will be introduced with the unique properties and position with the help of periodic table i.e. in group I and group 17
- Properties, preparation and uses will be taken up using chemical equations.
- Three types of hydrides- covalent, metallic, interstitial will be discussed.
- Hard water and soft water will be discussed with respect to RO used at home.
- Heavy water and H_2O_2 will be discussed by explaining their preparation, properties and uses.
- Hydrogen economy will be discussed by introducing H_2 as future fuel.



Participation of children:

- Group activity- children will be divided into two groups, one group will discuss position of hydrogen in group 1(alkali metals) and second will discuss in group 17(halogens).
- Children will perform activity to identify soft and hard water using soap.
- They will enumerate role of hydrogen in chemical world.

Recapitulation:

A short oral test will be conducted to judge their learning about the topic. They will be told to write chemical formulae of important compounds of hydrogen and chemical equations depicting the chemical properties of heavy water, hard water and H_2O_2.

Integration with other domains:

- This topic is integrated with maths for balancing of chemical equations and calculating strength of solution.
- Drawing is used to explain softening of water diagrammatically using various methods.

Resources:

NCERT text book for XI chemistry
Reference book- dinesh companion chemistry by SK Malhotra

Learning outcome:

After this topic students will know about

- Position of hydrogen.
- Isotopes, preparation, properties and economy of hydrogen.
- Hydrides, their properties and types.
- Water and heavy water
- Hard and soft water, softening of hard water.
- Hydrogen peroxide, preparation, properties, uses and strength of solution.

Students will be able to apply their knowledge to identify

- Hydrogen as a strong perspective of future fuel.

- Critical thinking will be developed by analysing role of D_2O and H_2O_2 in various fields of science.
- Importance of conserving water will be developed.
- Team work and collaboration skill will be inculcated.

Assignment:

NCERT exercise questions and numerical

- MCQ, assertion-reasoning, SA, VSA questions were given for practise.
- Comparison of hydrides in tabular form.
- Enlist chemical properties of H_2O, D_2O and H_2O_2.
- Models of inorganic and organic ion exchange resins.

Chapter: S – Block

(15 September – 30 September)

Objectives –

The objectives to study the chapter are these: -

- To inculcate the knowledge of common Alkali Metals.
- Their uses in daily life.
- Biological importance of metals like Magnesium and Calcium
-

Previous Knowledge Testing –

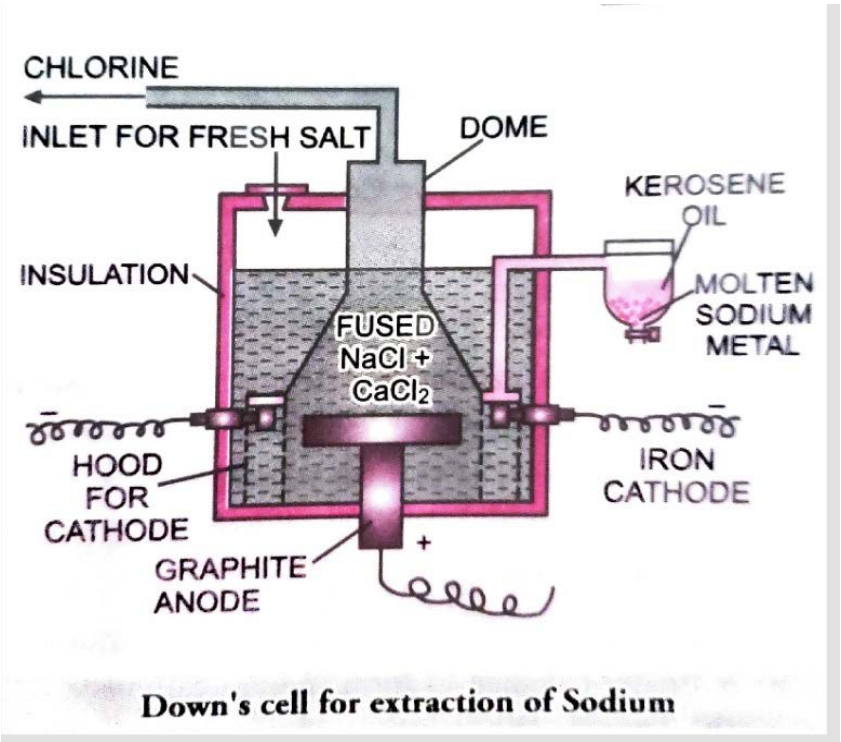
- Students are expected to know the general characteristics of S-Block elements.
- Their electronic configuration, Pattern of atomic size and Ionization Energy.

Vocabulary / Important Spellings –

- Atomic Size
- Ionization Energy
- Hydration Energy
- Diagonal Relationship

Innovative Methods / Resources –

- Smart Board
- Lecture method
- NCERT Book.



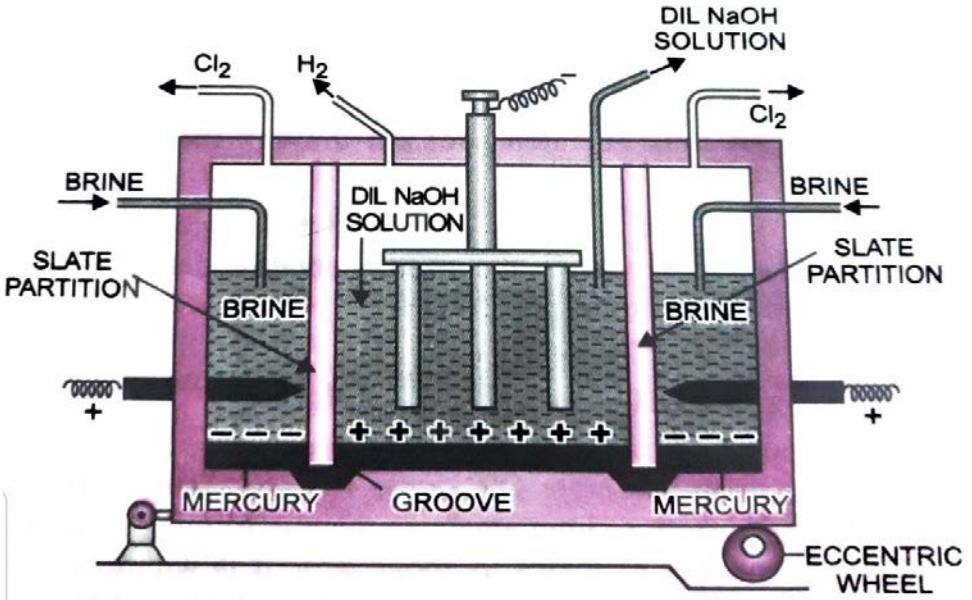
Down's cell for extraction of Sodium

Procedure –

Students would be told about: -

- Physical properties of Alkali Metals
- Chemical properties of Alkali Metals
- Anomalous behavior of Lithium
- Some important Compounds of Sodium
- Such as Baking Soda, Sodium Carbonate, Sodium Chloride, Caustic Soda

- Biological Importance of Sodium and Potassium
- Physical and Chemical Alkaline Earth Metals
- Diagonal Relationship in Lithium and Magnesium
- Uses of Alkaline Earth Metals
- Biological importance of Magnesium and Calcium



Castner and Kellner's cell for the manufacture of NaOH by electrolytic process

Student Participation –

Students Would be able to tell: -

- Why Lithium is having anomalous behavior
- They would be able to compare properties of Alkali Metals with Alkaline Earth Metals
- They would be able to explain flame coloration
- They would be able to explain Hydration Energy
- Atomic Size, I.E., Patterns of Alkali Metals with Alkaline Earth Metals

Student Recapitulations/ Assignments –

Students would be able to write the equation of Preparation of Lime, Slaked Lime, Gypsum, Marble, Cement, Baking Caustic Soda, Sodium Chloride.

Integration with other domains –

- S-Block can be integrated with language
- It can be integrated with Mathematics for balancing equation
- It can be integrated with Biology to study the importance of Ca, Mg, Na, K Metals in plants and human life.

Learning Outcomes –

After studying the chapter students will learn that: -

- S-Block elements are important in Chemistry and Biologically also
- They will learn about importance of all salts like Baking Soda, Washing Soda, NaCl, P.O.P, Marble in daily life
- Students will be able to solve all Conceptual Questions given in NCERT text book and as Assignments.

Co-Scholastic Activities –

Students can perform following activities after studying chapter: -

- Flame test of Salts like NaCl, KCl , $Bacl_2$, $Sicl_2$, $CaCl_2$ and study their flame color and uniqueness.
- Students can study manufacture of Portland Cement by making working model.

Chapter : Redox Reactions

(1 October – 15 October)

Objective –

The objective to study this chapter is that to inculcate the knowledge of Oxidation Number, Balancing of Redox Reactions, Electrochemical Cell. With the study of this chapter students will have knowledge of Electro Metallurgy, Electroplating and Refining of Metals.

Previous Knowledge Testing –

Students are expected to know about: -

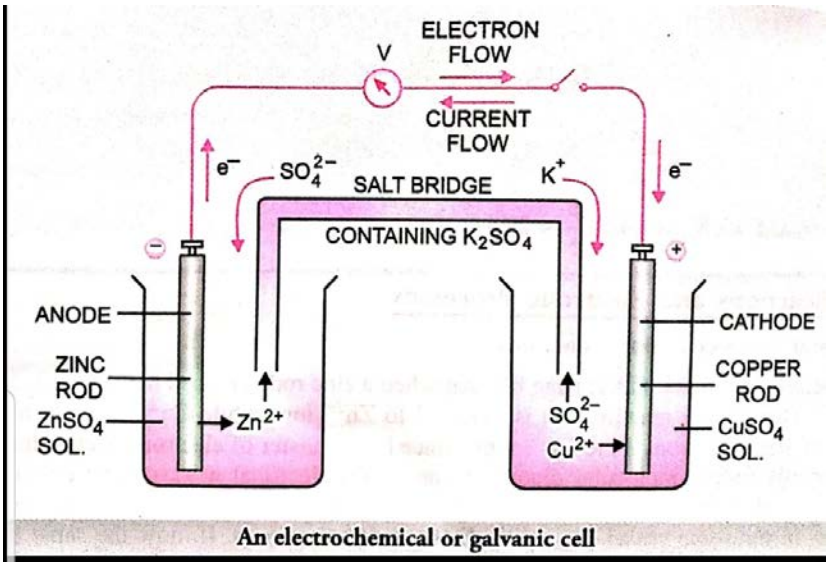
- Redox Reactions
- Oxidation and Reduction in terms of Loss and Gain of Oxygen and Hydrogen
- Oxidising Agent and Reducing Agent etc

Vocabulary / Important Spellings –

- Oxidation
- Reduction
- Oxidising
- Reducing Agent,
- Electrochemical Cell,
- Potential Electrochemical Force, etc.

Innovative Methods / Resources –

- Smart Board
- Lecture Method
- NCERT Book
- Reference Book.

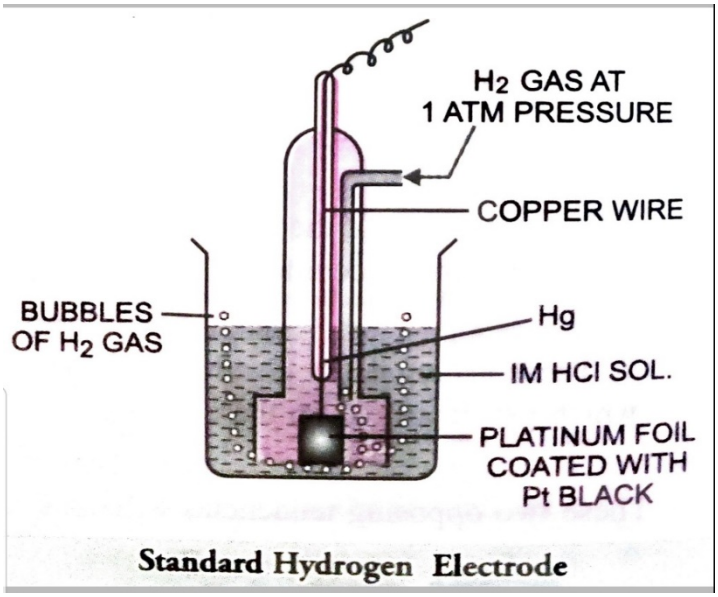


An electrochemical or galvanic cell

Procedure –

Students will be told about: -

- Redox Reactions in terms of Electron Transfer Reactions
- Concept of Oxidation Number
- Types of Redox Reactions
- Balancing of Redox Reactions
- Balancing by Oxidation Number Method
- Balancing by Ion-Electron Method



Standard Hydrogen Electrode

Students Participation –

Students would be able to explain: -

- Electrochemical Cell, Redox Potential, Electromotive Force
- Balancing of Redox Reactions by Ion Electron Method
- Balancing by Oxidation Number Method
- Standard Electrode Potential
- Electrochemical Series

Recapitulation / Assignments –

- Students would be able to tell Oxidant, Reductant
- They would be able to tell about Galvanic Cell and their application
- Students would be given NCERT Questions and Assignments

Integration with Other Domains –

- The Electrochemistry (Branch of Chemistry) is integrated with Language (English)
- Mathematics for balancing the equations
- It is integrated with Physics (Study Movement of Current, Voltage, etc

Learning Outcomes –

After having knowledge of this Chapter, Students would be able to study: -

- Redox Reactions
- Electrochemical Cell
- Electrode Potential
- Types of Redox Reactions

Co- Scholastic Activities –

With the help of above Chapter, Students can study the process of: -

- Electrometallurgy
- Electro Refining of Metals
- Electroplating
- Redox Titration like $KMnO_4$ (Potassium Permanganate) with Salt and Oxalic Acid

Chapter : Thermodynamics

(16 October – 30 October)

Objective –

The objective to study this chapter is that it helps to inculcate heat changes in various Thermodynamic Processes. To study about Internal Energy, Work Done, Law of Conservation of Energy, Spontaneous and Non-Spontaneous processes.

Previous Knowledge Testing –

Student should know about: -

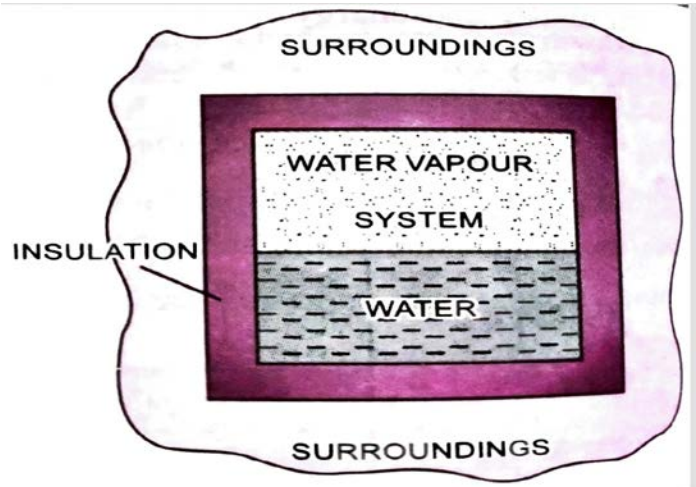
- Types of Energy
- Chemical Changes
- Mechanical Work
- Fuel Cell or Dry Cell etc.

Vocabulary / Important Spellings –

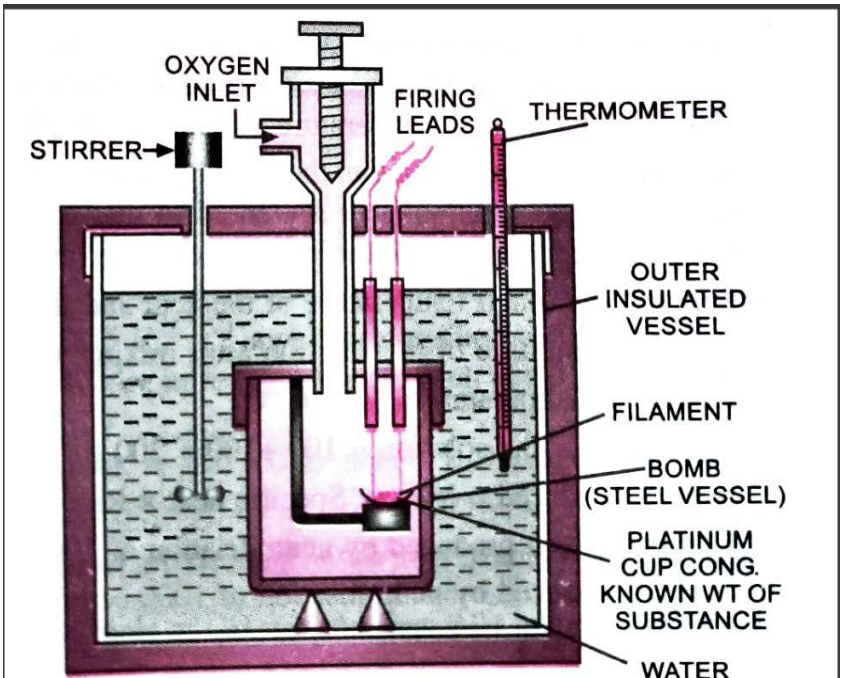
- System
- Surrounding Entropy
- Bond Dissociation
- Internal Energy
- Thermochemical Equations, etc

Innovative Methods –

- Smart Class
- Lecture Method
- NCERT Book



An example of an isolated system



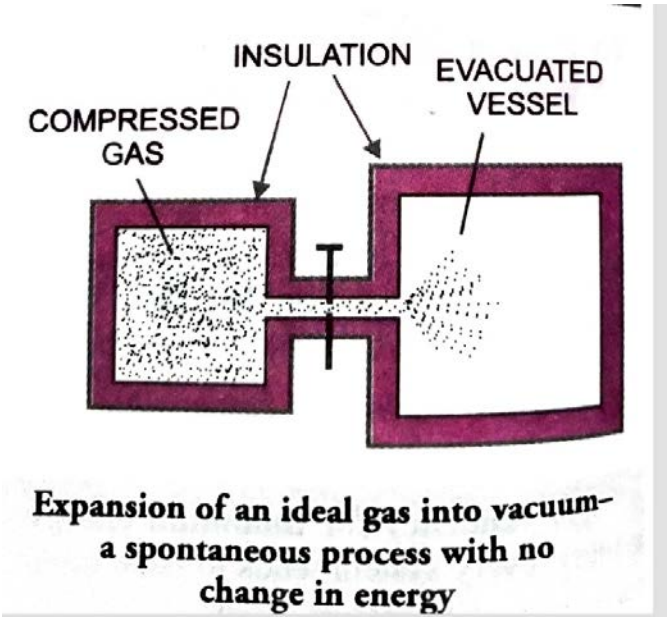
Bomb calorimeter

Procedure –

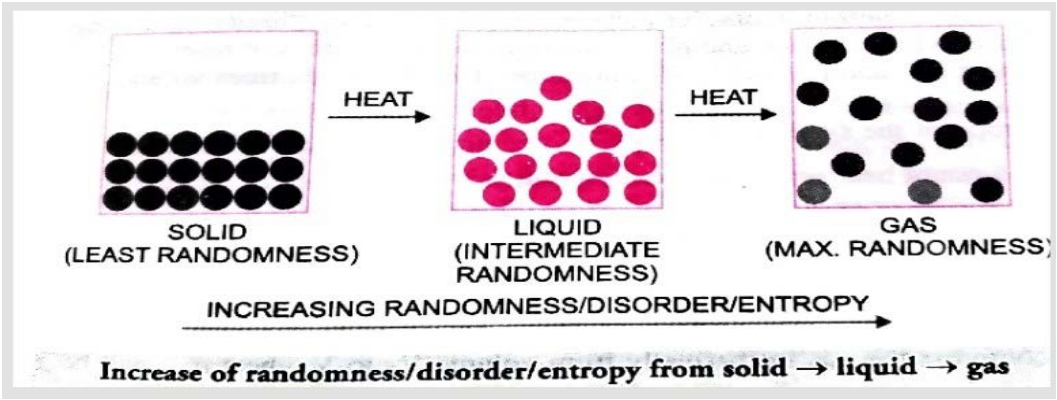
Student will be told about: -

- System, Surroundings, Intensive and Extensive Properties
- Internal Energy and Change in Internal Energy
- Enthalpy and change in Enthalpy
- Heat Capacity

- Different types of Enthalpies of Reactions
- Energies of Phase Changes
- Entropy – A State Function
- Spontaneity of a process
- Criteria of Spontaneity



Expansion of an ideal gas into vacuum– a spontaneous process with no change in energy



Increase of randomness/disorder/entropy from solid → liquid → gas

Students Participation –

Students will participate in doing: -

- Numerical Problems related to all topics covered in procedure from NCERT Book and Assignment
- Students will be able to solve Conceptual Questions

Recapitulation/ Assignment –

- Students will be able to tell definitions of all Thermodynamic Processes.
- Students will be able to recapitulate symbols of all Thermodynamic Processes

Integration with other domains –

The chapter Thermodynamics is integrated with: -

- Language
- Mathematics (To solve Numerical)
- Physics for topics like Work Done, Bomb calorimeter etc

Learning Outcomes –

Students will be able to solve: -

- Conceptual Reasoning Questions
- HOTS (High Order Thinking Questions)
- Derivations
- Numerical related to concepts above concepts

Co – Scholastic Activities –

With the knowledge of Chapter Thermodynamics, Students can perform activities like: -

- Experimental determination of Internal Energy of System with the help of Bomb Calorimeter
- Students can set up example of System and Surrounding
- Students can study change in Entropy of Reactions

Chapter : P- Block Elements
(1 November – 15 November)

Objective:

To study nature and properties of elements of group 13, 14, 15.

pK testing:

Children will be asked some basics of periodic trends.

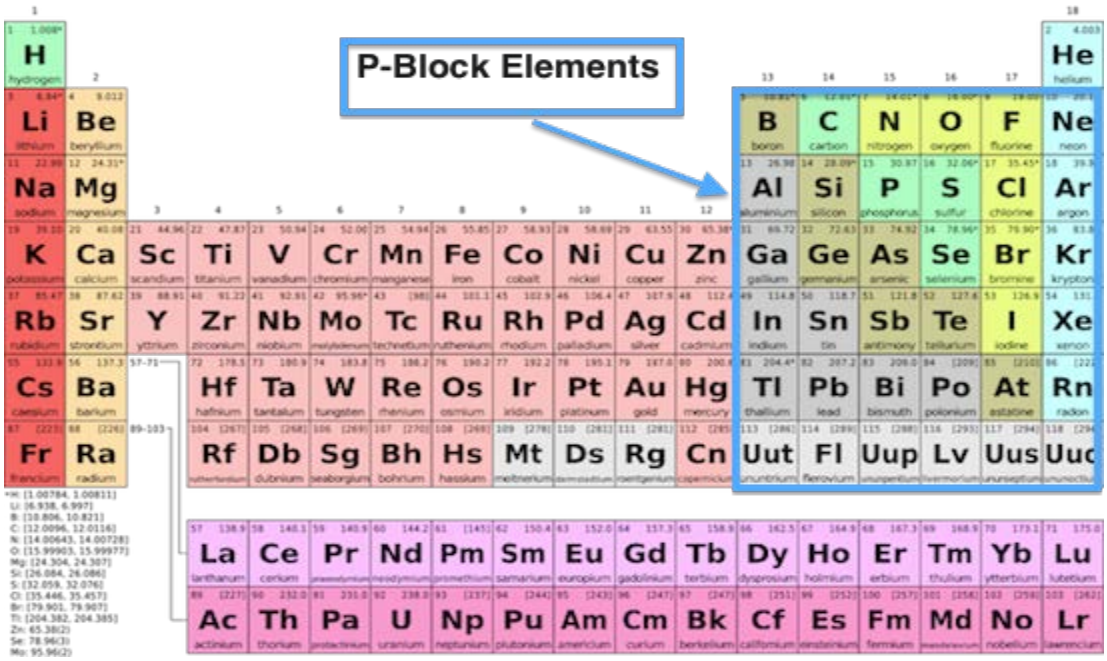
- What is periodic table?
- Basis of division of periodic table in blocks?
- Definition and general electronic configuration of all four blocks.
- Groups present in p-block.

Vocabulary used:

Electronegative, electropositive, horazine, inert pair, dihorane, horax, germomes, bridged, organosilicon.

Explanation with innovative methods:

- Role play methods. Class will be divided in three groups assigned as boron family, carbon family and N-family. One child will be made head of family, 1 group named as boron, carbon and nitrogen to represent their characteristics and inter relation with other family members.
- Models were used to explain structure of diamond, graphite, habers and Ostwald process.
- Student-teacher interaction, smart class, quiz, group discussion, MCQ, practise problems, activities in lab.



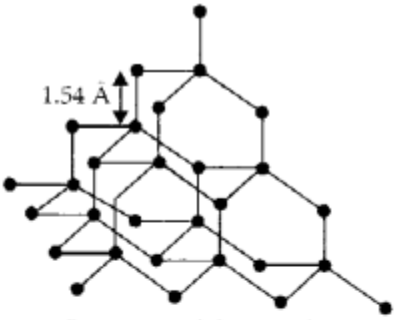
Procedure:

Following properties were taken up by lecture method.

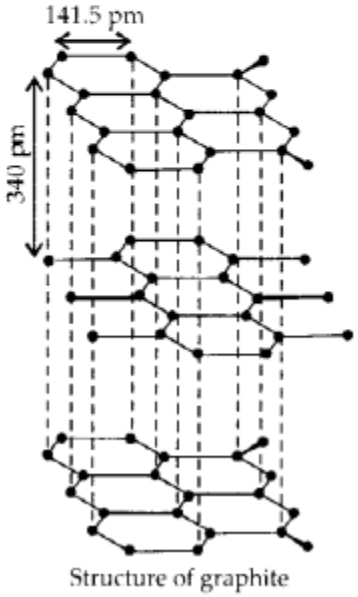
Physical properties group 13(ns^2np^1) group 14(ns^2np^2) group 15(ns^2np^3)

Atomic and ionic radii	Increase except Al to Ga	Increase	Increase
Ionisation enthalpy	Decrease except Al to Ga	Decrease(Sn>Pb)	Decrease
Electropositive character	Increase	Increase	Increase
Electro negativity	Decrease(B to Al), increase afterwards	Decrease	Decrease
MP/BP	No negative trend	Increase (catenation,self linkage)	Increase

Chemical properties	group 13(ns^2np^1)	group 14(ns^2np^2)	group 15(ns^2np^3)
Oxidation state	+1, +3	+2, +4	N(-3 to +5) others +3,+5
Nature of compounds	B-covalent, Al-both Other ionic	Covalent	Covalent
Formation of hydrides	Boranes B_nH_{n+4}, B_nH_{n+6}, stability and no. decreases	Large number of stable hydrocarbon,silanes and germanes	Covalent MH_3, basic
Formation of halides	MX_3, covalent, lewis acid	MX_4, tetrahedral	MX_3, MX_5
Formation of hydroxides/oxides	$M(OH)_3$, M_2O_3, basic nature increases	MO, MO_2, basic nature increases	M_2O_3, M_2O_5 except N



Structure of diamond



Structure of graphite

- Analogous behaviour of B, C, N will be explained
- Diagonal relationship will be discussed.
- Important compounds of the given group will be elaborated taking all characteristics and structures.

Participation of children:

- During discussion of this topic children will be able to find out trends followed in group using periodic table in all physical and chemical properties.
- Children will be able to give logical reasoning about formation of compounds when stability of oxidation states will be explained to them.
- They will be able to predict shapes and nature of compound by applying concept of bonding.
- They will be guided to make representation of habers process, Ostwald process etc.

Recapitulation:

- All the properties will be revused by taking one by one and summarized in tabular form.
- Blackboard test will be taken to draw structure of compounds .
- Content will be assimilated by comparative account of characteristics.

Integration with other domains:
This topic will be integrated with physics to explain bond angles, shapes of molecules will be integrated with geometrical shapes eg. Tetrahedral, hexagonal, pentagonal etc.
Increasing and decreasing orders of acidic, basic nature, reducing nature, bond angles will be explained using mathematical skills.

The p-Block elements

THE P-BLOCK ELEMENTS – CARD-1	THE P-BLOCK ELEMENTS – CARD-6
1# Which is more stable and why ? (BCl_3 , $TlCl_3$) 2# Which is poisonous and why ? (CO , CO_2) 3# Which one will get hydrolysed and why ? (BCl_3 , CCl_4) 4# Which is polar molecule ? (NF_3 , BF_3) 5# Which one is stable and exists? ($[SiF_6]^{2-}$ and $[SiCl_6]^{2-}$)	26# Which one forms dimmer ? (BCl_3 , BH_3) 27# Which is a Lewis Acid ($B(OH)_3$ and H_2SO_4) 28#Which one is having oxidizing character (PbO_2 , $SnCl_2$) 29# Which one disproportionates (GaCl , TlCl) 30# Which has more acidic character ? (BCl_3 , BF_3)
THE P-BLOCK ELEMENTS – CARD-2	**THE P-BLOCK ELEMENTS – CARD-7**
6# Whose B—F bond length is higher (BF_3 , $[BF_4]^-$) 7# Which one forms dimmer in anhydrous state (BCl_3 , $AlCl_3$) 8# Which has higher bond angle ? (BF_3 , $[BH_4]^-$) 9# Which is not a Bronsted acid (H_3BO_3 , H_3PO_3 , HCl , H_2SO_4) 10# Which one is not possible ? ($[BF_6]^{3-}$ and $[AlF_6]^{3-}$)	31# Which one has 3c-2e bond ? (B_2H_6 , H_3BO_3) 32# Which has higher Calorific value ? (water gas and producer gas) 33# Which one does not exist and why ? (PbF_4 , PbI_4) 34#Which is more covalent character and why ? ($PbCl_2$, $PbCl_4$) 35# Which is more ionic ? (AlF_3 , $AlCl_3$)
THE P-BLOCK ELEMENTS –CARD-3	**THE P-BLOCK ELEMENTS –CARD-8**
11# Which one shows allotropy and why ?(Carbon,Silicon) 12# Which one is used as abrasive and why ? (Graphite , fullerene , Diamond) 13# Which has larger size ? (Ga , Al) 14# Which has trigonal pyramidal structure ? (BCl_3 , PCl_3 , PCl_5 (g)) 15# Which one shows amphoteric character ?(B_2O_3 , Al_2O_3	36# Which is more stable and why ? ($PbCl_2$, $PbCl_4$) 37# Which has oxidizing nature ? (TlCl , $TlCl_3$) 38# Which has more IE1 and why ? (Al , Ga) 39#Which one contains pπ –dπ bond?(Nitrate , phosphate) 40# Which one is an oxidizing acid ? (HNO_3 , H_3PO_4)

Resource:

- NCERT book of XI chemistry
- Modern abc of XI chemistry
- Periodic table
- Youtube-shiksha house
- www.learncbse.in/p-block

Learning outcome:

Scholastic

After doing this topic student will come to know about periodic trends in physical and chemical properties of elements of group 13, 14, 15.

- They will acquire knowledge of reasons and exhibiting shapes and properties of various compounds like hydrides, oxides, hydroxides and halides of group 13, 14, 15.

- By analyzing electronic configuration and positions in periodic table children will be able to find out possible ionisation enthalpy, atomic size, electronegativity and oxidation states.
- By knowledge of oxidation states effected by inert pair effect they will be able to depict stability and formation of possible compounds by concerned elements.

Co-scholastic

- They will develop skill and competence.
- They will be able to realise importance and application of this topic in various fields of life.
- Critical thinking will be developed by analysing different cases.
- Team work and collaboration will be developed.

Assignment:

- NCERT exercise with practise problems will be given.
- MCQ,SA, VSA, assertion reasoning type questions will be covered.
- Trends in physical and chemical properties of group 13, 14, 15 will be given.

Chapter : Equilibrium
(16 November – 30 November

Objective:

To introduce the concept of physical and chemical process, law of mass action, Le chatlier principle, ionic equilibrium, concept of pH, hydrolysis of salt, buffers, solubility of products, common ion effect.

pH testing:

Students will be asked

- What physical and chemical processes.
- Electrolytes
- Define acids and bases.
- What do you mean by pH of a solution?

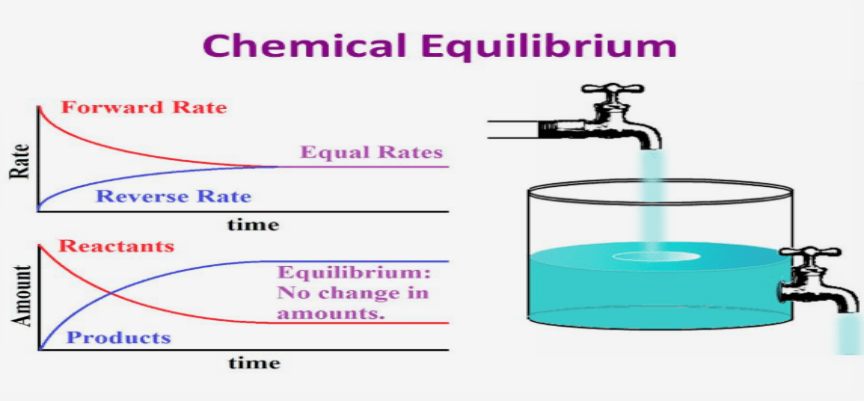
Important spelling/ vocabulary used:

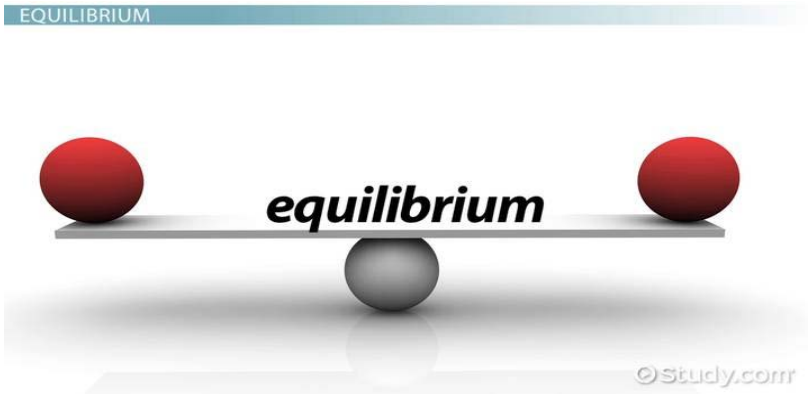
Le chatelier principle, ionization, dissociation, buffer solution, hydrolysis.

Explanation with innovative methods/acids used:

Smart class, examples from life processes like melting, vaporisation, salt solution, quiz, MCQ, practise problems, pH table, pH strips, peer assessment, student teacher interaction, tables of ionic compounds, log tables.

ACTIVITY





Procedure:

- After discussion of physical processes, sate of equilibrium in them will be discussed like

  Solid←------→liquid Ice←-----→water

  Liquid←------→gas water←-----→steam

  Gas←------→solid

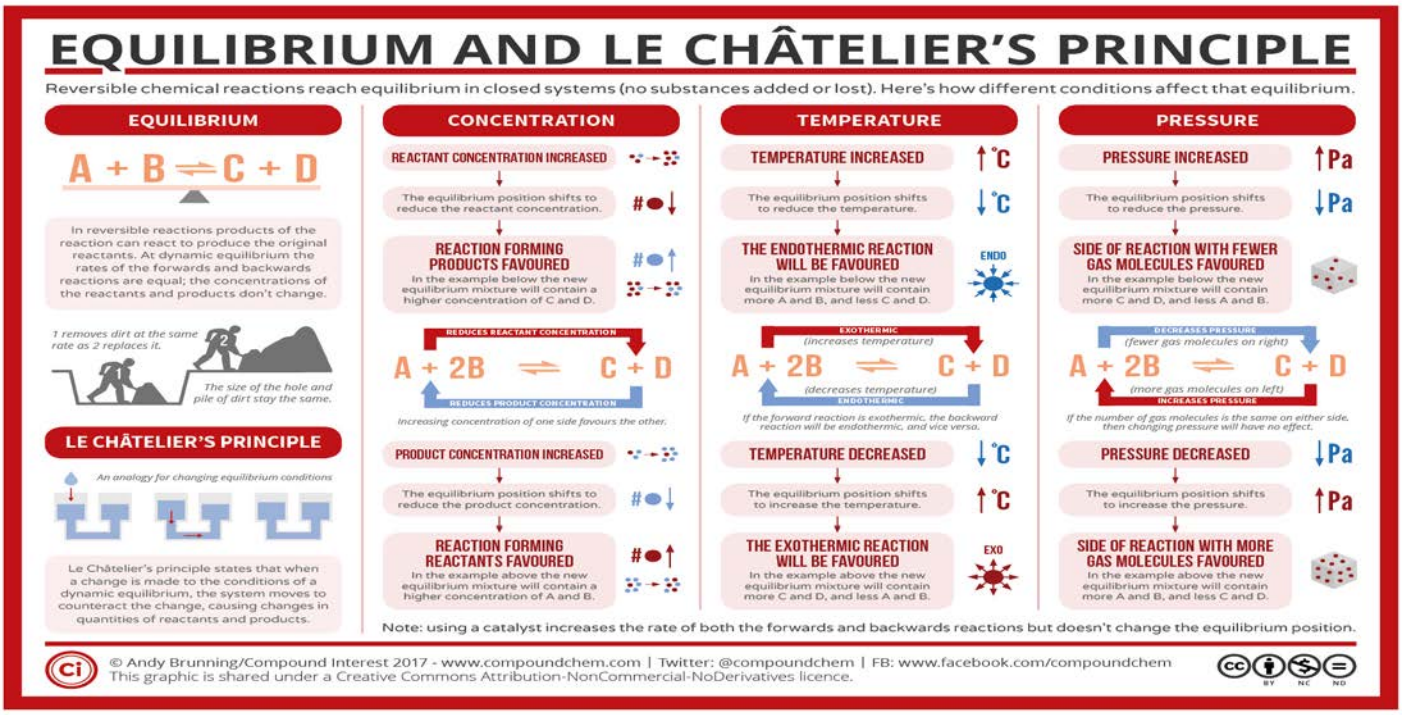
- Law of mass action will be introduced.

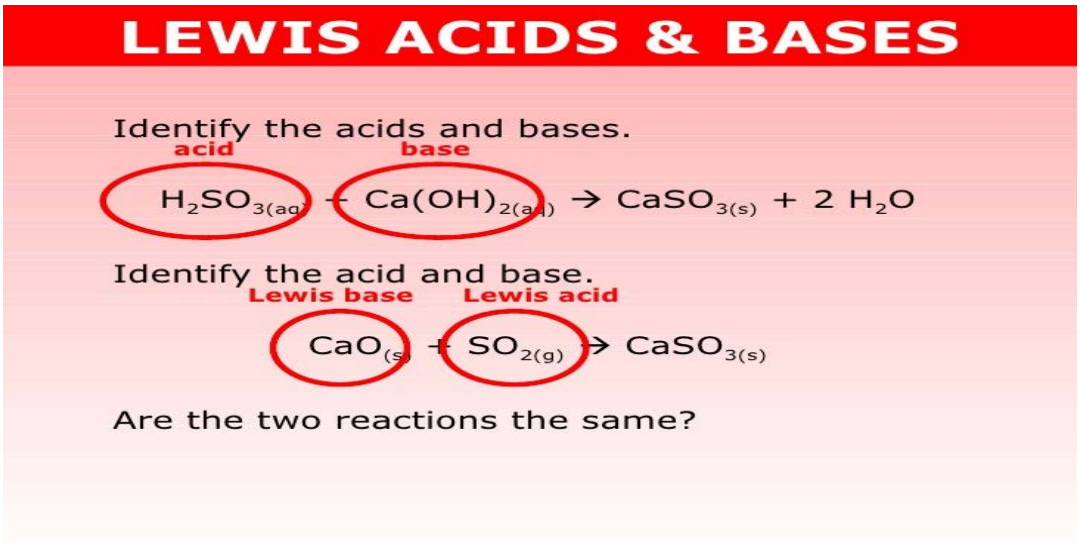
  Rate of reaction ∝ active mass of reactant

- Concept of equilibrium constant will be introduced and its applications will be discussed.
- Ionic equilibrium in ionic solutions wil be explained in acids, bases and salts.
- pH will be defined and formulated with examples.

  $pH = -\log[H^+]$

- Salt hydrolysis will be exemplified by taking examples of various types of salts eg. NaCl, $(NH_4)_2CO_3$, CH_3COONa, $(NH_4)_2SO_4$.
- Solubility product will be explained with practise of numerical
- Common ion effect and buffers will be explained by quoting various examples.





Participation of students:

Students will be able to quote various examples of state of equilibrium from their experiences of daily life, like evaporation in closed containers, freezing of water, melting of ice, bottle of cold drink. They will respond to examples of weak and strong electrolyte and will test pH of given sample using pH paper. They will compare strength of acids and bases using values of k_a and k_b.

Recapitulation:

After doing this topic students will be told to:

- Compare physical and chemical equilibrium
- Apply law of equilibrium constant in various case studies.
- State and apply Le Chatlier principle .
- Define and classify acids and bases.
- Understand solubility product, common ion, buffer solution and apply them.
- Solve numerical problems based on K_c, K_a, K_b, K_{sp}, pH etc.

Strong Acids/Bases

Strong Acids	Strong Bases
HCl	LiOH
HBr	NaOH
HI	KOH
HNO_3	RbOH
$HClO_4$	CsOH
H_2SO_4	$Ba(OH)_2$
	$Sr(OH)_2$

Summary of Le Chatelier's Principle

Type of Effect or Change	Direction of Equilibrium
Addition of more reactants	Forward direction
Addition of more products	Backward direction
Increase in temperature	Towards endothermic reaction
Decrease in temperature	Towards exothermic reaction
Addition of Catalyst	No effect
Increase in Pressure	where the no. of gaseous moles are less
Decrease in Pressure	where the no. of gaseous moles are more

Integration with other domains:

- Measuring the vapour pressure and concentration will be integrated with skills of measurement in physics
- Formula and expressions will be integrated with mathematical skills.
- Identification of acidic and basic nature will be integrated with act of colours.

	Acids	Bases
Litmus	Red	Blue
Phenolphthalein	Colourless	Dark pink
Methyl orange	Red	Orange

Resource:

NCERT book for class XI

Reference book: Chemistry for XII by pardeep publications

Youtube: Shiksha house, CBSE class 11 chemistry11 equilibrium chemistry.

Learning outcome:

1. Knowledge
   After accomplishing this topic students will learn to
   - State physical and chemical equilibrium with examples
   - Calculate K_c and write expression.
   - State and apply Henrys law and LeChatlier principle.
   - Appreciate theories of acids and bases.
   - Learn concept of ionic equilibrium and pH.
   - Solve numerical problems.

2. Skills and competence
   - Students will be able to apply knowledge of pH, acids and bases in food stuffs, items of daily use like toothpaste, shampoos, sauces, creams, eatables etc.
   - They can apply their knowledge to get maximum yield in various processes by using values of K_c.
   - Critical thinking will be developed, to apply the discussed concept in other cases.
   - They will be able to apply established principles to justify and observation.
   - Team work and collaboration skill will be inculcated.

Assignment:

- NCERT exercise
- Numerical problems for practise
- To write expression for K_c in various reactions.
- MCQ, SA, VSA
- Definitions and statements of acids, bases, LeChatlier principle, Solubility product, buffer, strengths of acids and bases.

Ch : Organic Chemistry : Some basic Principles and Techniques

(1 December – 24 December)

OBJECTIVES:

- Define organic compounds
- Identify three types of carbon compounds
- Explain how carbon is used and applied in everyday life.

PREVIOUS KNOWLEDGE:

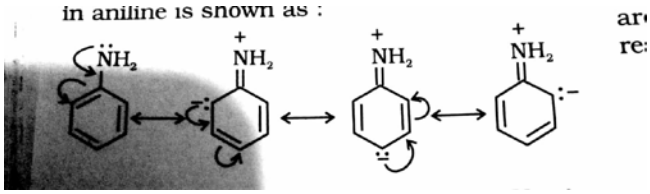
Students would be asked about the valency of carbon, allotropes of carbon, bonding in carbon compounds.

VOCABULARY:

IUPAC, isomerism, acyclic compounds, alicyclic compounds, aromatic compounds, stereoisomerism, nucleophilic and electrophiles.

IMPORTANT SPELLINGS:

Nucleophiles, electrophiles, substitution reaction, chromatography, kjeldah's method.



EXPLANATIONS WITH INNOVATING METHODS,

LINKS USED:

1 Smart class

2 Show all activities in lab

3 With the help of model to show bonding in organic carbon compounds.

PROCEDURE:

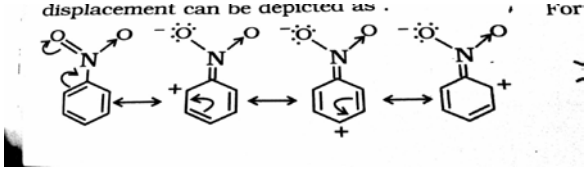
I. Students would understand reasons for tetravalency of carbon and shapes of organic compounds.

II. Classify the organic compounds.

III. Name the compounds according to IUPAC system of nomenclature and also derive their structure from the given name.

IV. Understand the concept of organic reaction mechanism

V. *E*xplain the influence of electronic displacements on structure and reactivity of organic compou



Presentation of shifting of electron pair is given below :

(i) $\overset{\curvearrowright}{=}Y-\longleftrightarrow -Y=$ from π bond to adjacent bond position

(ii) $=Y-\overset{\curvearrowright}{}\longleftrightarrow -\ddot{Y}-$ from π bond to adjacent atom

(iii) $-\ddot{Y}\overset{\curvearrowright}{-}\longleftrightarrow -Y=$ from atom to adjacent bond position

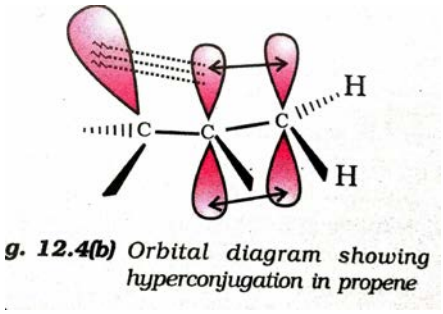
VI. Learn the techniques of purification of organic compound:

1. Simple distillation 2.

Fractional distillation.

3. Separatory funnel

4. Chromatography



g. 12.4(b) *Orbital diagram showing hyperconjugation in propene*

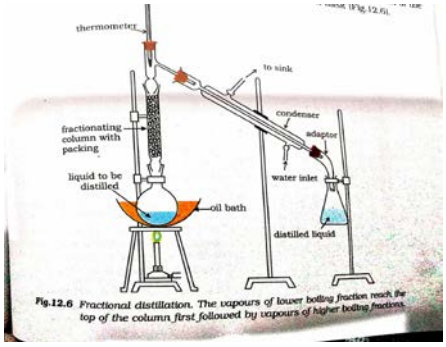
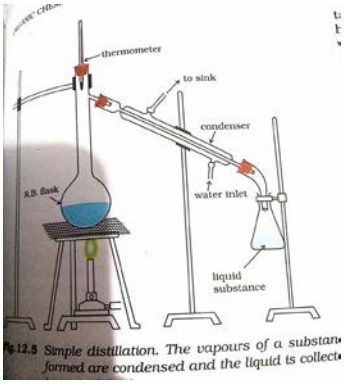
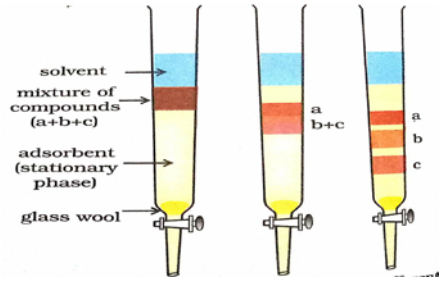


Fig.12.6 *Fractional distillation. The vapours of lower boiling fraction reach the top of the column first followed by vapours of higher boiling fractions*



Simple distillation. The vapours of a substan formed are condensed and the liquid is collect



VII. Write the chemical reaction involved in the quantitative analysis of organic compound: estimate of carbon and hydrogen, estimation of Nitrogen (dumas method,KJedahls),estimation of halogens(carier method)

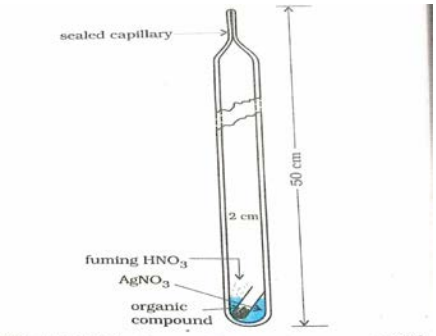
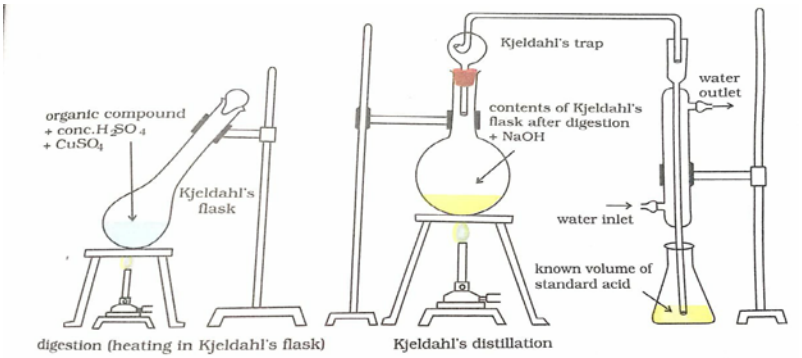


Fig. 12.17 *Carius method. Halogen containing organic compound is heated with fuming nitric acid in the presence of silver nitrate.*



ig.12.16 Kjeldahl method. Nitrogen-containing compound is treated with concentrated H_2SO_4 to c ammonium sulphate which liberates ammonia on treating with NaOH; ammonia is absorb in known volume of standard acid.

STUDENTS PARTICIPATION:

- Students would be able to name the organiccompounds.
- Students would be able to do numerical on topic quantitative analysis of carbon, hydrogen, nitrogen, halogens andSulphur.
- Students would be able to explain different techniques of purification of organic compounds.

RECAPTULATION/ ASSIGNMENT:

- Students would be able to name the organiccompounds.
- Students would be able to explain the influence of electronic displacements on Structure and reactivity of organic compounds.
- Recognize the type of organic reactions.
- NCERT intext and back exercise to be given as assignment.

ART INTEGRATION WITH OTHER DOMAINS:

Chapter Organic Chemistry is integrated with the following domain:

- English language
- Art integration(Diagrams of distillation, dumas method, Kjeldah's method and chromatography)

LEARNING OUTCOMES:

- Students would be able to give IUPAC name of organic compounds.
- They would be able to do numerical on quantitative analysis of elements like carbon, hydrogen and nitrogen.

RESOURCES:

NCERT and smart class and media like YouTube and google.

CO-SCHOLASTIC ACTIVITIES:

- Simple distillation will be shown in lab.
- Paper chromatography will be shown in lab.
- Students develop scientific attitude how to use the techniques.
- Students learn team work.

ASSESSMENT:

- Written tests will be taken.
- MCQ test will be taken.

Chapter : Hydrocarbons

(January)

OBJECTIVES:

- Students would be able to recognize and write structures of isomers of alkane, alkenes and alkynes aromatic hydrocarbons
- Learns about various methods of preparation of hydrocarbons.
- Predict the directive influence of substituents in monosubstituted benzene ring.
- Learn carcinogenicity and toxicity.

PREVIOUS KNOWLEDGE:

- Students would be asked about the IUPAC names and organic compounds.
- Students would be asked about alkanes, alkenes, alkynes and aromatic hydrocarbons.

VOCABULARY:

Isomerism, unsaturated hydrocarbons, Kolbe's electrolytic method, wurtz reaction, conformation of ethane, seahorse projection, markavnikov's rule.

IMPORTANT SPELLINGS:

Kolbe's electrolytic method, markanvnikov's rule, Friedel craft alkylation, friedal crafts acylation, carcinogenicity.

EXPLANATION WITH INNOVATIVE METHODS:

- Smart class
- Show all activities i n lab
- With the help of model (like ball and stick) to be shown confirmation of ethane.

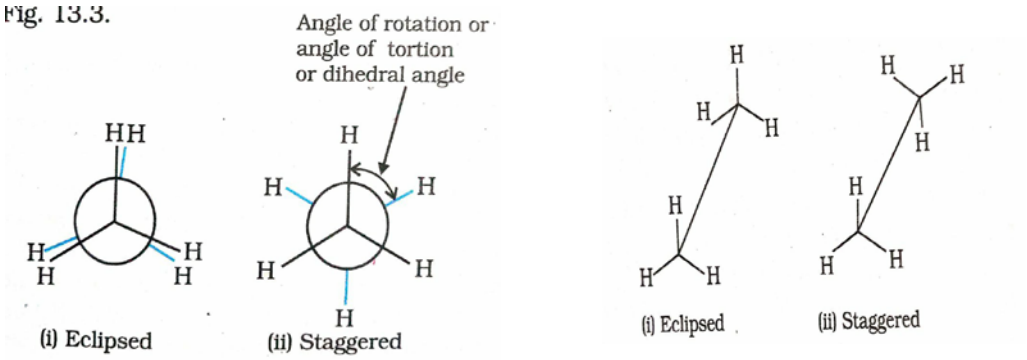
PROCEDURE:

- Students will explain the name of hydrocarbons according to IUPAC system of nomenclature.
- Recognize and write structures of isomers of alkane, alkenes, alkynes and aromatic hydrocarbons

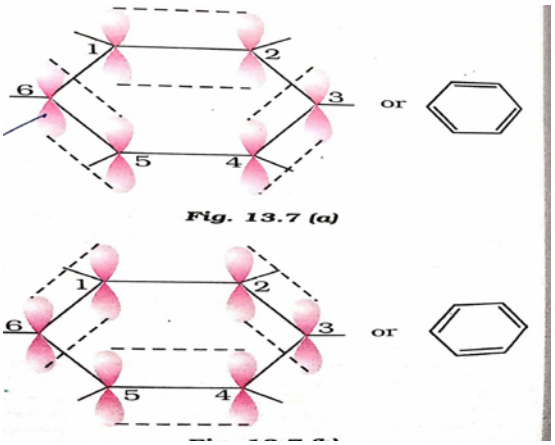
Structures of – C_5H_{11} group	Corresponding alcohols	Name of alcohol
(i) $CH_3-CH_2-CH_2-CH_2-CH_2-$	$CH_3-CH_2-CH_2-CH_2-CH_2-OH$	Pentan-1-ol
(ii) $CH_3-\underset{\displaystyle I}{CH}-CH_2-CH_2-CH_3$	$CH_3-\underset{\displaystyle OH}{\underset{\displaystyle I}{CH}}-CH_2-CH_2-CH_3$	Pentan-2-ol
(iii) $CH_3-CH_2-\underset{\displaystyle I}{CH}-CH_2-CH_3$	$CH_3-CH_2-\underset{\displaystyle OH}{\underset{\displaystyle I}{CH}}-CH_2-CH_3$	Pentan-3-ol
(iv) $\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-CH-CH_2-CH_2-$	$\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-CH-CH_2-CH_2-OH$	3-Methyl-butan-1-ol
(v) $\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-CH_2-CH-CH_2-$	$\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-CH_2-CH-CH_2-OH$	2-Methyl-butan-1-ol
(vi) $\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-C-CH_2-CH_3$	$\underset{\displaystyle OH}{\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}}CH_3-C-CH_2-CH_3$	2-Methyl-butan-2-ol
(vii) $\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-C-CH_2-\underset{\displaystyle I}{CH_3}$	$\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-C-CH_2OH\underset{\displaystyle I}{CH_3}$	2,2- Dimethyl-propan-1-ol
(viii) $\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}CH_3-CH-\underset{\displaystyle I}{CH}-CH_3$	$\underset{\displaystyle I}{\overset{\displaystyle CH_3}{}}\underset{\displaystyle I}{\overset{\displaystyle OH}{}}CH_3-CH-CH-CH_3$	3-Methyl-butan-2-ol

- Various methods of preparation of hydrocarbons.
- Distinguish between alkanes, alkenes, alkynes and aromatic hydro on the basis of physical and chemical properties.

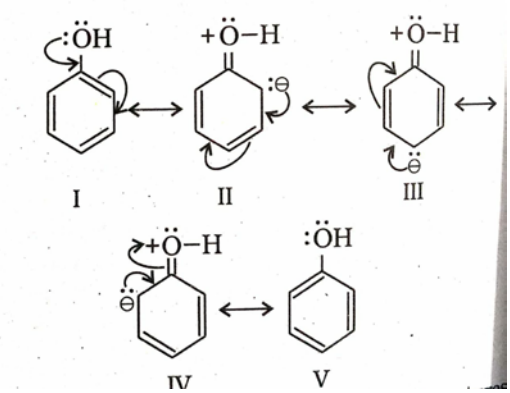
- *Draw and differentiate between various conformation of ethene.*

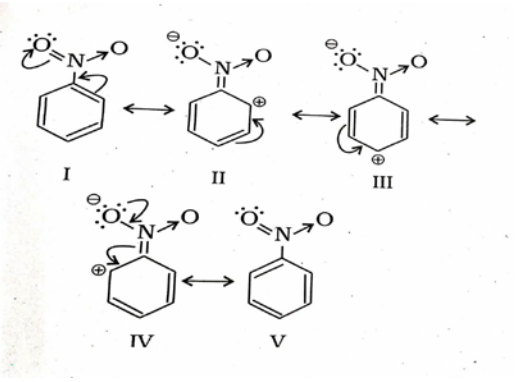


- Appreciate the role of hydrocarbons as sources of energy and for other industrial applications.
- Structure of benzene.



- Explain aromaticity and understand mechanism of electrophilic substitution reaction of benzene.
- Predict the directive influence of substituent in mono substituted benzene ring.





STUDENTS PARTICIPATION:

- Students would be able to name isomers of different hydrocarbons.
- Students would be able to write methods of preparation of alkanes, alkanes and alkynes.
- Students would be able to explain carcinogenicity and toxicity.

RECAPTULATION/ ASSIGNMENT

Students would able to give IUPAC name of isomers of alkanes.

- Students would be able to explain the confirmation of ethane.
- Would be able to explain influence of substituent in mono substituted benzene ring.
- NCERT intext and back exercise is given as assignment.

ART INTEGRATION WITH OTHER DOMAINS:

- English language
- Art (drawing confirmation of ethane, structure of organic compounds)
- Math (write the balanced chemical equation)

LEARNING OUTCOMES:

- Students would be able to explain the conformation of ethane.
- Methods of preparation of alkanes, alkenes and alkynes.
- Direct influence of substituents in mono substituted benzene rings.

CO- SCHOLASTIC ACTIVITIES:

- Model of conformation of ethane will be made by students.
- Students develop scientific attitude how to use the techniques.
- Students learn team work.

ASSESSMENT:

- Written tests will be taken.
- MCQ test will be taken.