

Ch:1(BasicConceptsOfChemistry)

Month-May

ClassTransaction-18Periods

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

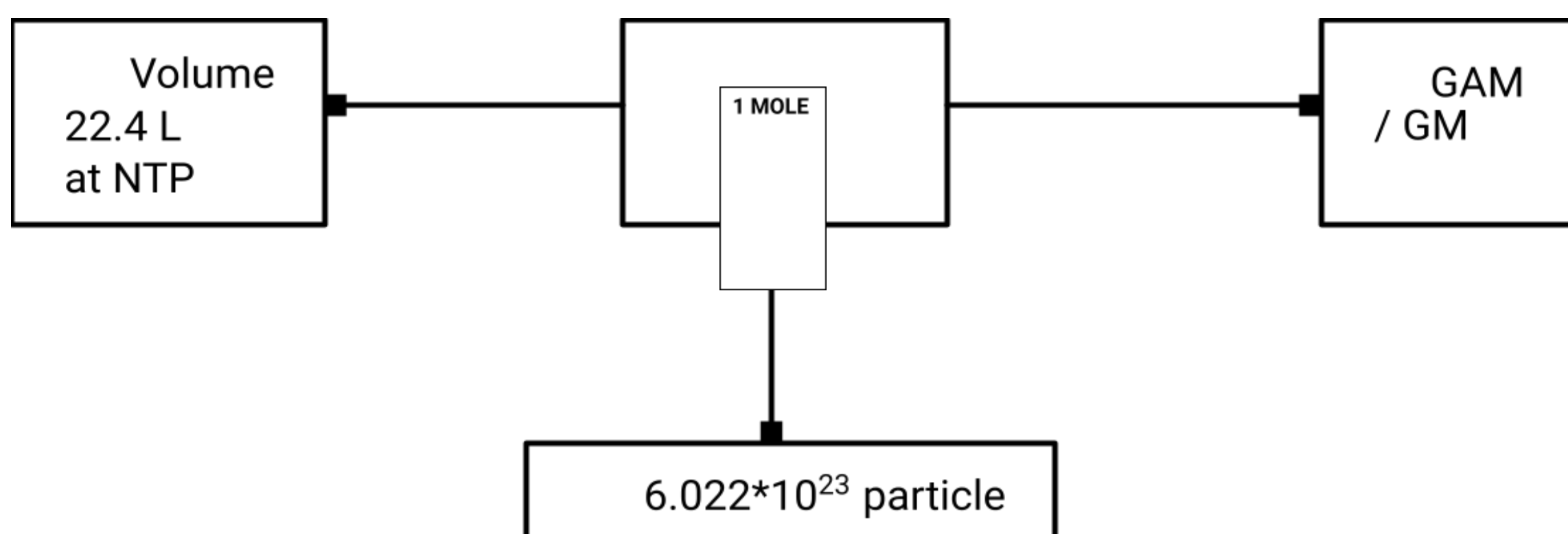
Element	Symbol	Element	Symbol	Element	Symbol
Aluminum	Al	Gold	Au	Platinum	Pt
Antimony	Sb	Helium	He	Plutonium	Pu
Argon	Ar	Hydrogen	H	Potassium	K
Arsenic	As	Iodine	I	Radium	Ra
Barium	Ba	Iron	Fe	Silicon	Si
Bismuth	Bi	Lead	Pb	Silver	Ag
Boron	B	Lithium	Li	Sodium	Na
Bromine	Br	Magnesium	Mg	Strontium	Sr
Cadmium	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		

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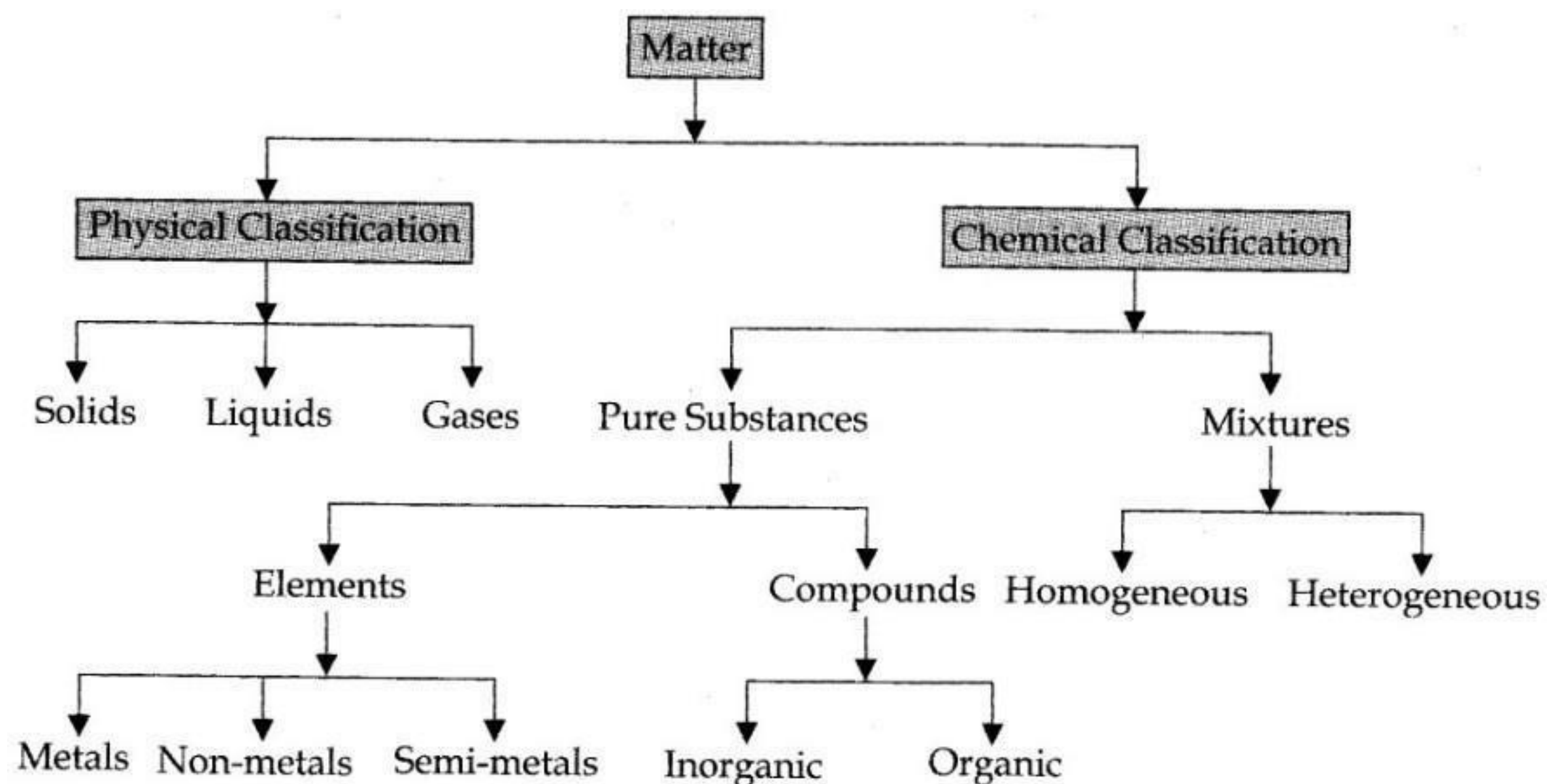
Element name	Atomic number	Atomic mass	Element name	Atomic number	Atomic mass
Hydrogen	1	1	Sodium	11	23
Helium	2	4	Magnesium	12	24
Lithium	3	7	Aluminium	13	27
Beryllium	4	9	Silicon	14	28
Boron	5	11	Phosphorus	15	31
Carbon	6	12	Sulphur	16	32
Nitrogen	7	14	Chlorine	17	35.5
Oxygen	8	16	Argon	18	40
Fluorine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

$$n = \frac{\text{mass}}{\text{molar mass}}$$

$$n = \frac{N}{N_0}$$

- 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 proportion and 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

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

(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 = $\frac{\text{Mass of solute}}{\text{Mass of solution}} \times 100$

AglaSem Admission

(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 = $2 \times \text{vapour density}$

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

AglaSem Admission

Integration with other domains:

This topic is integrated with skills of physical measurements and mathematical skills.

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.
- Understand, inspect and analyze the application of principles of chemistry in other fields of life.
- 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 will 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 an observation.
- Team work and collaboration skill will be inculcated.

Resource: NCERT book & Pardeep Publications

Co-Scholastic Activities

Students will be shown virtual lab activities related to the topics done in this chapter. It will help in enhancing the learning process of students. This will bring social skills, intellectual skills and moral value among students. This ensures that students get to learn effectively.

Feed Back & Remedial Teaching

- ☒ Step by Step instructions would be given to slow learning students such students would be taken out of normal classroom and taught in a different environment. They would be provided with routine assignments and practice activities.

- ☒ Inclusive Practices and Full Participation without discrimination. Lesson Plan is so designed so as to provide of children belonging to all Minority Communities and Particularly those Communities that are educationally under represented.

Sustainable Development Goal:-

Through teaching this lesson, we may prepare students to gain the goal of finding concentration of contaminants in water and attain goal of clean+save water.

Assignment:

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

Chapter:2(StructureOfAtom) Month-April

ClassTransaction-18Period

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 –

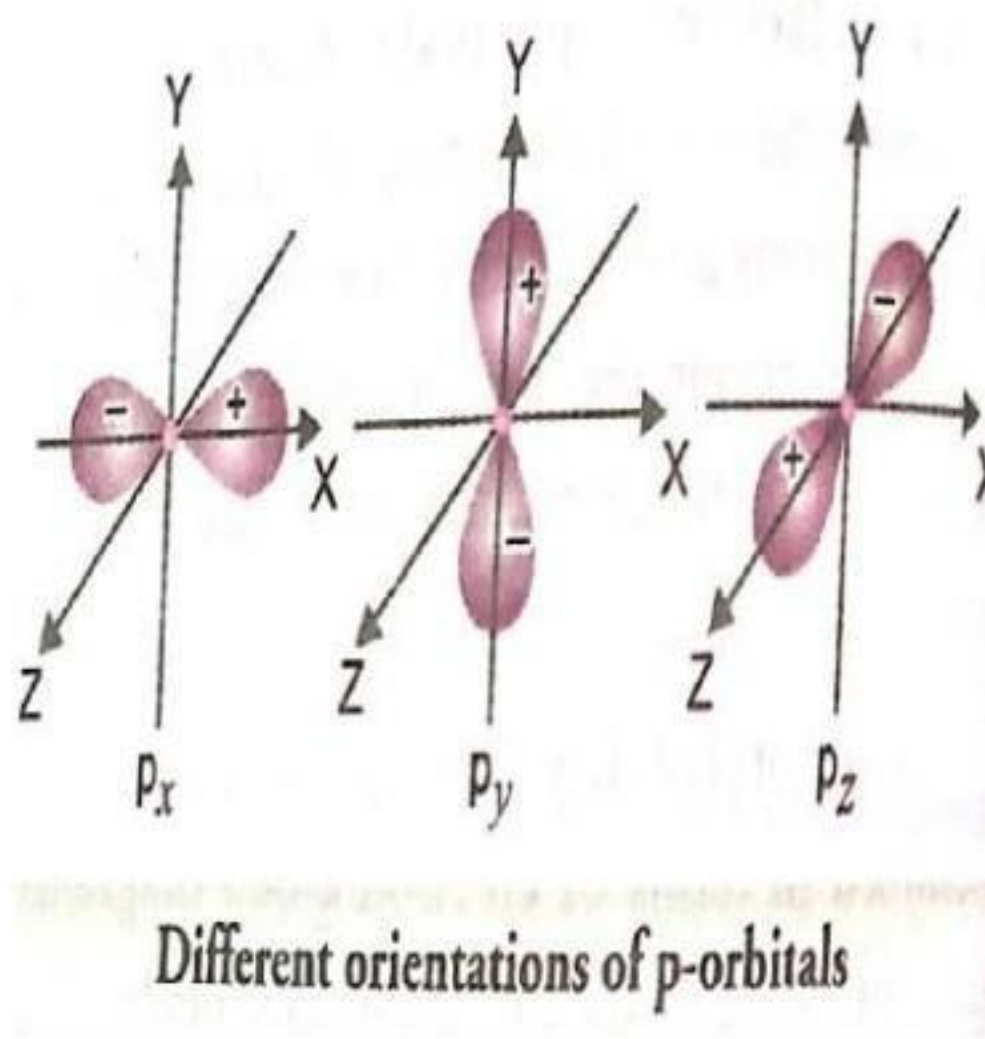
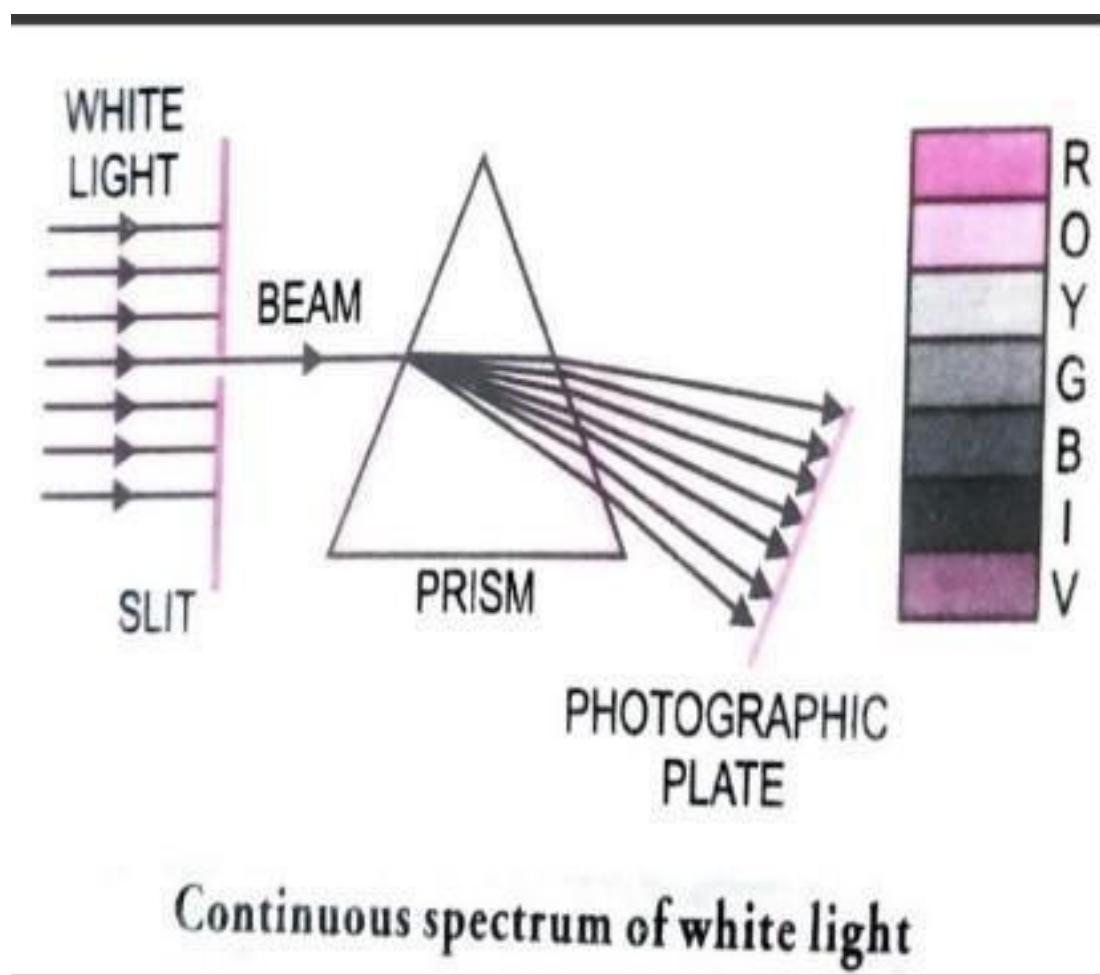
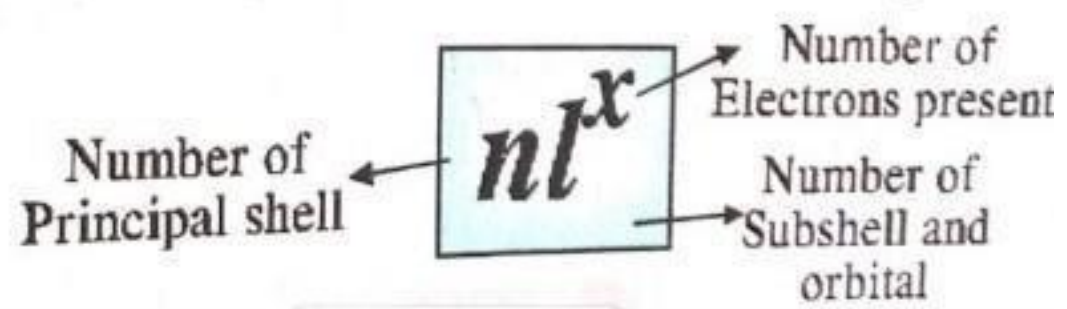
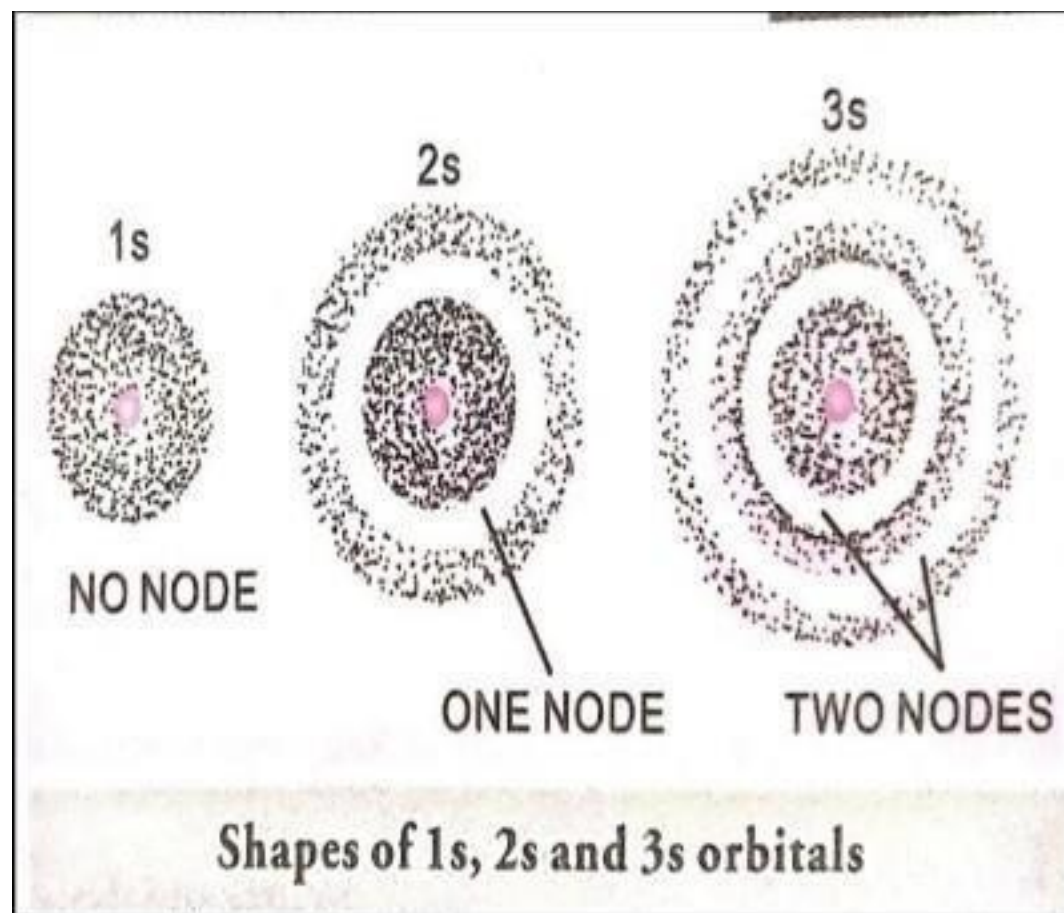
- ☒ Electromagnetic Spectrum Wave Number
- ☒ Velocity
- Wavelength
- ☒ Nano
- ☒ Picometer
- ☒ Planck's Quantum Theory Quantum
- Numbers Aufbau Principle
- ☒ Hund's Rule

Innovative Methods –

- ☒ NCERT Book

☒ Smart Board Periodic Table

☒



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

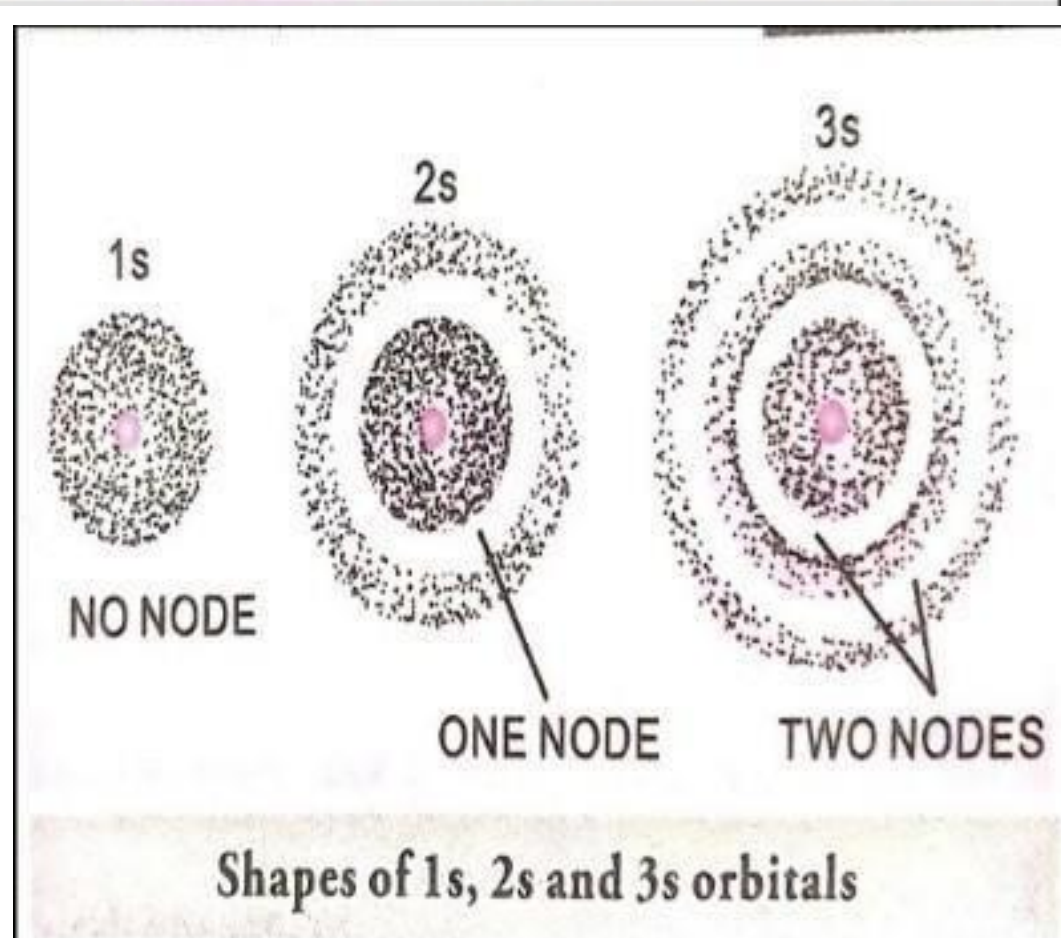
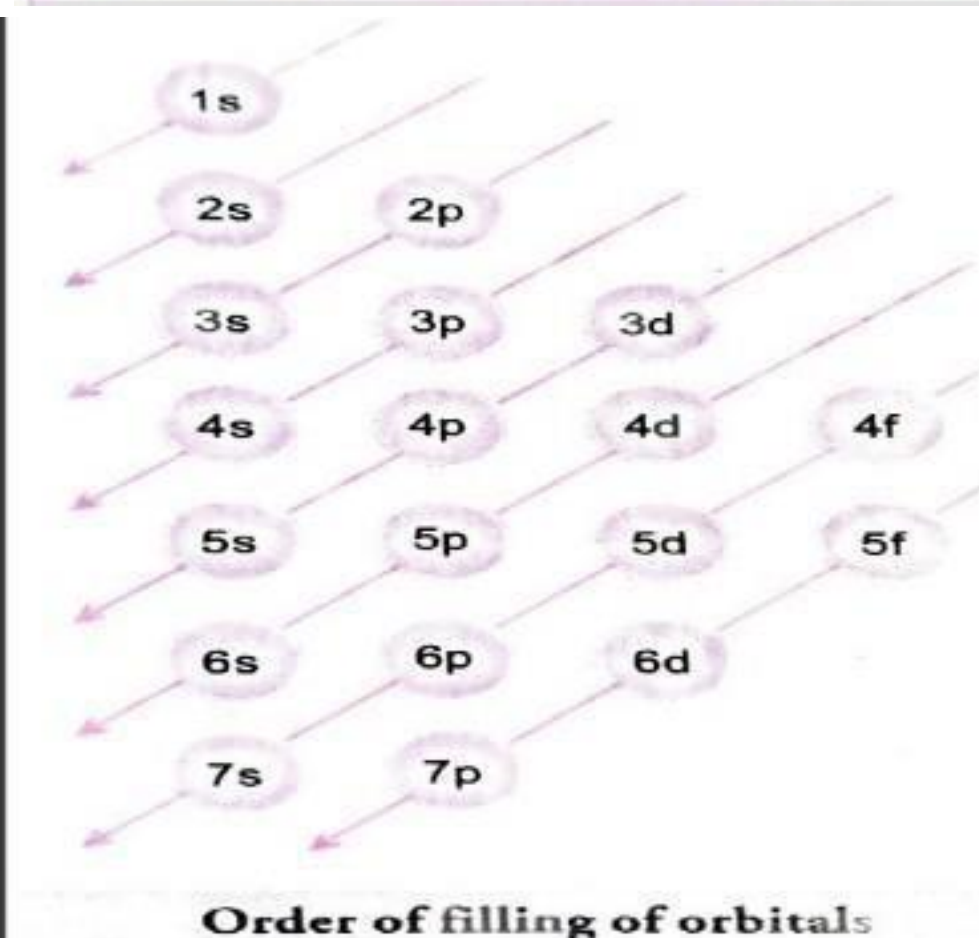
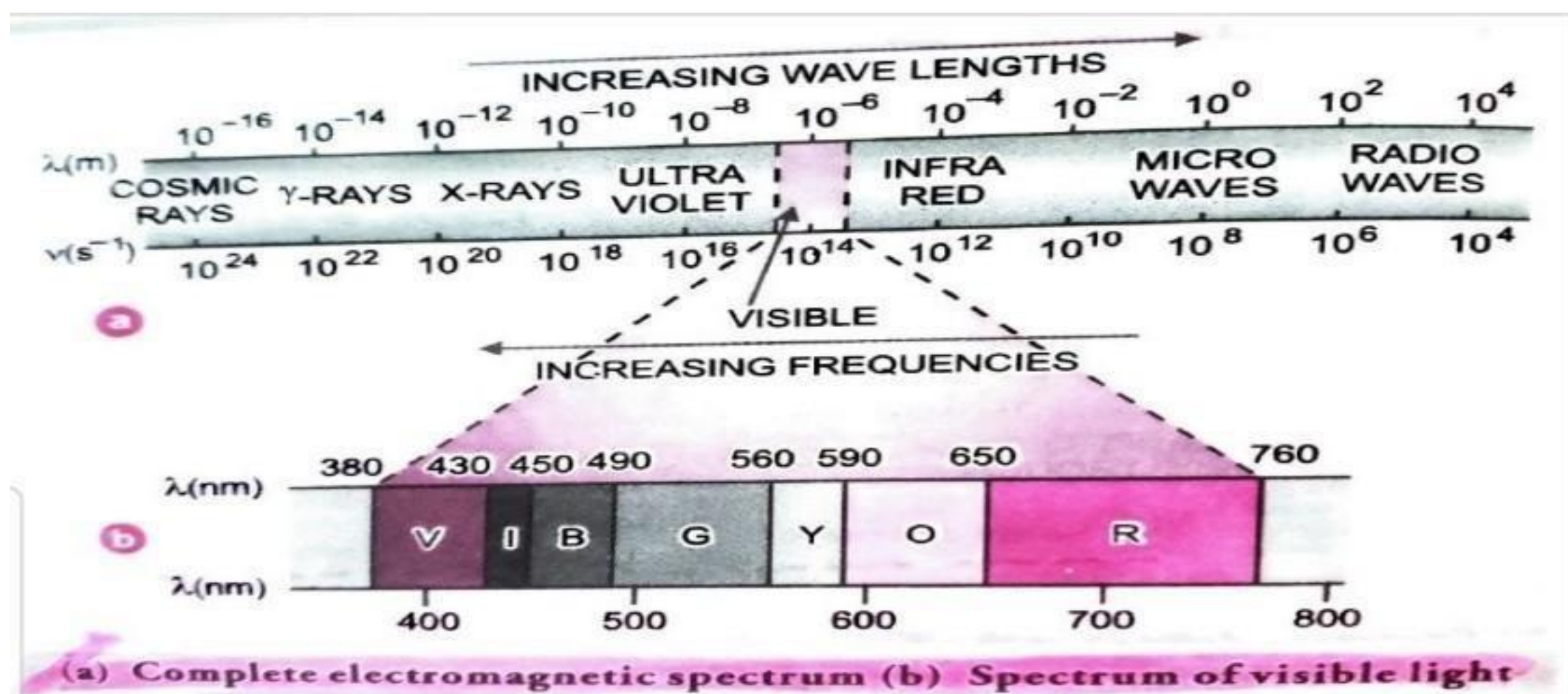
☒ Wave Nature of Electromagnetic Radiations Particle Nature of Electromagnetic Radiations Photoelectric Effect and Black Body

☒ Radiations Atomic Spectra

☒ Dual behaviour of Matter Heisenberg's Uncertainty

Principle

☒ Quantum Mechanics and Quantum Numbers

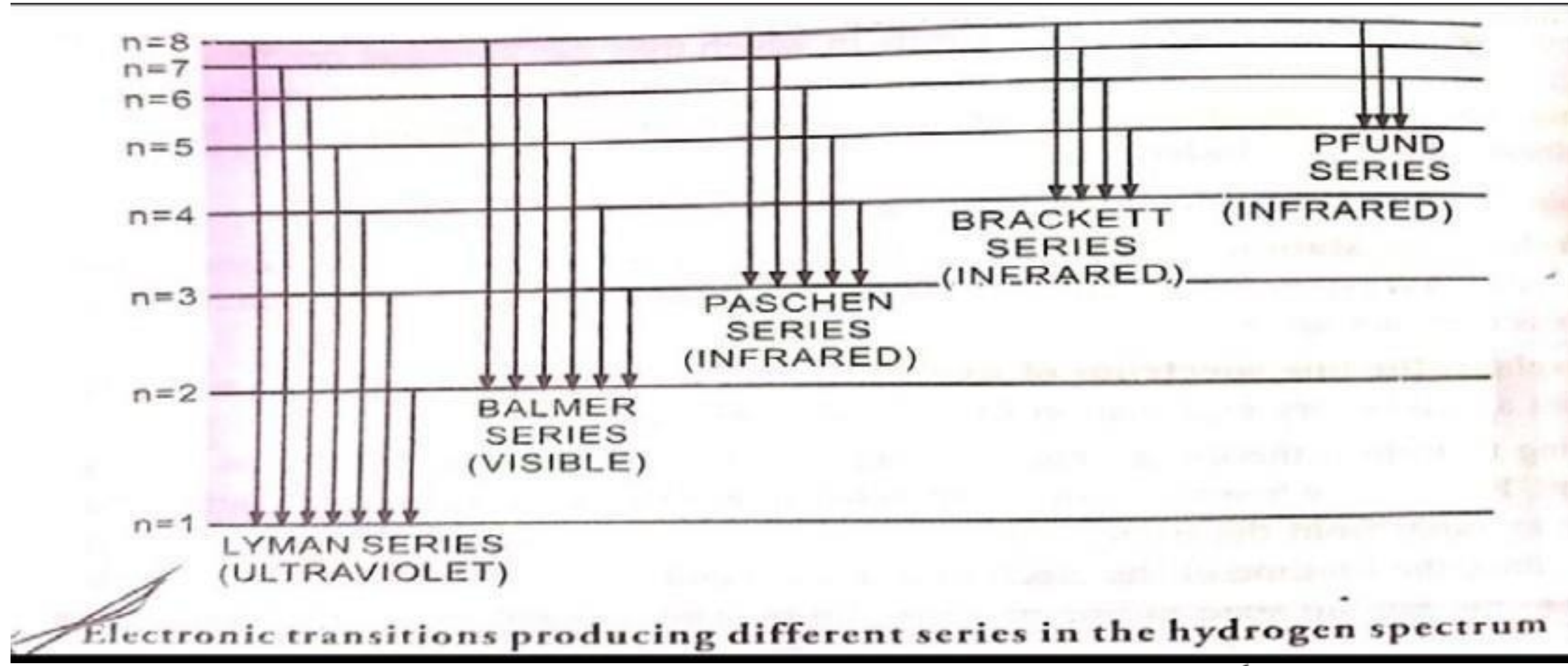


Students Participation -

Students would be able to explain: -

☒ Phenomenon like Photoelectric Effect $h\nu = h\nu_0 + m\nu$

☒ Writing of Electronic Configuration in terms of S, P, d, f Orbits



☒ Students would be able to numerical of $[C = v \times \lambda, = \frac{1}{\lambda}, \text{etc}$

☒ students would be able to explain and draw the shape of S , P , d , f orbitals

Student 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

Learning Outcomes

Students will be able to know :-

- ☒ Fundamental particles of atom. Spectra of atom.
- ☒ Quantum Number. Shapes of Orbitals.
- ☒ Electronic Configuration of Elements.

Resources- NCERT Book (DINESH Publications Book)

Co – Scholastic Activities –

Students will be shown virtual lab activities related to the topics done in the class. It will help in enhancing the learning process.

Feed Back and Remedial Teaching:-

- ☒ The students will be given objective worksheet and incorrect options will be discussed. Retest, Assignment , Practice Question would be given for preparation.

☒

Sustainable Development Goals:-

By teaching this chapter we may proceed towards achieving the SPG of same energy because it is based on photoelectric effect in this chapter.

**Chapter:3 (ClassificationOfElementsAnd
PeriodicityinProperties)**

Month-April&May ClassTransaction-12Periods

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
Common Elements

Symbols and Atomic No's of

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

PERIOD NUMBER	Representative elements		d-Transition elements										Representative elements					Noble gases
	GROUP NUMBER 1 IA	GROUP NUMBER 2 IIA	GROUP NUMBER 3 IIIA	GROUP NUMBER 4 IVA	GROUP NUMBER 5 VA	GROUP NUMBER 6 VIA	GROUP NUMBER 7 VIIA	GROUP NUMBER 8 VIII	GROUP NUMBER 9 VIII	GROUP NUMBER 10 VIII	GROUP NUMBER 11 IB	GROUP NUMBER 12 IIB	GROUP NUMBER 13 IIIB	GROUP NUMBER 14 IVB	GROUP NUMBER 15 VB	GROUP NUMBER 16 VIB	GROUP NUMBER 17 VIIB	GROUP NUMBER 18 0
1	1 H	2 He																
2	3 Li	4 Be										5 B	6 C	7 N	8 O	9 F	10 Ne	
3	11 Na	12 Mg										13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57 La*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89 Ac**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Fl	115 Uup	116 Lv	117 Uus	118 Uuo

f- Inner transition elements

* Lanthanoids $4f^x 5d^0 6s^2$	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
** Actinoids $5f^x 6d^0 7s^2$	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

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

☒

Resources-NCERT BOOK (Dinesh Publication Book) Co-Scholastic Activities

With the knowledge of the chapter, student will be able to perform following activities.

☒ To assign the position of elements in periodic table.

☒ To study properties of all elements including the elements which are not discovered yet. To study the periodic table systematically.

☒

Assignment Items

NCERT Intext Questions and Back Exercises

Feed Back And Remedial Teaching:-

☒ The students will be given objective questions worksheet.

☒ All questions with correct and incorrect option will be discussed. Alternative methods of learning will be discussed in class.

☒ Case based study questions will also be discussed in class.

Chapter:4(ChemicalbondingAndStructure)

Month-July

Number of Periods: 20

Objective:

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

bonding.

P.K Testing :

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, saw saw, ionisation, pyramidal, octahedral, tetrahedral, trigonal.

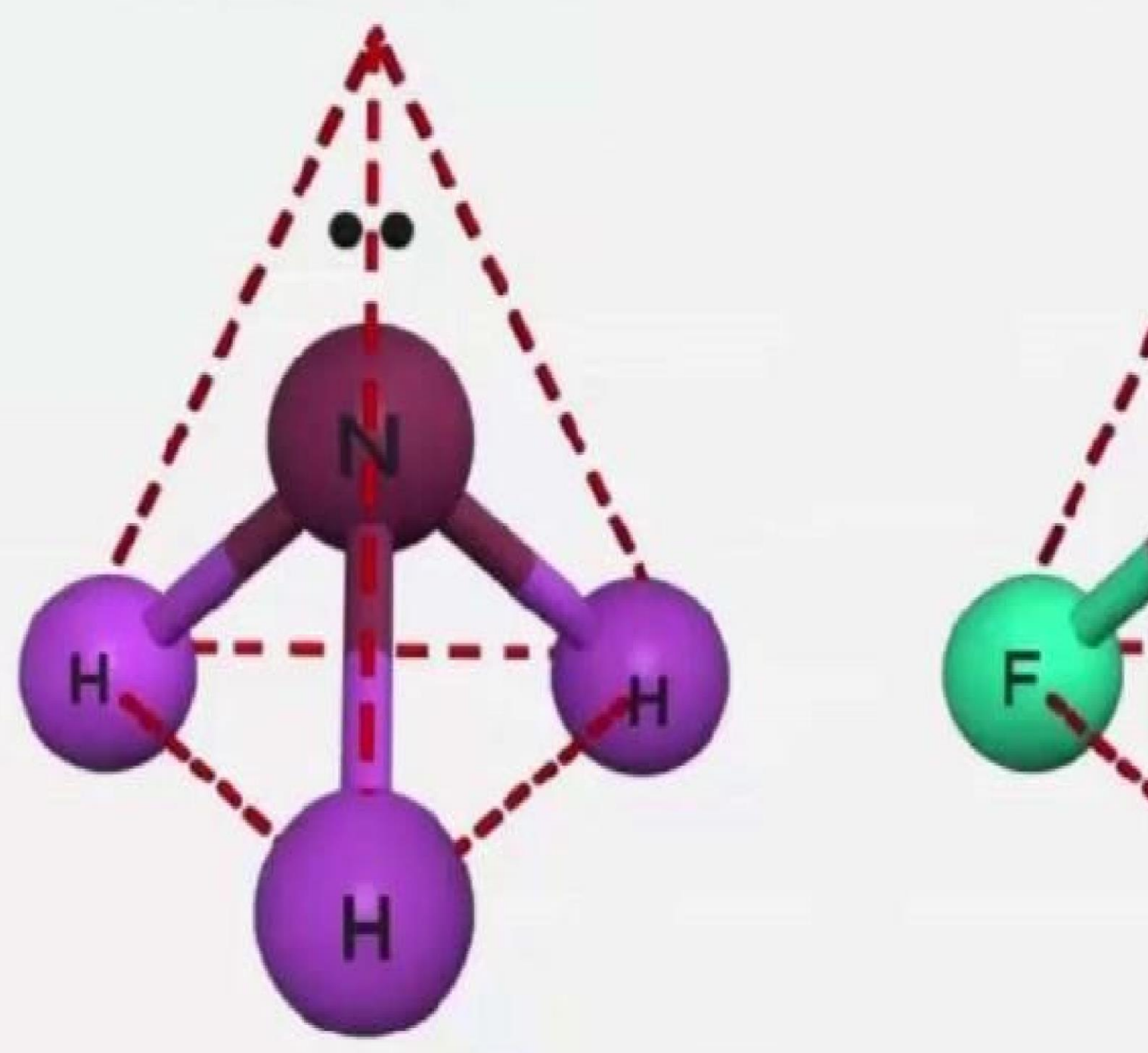
Explanation with innovative methods/ aids used:

Student teacher Interaction, smart class, quiz, group discussion, MCQ practice
s. Ball and stick models, group activity etc.

POLARITY OF BONDS

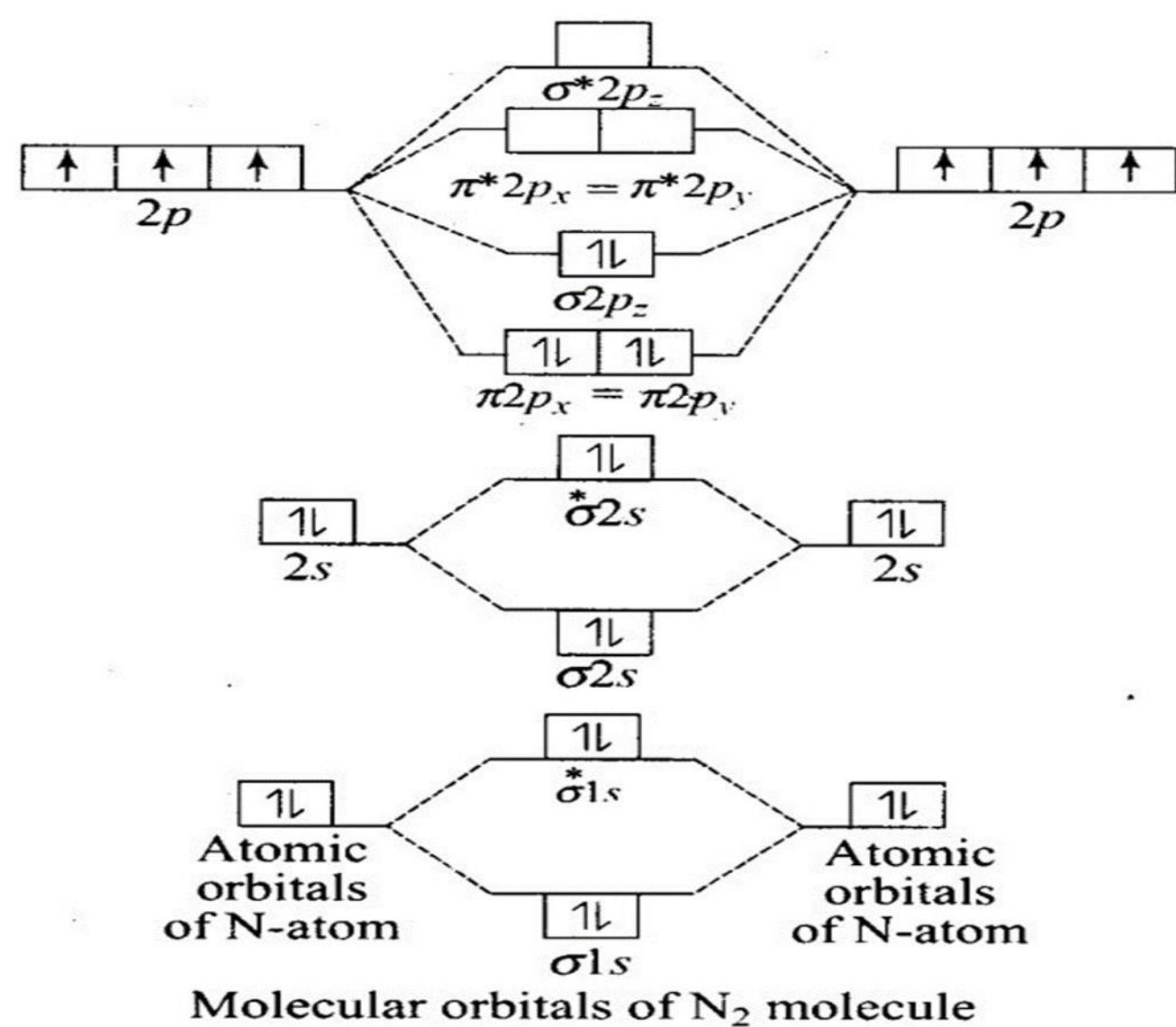
Ammonia NH₃

Nitro



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.



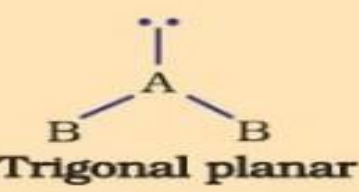
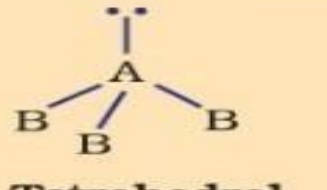
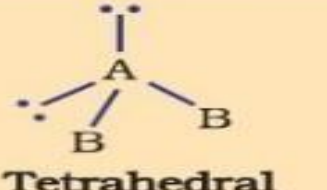
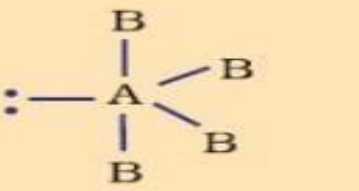

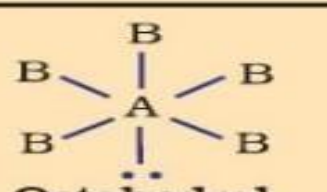

- Different theories like VBT, VSEPR, MOT will be introduced to explain bonding and their role in describing characteristics of molecules.
- Special case of hydrogen bonding, its types and significance will be explained.

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.

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

- VBT, VSEPR, MO theory will be summarised.

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 ₂ L	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 ₃ L	4	3	1	sp ³	Trigonal pyramidal	NH ₃ , PX ₃ (X = F, Cl, Br, I)
AB ₂ L ₂	4	2	2	sp ³	V-shaped	H ₂ O, OF ₂ , SCl ₂
AB ₅	5	5	0	sp ³ d	Trigonal bipyramidal	PF ₅ , PCl ₅ , SbCl ₅
AB ₄ L	5	4	1	sp ³ d	See saw	SF ₄ , TeBr ₄
AB ₃ L ₂	5	3	2	sp ³ d	T-shaped	ClF ₃ , XeOF ₂
AB ₂ L ₃	5	2	3	sp ³ d	Linear	XeF ₂ , ICl ₂ ⁻ , I ₃ ⁻
AB ₆	6	6	0	sp ³ d ²	Octahedral	SF ₆
AB ₅ L	6	5	1	sp ³ d ²	Square pyramidal	IF ₅ , ClF ₅ , BrF ₅
AB ₄ L ₂	6	4	2	sp ³ d ²	Square planar	XeF ₄ , ICl ₄ ⁻
AB ₇	7	7	0	sp ³ d ³	Pentagonal bipyramidal	IF ₇ , XeF ₆

Species	Total electrons	Configuration	Bond order	Magnetic character
O ₂	16	KKσ(2s) ² σ*(2s) ² σ(2p _z) ² π(2p _x) ² =π(2p _y) ² π*(2p _x) ¹ =π*(2p _y) ¹	$\frac{(8-4)}{2} = 2.0$	Paramagnetic
O ₂ ⁺	15	KKσ(2s) ² σ*(2s) ² σ(2p _z) ² π(2p _x) ² =π(2p _y) ² π*(2p _x) ¹	$\frac{(8-3)}{2} = 2.5$	Paramagnetic
O ₂ ⁻	17	KKσ(2s) ² σ*(2s) ² σ(2p _z) ² π(2p _x) ² =π(2p _y) ² π*(2p _x) ² =π*(2p _y) ¹	$\frac{(8-5)}{2} = 1.5$	Paramagnetic
O ₂ ²⁻	18	KKσ(2s) ² σ*(2s) ² σ(2p _z) ² π(2p _x) ² =π(2p _y) ² π*(2p _x) ² =π*(2p _y) ²	$\frac{(8-6)}{2} = 1.0$	Diamagnetic

∴ Relative order of stability is O₂⁺ > O₂ > O₂⁻ > O₂²⁻.

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 H₂, O₂, 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, MgCl₂, CaO etc.
- Representation of covalent bonding in various molecules like CH₄, C₂H₄, H₂O, NH₃, 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.

Feed Back and Remedial Teaching –

Remedial Teaching is provided to those students who have fallen back in studies . They need short term learning assistance. They would be given step by step instructions so that the taught topics become clear to them.

Inclusive Properties And Full Participation with Discrimination-

There will be enabling mechanism for providing children with special need (CWSN).

Chapter:5 (Chemical Thermodynamics) Month-August

No.OfTeachingPeriods-23

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 –

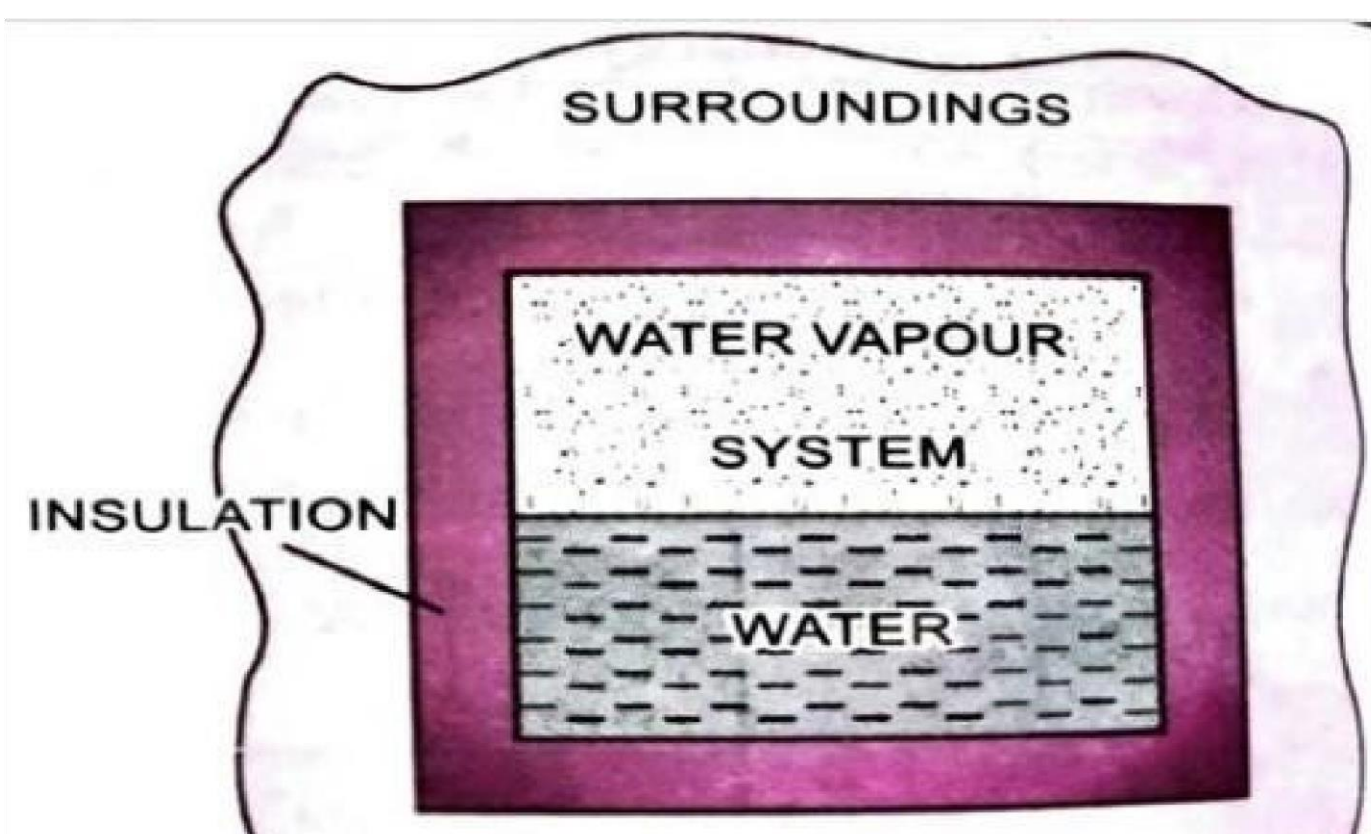
Student should know about: -

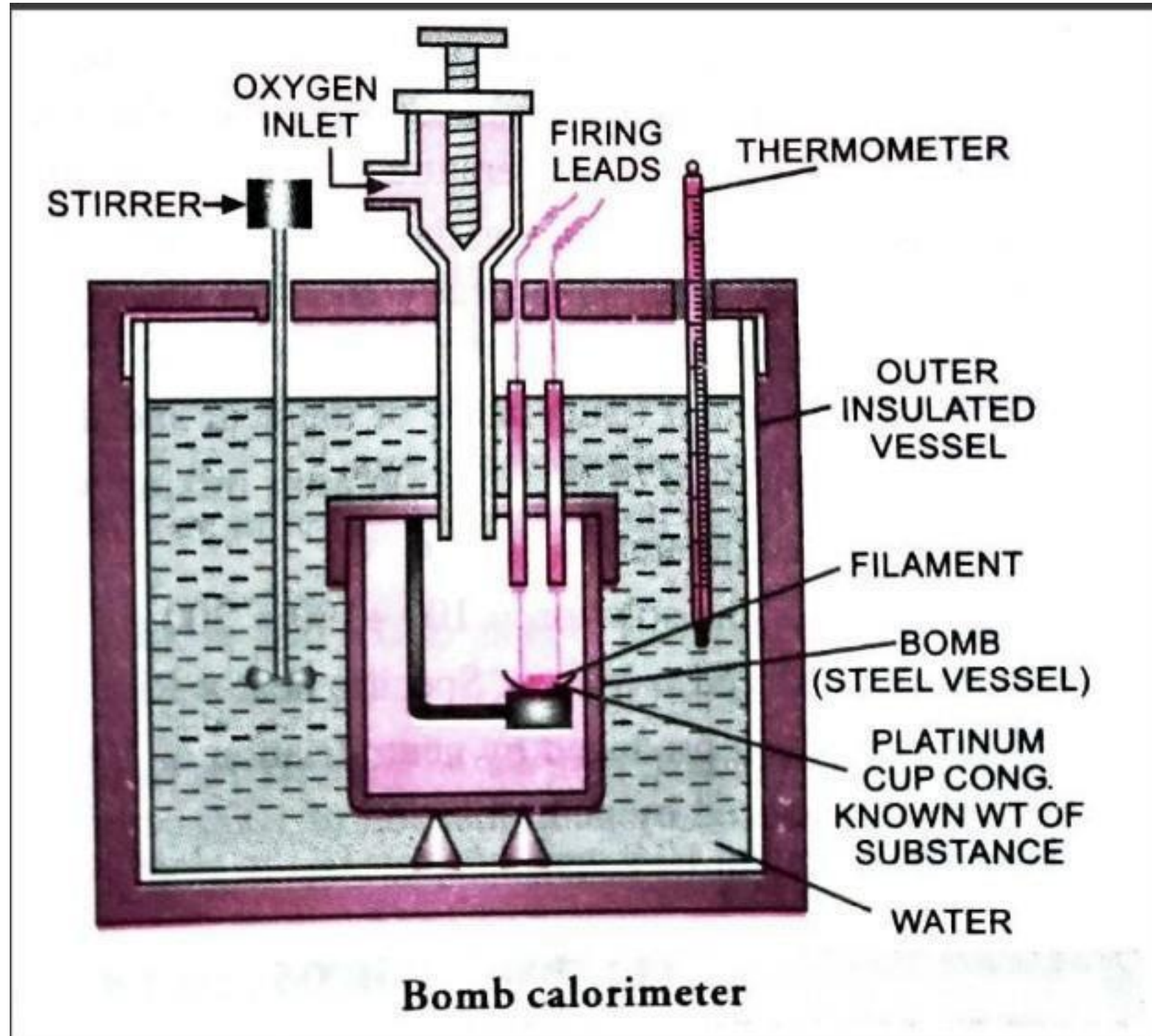
- ☒ Types of Energy
- ☒ Chemical Changes
- ☒ Mechanical Work Fuel Cell or Dry Cell etc.
- ☒

Vocabulary / Important Spellings –

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

Innovative Methods –





☒ Smart Class Lecture

Method NCERT Book

☒

☒

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

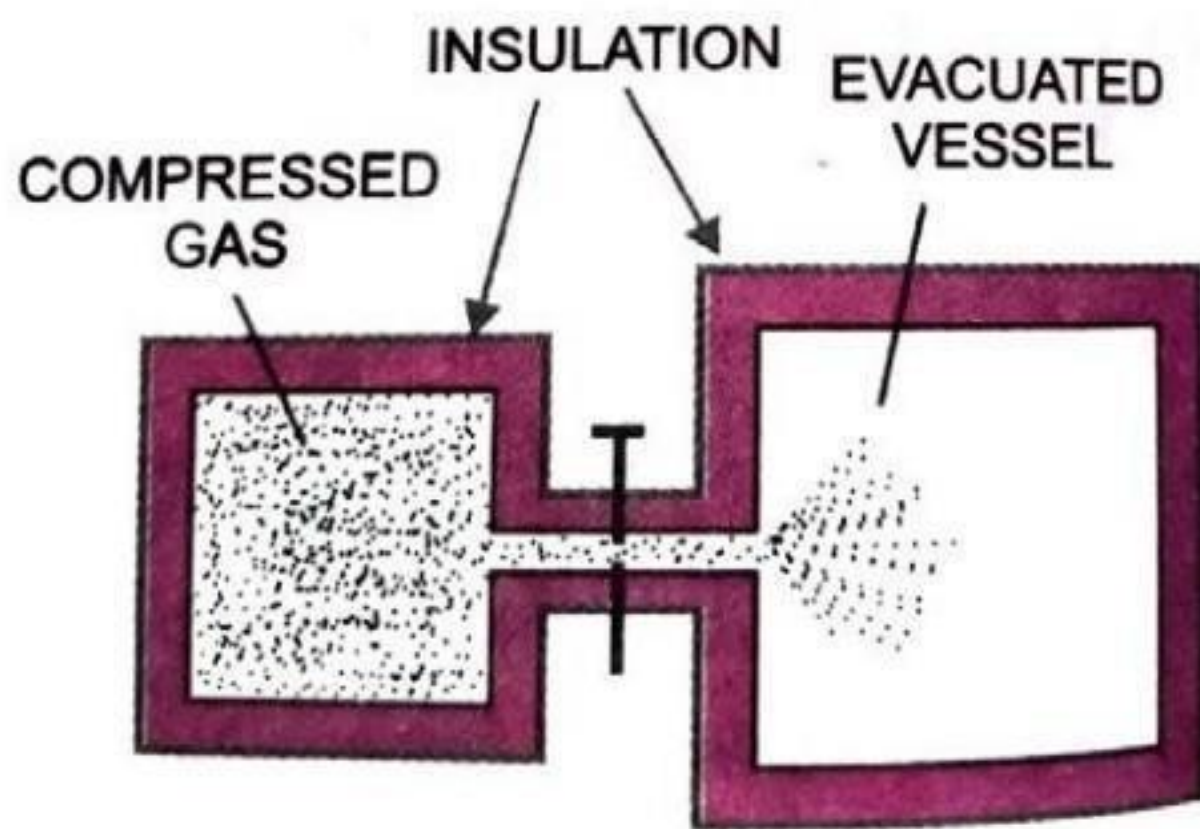
☒ Different types of Enthalpies of Reactions Energies of Phase

Changes

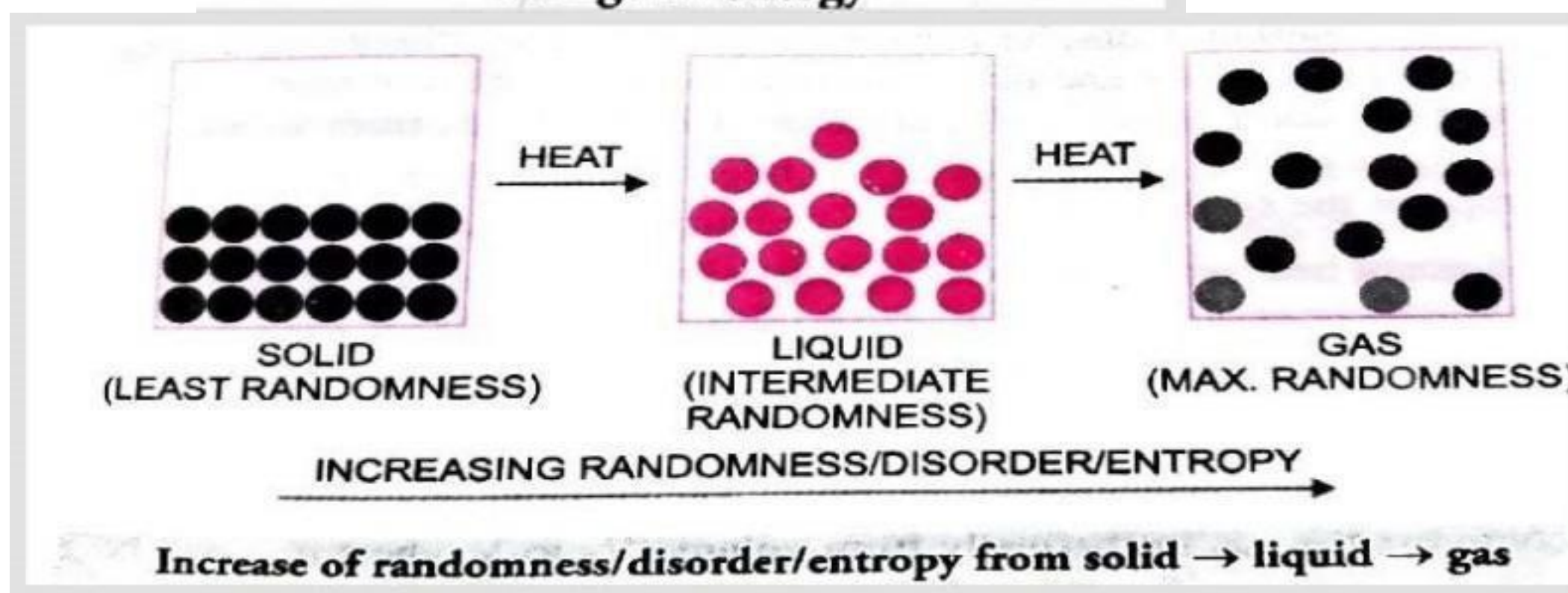
☒ Entropy – A State Function

☒ Spontaneity of a process

☒ Criteria of Spontaneity



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



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

Feedback And Remedial Teaching-

- ☒ Feedback from the students would be taken and such students would be identified whose preparation of the topics is not upto the mark. They would be explained the topic again and simple test from the concerned topic would be taken up.

Inclusive Practices And Full Participation With Discrimination-

To Develop respect for diversity, the lesson plan would include, early on material on human values such as respect for all persons, empathy, tolerance, human rights etc.

Chapter 7: Redox Reactions

Number Of periods :9

Month November

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

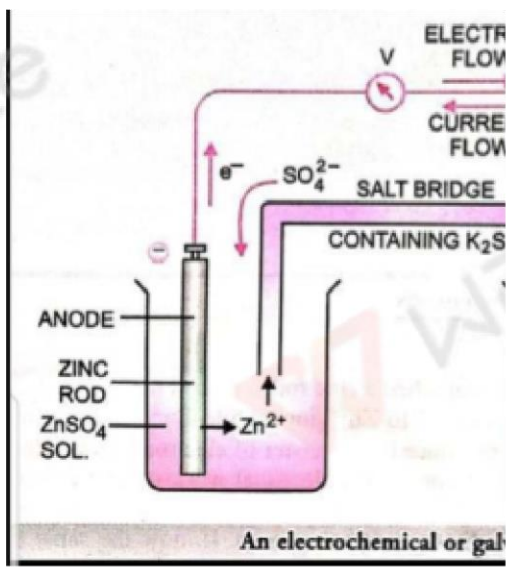
☒ Reducing Agent,

☒ Electrochemical Cell,
Potential Electrochemical Force, etc.

Innovative Methods / Resources –

Smart Board

Lecture Method



NCERT Book

Reference Book.

Procedure

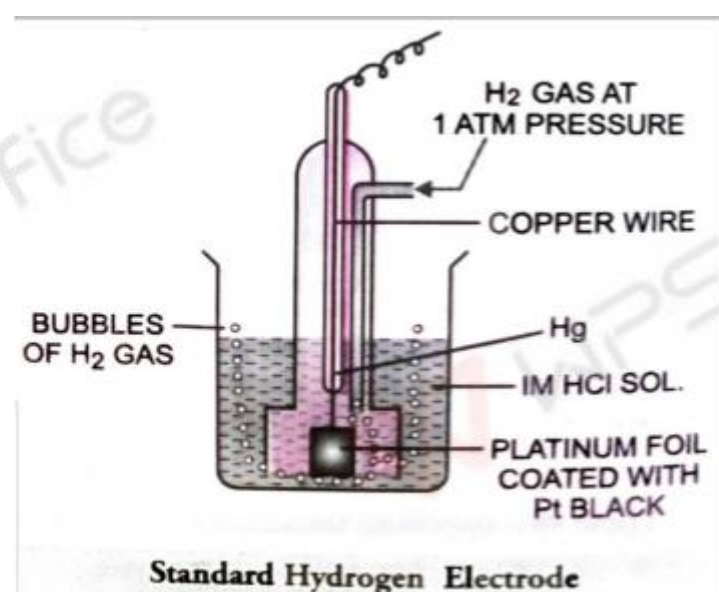
– Students will be told
about: -

☒

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

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

Feedback And Remedial Teaching: Feedback from the students will be taken and such students will be identified whose preparation of topic is not up to the mark. They would be explained topic again and simple test from concerned topic would be taken up.

Inclusive Practices and full participation without discrimination:

To develop respect for diversity the lesson plan would include material on human values such as respect for all persons, empathy, tolerance, human rights etc.

Sustainable Development Goals:

Students will attain the goal of decent work and economic growth.

Chapter- 6 : Equilibrium

MONTH= OCTOBER No

of teaching days=20

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?

will be discussed like

Solid \rightleftharpoons liquid
Ice \rightleftharpoons water Liquid \rightleftharpoons gas
water \rightleftharpoons steam
Gas \rightleftharpoons solid

- Law of mass action will be introduced. mass of

EQUILIBRIUM AND LE CHÂTELIER'S PRINCIPLE
Reversible chemical reactions reach equilibrium in closed systems (no substances added or lost). Here's how different conditions affect that equilibrium.

EQUILIBRIUM	CONCENTRATION	TEMPERATURE	PRESSURE
A + B \rightleftharpoons C + D In reversible reactions products of the reaction can react to produce the original reactants. At dynamic equilibrium the rates of the forwards and backwards reactions are equal, the concentrations of the reactants and products don't change. 2 moles of A and 2 moles of B react to form 2 moles of C and 2 moles of D. The rate of the forwards and backwards reactions are equal.	REACTANT CONCENTRATION INCREASED \rightleftharpoons \rightarrow \rightarrow The equilibrium position shifts to reduce the reactant concentration. REACTION FORMING PRODUCTS FAVOURED In the example below the reactant concentration of A and B is increased. The equilibrium position shifts to reduce the reactant concentration. A + 2B \rightleftharpoons C + D Increasing concentration of one will favour the other.	TEMPERATURE INCREASED \uparrow $^{\circ}\text{C}$ The equilibrium position shifts to reduce the temperature. THE ENDOTHERMIC REACTION WILL BE FAVOURED In the example below the reactant concentration will remain more A and B, and less C and D. A + 2B \rightleftharpoons C + D Increasing temperature will favour the endothermic reaction.	PRESSURE INCREASED \uparrow Pa The equilibrium position shifts to reduce the pressure. SIDE OF REACTION WITH FEWER GAS MOLECULES FAVOURED In the example below the reactant concentration will remain more A and B, and less C and D. A + 2B \rightleftharpoons C + D Increasing pressure will favour the side with fewer gas molecules.
LE CHÂTELIER'S PRINCIPLE An analogy for changing equilibrium conditions. Le Chatelier's principle states that when a change is made to the conditions of a dynamic equilibrium, the system responds to counteract the change, causing changes in quantities of reactants and products.	PRODUCT CONCENTRATION INCREASED \leftarrow \leftarrow The equilibrium position shifts to reduce the product concentration. REACTION FORMING REACTANTS FAVOURED In the example below the reactant concentration will remain more A and B, and less C and D.	TEMPERATURE DECREASED \downarrow $^{\circ}\text{C}$ The equilibrium position shifts to increase the temperature. THE EXOTHERMIC REACTION WILL BE FAVOURED In the example below the reactant concentration will remain more A and B, and less C and D.	PRESSURE DECREASED \downarrow Pa The equilibrium position shifts to increase the pressure. SIDE OF REACTION WITH MORE GAS MOLECULES FAVOURED In the example below the reactant concentration will remain more A and B, and less C and D.

Note: using a catalyst increases the rate of both the forwards and backwards reactions but doesn't change the equilibrium position.

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metho

Smart
from li
melting
solution
practic

table, pH strips, peer
assessment, student
teacher interaction, tables

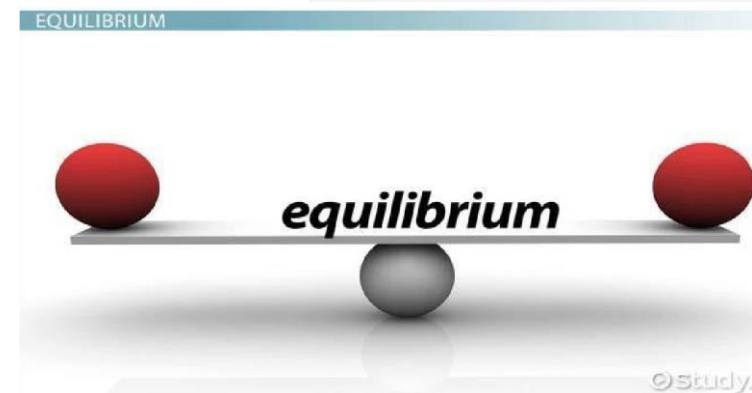
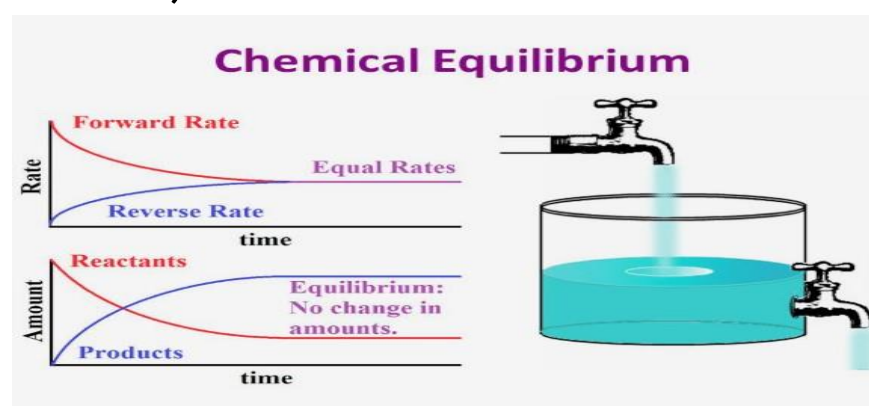
LEWIS ACIDS & BASES

Identify the acids and bases.
acid base
 $\text{H}_2\text{SO}_3(\text{aq}) + \text{Ca}(\text{OH})_2(\text{s}) \rightarrow \text{CaSO}_3(\text{s}) + 2 \text{H}_2\text{O}$

Identify the acid and base.
Lewis base Lewis acid
 $\text{CaO}(\text{s}) + \text{SO}_2(\text{g}) \rightarrow \text{CaSO}_3(\text{s})$

Are the two reactions the same?

- Salt hydrolysis will be exemplified by taking



of ionic compounds, log
tables.

ACTIVITY

Procedure:

- After discussion of physical processes, state of equilibrium in them

by quoting various examples.

Participation of students:

- examples of various types of salts eg. NaCl, $(\text{NH}_4)_2\text{CO}_3$, CH_3COONa , $(\text{NH}_4)_2\text{SO}_4$.
- Solubility product will be explained with practice of numerical
- Common ion effect and buffers will be explained

Summary of Le Chatelier's P

Type of Effect or Change	Direction of
Addition of more reactants	Forward dir
Addition of more products	Backward di
Increase in temperature	Towards er
Decrease in temperature	Towards ex
Addition of Catalyst	No effect
Increase in Pressure	where the nc
Decrease in Pressure	where the nc

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

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 nature will be

Strong Acids/Bases

Statⁿ Strong Acids

- Ch. HCl
- HBr
- Defil HI
- aci HNO₃
- Undⁿ HClO₄
- prc H₂SO₄

buffer solution and apply them.

Solve numerical problems based on K_c , K_a , K_b , K_{sp} , pH etc.

Strong Basesⁿ ad with act of

- LiOH
- NaOH
- KOH
- RbOH
- CsOH
- Ba(OH)₂
- Sr(OH)₂
- ein

	Acids	Bases
	Red	Blue
thal	Colourless	Dark pink
Methyl orange	Red	Orange

Resource: _____

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 Henry's 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.

Feedback and Remedial
Teaching

Students who would
fallen back in studies.
They would be given
extra attention, mcq

exercises would be
given for practice

**Inclusive practice and
Full Participation :**

The lesson plan would also include emphasis on global citizenship , inclusion, equality detailed knowledge of various
culture **Sustainable Development Goals**

With the knowledge of topic PH .The students can achieve the goal of better health and commu

Chapter - 8 : Organic Chemistry :

Some basic Principles

Month=November and
December

No Of Teaching

Period=11

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.

IMPORTANT SPELLINGS:

□

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 inlab
- 3 With the help of model to show bonding in organic carboncompounds.

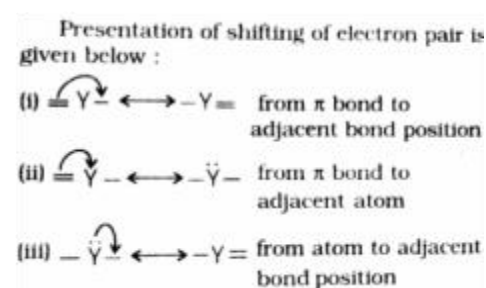
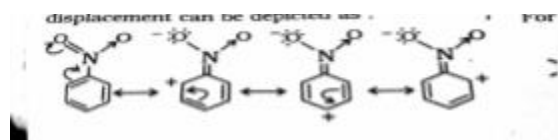
I. PROCEDURE:

- II. Studentswouldunderstandreasonsfortetralencyofcarbonand shapes of organiccompounds.
- III. Classify the organiccompounds.
- IV.
- V.

VI. Namethecompoundsaccording to IUPACsystemofnomenclature and also derive their structure from the given name. VII.

Understand the concept of organic reactionmechanism

V Explaintheinfluenceofelectronicdisplacementsonstructurean reactivity of organiccompou



STUDENTS PARTICIPATION:

Students would be able to name the organic compounds.

Students would be able to do numerical on topic quantitative analysis of carbon,hydrogen ,nitrogen,halogen and sulphur.

RECAPTULATION/ ASSIGNMENT

Students would be able to name organic compounds

**IMPORTANT
SPELLINGS:**

Students will be able to explain the

influence of electronic displacement on structure and reactivity of

organic compound Recognize the type of organic reactions.

NCERT in text 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,

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.

Feedback and remedial teaching

**IMPORTANT
SPELLINGS:**

Step by step instruction would be given to slow learning students. Such student would be take out of normal classroom and taught in a different environment. They would be provided with routine assessment and practice activities

Inclusive practices and full participation without discrimination lesson plan is so design so as to promote education of children belongs to all minority

Chapter 9 : Hydrocarbons

No of teaching periods=18

Month=December and 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, sawhorse projection, markovnikov's rule.

Kolbe's electrolytic method, markovnikov's rule, Friedel craft alkylation, friedel crafts acylation, carcinogenicity.

EXPLANATION WITH INNOVATIVE METHODS:

□ Smart class

□ Show all activities in lab

□ With the help of model (like ball and stick) to be shown confirmation of ethane.

PROCEDURE:

IMPORTANT
SPELLINGS:

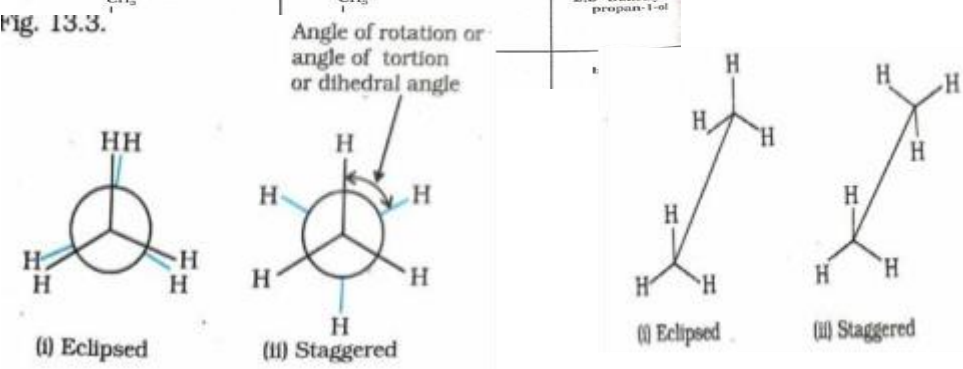
□ Students will explain the name of hydrocarbons according to IUPAC system of nomenclature. □ Recognize and write structures of isomers of alkane, alkenes, alkynes and aromatic hydrocarbons □ Various methods of preparation of hydrocarbons.

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

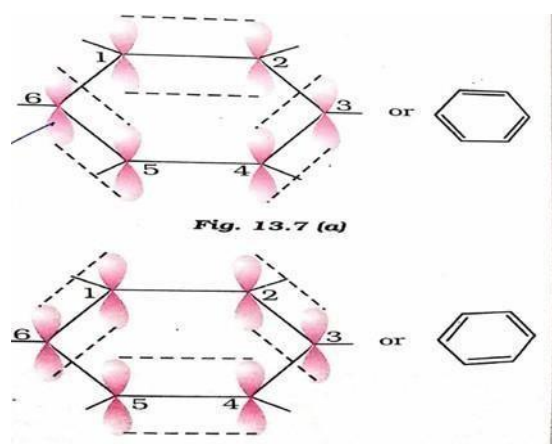
IMPORTANT
SPELLINGS:

Structures of $-C_nH_{2n+1}$ group	Corresponding alcohols	Name of alcohol
(i) $CH_3-CH_2-CH_2-CH_2-CH_2-$	$CH_3-CH_2-CH_2-CH_2-CH_2-OH$	Pentano-1-ol
(ii) $CH_3-CH(CH_3)-CH_2-CH_2-CH_2-$	$CH_3-CH(CH_3)-CH_2-CH_2-CH_2-OH$	Pentano-2-ol
(iii) $CH_3-CH_2-CH(CH_3)-CH_2-CH_2-$	$CH_3-CH_2-CH(CH_3)-CH_2-CH_2-OH$	Pentano-3-ol
(iv) $CH_3-CH_2-CH_2-CH_2-$	$CH_3-CH_2-CH_2-CH_2-OH$	Butano-1-ol
(v) $CH_3-CH_2-CH(CH_3)-CH_2-$	$CH_3-CH_2-CH(CH_3)-CH_2-OH$	Butano-2-ol
(vi) $CH_3-CH_2-CH_2-$	$CH_3-CH_2-CH_2-OH$	Propano-1-ol
(vii) CH_3-CH_2-	CH_3-CH_2-OH	Ethano-1-ol
(viii) CH_3-	CH_3-OH	Methano-1-ol

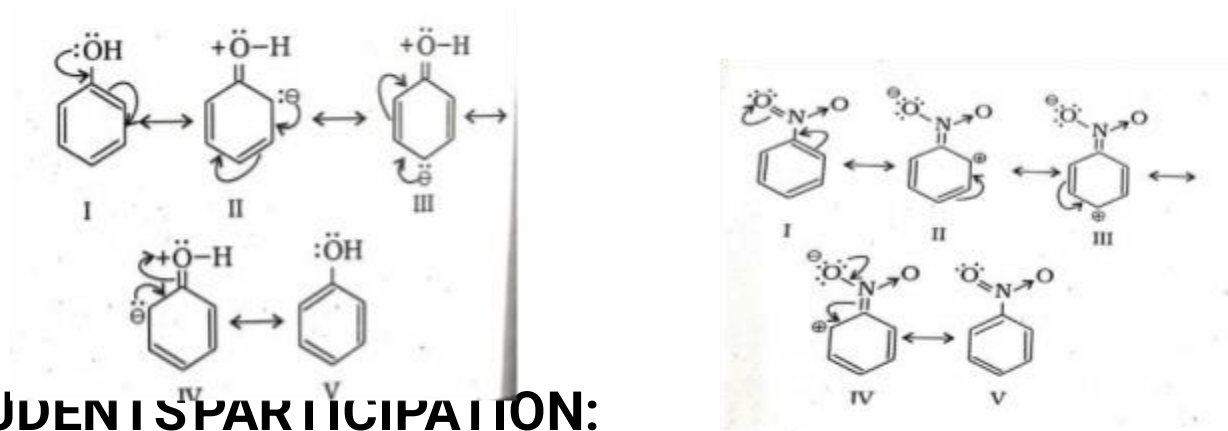
Fig. 13.3.



- 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.



STUDENT 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 be 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.

Feedback and Remedial teaching

The student will be given objective work sheet and Incorrect options will be discussed

Retest, Assignment, Practice question would be given for preparation

Sustainable Development Goals

by teaching this chapter we may proceed towards achieving the SDG of decent work and economic growth