# BUDHA DAL PUBLIC SCHOOL

## TERM –I

## CLASS-X SUBJECT-SCIENCE (CHEMISTRY)

## LESSON PLAN - Month- April

# Chemical Reaction and Equations

**Objective –**

- To recognise the physical and chemical processes associated with biological and industrial process.
- To understand chemical processes occurring in daily life.
- To apply the principle of conservation of mass to balance chemical reaction.

**Previous knowledge Testing –**

- Students would be asked about physical and chemical changes.
- Daily life examples would be discussed.

## Vocabulary Used –

- Equations, Reaction, Symbols, Physical states, Combustion, precipitation etc.

## Important Spellings –

- Precipitation, Combination, Neutralisation, Displacement, Decomposition, Thermal Photolysis.

## Aids / Innovative Methods used to explain the topic –

- With the help of Smart Class (Extra marks)

- Learning methods and making them learn the formulas of various chemical compounds which would be used in explaining chapters and Smart Class.

## Procedure –

Students would be taught firstly the various activities related to types of chemical reactions and then Balancing of Chemical Equations.

Types of Chemical Reactions –

- Combination

- Decomposition
- Thermal
- Electrolyte

- Photolytic

- Displacement

- Double Displacement

- Oxidation and Reduction
- Identify Oxidant, Reductants, Oxidising Agent, Reducing Agents.

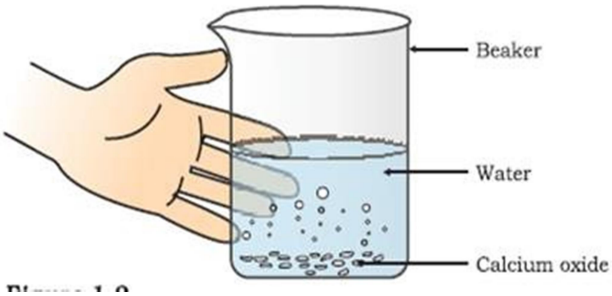
  Many examples for practising would be given to them

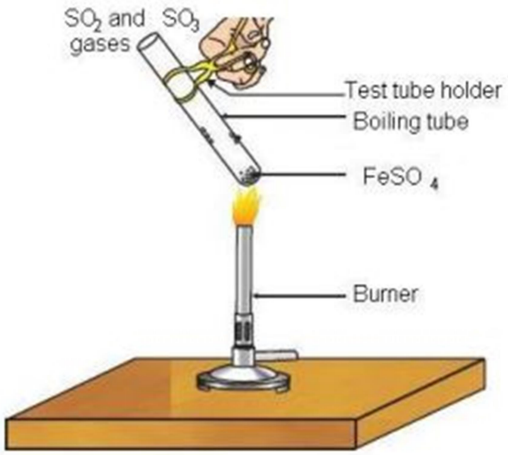
## Participation of Students –

Students will be asked: -

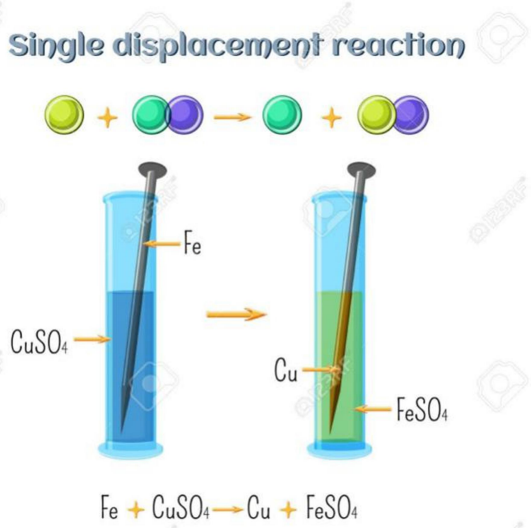
- To solve / Balance chemical Equation on the Green board.
- Day to day life examples related to chemical reaction.

Combination Reaction






Decomposition reaction




## Recapitulation –

From the above topics, following point would be cleared to students.

- Electrolysis of water
- Thermal decomposition of many compounds
- Oxidation of saline and many metals when kept in air, why they become black
- Use of Agar in photography
- Acid, Base Neutralization Reactions

## Assignments –

- NCERT In text and Back exercise questions would be discussed in class and given as a homework to students.

## Integration With Other Domains –

During chemical reactions, lot of changes occur in a beaker / or test tube. For e.g. Change in colour of solution, change in state of substance or evolution of gas, Test tube becomes hot or cold then chemical reaction occurs

These all above changes can be correlated with art, related to colour change, Rusting of Iron which occur in daily life shows a change in colour, Texture of iron to form rust.
Balancing of chemical equation can be done with the help of Mathematics

## Resources –

Smart Class, Extra marks, NCERT Book, Reference (Pardeep's Publications)
**www.learncbse.in, byjus.com, you tube**

## Learning Outcome –

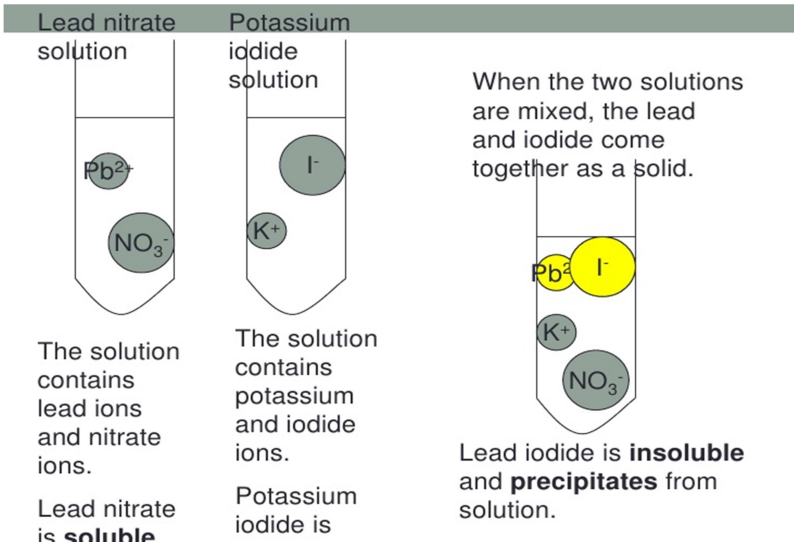
Students would be able to know: -

- A complete chemical equation which represents the reactants, products and their physical states symbolically.
- A combination and decomposition reaction.
- Exothermic and Endothermic reaction.
- Rusting and how it occurs.

## Activities of Chemical Reactions And Equations –

1. Burning of Magnesium Ribbon


2. Mixing of Lead Nitrate and KI solution

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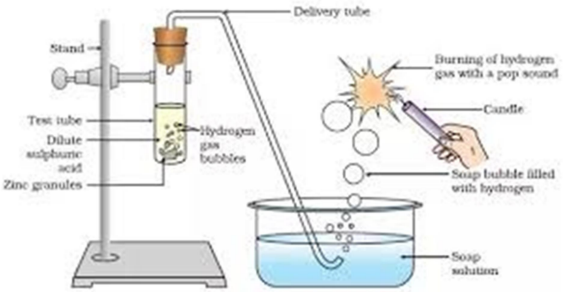
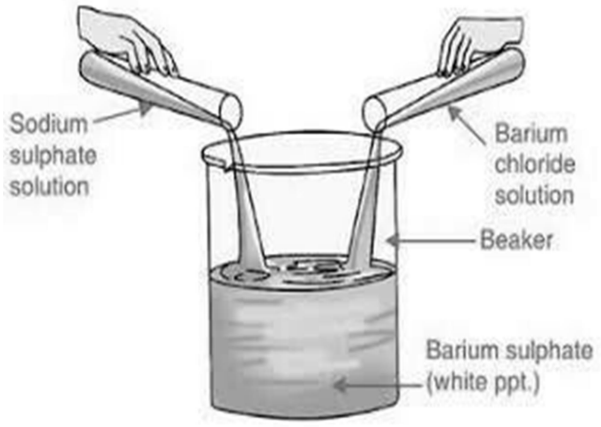
3. Action of HCl on Zinc Metal

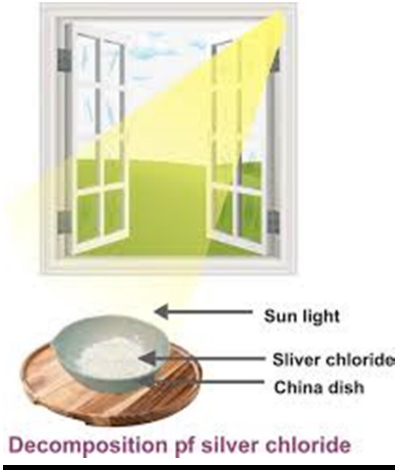



4. Action of Quick lime on water
5. Heating of $FeSO_4$ Crystals
6. Heating of Lead Nitrate Crystals
7. Reaction between Copper Metal and $FeSO_4$ Solution

8. Mixing of $BaCl_2$ and $Na_2SO_4$ Solution




9. Decomposition of AgCl in light



# BUDHA DAL PUBLIC SCHOOL

## TERM –I

## CLASS-X SUBJECT-SCIENCE (CHEMISTRY)

## LESSON PLAN - Month- May&July

# Acids Bases and Salts

## Objectives –

- To learn the chemical properties of acids and bases.
- To describe the methods of preparation, properties and uses of Bleaching Powder, Baking Soda, Washing Soda and POP.

## Previous Knowledge Testing –

Students would be asked about common acids, bases, salts and their nature and indicators like red litmus, blue litmus.

## Vocabulary Used –

- Phenolphthalein, Methyl orange, Olfactory Indicators, Ph of Salts, Bleaching Powder, Washing Soda,
  Plaster of Paris.

## Important Spellings –

- Phenolphthalein, Bleaching Powder, Olfactory Indicators, Sodium bicarbonate

## Alternate Methods Used –

- Smart Class

- Show activities in lab
- Black Board

## Procedure –

- Students should be taught about effect of blue litmus, Red litmus, Phenolphthalein, Methyl Orange, indicators on solutions of acids / bases.
- Properties of Acids and Bases and their reaction with metals, metal bicarbonates with each other, metal oxides with acids, non – metallic oxides with bases.
- Students should be taught about what happens when acid or base is added in a water solution.
- Strength of Acids and bases with the help of pH paper.
- Preparation of NaOH, Bleaching Powder ( $CaOCl_2$) , Baking Soda ( $NaHCO_3$), Washing Soda ( $Na_2CO_3.10H_20$)
  And POP ($CaSO_4.\frac{1}{2}H_2O$)

## Recapitulation –

- Students will be able to tell about all the properties of acids and bases.
- They would be able to understand properties of all chemicals from common salt.

## Integration With Other Domains –

Concept of acids and bases can be correlated with Biology. We can find pH of edible substances and things like saliva etc. Some plants are acidic and basic in nature. They can be put to various uses based on their nature.
This concept can also be integrated with Art because acids/ bases give different colour with different indicators.

## Resource-

**www.learncbse.in, byjus.com, you tube**

## Learning Outcomes –

Students would be able to: -

- Compare chemical properties of acids / bases.
- pH of given solution and its importance in daily life.
- To describe preparation of different salts and their uses in everyday life

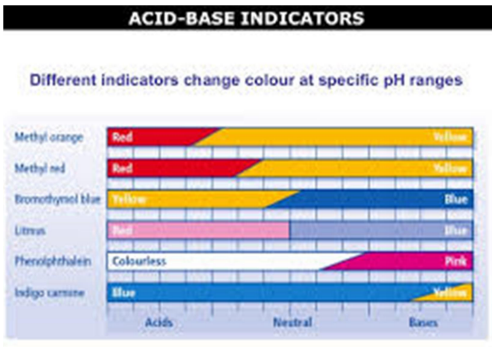
## Assignment –

- NCERT question / Answers would be discussed and given as Homework.

## Activities –

- Collect samples of salts and see the change in colour of acid / base indicators: -

- Red Litmus
- Blue Litmus
- Methyl Orange



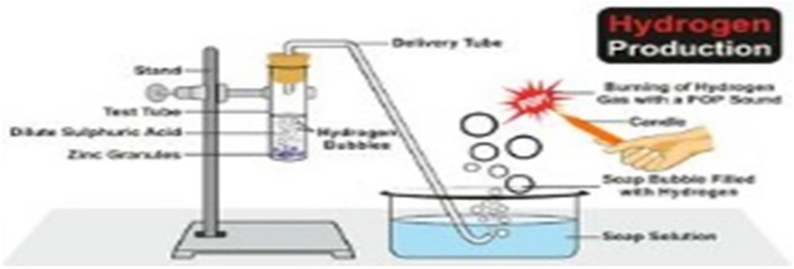
## Acid – Base Indicators

**Methyl Orange Indicator**

In Acid  In Base

For example, phenolphthalein is colorless in its HIn form and pink in its $In^-$ form.

- Action of $H_2SO_4$ on Zn granules and test for $H_2$ gas.



- Reaction of Metal Carbonates and metal hydrogen carbonates with acids like HCl and test for $CO_2$ gas.

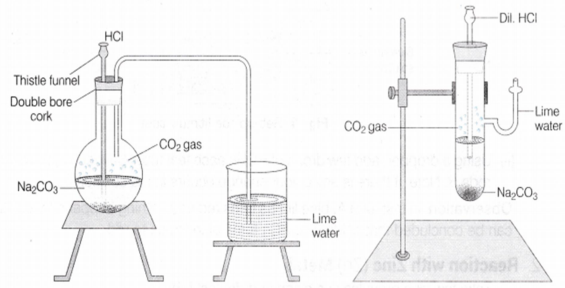


**Fig. 3** Reaction of dil.HCl with sodium carbonate

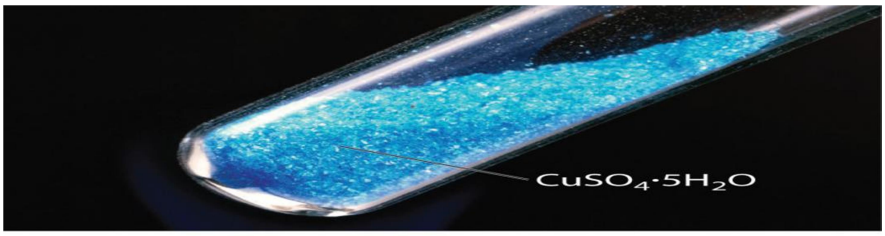
- Reaction between NaOH / HCl

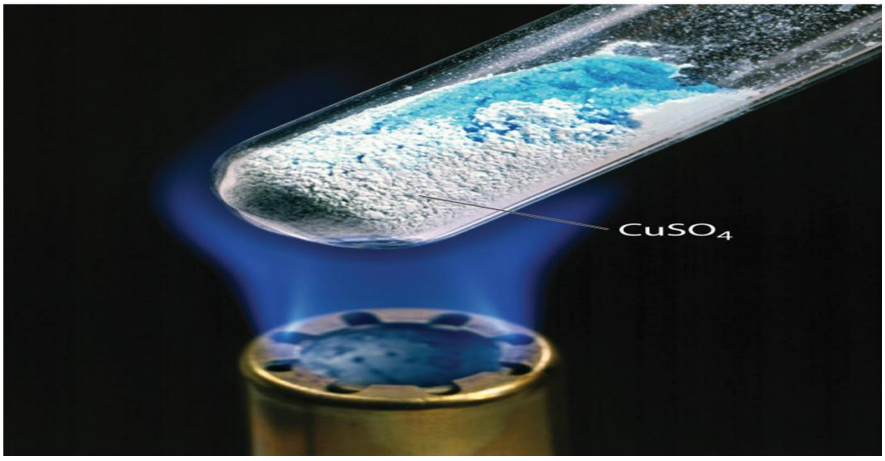
- Activity to show that solution of acids i.e. HCl, $H_2SO_4$ conduct electricity and solution of glucose, alcohol does not conduct activity.

- Strength of Acids and Bases with help of pH paper.

- Activity to show the acidic, basic, neutral nature of salts with the help of pH paper.

- Heating of crystal of $CuSO_4.5H_2O$




- Preparation of Gypsum and tell how it is used.

# BUDHA DAL PUBLIC SCHOOL

## TERM –I

## CLASS-X SUBJECT-SCIENCE (CHEMISTRY)

## LESSON PLAN - Month- August

# Metals And Non-Metals

## Objectives-

By studying this chapter, students would be able to: -

- Understand the difference between metals and non-metals, minerals and ores
- Various steps of metallurgy
- Chemical Reactions involved in extraction of metals
- Properties of Alloys

## Previous Knowledge Testing –

This lesson requires the following knowledge –

- Metals are obtained from minerals and ores
- Metals are mined from earth. They ae impure and need to be purified
- Alloys are mixed metals

## Vocabulary-

Mineral, Ore, Gangue, Roasting, Calcination

## Important Spelling –

Electrolyte, Refining, Corrosion, Smelting, Reduction, Thermite Reaction, Alloys

## Innovative Methods / Resources –

- Extra Marks / Smart Class
- NCERT Book
- Reference Book ( Pradeep's Publication)
- Green Board
- Various samples of metals would be shown to students in the lab

## Procedure –

- Students would be told about Physical and Chemical Properties of metals and non-metals
- Reaction of metals/non metals would be discussed with $H_2O$ / salts / acids / bases.
- Reactivity series would be discussed
- Electron dot structure of compounds
- Extraction of metals would be discussed

## Students Participation –

- Students would be able to tell the difference between metals and non-metals
- They would be able to differentiate between various processes of metallurgy.

## Recapitulation –

Students would be able to recapitulate: -

- The properties of metals and non-metals
- Various methods of metallurgy
- Students would be able to tell which metal is more reactive and which is less reactive based on their knowledge of reactivity series.

## Integration with other domain –

- This topic can be corelated with English language and mathematical concept of comparison.
- Since metals are lustrous, so it can be related with different colour of art.

## Resource-

**www.learncbse.in, byjus.com, you tube**

## Learning Outcome-

- Students would be able to state the various steps in obtaining metals from ore
- Can write chemical reactions involved in extraction.
- Give examples of commonly alloys
- Process of electrolytic refining with the help of labelled Diagram

## Co-Scholastic Activities –

- To see and examine various samples of metals like Na, Mg, Fe, etc.
- Burning of metals like Mg, Na, etc.
- Reaction of Metals with water.

**Table 1: Reaction of Metals with cold water**

Reactivity of metals increase up the series

| Metal | Observations/Equations |
|---|---|
| Potassium | Reacts very violently; explodes with cold water<br>Enough heat is produced to ignite the hydrogen gas produced<br>Hydrogen gas burn in air<br>$2K(s) + 2H_2O(l) \longrightarrow 2KOH(aq) + H_2(g)$ |
| Sodium | Reacts violently<br>Hydrogen formed may catch fire and explode<br>$2Na(s) + 2H_2O(l) \longrightarrow 2NaOH(aq) + H_2(g)$ |
| Calcium | Reacts readily<br>Hydrogen gas formed<br>$Ca(s) + 2H_2O(l) \longrightarrow Ca(OH)_2(aq) + H_2(g)$ |
| Magnesium | Reacts very slowly with cold water<br>A few bubbles of hydrogen gas produced only |
| Zinc<br>Iron<br>Lead<br>Copper<br>Silver | No reaction occurs |

- Reacting metals with solutions of other metals salts

## Reaction of Metals with Metal Salt Solutions

**A more reactive metal displaces a less reactive metal from its salt solution.**
**(Displacement reaction)**

**Magnesium displaces copper from copper sulphate solution.**

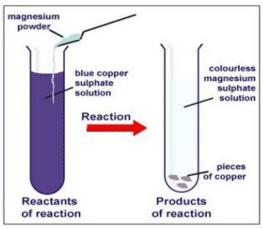
**$Mg + CuSO_4 \rightarrow MgSO_4 + Cu$**

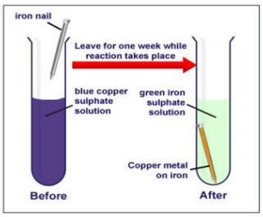
**Zinc displaces copper from copper sulphate solution.**

**$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$**

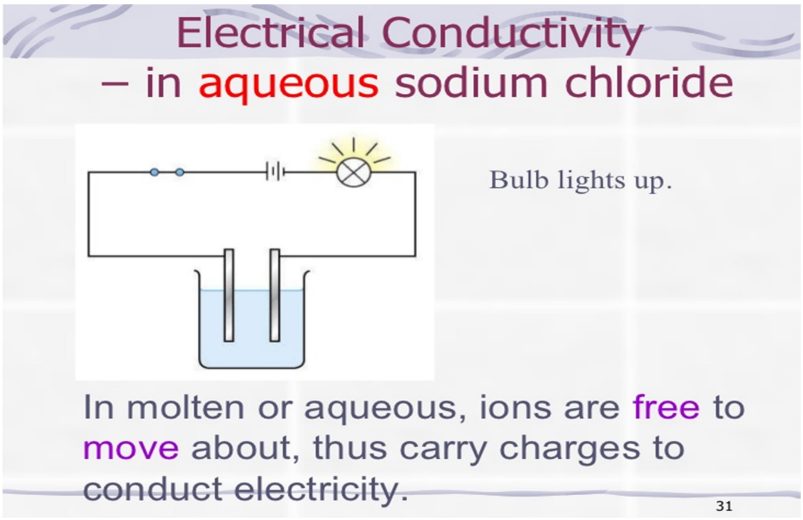
**Iron displaces copper from copper sulphate solution**

**$Fe + CuSO_4 \rightarrow FeSO_4 + Cu$**



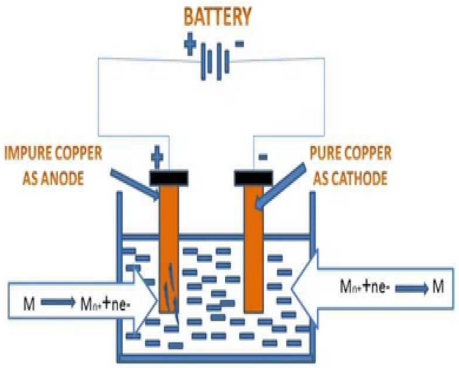

- Heat and electrical conductivity of Metals
- Electrical conductivity of an aqueous solution of Sodium Chloride




- Refining of metals by electrolysis

# ELECTROLYTIC REFINING

This method is use for refining of metal like silver, gold, copper, nickel etc.



# BUDHA DAL PUBLIC SCHOOL

## TERM –I

## CLASS-X SUBJECT-SCIENCE (CHEMISTRY)

## LESSON PLAN - Month- September

# CARBON AND ITS COMPOUNDS

## Objectives-

Students will be able to

- understand covalent bond and its types and its formation
- know reasons behind its versatile nature
- differentiate between saturated and unsaturated compounds
- write isomers of butane and pentane
- know various functional groups that are present which are responsible for different chemical properties

## Previous knowledge testing-

This lesson requires

- basic knowledge of structure of atom
- knowledge of allotropy and existence of carbon in various forms as diamond, graphite, black coal etc
- understand valence shell and writing electronic configuration
- knowledge of carbon and its compounds in our daily life as fabric, polymers etc
- requirement of combustion to take place
- examples of carbon compounds
- awareness regarding soaps and detergents

## Vocabulary/Important spellings

- catenation, tetravalency, allotropy, fullerenes, covalent bond, combustion, IUPAC names, isomers, functional groups, homologous series, ethanol, soap, detergent

## Innovative methods/Resources

- smart class, green board
- NCERT book, Pradeep's reference book
- Discussion, quiz, MCQ's etc
- **www.learncbse.in, byjus.com, you tube**

## Procedure-

- Class would start with a discussion on what type of compound students observe around them.
- they will notice that most of the things are made up of carbon. Versatile nature of carbon would be discussed.
- students would be told about covalent bonds, ionic bonds and allotropy of carbon * saturated and unsaturated carbon compounds would be discussed.
- students would be told about functional groups and homologous series. * IUPAC names would be taught to the students.

## Student participation-

- students will be able to make electron dot structures of $CH_4$ ,$C_2H_4$ ,and other carbon compounds.
- they will be able to describe the process of oxidation, reduction, combustion, and hydrogenation of carbon compounds
- they will be able to name carbon compounds according to IUPAC nomenclature
- they will be able to tell differences between soaps and detergents
- they will be able to make structures of carbon compounds in the form of straight chain, rings and branches

## Recapitulation/Assignment

- Students would be able to recapitulate the nomenclature rules and give names of carbon compounds

- assignment on difference between soap and detergent, saturated and unsaturated compounds, graphite and diamond, oxidation and reduction would be given to students.
- they will be able to explain cleaning action of soaps

## Integration with other domains –

- Knowledge of structures of diamond, graphite etc integrate the topic with art and geometrical patterns. It can also be integrated with English language and mathematical concept of comparison.

## Learning outcomes-

- Students would be able to tell about covalent bonds, electron dot structures, of various carbon compounds.
- they will acquire knowledge of various industrial processes like oxidation, hydrogenation etc.
- they will know the differences between soaps and detergents and which one is better for cleaning purposes.
- students would be able to tell about various functional groups and how they can change the properties of a compound.
- they can name and draw the structure of a carbon compound based on IUPAC nomenclature.

## Co scholastic activities-

- students will critically analyse and examine substances like graphite, ethanol, acetic acid etc.
- they will appreciate the importance of ethanoic acid and perform activities in the lab.
- this topic will help them in building character when they will discuss amongst themselves various topics of this chapter.
- they will learn to prepare soap in chemistry lab by collaborating with each other.

# BUDHA DAL PUBLIC SCHOOL

## TERM –I

## CLASS-X SUBJECT-SCIENCE (CHEMISTRY)

## LESSON PLAN -

## Month- December and January

# PERIODIC CLASSIFICATION OF ELEMENTS

## Objectives –

Students will understand that

- elements are classified on the basis of similarities in their properties.
- Dobereiner grouped the elements into triads and Newlands gave the law of octaves.
- Mendeleev's arranged the elements in increasing order of their atomic masses and according to their chemical properties.
- elements in the Modern periodic table are arranged in 18 vertical columns called groups and 7 horizontal rows called periods.

## Previous knowledge testing-

- Before studying this chapter , students should have the knowledge of * basic structure of an atom i.e., atomic number, atomic mass etc.
- electronic configuration of atoms.
- difference between metals and non metals.

## Vocabulary/Important spellings-

Electronic configuration ,Modern periodic table, trends in physical and chemical properties, periodicity , atomic numbers, atomic mass etc. electronegativity ,ionisation energy, metallic character and non metallic character.

## Innovative methods/ Resources

- periodic table chart * smart class/ green board.
- lecture method
- NCERT book / Reference book
- **www.learncbse.in, byjus.com, you tube**

## Procedure-

Students would be told about

- the need of classification of elements on the basis of similarities in their properties,
- earlier attempts at classification i.e., Dobereiner's triads, Newlands law of octaves ,
- Mendeleev's attempts in arranging elements in increasing order their atomic masses and according to their chemical properties,
- how Mendeleev even predicted the existence of some yet to be discovered elements on the basis of gaps in his periodic table,
- Modern periodic table
- periodicity of properties of elements including atomic size , valency and metallic and non metallic character.

## Students participation –

- Students would be able to identify triads in earlier attempts of classification,
- they can define Mendeleev's periodic law and Modern periodic law
- they will understand that anomalies in arrangement of elements based on increasing atomic masses could be removed when the elements were arranged in order of increasing atomic numbers

## Recapitulation –

Students would be able to recapitulate that

- elements in the periodic table are arranged in 18 vertical columns called groups and 7 horizontal rows called periods.

- elements belonging to the same group have same chemical properties with gradation of trends,
- elements thus arranged show periodicity of properties including atomic size, valency or combining capacity and metallic and non-metallic character.

## Integration with other domains

After studying this chapter , students will know how to group /classify objects based on their properties. In this way ,they can get rid of chaos and learn things in an organised way. Moreover students will learn the art of comparison and apply their knowledge accordingly.

## Learning outcomes-

After studying this chapter , students will be able to

- know the historical attempts made at classification of elements,
- know that even in the absence of modern equipment, scientists could classify elements on the basis of their power of observation.
- locate an element i.e, to find group ,period and block of an element in the periodic table by knowing its electronic configuration.
- predict the nature of an element on the basis of its position in the periodic table.

## Co-scholastic activities-

- Students will learn understanding, knowledge-based concepts when they will be able to locate the position of an element in periodic table on the basis of electronic configuration.
- they will learn the skill of collaborating with each other when they will study periodic table.
- they will be able to critically analyse the trends in the properties of elements in groups and in periods.