

SYLLABUS

FOR CLASS 12 CHEMISTRY

PRACTICALS

Micro-chemical methods are available for several of the practical experiments. Wherever possible such techniques should be used:

A. Surface Chemistry

1. Preparation of one lyophilic and one lyophobic sol
Lyophilic sol - starch, egg albumin and gum
Lyophobic sol - aluminium hydroxide, ferric hydroxide, arsenous sulphide.
2. Dialysis of sol-prepared in (a) above.
3. Study of the role of emulsifying agents in stabilising the emulsion of different oils.

B. Chemical Kinetics

1. Effect of concentration and temperature on the rate of reaction between sodium thiosulphate and hydrochloric acid.
2. Study of reaction rates of anyone of the following:
 - (i) Reaction of iodide ion with hydrogen peroxide at room temperature using different concentration of iodide ions.
 - (ii) Reaction between potassium iodate (KIO_3) and sodium sulphite (Na_2SO_3) using starch solution as indicator (clock reaction).

C. Thermochemistry

Anyone of the following experiments

1. Enthalpy of dissolution of copper sulphate or potassium nitrate.
2. Enthalpy of neutralisation of strong acid (HCl) and strong base (NaOH).
3. Determination of enthalpy change during interaction (hydrogen bond formation) between acetone and chloroform.

D. Electrochemistry

Variation of cell potential in $\text{Zn}/\text{Zn}^{2+} \parallel \text{Cu}^{2+}/\text{Cu}$ with change in concentration of electrolytes (CuSO_4 or ZnSO_4) at room temperature.

E. Chromatography

1. Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of R_f values.
2. Separation of constituents present in an inorganic mixture containing two cations only (constituents having large difference in R_f values to be provided).

F. Preparation of Inorganic Compounds

1. Preparation of double salt of ferrous ammonium sulphate or potash alum.
2. Preparation of potassium ferric oxalate.

G. Preparation of Organic Compounds

Preparation of any one of the following compounds

1. Acetanilide
2. Dibenzalacetone
3. *p*-nitroacetanilide
4. Aniline yellow or 2-naphthol aniline dye.

H. Tests for the Functional Groups Present in Organic Compounds:

Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.

I. Characteristic Tests of Carbohydrates, Fats and Proteins in Pure Samples and their Detection in Given Food Stuffs.

J. Determination of Concentration/ Molarity of KMnO_4 Solution by Titrating it Against a Standard Solution of:

1. Oxalic acid,
2. Ferrous ammonium sulphate
(Students will be required to prepare standard solutions by weighing themselves).

K. Qualitative Analysis

Determination of one cation and one anion in a given salt.

Anions CO_3^{2-} , SO_3^{2-} , SO_4^{2-} , NO_2^- , NO_3^- , Cl^- , Br^- , I^- , PO_4^{3-} , $\text{C}_2\text{O}_4^{2-}$, CH_3COO^-
(Insoluble salts excluded)

Cations Pb^{2+} , Cu^{2+} , As^{3+} , Al^{3+} , Fe^{3+} , Mn^{2+} , Ni^{2+} , Zn^{2+} , Co^{2+} , Ca^{2+} , Sr^{2+} , Ba^{2+} , Mg^{2+} , NH_4^+

PROJECTS

Scientific investigations involving laboratory testing and collecting information from other sources.

A few suggested Projects

- Study of the presence of oxalate ions in guava fruit at different stages of ripening.
- Study of quantity of casein present in different samples of milk.
- Preparation of soyabean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.
- To study the effect of potassium bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)
- To study of digestion of starch by salivary amylase and effect of pH and temperature on it.
- A comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.
- Extraction of essential oils present in saunf (aniseed), ajwain (carum), illaichi (cardamom).
- To study the common food adulterants in fat, oil, butter, sugar, turmeric powder, chilli powder and pepper.

Note: Any other investigatory project, which involves about 10 periods of work, can be chosen with the approval of the teacher.