

CHEMISTRY PRACTICAL

(Class XII)

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

A. Surface Chemistry

- (a) Preparation of one lyophilic and sol
Lyophilic sol-starch, egg albumin and gum
Lyophobic sol-aluminium hydroxide, ferric hydroxide, arsenious sulphide.
- (b) Dialysis of sol-prepared in (a) above.
- (c) Study of the rule of emulsifying agents in stabilizing the emulsion of different oils.

B. Chemical Kinetics

- (a) Effect of concentration and temperature on the rate of reaction between sodium thiosulphate and hydrochloric acid.
- (b) Study of reaction rates of any one 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, (KIO₃) and sodium sulphite: (Na₂SO₃) using starch solution as indicator (clock reaction).

C. Thermochemistry

Any one of the following experiments

- (i) Enthalpy of dissolution of copper sulphate or potassium nitrate.
- (ii) Enthalpy of neutralization of strong acid (HCl) and strong base (NaOH).
- (iii) Determination of enthalpy change during interaction (Hydrogen bond formation) between acetone and chloroform.

D. Electrochemistry

Variation of cell potential in Zn/Zn²⁺ || Cu²⁺/Cu with change in concentration of electrolytes (CuSO₄ or ZnSO₄) at room temperature.

E. Chromatography

- (i) Separation of pigments from extracts of leaves and flowers by paper chromatography
determination of R_f values.
- (ii) 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

- (i) Preparation of double salt of ferrous ammonium sulphate or potash alum.
- (ii) Preparation of potassium ferric oxalate.

G. Preparation of Organic Compounds

Preparation of any one of the following compounds

- (i) Acetanilide
- (ii) Di-benzal acetone
- (iii) p-Nitroacetanilide
- (iv) 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 derivatives in given stuffs.

J. Determination of concentration/molarity of KMnO₄ solution by titrating it against standard solution of:

- (i) Oxalic acid,
- (ii) 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.

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

Anions: CO_3^{2-} , S^{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^-

(Note: insoluble salts excluded)

INVESTIGATORY 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.
- Study of the effect of potassium bisulphate as food preservative under various conditions (temperature, concentration, time etc.)
- Study of digestion of starch by salivary amylase and effect of pH and temperature on it.
- 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).
- Study of common food adulterants in fat, oil, butter, sugar, turmeric powder, chilli powder and pepper.