CHEMISTRY (+1) (2024-2025)

RATIONALE

Higher Secondary is the most crucial stage of school education because at this juncture specialized discipline based content - oriented courses are introduced . Students reach this stage after 10 years of general education and opt for Chemistry with a purpose of pursuing their career in basic sciences or professional courses like medicine , engineering , technology and study courses in applied areas of science and technology at tertiary level . Therefore , there is a need to provide learners with sufficient conceptual background of Chemistry , which will make them competent to meet the challenges of academic and professional courses after the higher secondary stage .

The new and updated curriculum is based on disciplinary approach with rigour and depth taking care that the syllabus is not heavy and at the same time it is comparable to the international level . The knowledge related to the subject of Chemistry has undergone tremendous changes during the past one decade . Many new areas like synthetic materials , bio - molecules , natural resources , industrial chemistry are coming in a big way and deserve to be an integral part of chemistry syllabus at senior secondary stage At international level , new formulations and nomenclature of elements and compounds , symbols and units of physical quantities floated by scientific bodies like IUPAC and CGPM are of immense importance and need to be incorporated in the updated syllabus . The revised syllabus takes care of all these aspects . Greater emphasis has been laid on use of new nomenclature , symbols and formulations , teaching of fundamental concepts , applications of concepts in chemistry to industry / technology , logical sequencing of units , removal of obsolete content and repetition etc.

OBJECTIVES

The broad objectives of teaching Chemistry at Senior Secondary Stage are to help the learners

- To promote understanding of basic facts and concepts in chemistry while retaining the excitement of chemistry
- To make students capable of studying chemistry in academic and professional courses (such as medicine technology) at tertiary level .
- To expose the students to various emerging new areas of chemistry and apprise them with their relevance in their future studies and their application in various spheres of chemical sciences and technology
- To equip students to face various changes related to health , nutrition , environment , population , weather , industries and agriculture .
- To develop problem solving skills in students .
- To expose the students to different processes used in industries and their technological applications .
- To apprise students with interface of chemistry with other disciplines of science such as physics , biology , geology , engineering etc.
- To acquaint students with different aspects of chemistry used in daily life ,
- To develop an interest in students to study chemistry as a discipline .

COURSE STRUCTURE
THEORY

One Paper	Time : 3 Hours	60 Marks

Unit No.	Title	Marks
Unit I	Some basic Concepts of Chemistry	
Unit II	Structure of Atom	
Unit III	Classification of Elements and Periodicity in Properties	
Unit IV	Chemical Bonding and Molecular Structure	
Unit V	Thermodynamics	
Unit VI	Equilibrium	
Unit VII	Redox Reactions	
Unit VIII	Organic Chemistry - some basic Principles and Techniques	
Unit IX	Hydrocarbons	

PRACTICALS

EVALUATION SCHEME FOR EXAMINATION	MARKS
➢ Volumetric Analysis	Marks
➢ Salt Analysis	Marks
➢ Content Based Experiment	Marks
➢ Class Record and Viva	Marks
➢ Investigatory Project	Marks
Total	**20 Marks**

PRACTICALS SYLLABUS

A. Basic Laboratory Techniques

(a) Cutting a glass tube and glass rod .
(b) Bending of a glass tube
(C) Draw out , a glass jet .
(d) Boring a Cork .

B. Characterization and Purification of chemical substance

1 . Determination of melting point of organic compound
2 . Determination of boiling point of organic compound
3 . Crystallization involving impure sample of anyone of the following Alum , copper sulphate , Benzoic acid .

C. Experiments related of pH change

(a) Anyone of the following experiments : Determination of pH of some solutions obtained from fruit juices , solutions of known and varied concentrations of acids . bases and salts using pH paper or universal indicator Comparing the pH of solutions of strong and weak acid of same concentration . Study the pH change in the titration of a strong base using universal indicator

(b) Study of pH change by common - ion effect in case of weak acids and weak bases .

D. Chemical equilibrium

One of the following experiments :

(a) Study the shift in equilibrium between ferric ions and thiocyanate ions by increasing / decreasing the concentration of either ions .

(b) Study the shift in equilibrium between [Co (H20) 612+ and chloride ions by changing the concentration of either of the ions.

E. Quantitative estimation

- using a chemical balance .
- Preparation of standard solution of oxalic acid .
- Determination of strength of a given solution of sodium hydroxide by titrating it against standard solution of oxalic acid .
- Preparation of standard solution of sodium carbonate .
- Determination of strength of a given solution of hydrochloric acid by titrating it against standard sodium carbonate solution .

F. Qualitative analysis

Determination of one anion and one cation in a given salt

Cations - Pb^{2+} , Cu^{2+} , As^{3+}, Al^{3+}, Fe^{3+} Mn^{2+} , Zn^{2+} , Co^{2+} , Ca^{2+} Sr^{2+} , Ba^{2+} , Mg^{2+} NH^{4+}
Anions - CO_3^{2-} , S^{2-} , SO_3^{2-} . HO_2^{1-} , NO_3^{-1}, Cl^-, Br^- ,I^- PO_4^{3-} , $C_2O_4^{2}$, $CH_3\ COO^-$
(Note : Insoluble salts excluded)

(G) Detection of nitrogen , sulphur , Chlorine

Bromine and iodine in an organic compound

PROJECT :

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

A Few suggested Projects

Checking the bacterial contamination in drinking water by testing sulphide ion

Study of the methods of purification of water .

Testing the hardness , presence of iron , fluoride , chloride etc. depending upon the regional variation in drinking water and the study of causes of presences of these ions above permissible limit (if any) .

Investigation of the foaming capacity of different washing soaps and the effect of addition of sodium carbonate on them .

Study of the acidity of different samples of the tea leaves

Determination of the rate of evaporation of different liquids

Study of the effect of acids and bases on the tensile strength of fibers . Analysis of fruit and vegetable juices for their acidity

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