

Department of Inorganic and Analytical Chemistry

M.Sc Final Chemistry

Syllabus for IIIrd SemesterSpecialisation : *Analytical Chemistry*Paper- II : Quality control and Traditional methods of Analysis-I
(Effective from 2008-09 Admitted batch)

Unit – I Quality control in Analytical Chemistry

- (a) *Characteristics of an analysis*: quality of an analytical procedure, limit of detection, sensitivity, safety, cost measurability, selectivity and specificity, quality control-principles of Ruggedness test, control charts, Youden plot, ranking test.
- (b) *Evaluation and reliability of analytical data*: limitation of analytical methods, accuracy, precision, errors in chemical analysis, classification of errors, minimization of errors, significant figures, computations and propagation of errors.
- (c) *Statistical analysis*: Mean deviation, Standard deviation, coefficient of variance, normal distribution, F test, T test, rejection of results, presentation of data.
- (d) *Quality assurance and management systems*: elements of quality assurance, quality assurance in design, development, production and services, quality and quantity management system, ISO 9000 and ISO 14000 series-meaning of quality, quality process model, customer requirement of quality calibration and testing, statistical process control, process control tools, control chart, statistical quality control, acceptance sampling.
Good laboratory practices (GLP) – need for GLP, GLP implementation and organization, GLP status in India.
- (e) Brief out line of ICH guide lines on drug substances and products.

Unit – II Decomposition techniques in analysis

(a) Inorganic Compounds

Principle of decomposition and Dissolution. Difference between dissolution /decomposition of Organic and Inorganic substances.

Importance of Decomposition Techniques in Analysis.

Principle of Dissolution of an inorganic substance.

Decomposition of samples with acids – H_2O , HCl , HF , HNO_3 , H_2SO_4 and $HClO_4$

Decomposition of samples by fusion, Principle and with two examples each

Alkali Fusion--- Na_2CO_3 , $NaOH$,

Acidic Fusion--- Sodium Hydro Sulphate, Sodium Pyro Sulphate

Oxidation Fusion--- Na_2O_2 , Sodium Chlorate

Reductive Fusion $Na_2CO_3 + Na_4B_4O_7$

What is Sintering process, How is it different from Fusion.

Fusion with alkali carbonates, alkali hydroxides, Sodium Peroxide

Decomposition of samples by sintering with sodium peroxide, sodium carbonate.

Principles of decomposition at high-temperatures, high pressures .

Principles of Microwave and ultrasonic decomposition techniques.

(b) Organic Compounds

Principles of solubility of organic compounds, non polar, polar solvents.

Recrystallisation methods and application of solubility and Recrystallisation.