

Department of Inorganic and Analytical Chemistry

M.Sc Final Chemistry

Syllabus for IV th Semester

Specialisation : *Analytical Chemistry*

Paper – III : Applied Analysis – II

Unit – I Analysis of raw materials

(a) Analysis of non-ferrous alloys:

- (i) Brass – Analysis of the constituents – Cu, Zn, Sn, Pb and Fe.
- (ii) Bronze - Analysis of the constituents – Cu, Sn, Zn, Pb and Fe.
- (iii) Solder - Analysis of the constituents – Sn, Pb and Sb.

(b) Analysis of Ferro alloys :

- (i) Ferro silicon - Analysis of the constituents – Si, C, P, S
- (ii) Ferro vanadium - Analysis of the constituents – V, C, P, S, Si, Al.
- (iii) Ferro manganese - Analysis of the constituents – Mn, S, C, P, Si
- (iv) Silico manganese - Analysis of the constituents – Mn, S, C, P, Si
- (v) Ferro chromium - Analysis of the constituents – Cr, C, Si.

Unit – II Analysis of Soil, Fertilizer and Fuel

- (a) Analysis of soils: sampling, determination of moisture, total N, P, Si, lime, humus nitrogen, alkali salts, soil absorption ratio.
- (b) Analysis of fertilizers: ammonical fertilizers, Phosphate fertilizers, Nitrate fertilizers.
- (c) Analysis of fuels: solid fuels-coal, proximate analysis, ultimate analysis, heating value, grading of coal based on Ultimate Heat Value(UHV).

Unit – III Assessment of Air Quality

Composition of pure air, classification of air pollutants, toxic elements present in dust and their sources – collection of air samples.

Sources, effects, control of pollution and chemical analysis for the following.

(a) Primary pollutants:

- (i) Carbon compounds - Carbon monoxide(CO) and Carbon dioxide(CO₂).
- (ii) Sulphur compounds- sulphur dioxide (SO₂), Sulphur trioxide (SO₃) and Hydrogen Sulphide (H₂S).
- (iii) Nitrogen compounds - nitric oxide (NO), and nitrogen dioxide (NO₂),
- (iv) Hydrocarbons - Aliphatic hydrocarbons and polycyclic aromatic hydrocarbons (PAH).
- (v) Particulate matter - Respirable and Suspended particulate matter, Inorganic and Organic particulates.

(b) Secondary pollutants - ozone (O₃), peroxy acetyl nitrate (PAN), peroxy benzyl nitrate (PBN).

(c) Standards for ambient air quality.