

CHMDC234(T+P) – Applied Industrial Chemistry
Credit – (2T+2P), Theory Hours – 30, Practical Hours – 60

Course Outcomes:

After the completion of this course, student will be able to-

CO-1. Gain the fundamental knowledge of different types of fertilizers and polymers.

CO-2. Understand the basic concepts of preparation and mechanism involved in fertilizers and polymers.

CO-3. Know the various applications of fertilizers and polymers and also solve the problems regarding the preparations, sources and their working methods.

CO-4. Analyse, relate, connect and devise the facts regarding different types of fertilizers and polymers.

CO-5. Evaluate, defend and criticize the theory involved in the preparation, classification and properties of different types of fertilizers and polymers.

CO-6. Modify, create, and synthesise the things associate with different types of fertilizers and polymers.

CO-PO mapping (connecting COs with POs)

CO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO-1	3	3	2	2	2	3
CO-2	3	3	2	3	2	3
CO-3	2	3	3	2	3	2
CO-4	3	2	3	3	2	3
CO-5	3	2	3	3	2	3
CO-6	3	2	2	3	3	2

Unit – I – Fertilizers

[25 Marks]

[15 Hours]

Plant nutrients, Nutrient function, Micronutrients, Need of fertilizers, Classification of fertilizers,

Nitrogenous Fertilizers: Introduction, Classification, General characteristics, Manufacturing process and Properties of ammonium nitrate, ammonium sulphate, Urea.

Phosphatic Fertilizers: Introduction, Classification, Manufacturing Process and Properties of Phosphate Rock, Super Phosphate, Triple super phosphate.

Potassium fertilizers: Potassium sulphate

NPK Fertilizers and mixed fertilizers.

Unit – II – Polymers

[25 Marks]

[15 Hours]

Introduction, polymers, Homopolymers and Copolymers.

Classification of polymers: Classification based upon source, Classification based upon structure, Classification based upon mode of polymerization, Classification based upon molecular force, Classification based upon the type of mechanism involved during polymerization chain.

Types of polymerization: Addition polymerization, Preparation of some addition polymers (Polythene or Polyethylene, Teflon, Polyacrylonitrile), Condensation polymerization, Preparation of polyamides (Nylon 6, 6, Nylon 6, 10, Nylon 6), Preparation of polyesters (Terylene).

Molecular mass of polymers, Biodegradable polymers

REFERENCE BOOKS

1. ‘**Industrial Chemistry**’ by B. K. Sharma, 2011, GOEL Publishing House, Krishna Prakashan Media (P) Ltd, Meerut, India.
2. ‘**Polymer Science**’ by Gowarikar V. R., 2019, New Age International Publishers Ltd, 3rd Edition.
3. ‘**Text book of Polymer Science**’ by Billmeyer, Wiley, India.

CHMDC234(P) – Chemistry Practical

CHEMISTRY LAB – I

Credit – 2, Hours – 60, Marks - 50

Inorganic salts (minimum requirement 20 salts)

K^+ , NH_4^+ , Na^+ , Cu^{+2} , Cd^{+2} , Fe^{+2} , Fe^{+3} , Al^{+3} , Cr^{+3} , Mn^{+2} , Co^{+2} , Ni^{+2} , Zn^{+2} , Ca^{+2} , Ba^{+2} , Sr^{+2} , Mg^{+2} in the form of Cl^- , Br^- , I^- , NO_3^- , NO_2^- , SO_4^{-2} , SO_3^{-2} , S^{-2} , PO_4^{-3} , CO_3^{-2} , CrO_4^{-2} , $Cr_2O_7^{-2}$, O^{-2}

Inorganic Preparations

- (1) Tetrammine cupric sulphate $[\text{Cu}(\text{NH}_3)_4\text{SO}_4] \cdot \text{H}_2\text{O}$
- (2) Ferrous ammonium sulphate (Mohr's salt) $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$
- (3) Hexa-ammine nickel(II) chloride $[\text{Ni}(\text{NH}_3)_6] \text{Cl}_2$
- (4) Potash Alum $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
- (5) Reineck's salt (Ammonium tetrathiocyanato diamine chromate)
 $\text{NH}_4(\text{NH}_3)_2\text{Cr}(\text{CNS})_4$
- (6) Sodium cobaltinitrite $\text{Na}_3[\text{Co}(\text{NO}_2)_6]$

Viva-Voce questions

REFERENCE BOOKS

1. '**Vogel's Qualitative analysis**' by **G. Svehla**, Pearson Education Ltd., Seventh Edition, 2009
2. '**Analytical Chemistry**' by Dhruba Charan Dash, 2011, 2th Ed., PHI Learning Private Ltd, New Delhi.
3. '**Advanced Practical Inorganic Chemistry**' by Gurdeep Raj, 9th Ed., Goel Publishing House, Meerut.
4. '**Advanced University Practical Chemistry**' by P. C. Kamboj, Vishal Publishing Co., Jalandhar – Delhi.