

Dronacharya College of Engineering
Department of Applied Sciences and Humanities
Engineering Chemistry
Question Bank

Lecture 1:

1. What are the main sources of water and its purest form?
2. What is hardness of water?
3. What is permanent hardness? What is the cause of permanent hardness?

Lecture 2

1. Discuss the principle and procedure of different methods used for determination of hardness?
2. What are the units of hardness?
3. What are relationships between the different units of hardness of water?
4. What is CaCO_3 equivalent?

Lecture 3

1. What is the structure of EDTA and EBT molecule.
2. Why $\{\text{M-EDTA}\}$ complex is more stable compared to $\{\text{M-EBT}\}$ complex in determination of hardness by EDTA method?
3. Explain alkalinity of water and the ions responsible for causing alkalinity?
4. Why is the combination of OH^- and HCO_3^- not possible in alkalinity, Explain
5. Discuss the method of determination of alkalinity?

Lecture 4

1. State different boiler troubles due to hardness of water?
2. Differentiate between scale and sludge?
3. Write a note on Boiler corrosion & Caustic embrittlement?

Lecture 5

1. Discuss different methods for domestic water treatment?
2. Describe briefly about the sterilization of water?
3. Define break point chlorination?

Lecture 6

1. What are the different methods of softening of hard water?
2. Discuss Cold and Hot lime soda process.
3. What is Reverse osmosis and electrodialysis?

Lecture 7

1. What is the chemical formation of zeolite and how they used in softening of water?
2. What are limitations of Ion exchange method for softening of water?

Phase Rule and catalysis:

Lecture 8

1. Define phase rule and its limitations.
2. Differentiate between metastable and true equilibrium?

Lecture 9

1. Explain application of phase rule to one-component system.

2. Compare phase diagram of water system with carbon di- oxide system.

Lecture 10

1. Define simple eutectic system with an example.
2. Apply phase rule to a two-component system (Pb-Ag).

Lecture 11

1. Define the term congruent melting point.
2. Explain Zn- Mg system with well labelled phase diagram.

Lecture 12

1. What do you understand by incongruent melting point system?
2. Name three systems which form compounds with incongruent melting point.

Lecture 13

1. What is catalysis and catalyst? Mention different type of catalyst.
2. Describe the concept of promoters, inhibitors and poisoners in catalysis.

Lecture 14

1. What are enzymes? Give two examples of enzyme catalyzed reactions.
2. Explain the terms: Prosthetic group, cofactor, coenzyme, apoenzyme in connection with enzyme catalysis
3. Explain homogeneous catalysis and its mechanism. What are the limitations of this theory?

Corrosion and its prevention

Lecture 15

1. What is corrosion and why does it occur?

2. What type of metals is susceptible to corrosion? Explain dry corrosion.

Lecture 16

1. Give a brief account of stress corrosion.
2. What is galvanic series and how is it helpful in predicting the relative tendency of a metal to undergo corrosion?

Lecture 17

1. Give a brief account of pitting corrosion.
2. What is water line corrosion?

Lecture 18

1. Why do impurities accelerate the corrosion of a metal?
2. How does the presence of chloride and silicate ions in the environment affect the rate of corrosion?

Lecture 19

1. Give a brief account of the measures which control the metal corrosion.
2. What is meant by barrier protection and how is it carried out?

Lecture 20

1. What is soil and microbiological corrosion?
2. What do you mean by electroplating and galvanization?

Lubrication and Lubricants

Lecture 21

1. What is lubricants and how they work?
2. What do you understand by fluid film and thin film lubrication?

Lecture 22

1. What are the different types of lubricants?
2. What are biodegradable lubricants?

Lecture 23

1. Explain the terms flash and fire point, saponification number, iodine number, acid value, Aniline point with their significance.

Lecture 24

1. What is the difference between cloud point and pour point?
2. What is viscosity and viscosity index?

Analytical methods of analysis

Lecture 25

1. What are thermal methods of analysis?
2. Give the principle and applications of TGA?

Lecture 26

1. What is the basic difference between DTA and DSC?
2. List the applications of DTA and DSC

Lecture 27

1. State the basic concept of spectroscopy.
2. Define Lambert - Beer's law

Lecture 28

1. What is the basic principle of absorption and emission spectroscopy?
2. Explain the working of spectrophotometer.
3. Give two advantages of flame photometry? What are the limitations of flame photometry?
4. Give the block diagram of flame photometry?

Lecture 29

1. What is the principle of UV-visible spectroscopy?
2. State the main applications of UV-visible spectroscopy.

Polymer and Polymerisations

Lecture 30

1. What are changes in molecule interacting with IR?
2. Why IR spectroscopy is known as fingerprint technology?

Lecture 31

1. Define terms: Polymer, Monomer, Degree of polymerization
2. Compare linear, branched and cross-linked polymers.
3. Distinguish between chain growth and step growth polymerization?
4. Distinguish between addition and condensation polymerization?

Lecture 32

1. What are the effects of structure on the properties of polymer?
2. Explain bio-degradable polymers

Lecture 33

1. Name five commercially important polymers and state their uses
2. Define thermoplastic and thermoset with example.