

# AMEV05 ENVIRONMENTAL CHEMISTRY

## UNIT-1 INTRODUCTION

- 1.1 Oxidation state, redox potential- chemical equilibrium,
- 1.2 Le-Chatlier Principle- heterogeneous equilibria- solubility product- common ion effect,
- 1.3 Application in water treatment.
- 1.4 Chemical kinetics- factors influencing the rate
- 1.5 Order and molecularity (examples)- derivation of rate constant for first order reaction
- 1.6 Time for half- change- nature of BOD reactions- Enzyme reactions, temperature dependence, catalyst.

## UNIT-2 CHEMICAL REACTIONS OF WATER

- 2.1 Colloids, Classification- solids in liquids
- 2.2 Hydrophilic and hydrophobic colloids- electrokinetic properties
- 2.3 Chemical coagulation of water- Schulz Hardy rule- mechanism of coagulation electro dialysis
- 2.4 Water purification- electro-osmosis- dewatering of sludges- electrophoresis- adsorption,
- 2.5 Freundlich and Langmuir isotherms
- 2.6 Applications in pollution control.

## UNIT-3 ORGANIC COMPOUNDS AND STRUCTURES

- 3.1 Functional groups in organic compounds and their structures (Preparation & Properties not required)
- 3.2 Carbohydrates- classification- monosaccharides, pentoses (Xylose and arabinose)
- 3.3 Hexoses (Glucose, galactose, mannose and fructose)
- 3.4 Disaccharides (Sucrose, maltose and lactose)
- 3.5 Polysaccharides (Starch, cellulose and hemicellulose)
- 3.6 Structural formulae - ring structure and hydrolysis reaction only.

## UNIT-4 ATMOSPHERIC CHEMISTRY

- 4.1 Photochemical reactions in the atmosphere
- 4.2 Degradation of VOCs
- 4.3 Chemical process for the formation of inorganic and organic particulate matter
- 4.4 Photochemical smog.

## UNIT-5 SOIL CHEMISTRY

- 5.1 Soil classification- Inorganic and organic components of soil
- 5.2 physical and chemical properties of soil
- 5.3 Acid -base and ion exchange reactions
- 5.4 Salt affected soil.

## References Books

1. Sawyer, C.N. and McCarty, P.L., and Parkin, G.F. "Chemistry for Environmental Engineers", 3rd Edition. Tata McGraw Hill, New Delhi, 2013