Chapter 1 : Chemical Bonding and Catalysis 1-1 to 1-24

Syllabus :

Electronic theory of valency, chemical bonds : Types and characteristics - Electrovalent bond, covalent bond, coordinate bond, hydrogen bond, metallic bond, metallic properties, intermolecular force of attraction. Molecular arrangement in solid, liquid and gases.

Structure of solids : Crystalline and amorphous solid, properties of metallic solids - unit cell- of simple cubic, body centre cubic, face centre cubic, hexagonal close pack crystals.

Catalysis : Types of catalysis, Catalyst, Types of Catalyst, Positive Catalyst, Negative Catalyst, Auto-catalyst, Catalytic Promoter and Catalytic inhibitor, Industrial Application of Catalyst.

Chapter 2 : Corrosion 2-1 to 2-61

Syllabus :

Corrosion : Types of corrosion – dry corrosion, Wet corrosion. Oxidation corrosion (Atmospheric corrosion due to oxygen gas), mechanism, Types of oxide film, Wet corrosion mechanism (Hydrogen evolution in acidic medium)

Concentration cell corrosion : oxygen absorption mechanism in neutral or alkaline medium, Pitting corrosion, Waterline corrosion, Crevice corrosion, Waterline corrosion, Crevice corrosion.

Factors affecting the rate of corrosion control : Modification environment, Use of protective coatings-coating of less active metal like Tin (Tinning), coating f more active metal active metal like Zinc (Galvanizing), Anodic and cathodic protection, Choice or material – using pure metal and using metal alloys.

Electrolyte-strong and weak, Non-Electrolyte, Electrolytic, Anode, electrode potential-oxidation and reduction, Construction and working of Daniel cell lionisation and dissociation. Faradays first and second law

Primary cell and secondary cell Electrolysis – Mechanism, Electroplating and electro-refining of copper.

Syllabus :

Paints : Purpose of applying paint, Characteristics of paints, Ingredients of paints, Function and Examples of each ingredients

Varnish : Types, Difference between paints and varnishes

Insulators : Characteristics, Classification, Properties and Application of Glass wool, Thermo Cole

Polymer and Monomer, Classification : on the basis of Molecular structure, on the basis of monomers (homo polymer and copolymer), on the basis of Thermal behavior (Thermoplastics and Thermosetting)

Types Polymerization Reaction, Addition Polymerization, Condensation Polymerization, Synthesis, properties and application of Polyethylene, Polyvinyl chloride, Teflon. Polystyrene, Phenol formaldehyde, Epoxy Resin

Adhesives : Characteristics, Classification and their uses

Lubricants : Classification, properties and applications

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