AMTE-4 POLYMER SCIENCE

UNIT-1 POLYMERIZATION

1.1 Polymers- Classifications- Polymerization- Mechanisms- Chain Polymerization (Free radical, ionic and Ziegler Natta).

1.2 Polymerization Techniques- Bulk, Solution, Suspension, Emulsion, Solid and Liquid Phase.

1.3 Polycondenzation Techniques- Melt Solution and Interfacial.

UNIT-2 IMPORTANT POLYMERS

2.1 Synthesis, properties and Applications :

2.2 Polyethylene (LDPE & HDPE), Polyacrylonitrile, Polymethyl methacrylate, Polyesters (PET),

2.3 Polyamides- Nylon 6, Nylon 6, 6, Polyurethane, Polyvinylchloride, Polypropylene, Polytetrafluoroethylene.

UNIT-3 CHARACTERIZATION OF POLYMERS

3.1 Degree of Polymerization- Glass Transition Temperature- Factors affecting Tg- Determination of Tg

3.2 Dilatometer and Thermo mechanical methods.

3.3 Determination molecular weights- Weight average- Light scattering,

3.4 Number average- End group analysis, Viscosity average- Ubbelholde viscometer.

3.5 Thermal characterization- TGA and DSC.

UNIT-4 REGENERATED CELLULOSE AND PROTEIN

4.1 Manufacture of Viscose,

4.2 Cup ammonium and Acetate rayon

4.3 Modified high wet modulus

4.4 Polynosic, Lyocell

4.5 Super high wet modulus.

4.6 Regenerated proteins.

UNIT-5 POLYMER PROCESSING AND REUSE OF POLYMERS

5.1 Additives of Polymers- Fillers, Plasticizers, Anti-oxidants, UV Stabilizers and Coloring agents.

5.2 Polymer processing methods- Molding, Extrusion, Calendaring and Film cating.

5.3 Recovery from Polyester and Nylon. Reuse of acrylic and polypropylene wastes.

References Books

1 Odion G., “Principles of Polymerization”, John Wiley, UK, 2002. Woodings C., “Regenerated Cellulose FIBREs”, Wood head Publishing, UK, 2000.