

(4 Lect./Week)
(4 hrs. Lab/Week)
(1 Student's presentation /Week)

(Total Credits -7)

Paper 501: Polymer Degradation

1. Introduction to degradation. Various types of polymer degradation:
 - (i) Thermal degradation
 - (ii) Oxidative degradation
 - (iii) Degradation by radiation
 - (iv) Mechanical degradation
 - (v) Chemical degradation
 - (vi) Biological degradation
2. Degradation of specific polymers
 - (i) Polyolefins (PE and PP)
 - (ii) PVC
 - (iii) Natural Rubber
 - (iv) Polyamides
 - (v) PMMA
 - (vi) Cellulose
 - (vii) SBR
 - (viii) Poly acrylonitrile (PAN)
 - (ix) Polystyrene (PS)
 - (x) PET
 - (xi) PU
3. Degradation studies using DSC, TGA, DTA and DMA.

Practical - Polymer V:

1. Biodegradation of polymers.
2. Mechanical degradation of polymers and its effect on properties.
3. Thermal ageing of polymer under various conditions.
4. Thermal analysis by DSC, DTA and TGA.
5. Photo-degradation of PVC.
6. Environmental stress cracking resistance of polymers

Suggested Readings:

1. Encyclopedia of Polymer Science and Technology by W. J. Pesce and P. B. Wiley (2007).
2. Thermal Characterization of Polymeric Materials, E. A. Turi, Academic Press (1997).
3. Handbook of Polymer Degradation by S. H. Hamid and M. B. Amin, Marcel Dekker (1992).
4. Thermal analysis of plastics by G. W. Ehrenstein, G. Riedel, P. Trawiel, Hanser (2004).