

DEPARTMENT OF TEXTILE TECHNOLOGY
MAJOR TEST, TTL212N /TY202N
Manufactured Fibre Technology

4th May 2007

Marks: 40
Time: 2Hrs

Answer all the questions

- Q1. Explain, how are the degradation or side reactions minimized during the production of industrial grade PET ? (3 marks)
- Q2. What variations would you suggest in the polymerization of nylon 6 in the following situations to improve?
- a) Final conversion in nylon 6 polymerization (keeping the same molecular weight).
 - b) Quality of fibre, if the acid dyeability is at the desired level, but the strength of the fibres is slightly lower. (2X2=4 marks)
- Q3. Explain the following statements with reasons
- a) Radial quenching is advantageous when spinning a large number of filaments.
 - b) The l/d ratio of spinneret for melt spinning is more than ~~these~~ ^{that} used for solution spinning (1.5X2=3 marks)
- Q4. Under what reaction conditions would you expect an acrylic copolymer produced by redox initiator system to result in
- a) Good polymer conversion but very low molecular weight ?
 - b) How would you confirm this (low molecular weight in part a) without determining the molecular weight? (2X2=4 marks)
- Q5 a) "Optimum polymer concentration is required for obtaining homogeneous, void Free Fibre" Explain this statement using a three component phase diagram. (4.5 marks)
- b) For the production of solution spun high denier fibres, which spinning process will you recommend- Dry spinning or wet spinning? Also give justification for your answer. (1.5 marks)
- Q6 Explain the following terms (1X4=4marks)
- a) Jet stretch
 - b) Stress induced crystallization
 - c) Stop acid
 - d) Flow instabilities

Q7. Indicate the chemical reactions/changes occurring during ripening and coagulation in the viscose fibre manufacture. (3 marks)

Also explain the role of zinc in structure formation during coagulation. (1)

Q8 Explain why diacetates are produced by hydrolyzing the triacetate and not by direct Substitution ? (2 marks)

Q9 a) In Lyocell spinning- "the quantity of water in the dope plays a very critical Role". Explain why?

b) For an Elastomeric fibre polymer, explain how the chemical structure of the Polymer governs the properties of fibres produced. Take a suitable example To explain your answer.

(2X2=4 marks)

Q10 a) Two acrylic fibres have been to be produced by both wet spinning and dry spinning method (using the same polymer and solvent system). Suggest the suitable spinning conditions for obtaining a good fibre both the cases. ? (4marks)

b) Explain the mechanism of heat setting of thermoplastic fibres (2 marks)