

Part 1. Problems in the textbook

Do all the end-of-chapter problems in Chapter 5 – 6.

Part 2. Last year's Exam #2

1. For living radical polymerization (LRP), answer the following questions.
 - (a) Name three methods of LRP. Show both acronyms and spelled-out terms.
 - (b) One of the three of (a) is different from the other two in mechanism. Explain
 - (c) Why is LRP called pseudo-living polymerization?
 - (d) 'Persistent radical effect (PRE)' is observed for all three LRPs of (a). Show the persistent radical or species for each. You may describe the species or draw example structure.
 - (e) What is the cause and consequence of PRE?

2. For ionic polymerization, answer the following questions.
 - (a) Cationic polymerization of vinyl chloride does not proceed, and anionic polymerization is not facile also. Explain why.
 - (b) You have found for an ionic polymerization that, as you raise the polymerization temperature, the rate of polymerization does not change and molar mass lowered. How would you explain?
 - (c) Explain the effect of reaction media [solvent] in ionic polymerizations in terms of the state of active center.

3. For polybutadiene (PBD) and polyisoprene (PIP), answer the following questions.
 - (a) Draw the structure of the monomers for PBD and PIP.
 - (b) How many isomers PBD have? Draw the structure of them.
 - (c) How many isomers PIP have? Draw the structure of them.
 - (d) In radical polymerization of PBD, which is produced more, 1,2- or 1,4-isomer? Explain your answer.

4. Answer the following questions. No need to explain, just answer.
 - (a) How is miniemulsion polymerization different from ordinary emulsion polymerization in terms of reaction condition and starting materials?
 - (b) How are polymerization systems that have floor temperature different from those with ceiling temperature in terms of enthalpy and entropy change?
 - (c) How is the term 'gel' used differently in step polymerization and in chain polymerization?