

CHAPTER-15(Polymer)

(one mark questions Q1 to Q20)

Q1. Give the name and structure of reagent used for initiating a free radical chain reaction.

Ans: Name- benzoyl peroxide, $C_6H_5-CO-O-O-CO-H_5C_6$

Q2. Classify them as addition and condensation polymers: Nylon-66, Buna-S, polythene, terylene

Ans: Addition polymer: Polythene and Buna-S, Condensation polymer: Nylon-66, terylene

Q3. Give name and structure of monomer present in natural rubber.

Ans: Name: Isoprene (2-Methyl 1,3-Butadiene), Structure: $CH_2=C(CH_3)CH=CH_2$

Q4. What are biodegradable polymers? Give one example

Ans: PHBV

Q5. What are polymers?

Ans: Polymers are high molecular mass substances consisting of large no. of repeating structural units.

Q6. How are the polymers classified on the basis of structure?

Ans: a) Linear Polymer b) Branched chain polymers c) Cross linked polymers

Q7. Write the names of monomer of the following $(-CO-(CH_2)_5-NH-)_n$

Ans: Caprolactam

Q8. Arrange the following polymers in increasing order of their intermolecular forces: Nylon-6, Neoprene, polyvinyl chloride.

Ans: Neoprene < Polyvinyl chloride < Nylon-6

Q9. Is $(-NH-CHR-CO-)_n$ a homopolymer or copolymer?

Ans: Homopolymer

Q10. What is vulcanized rubber?

Ans: Process of heating a mixture of natural rubber with sulphur is called vulcanized rubber.

Q11. Write the monomer of Bakelite.

Ans: Phenol and formaldehyde

Q12. Mention two uses of Bakelite.

Ans: It is used for making combs, electrical switches and handles of various utensils

Q13. Explain the term copolymer and give two examples.

Ans: Polymers which are made up of two different monomer units are called copolymers: eg. Buna-N, Buna-S (CH-15)

Q14. Mention one use of melamine?

Ans: It is used in the manufacture of unbreakable crockery.

Q15.How can natural rubber be made more tough?

Ans: By the process of vulcanization with sulphur.

Q16.What is natural rubber?

Ans: It is a cis 1,4-polyisoprene.

Q17.How do you explain functionality of monomer?

Ans:No of bonding sites in monomers.

Q18.What are natural polymers?

Ans:Those polymers which are obtained mostly from plants and animals are called natural polymers eg Natural rubber,cellulose

Q19.What is synthetic polymers?

Ans:Those polymer which are obtained from chemical compound are called synthetic polymer

Q20.What is monomer of Nylon-2-Nylon-6?

Ans: Glycine,6-Aminocaproic acid.

(Two marks questions on polymer)

Q1.Explain the difference between Buna-N and Buna-s.

Ans:Buna-Nis a polymer of 1,3-Butadiene and acrylonitrile and buna-s is a polymer of 1,3-Butadiene and styrene.

Q2.Distinguish between homopolymer and copolymer?

(For two marks,polymer)

Q2.Ans:Homopolymer is made up of only one type of monomer unit eg. PVC. Where as co-polymer is made up of two different monomer units eg Buna-s.

Q3.What are polyamides and polyesters?Give one example of each.

Ans:Polymers having amide linkage in the chain are called polyamides eg Nylon-6.Polymers having ester linkage in the chain are called polyesters eg. Terylene.

Q4.Discuss the main purpose of vulcanization.

Ans:Natural rubber become soft at high temperature,Brittle at low temperature.And show higher water absorption capacity. It is nonresistant to attack by oxidizing agent .In order to improve these properties a process of vulcanization is carried out.

Q5.In which classes, the polymers are classified on the basis of molecular forces?

Ans: Elastomer, fibre, thermoplastics and thermosetting polymers.

Q6. Write names of monomers of the following polymers.

a) $(-CF_2-CF_2-)_n$ b) $(CH_2-CH(Cl)-)_n$.

Ans: a) Tetrafluoroethene b) Vinyl chloride.

Q7. What are monomeric repeating units of nylon-6 and nylon-6,6?

Ans: Caprolactam, Hexamethylenediamine and Adipic acid

Q8. Arrange the following polymers in increasing order of their intermolecular forces.

a) nylon-6,6, Buna-S, Polythene

b) Neoprene, Nylon-6, PVC

Ans: a) BUNA-S < Polythene < Nylon-6,6

b) Neoprene < PVC < nylon-6

Q9. Classify the following as Addition and condensation polymers: Bakelite, melamine, PVC, Buna-S, Buna-N, Nylon-6,6

Ans: Addition polymers: Buna-N, Buna-S, PVC

Condensation polymer: Nylon-6,6, Bakelite, melamine,

Q10. How is novolac converted into bakelite?

Ans: Novolac on heating with formaldehyde undergoes crosslinking to form an infusible solid mass called Bakelite.

Q11. Differentiate between Addition and condensation polymers.

Ans: Addition polymer: 1) It takes place in unsaturated monomers.

2) Loss of small molecule like water and ammonia does not take place.

(Two marks questions, Polymer)

Condensation polymer: 1) It takes place in monomers having multi functional groups. 2) Loss of small molecules like water and ammonia takes place.

Q12. Differentiate between thermoplastic and thermosetting polymer.

Ans:..

Those polymers which are remoulded into our desired shape on heating and cooling are called thermoplastic. eg. PVC, Teflon

Those polymers which are not re moulded into our desire shape on heating and cooling are called thermoplastic. eg. Bakelite, Melamine.

Q13. How is Dacron obtained?

Ans: Dacron is obtained by the condensation of ethylene glycol and terephthalic acid.

Q14. Give the synthesis of a) Neoprene b) Teflon.

Ans: (a) $n \text{CH}_2=\text{C}(\text{Cl})-\text{CH}=\text{CH}_2 \longrightarrow (\text{CH}_2-\text{C}(\text{Cl})=\text{CH}-\text{CH}_2)_n$

(b) $n(\text{CF}_2=\text{CF}_2) \longrightarrow (-\text{CF}_2-\text{CF}_2)_n$

Q15. What do you mean by nylon-6,6?

Ans: Nylon 6,6 is a condensation polymer and is made up of two different monomer units i.e., hexamethylenediamine and adipic acid.

(Three marks questions on polymer)

Q1. How does the presence of double bond in rubber molecule influence their structure and reactivity?

Ans: The natural rubber is a linear 1,4-polyisoprene. Double bonds are located between C-2 and C-3 of isoprene units. This configuration about double bond does not allow the chains to come closer for effective attraction due to weak intermolecular forces of attraction. That is why natural rubber has a coiled structure and shows elasticity.

Q2. Arrange the following polymers in increasing order of their intermolecular forces.

a) PVC, Natural rubber, Terylene,

b) Nylon-6,6, Neoprene, PVC

c) Nylon 6, Buna-N, Teflon

Ans: a) Natural rubber < PVC < Terylene

b) Neoprene < PVC < Nylon 6,6

c) Buna-N < Teflon < nylon 6

Q3. Write the names of monomers used for getting the following polymers.

a) PVC

b) Teflon

c) bakelite

d) Neoprene

e) Polyacrylonitrile

f) Buna-S

Ans: a) Vinyl chloride b) Tetrafluoroethene c) Phenol and formaldehyde

d) 2-chloro 1,3-butadiene, e) Acrylonitrile, f) 1,3 Butadiene and styrene

Q4. Classify the following as addition and condensation polymer: PHBV, Dacron, Teflon, neoprene, PVC, Bakelite

Ans: Addition polymer: Teflon, PVC, Neoprene

Condensation polymer: PHBV, Bakelite, Dacron

Q5. Discuss and classify the polymers on the basis of intermolecular forces.

Ans 1) Elastomer: Weakest intermolecular forces eg. Buna-N, Buna-S

2. Fibre; Strong intermolecular force like hydrogen bond eg Nylon-66

3. Thermoplastic; No cross linkage eg PVC

4. Thermosetting Polymer; numerous cross linkage eg Bakelite