JEE Main Chemistry Previous Year Questions With Solutions on Polymer

1. Polymer formation from monomers starts by
(1) condensation reaction between monomers
(2) coordinate reaction between monomers
(3) conversion of monomer to monomer ions by protons
(4) hydrolysis of monomers

Solution:
Polymerisation starts either by addition or condensation reactions between monomers.

Hence option (1) is the answer.

2. Which of the following is a polyamide?
(1) Teflon
(2) Nylon – 6,6
(3) Terylene
(4) Bakelite

Solution:
Nylon has amide linkage.

Hence option (2) is the answer.

3. Which of the following is fully fluorinated polymer?
(1) Neoprene
(2) Teflon
(3) Thiokol
(4) PVC

Solution:
Teflon is Polytetrafluoroethene. So teflon is a fully fluorinated polymer.
Hence option (2) is the answer.

4. Bakelite is obtained from phenol by reacting with
(1) $(CH_2OH)_2$
(2) CH_3CHO
(3) CH_3COCH_3
(4) HCHO

Solution:
Bakelite is obtained from phenol by reacting with formaldehyde HCHO.

Hence option (4) is the answer.

5. The polymer containing strong intermolecular forces e.g. hydrogen bonding, is
(1) teflon
(2) nylon 6,6
(3) polystyrene
(4) natural rubber

Solution:
Nylon 6,6 is a polymer of adipic acid and hexamethyline diamine. It has strong intermolecular forces.

Hence option (2) is the answer.

6. Which one is classified as a condensation polymer?
(1) Acrylonitrile
(2) Dacron
(3) Neoprene
(4) Teflon

Solution:
Dacron is a condensation polymer. Teflon, neoprene and acrylonitrile are addition polymers.

Hence option (2) is the answer.

7. Which polymer is used in the manufacture of paints and lacquers?
(1) Bakelite
(2) Glyptal
(3) Polypropene
(4) Poly vinyl chloride

Solution:
Glyptal is used in the manufacture of paints and lacquers.

Hence option (2) is the answer.

8. The species which can best serve as an initiator for the cationic polymerization is
(1) $LiAlH_4$
(2) HNO_3
(3) $AlCl_3$
(4) BuLi

Solution:
$AlCl_3$ can serve as an initiator for cationic polymerization.
Hence option (3) is the answer.

9. Nylon threads are made of

(1) Polyester polymer
(2) Polyamide polymer
(3) Polyethylene polymer
(4) Polyvinyl polymer

Solution:

Nylon is a polyamide. It is made from reacting carbon-based chemicals found in coal and petroleum in a high-pressure, heated environment.
Hence option (2) is the answer.

10. Which one of the following structures represents the neoprene polymer:-

(1) $(-CH_2-\underset{\underset{CN}{|}}{CH}-)_n$

(2) $(-\underset{\underset{C_6H_5}{|}}{CH}-CH_2-)_n$

(3) $(-CH_2-\underset{\underset{Cl}{|}}{C}=CH-CH_2-)_n$

(4) $(-CH_2-\underset{\underset{Cl}{|}}{CH})_n$

Solution:

Neoprene is a polymer of chloroprene.

$(-CH_2-\underset{\underset{Cl}{|}}{C}=CH-CH_2-)_n$

Hence option (3) is the answer.

11. The formation of which of the following polymers involves hydrolysis reaction?

(1) Nylon 6
(2) Bakelite
(3) Nylon 6, 6
(4) Terylene

Solution:

The formation of nylon -6 involves the hydrolysis of caprolactum which is a monomer.
Hence option (1) is the answer.

12. Among the following substituted silanes the one which will give rise to cross linked silicone polymer on hydrolysis is

(1) R_4Si
(2) $RSiCl_3$
(3) R_2SiCl_2
(4) R_3SiCl

Solution:
$RSiCl_3 + H_2O \rightarrow RSi(OH)_3 + HCl$
Trichlorosilane is used in the production of purified cross-linked silicon polymer. It decomposes in water to produce a silicone polymer while giving off HCl.
Hence option (2) is the answer.

13. Formation of Bakellite follows:
(1) Electrophilic substitution followed by condensation
(2) Nucleophilic addition followed by dehydration.
(3) Electrophilic addition followed by dehydration
(4) Hydration followed by condensation

Solution:
Formation of Bakellite follows electrophilic substitution followed by condensation.
Hence option (1) is the answer.

14. Poly-β-hydroxybutyrate-co-β-hydroxyvalerate (PHBV) is a copolymer of
(1) 2- hydroxybutanoic acid and 3-hydroxypentanoic acid.
(2) 3- hydroxybutanoic acid and 3-hydroxypentanoic acid.
(3) 2- hydroxybutanoic acid and 2-hydroxypentanoic acid.
(4) 3- hydroxybutanoic acid and 4-hydroxypentanoic acid.

Solution:
PHBV is a copolymer of 3- hydroxybutanoic acid and 3-hydroxypentanoic acid.
Hence option (2) is the answer.

15. The two monomers for the synthesis of Nylon 6,6 are
(1) $HOOC(CH_2)_6COOH$, $H_2N(CH_2)_6NH_2$
(2) $HOOC(CH_2)_6COOH$, $H_2N(CH_2)_4NH_2$
(3) $HOOC(CH_2)_4COOH$, $H_2N(CH_2)_6NH_2$
(4) $HOOC(CH_2)_4COOH$, $H_2N(CH_2)_4NH_2$

Solution:
Monomers of Nylon 6,6 are adipic acid and hexamethylene diamine.
Hence option (3) is the answer.