Chapter 9
POLYMERS

CLASSIFICATION OF POLYMERS

1. "Based on source", polymers are classified as - (3)
2. Natural polymers ex. - (5)
3. Semi-synthetic polymers ex. - (2)
4. Cellulose acetate is also called -
5. "Based on structure", polymers classified as - (3)
6. Cross-linked polymer also called -
7. PVC is an ex. of linear/branched/network polymers.
8. Linear polymers ex - (2)
9. Branched-chain polymers ex - (1)
10. Cross-linked polymers ex - (2) (NEET)
11. _____ polymers are usually formed from bi-functional and tri-functional monomers. (NEET)
12. "Based on Mode of Polymerisation", polymers are classified as - (2)
13. Homopolymers ex - (1)
14. Copolymers ex - (2)
15. Monomers is Buna-S are - (NEET)
16. Monomers in Buna-N are -
17. Condensation polymers ex - (3)
18. Terylene is also called -
19. "Based on Molecular Forces", polymers are classified as - (4)
20. Elastomers are held together by weak/strong intermolecular forces.
21. Elastomers ex - (3)
22. Fibers possess high tensile strength and high modulus. T/F
23. Fibers have strong intermolecular forces. T/F
24. Ex. of intermolecular forces present in fibers are -
25. Fibers ex - (2)
26. Thermoplastic possess intermolecular forces of attraction intermediate between elastomers and fibres. T/F
27. Thermoplastic polymers ex - (3)
28. Thermosetting polymers are slightly branched. T/F
29. Thermosetting polymers can be reused. T/F
30. Thermosetting polymers ex - (2)
31. "Based on Growth Polymerisation", polymers are classified as - (2)
32. Chain growth polymers are actually condensation polymers. T/F

TYPES OF POLYMERISATION REACTIONS

ADDITION POLYMERISATION

33. Chain growth polymerisation is the most common mode of formation of polymers. T/F
34. Ex. of free radical generating initiator - (3)
35. LDP full form -
36. LDP is made under pressure of _____ to _____ atm at a temperature of ____- ____ K in the presence of traces of _____ or _____
37. LDP have very little branching. T/F
38. LDP is used to manufacture - (3)
39. Catalyst used to make HDP is -
40. Ziegler-Natta catalyst consist of - (2)
41. Pressure used to make HDP is less as compared to pressure used to make LDP. T/F
42. Pressure used to make HDP is __-__ atm and temp is _____ -_____ K
43. HDP have linear molecules. T/F
44. HDP is chemically inert and more tough and hard. T/F
45. HDP is used to manufacture - (3)
46. Monomer of teflon is - (NEET)
47. Tetrafluoroethene is heated with _____ or _____ catalyst to form teflon.
48. _____ is used for non-stick surface coated utensils. (NEET)
49. Acrylonitrile formula -
50. Polyacrylonitrile is used as a substitute for _____ (NEET)
51. Polyacrylonitrile is used to make fibers like _____ or _____

CONDENSATION POLYMERISATION

52. Polyamides ex - (2) (NEET)
53. Nylon 6,6 monomers - (2) (NEET)
54. Adipic acid formula -
55. Nylon 6,6 is used in making - (2)
56. Nylon 6 monomer - (NEET)
57. Nylon 6 is used in making - (3)
58. Polyesters ex - (1) (NEET)
59. Monomers used in terylene - (2) (NEET)
60. Dacron is obtained by heating the monomers at ____-____ K in the presence of _____ catalyst.
61. Dacron fibre is crease resistant. T/F
62. It is used as glass reinforcing material in safety helmets. T/F

63. Novolac monomers are - (2)
64. Novolac is used in _____
65. Novolac on heating with formaldehyde undergo cross linking to form _____ (NEET)
66. Electrical switches are made of -
67. Unbreakable crockery is manufactured by -

COPOLYMERISATION & RUBBER

68. Buna-S is used to manufacture - (4)
69. Rubber latex is colloidal dispersion of _____ in _____
70. Natural rubber is linear polymer of _____ (NEET)
71. Cis/trans isoprene is present in natural polymer. (NEET)
72. Natural polymer is chemically called - (NEET)
73. Cis-polyisoprene chains are held together by _____ interactions.
74. Vulcanisation of rubber is done by heating rubber with ___ at temp between ____-____ K.
75. Rubber gets stiffened on vulcanisation. T/F (NEET)
76. In manufacture of tyre rubber, ___% of sulphur is used.
77. Synthetic rubber ex - (2)
78. Neoprene monomer is - (NEET)
79. _____ is used to manufacture conveyor belts, gaskets and hoses.
80. _____ is used in making oil seals, tank lining.

BIODEGRADABLE POLYMERS & COMMERCIALLY IMPORTANT POLYMERS

81. Ex. of biodegradable polymers - (2) (NEET)
82. PHBV full form -
83. PHBV monomers - (2)
84. 'Bute' means 4 and 'Valler' means -
85. 'Capro" means -
86. Nylon 2-nylon 6 monomers - (2)
87. _____ is used in specialty packaging, orthopaedic devices and in controlled release of drugs.
88. Glyptal monomers

DIGAQS

DigaQ1. Melamine Structure
DigaQ2. Chloroprene Structure

ANSWERS

CLASSIFICATION OF POLYMERS

1. Natural, semi-synthetic, synthetic
2. Proteins, cellulose, starch, some resins and rubber
3. cellulose acetate and cellulose nitrate
4. Rayon
5. Linear, Branched, Cross-linked
6. Network polymers
7. Linear
8. Polythene, PVC
9. LDP (low density polythene)
10. Bakelite, melamine
11. Cross linked
12. Addition, condensation
13. Polythene
14. Buna-S, Buna-N
15. 1,3-Butadiene + Styrene
16. 1,3-Butadiene + Acrylonitrile
17. Terylene, nylon 6, 6, nylon 6
18. Dacron
19. Elastomers, fiberes, thermoplastic polymers, thermosetting polymers
20. Weak
21. Buna-S, Buna-N, neoprene
22. T
23. T
24. Hydrogen bonding
25. Terylene, nylon 6,6
26. T
27. Polythene, polystyrene, polyvinyls
28. F
29. F
30. Bakelite, urea-formaldehyde resins
31. Chain growth polymers and step growth polymers
32. F

ADDITION POLYMERISATION

33. T
34. benzoyl peroxide, acetyl peroxide, tert-butyl peroxide
35. Low density polythene
36. 1000 to 2000 atm, 350-570 K, dioxygen or a peroxide initiator
37. F
38. squeeze bottles, toys and flexible pipes
39. Ziegler-Natta catalyst
40. $TiCl_4$, $Al(C_2H_5)_3$
41. T
42. 6-7 atm, 333-343 K
43. T
44. T
45. buckets, dustbins, bottles, pipes
46. Tetrafluoroethene
47. Free radical or persulfate catalyst
48. Teflon
49. $CH_2=CHCN$
50. Peroxide catalyst
51. Orlon or acrilan

CONDENSATION POLYMERISATION

52. Nylon 6 & Nylon 6,6
53. Hexamethylenediamine and adipic acid
54. $HOOC-(CH_2)_4-COOH$
55. Sheets, bristles for brushes
56. Caprolactam
57. Type cords, fabrics and ropes
58. Terylene
59. ethylene glycol and terephthalic acid

60. 420-460 K, zinc acetate-antimony trioxide catalyst
61. T
62. T
63. Phenol and formaldehyde
64. Paints
65. Bakelite
66. Bakelite
67. Melamine-formaldehyde polymer

- **COPOLYMERISATION & RUBBERS**

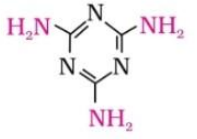
68. autotyres, floor tiles, footwear components, cable insulation
69. Rubber in water
70. Isoprene
71. Cis
72. cis-1,4-polyisoprene
73. van der Waals
74. S, 373-415 K
75. T
76. 5%
77. Neoprene, Buna-S
78. Chloroprene
79. Neoprene
80. Buna-N

- **BIODEGRADABLE POLYMERS & COMMERCIALLY IMPORTANT POLYMERS**

81. PHBV, Nylon 2-nylon 6
82. Poly β-hydroxybutyrate – co-β-hydroxy valerate
83. 3-Hydroxybutanoic acid + 3-Hydroxypentanoic acid
84. 5
85. 6
86. Glycine + amino caproic acid
87. PHBV
88. Ethylene glycol + Phthalic acid

- **DIGAQS**

DigaQ 1.



DigaQ 2.