AU SPECIAL SCHOOL

GRADE 12 CHEMISTRY PRACTICE QUESTIONS ON

POLYMERS

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ACKNOWLEDGEMENT

1. What is the chemical name for Dacron?
   A) Polyethylene terephthalate
   B) Polyvinyl chloride
   C) Polypropylene
   D) Polystyrene Answer: A
2. Which of the following polymers is commonly used in making clothing?
   A) Nylon C) Perspex
   B) Natural rubber D) Dacron
   Answer: D) Dacron
3. What is the monomer unit of nylon?
   A) Ethylene
   B) Propylene
   C) Adipic acid and hexamethylenediamine
   D) Terephthalic acid and ethylene glycol
   An: C) Adipic acid and hexamethylenediamine
4. What is the chemical name for Perspex?
   A) Polystyrene
   B) Polyvinyl chloride
   C) Polymethyl methacrylate
   D) Polypropylene Answer: C
5. Which of the following polymers is known for its elasticity and flexibility?
   A) Nylon C) Dacron
   B) Perspex D) Natural rubber
   Answer: D) Natural rubber
6. What is the monomer unit of natural rubber?
   A) Isoprene C) Ethylene
   B) Propylene D) Butadiene
   Answer: A) Isoprene
7. What is the chemical name for nylon?
   A) Polyethylene terephthalate
   B) Polyvinyl chloride
   C) Polymethyl methacrylate
   D) Polyamide Answer: D) Polyamide
8. Which of the following is a property of nylon?
   A) High elasticity C) Low melting point
   C) Brittle D) Low tensile strength
   Answer: A) High elasticity
9. Which of the following is a common use of Perspex?
   A) Carpet fibers C) Food packaging
   B) Clothing D) Acrylic glass
   Answer: D) Acrylic glass
10. Which of the following is not a characteristic of condensation polymerization?
    A) Formation of small molecules as byproducts
    B) Loss of water or alcohol during polymeriz^{n} rxn
    C) Formation of long chains of repeating units
    D) High temperature and pressure required for polymerization
    Answer: D) High temperature and pressure required for polymerization
11. What is the chemical structure of Perspex?
    A) Polyvinyl chloride
    B) Polymethyl methacrylate
    C) Polyethylene terephthalate
    D) Polystyrene
    Answer: B) Polymethyl methacrylate
12. 14. What is the monomer unit of Dacron?
    A) Ethylene
    B) Propylene
    C) Terephthalic acid and ethylene glycol
    D) Adipic acid and hexamethylenediamine
    Answer: C
13. What is the chemical name for natural rubber?
    A) Poly Isoprene
    B) Ethylene
    C) Propylene
    D) Butadiene
    Answer: A) Poly Isoprene
14. Which of the following is a characteristic of natural rubber?
    A) High tensile strength
    B) Low elasticity
    C) Brittle
    D) Low resistance to abrasion
    Answer: A) High tensile strength
15. What is the monomer unit of Perspex?
    A) Ethylene
    B) Methyl methacrylate
    C) Propylene
    D) Butadiene
    Answer: B) Methyl methacrylate
16. Which of the following is a common use of nylon?
    A) Electrical insulation C) Clothing
    B) Food packaging D) Carpet fibers
    Answer: A) Electrical insulation

17. What is the chemical structure of natural rubber?
    A) Polyisoprene
    B) Polyethylene terephthalate
    C) Polymethyl methacrylate
    D) Polystyrene
    Answer: A) Polyisoprene
18. Which of the following is a property of Perspex?
    A) High elasticity
    B) Low melting point
    C) Transparent
    D) Low tensile strength
    Answer: C) Transparent
19. What is the monomer unit of natural rubber?
    A) Isoprene
    B) Ethylene
    C) Propylene
    D) Butadiene
    Answer: A) Isoprene
20. Which of the following is a common use of natural rubber?
    A) Electrical insulation
    B) Food packaging
    C) Clothing
    D) Tires
    Answer: D) Tires
21. What is the chemical name for nylon?
    A) Polyethylene terephthalate
    B) Polyvinyl chloride
    C) Polyamide
    D) Polymethyl methacrylate
    Answer: C) Polyamide
22. Which of the following is a characteristic of condensation polymerization?
    A) Formation of long chains of repeating units
    B) Loss of water or alcohol during polymerization
    C) Low temperature and pressure required for polymerization
    D) Formation of small molecules as byproducts
    Answer: B) Loss of water or alcohol during polymerization
23. What is the monomer unit of Perspex?
    A) Ethylene
    B) Methyl methacrylate
    C) Propylene
    D) Butadiene
    Answer: B) Methyl methacrylate
24. Which of the following is a property of natural rubber?
    A) High tensile strength
    B) Low elasticity
    C) Transparent
    D) Low resistance to abrasion
    Answer: A) High tensile strength
25. What is the chemical structure of Dacron?
    A) Polyethylene terephthalate
    B) Polyvinyl chloride
    C) Polymethyl methacrylate
    D) Polyamide
    Answer: A) Polyethylene terephthalate
26. What is the monomer unit of nylon?
    A) Adipic acid and hexamethylenediamine
    B) Terephthalic acid and ethylene glycol
    C) Propylene
    D) Ethylene
    Answer: A)
27. Which of the following is not a type of condensation polymerization?
    A) Polyethylene C. Nylon
    B) Dacron D. Perspex
    Answer: A) Polyethylene
28. Which of the following is a byproduct of condensation polymerization?
    A. Water C. Carbon dioxide
    B. Oxygen D. Nitrogen
    Answer: a) Water
29. Most of the time condensation polymerization involves the reaction between:
    A. Monomers with the same functional groups
    B. Monomers with different functional groups
    C. Monomers with no functional groups
    D. Monomers with only one functional group
    Answer: b) Monomers with different functional groups
30. Which of the following is an example of a condensation polymer?
    A. Polyethylene
    B. Polypropylene
    C. Nylon
    D. Polyvinyl chloride
    Answer: c) Nylon

31. During condensation polymerization, the polymer chains grow by:
    A. Addition of monomers to the chain
    B. Elimination of small molecules
    C. Breaking of covalent bonds
    D. Formation of ionic bonds
    Answer: b) Elimination of small molecules

32. Which of the following conditions is commonly required for condensation polymerization?
    A. Low temperature
    B. High pressure
    C. Presence of a catalyst
    D. Absence of any catalyst
    Answer: c) Presence of a catalyst

33. Which of the following polymers is formed by condensation polymerization?
    A. Polyethylene
    B. Polystyrene
    C. Polyethyleneterepahtalate
    D. Polypropylene
    Answer: c) Polyethyleneterepahtalate

34. What is the main byproduct produced during the condensation polymerization of polyamides?
    A. Carbon dioxide
    B. Water
    C. Ethanol
    D. Methane
    Answer: b) Water

35. Which of the following is not a step in addition polymerization?
    A. Chain initiation C. Chain propagation
    B. Chain termination D. Chain branching
    Answer: d) Chain branching

36. Which of the following is an example of a condensation polymerization reaction?
    A. Formation of polyethylene from ethylene monomers
    B. Formation of polypropylene from propylene monomers
    C. Formation of polystyrene from styrene monomers
    D. Formation of polyester from dicarboxylic acid and diol monomers
    Answer: d) Formation of polyester from dicarboxylic acid and diol monomers

37. Which of the following monomers is commonly used in the condensation polymerization reaction to produce polyesters?
    A. Ethylene
    B. Styrene
    C. Ethylene glycol
    D. Vinyl chloride
    Answer: c) Ethylene glycol

38. Which of the following is NOT a characteristic of condensation polymerization?
    A. Formation of small byproducts
    B. Reaction between monomers with different functional groups
    C. Growth of the polymer chain through the addition of monomers
    D. Utilization of catalysts
    Answer: c) Growth of the polymer chain through the addition of monomers

39. Which of the following factors can affect the rate of condensation polymerization?
    A. Temperature
    B. Pressure
    C. Concentration of reactants
    D. All of the above
    Answer: d) All of the above

40. Which of the following polymers is NOT formed by condensation polymerization?
    A. Polyethylene terephthalate (PET)
    B. Polyvinyl chloride (PVC)
    C. Bakelite
    D. Naylon
    Answer: b) Polyvinyl chloride (PVC)

1. What kind of reaction is addition polymerization?
   A)Redistribution reaction\
   B) Condensation reaction\
   C)Addition reaction\
   D) Substitution reaction
   Answer: C) Addition reaction

2. Which of the following is a key characteristic of addition polymerization?
   A)Formation of byproducts
   B) Involves elimination reactions
   C)The monomers usually contain carbon–carbon single bonds.
   D) Usually are carried out in the presence of catalysts,
   Answer: D)

3. What kind of bonds form during addition polymerization?
   A)Ester bonds
   B) Hydrogen bonds
   C)Covalent bonds
   D) Ionic bonds
   Answer: C) Covalent bonds

4. Which of the following is an example of addition polymerization?
   A)Polyethylene
   B) Nylon-6,6
   C)Polyethylene terephthalate
   D) Bakelite
   Answer: A) Polyethylene

5. What is the chain growth polymerization method used in addition polymerization known as?
   A)Step polymerization
   B) Ring-opening polymerization
   C)Ziegler-Natta polymerization
   D) Free radical polymerization
   Answer: D) Free radical polymerization

6. Polymer chains in addition polymerization grow by the addition of:
   A)Monomers to an initiator
   B) Small molecules
   C)Cross-linkers
   D) Multiple catalysts
   Answer: A) Monomers to an initiator

7. What happens to the polymer chain in the termination step of addition polymerization?
   A)It stops growing
   B) It becomes a copolymer
   C)It branches out
   D) It combines with another initiator
   Answer: A) It stops growing

8. Which of the following is a common monomer used in addition polymerization to produce polystyrene?
   A)Ethylene\ C. Styrene\
   B) Vinyl chloride\ D. Acrylonitrile
   Answer: C) Styrene

9. What role do initiators play in the addition polymerization process?
   A. Determine the chain length
   B. Provide monomers
   C. Induce the formation of radicals
   D. Terminate polymerization reactions
   Answer: C) Induce the formation of radicals

10. Addition polymerization typically involves the reaction of monomers with:
    A)Oxygen
    B) Hydrogen
    C)Carbon-carbon double bonds
    D) Metal ions
    Answer: C) Carbon-carbon double bonds

11. Which polymerization process leads to the formation of high-density polyethylene (HDPE)?
    A)Addition polymerization\
    B) Condensation polymerization\
    C)Free radical polymerization\
    D) Ziegler-Natta polymerization
    Answer: A) Addition polymerization

12. Which type of polymerization results in the release of a small molecule like water ?
    A)Step-growth polymerization\
    B) Addition polymerization\
    C)Ionic polymerization\
    D) Free radical polymerization
    Answer: A) Step-growth polymerization

13. Which of the following initiates the formation of free radicals in free radical polymerization?
    A)Solvent C. Monomer
    B) Initiator D. Catalyst
    Answer: C) Initiator**

14. What is the characteristic feature of the chain-growth polymerization method used in addition polymerization?
A)Involves formation of 3D networks
B) Multiple steps in the polymerization process
C)Growing polymer chain by the reactive end group
D) Dependent on the stoichiometry of reacting monomers
Answer: C)

15. In addition polymerization, what type of polymer is formed when more than one monomer type is used?**
A)Homopolymer C, Copolymer
B) Isomer D. Terpolymer
Answer: B) Copolymer**

16. What is the role of the catalyst in addition polymerization reactions?
A)Initiates the reaction
B) Terminates the polymer chain growth
C)Controls the chain length
D) Provides the monomers
Answer: A) Initiates the reaction**

17. Which polymerization process involves the formation of a pi bond with the elimination of a small molecule like water ?
A)Condensation polymerization
B) Addition polymerization
C)Ring-opening polymerization
D) Ziegler-Natta polymerization
Answer: A) Condensation polymerization**

18. Which of the following polymers is most likely produced by a radical polymerization process?**
A)Polyethylene terephthalate (PET)\
B) Polystyrene\
C)Bakelite
D) Nylon-6,6
Answer: B) Polystyrene**

19. What is a key feature of the process of chain-growth polymerization in addition polymerization?**
A)Formation of a-bonds\
B) Stepwise polymer growth\
C)Miktoarm formation\
D) Random monomer addition

Answer: B) Stepwise polymer growth

20. Which of the following initiates the propagation step in free radical polymerization?**
A)Catalyst\
B) Solvent\
C)Monomer\
D) Free radical Answer: D) Free radical

21. Polymer chains in addition polymerization grow through the:**
A)Termination step\
B) Propagation step\
C)Initiation step\
D) Conservation step
Answer: B) Propagation step**

22. What is the most common mechanism for the termination step in radical polymerization?**
A)Beta-scission\
B) Cross-linking\
C)Redox reaction\
D) Combination of radicals
Answer: D) Combination of radical

23. Which reactivity feature makes addition polymerization ideal for hydrocarbon-based monomers?**
A)Carbon-carbon double bonds\
B) Aromatic rings\
C)Carbonyl groups\
D) Sulfur-sulfur bonds
Answer: A) Carbon-carbon double bonds**

24. What is the primary reason for the high chain reaction speed in radical addition polymerization?**
A)High pressure\
B) Presence of byproducts\
C)Formation of free radicals\
D) Low temperature
Answer: C) Formation of free radicals*

25. For radical polymerization, what is the role of the initiator in the initiation step of the polymerization chain?**
A)Modifies the chain length\
B) Acts as a chain transfer agent\
C)Forms a free radical\
D) Promotes side reactions

Answer: C) Forms a free radical

26. What is the periodic table arranged by?**
A) Atomic Mass\
B) Atomic Number\
C) Valence Electrons\
D) Density
Answer: B) Atomic Number**

27. The modern periodic table is arranged based on:**
A) Atomic Mass\
B) Atomic Radius\
C) Electronic Configuration\
D) Atomic Number
Answer: D) Atomic Number**

28. Which element is a metalloid in the periodic table?**
A) Iron\
B) Phosphorus\
C) Arsenic\
D) Silver Answer: C) Arsenic**

29. The elements in each vertical column of the periodic table are called:**
A) Periods\
B) Rows\
C) Groups\
D) Blocks **Answer: C) Groups**

30. Which element is a transition metal in the periodic table?**
A) Lithium\
B) Titanium\
C) Chlorine\
D) Krypton Answer: B) Titanium**

31. How does screening effect influence effective nuclear charge?
A) It increases effective nuclear charge by adding more protons to the nucleus
B) It decreases effective nuclear charge by shielding outer electrons from the full nuclear charge
C) It has no impact on effective nuclear charge
D) It causes electrons to lose energy levels in an atom
Answer: B) It decreases effective nuclear charge by shielding outer electrons from the full nuclear charge

32. In which type of atom is the screening effect more pronounced?
A) Atoms with a high atomic number
B) Atoms with a low atomic number
C) Atoms with a high electron affinity
D) Atoms with a high ionization energy
Answer: B) Atoms with a low atomic number

33. How does effective nuclear charge change as you move across a period on the periodic table?
A) It decreases due to increased screening effect
B) It increases due to decreased shielding by inner electrons
C) It remains constant across a period
D) It fluctuates unpredictably

Answer: B) It increases due to decreased shielding by inner electrons

34. Which factor contributes most significantly to the screening effect in an atom?
A) Number of protons in the nucleus
B) Number of neutrons in the nucleus
C) Number of inner electrons surrounding the nucleus
D) Number of valence electrons in the atom
Answer: C) Number of inner electrons surrounding the nucleus

35. Which of the following statements is true about isoelectronic species?
A) They have the same number of protons and neutrons
B) They have different numbers of electrons
C) They have the same number of electrons
D) They have the same atomic mass
Answer: C) They have the same number of electrons

36. Which of the following pairs represents isoelectronic species?
A) O^{2-} and F^-
B) Na^+ and Mg^{2+}
C) N^{3-} and O^{2-}
D) Ne and Na^+
Answer: C) N^{3-} and O^{2-}