

Select the letter of the best answer below.

- K/U** Which reaction would be performed to convert an alkyne to alcohol?
  - substitution
  - elimination
  - esterification
  - addition
  - hydrolysis
- K/U** Which reaction is used in industry to convert alkanes to alkenes?
  - esterification
  - polymerization
  - cracking
  - breaking
  - elimination
- K/U** Which pair of reactions are the reverse of one another?
  - addition and substitution
  - hydrolysis and condensation
  - elimination and substitution
  - esterification and condensation
  - oxidation and addition
- K/U** Identify the name of the major product for an addition reaction with the following reactants.
 
$$\begin{array}{ccccccc}
 & \text{H} & & \text{CH}_3 & \text{H} & & \text{H} \\
 & | & & | & | & & | \\
 \text{H} & - \text{C} & - & \text{C} = & \text{C} & - & \text{C} - \text{H} \\
 & | & & & & & | \\
 & \text{H} & & & & & \text{H}
 \end{array} + \text{HCl} \rightarrow$$
  - 2-methylbut-2-ene
  - 2-chloro-3-methylbutane
  - 3-chloro-2-methylbutane
  - 2-chloro-2-methylbutane
  - 2-chloro-3-methylbutene
- K/U** Which statement about oxidation reactions is true?
  - Oxidation reactions can change an aldehyde to a carboxylic acid.
  - Oxidation reactions can change a ketone to an alcohol.
  - Oxidation reactions can change an alkene to an alkane.
  - Oxidation reactions can change an alkyne to an alkene.
  - Oxidation reactions can change an aldehyde to an alcohol.

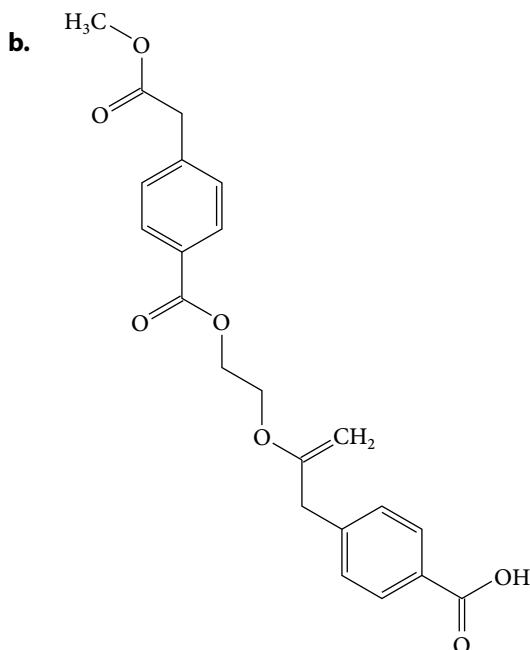
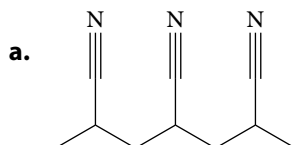
- K/U** Which reaction would be used to convert an alkyl halide to an alcohol?
  - reduction
  - addition
  - condensation
  - elimination
  - substitution
- K/U** Which is *not* a solution to petroleum-based plastics' inability to degrade easily?
  - Reduce the use of plastics.
  - Burn plastics when they are discarded.
  - Re-use plastics as often as possible.
  - Recycle plastics as often as possible.
  - Replace petroleum-based plastics with degradable plastics.
- K/U** Which are the monomers of proteins?
  - glucose
  - alkanes
  - nucleotides
  - amino acids
  - sucrose
- K/U** Which two functional groups react together in a condensation reaction to form an amide and water?
  - an amine and an alcohol
  - a carboxylic acid and an amine
  - a carboxylic acid and an amide
  - a carboxylic acid and an alcohol
  - an ester and an alcohol
- K/U** Crosslinking is seen in which of the following polymers?
  - polystyrene
  - PVC
  - polyacrylamide
  - PET
  - Kevlar®

Use sentences and diagrams as appropriate to answer the questions below.

- A** What monomer would you expect to be an active ingredient in muscle-building supplements? Explain your answer.
- T/I** Determine the products of the following condensation and esterification reactions.
  - 2,2-dimethylbutanoic acid + 2-methylpropan-2-ol  $\xrightarrow{\text{H}_2\text{SO}_4}$
  - 3-chlorobutanoic acid + propan-1-amine  $\xrightarrow{\text{H}_2\text{SO}_4}$

13. **A** Propose a synthesis, including any necessary conditions, for cycloheptanone from an alkene.

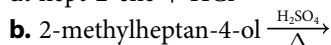
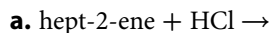
14. **T/I** Determine the monomers for the following polymers and identify the polymers as addition or condensation polymers.



15. **K/U** What are the similarities and differences between cellulose and starch?

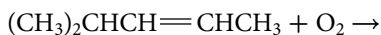
16. **T/I** Write a laboratory procedure (main reactions only) to perform an addition polymerization if your starting material is a carboxylic acid.

17. **T/I** Determine the products of the following addition and elimination reactions. Identify the major product in each case.



18. **C** Write a short essay explaining how plastics contribute to your life. Include your opinion on whether the benefits outweigh the consequences of their use.

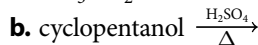
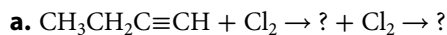
19. **T/I** Determine the products of the following reaction, then balance the equation.



20. **T/I** Is a protein an example of a polyester or a polyamide? Explain your answer.

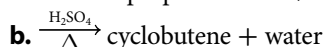
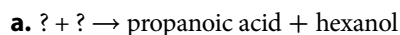
21. **K/U** Explain what happens during reduction of an organic molecule.

22. **T/I** Determine the products for the following reactions.

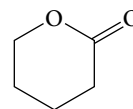


23. **A** Propose a synthesis, including any necessary conditions, for a four-carbon alkyl halide from butanone.

24. **T/I** Determine the reactants in the following reactions.



25. **A** Propose a one-step synthesis of the following compound from a non-cyclic reactant.



### Self-Check

If you missed question ...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Review section(s)...	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1