

Friday Worksheet

Name:

Organic worksheet 6

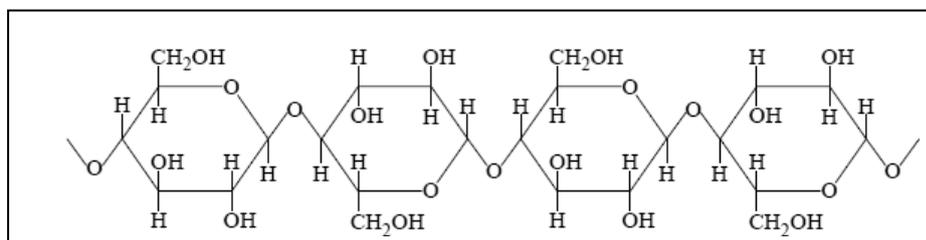
1) 2.10 g of an alkene that contains only one double bond per molecule reacted completely with 3.55 g of chlorine, Cl_2 .

The molar mass of chlorine, Cl_2 , is 71.0 g mol^{-1} .

Which one of the following is the molecular formula of the alkene? Explain how you arrived at your choice and show all working .

- A. C_5H_{10}
- B. C_4H_8
- C. C_3H_6
- D. C_2H_4

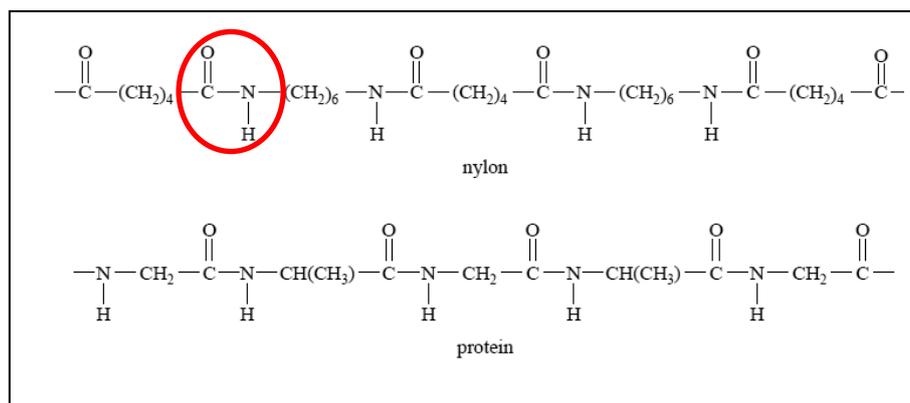
2) A section of cellulose polymer is shown below.



This polymer is chemically degraded to obtain the monomer.

- a) Name the monomer
- b) What two words best describe the reaction that forms cellulose from its monomers?
- c) The monomer of cellulose is used to form ethanol. Write the chemical reaction taking place indicating the appropriate catalyst, reactant and products.
- d) What is the reaction in c) above called?
- e) What type of reaction is d) above? Select from the list below explain why.
 - i) Oxidation only, ii) Reduction only, iii) Addition, iv) Substitution, iv) Redox
- f) Starch is a spiral polymer of glucose. A plant cell forms a small starch molecule composed of 100 glucose molecules. If each glucose molecule has a molar mass of 160.2 g mol^{-1} what is the formula mass of the polymer?

3)



- Name the monomers of the protein chain shown?
- What is the functional group, that is circled above, called?

4) A polymer is formed from but-2-ene molecules only.

- Draw a section of the polymer showing at least two units of the monomer

b) A polymer is formed from 100 molecules of but-2-ene. What is the formula mass of the polymer?

5) a) Given a pure sample of butan-1-ol describe the steps that are required to prepare a sample of **pure** butyl butanoate. Include any reagents that are used in the synthesis. An annotated flow chart may be used in your answer.

b) Discuss how the product could be tested to see if it is pure butyl butanoate using IR spectroscopy.