

# Intro to Organic Reactions

Name \_\_\_\_\_

1. Describe the key characteristics of a combustion reaction and give the two possible products of an incomplete combustion.
  
2. Besides combustion, what is the only other type of reaction that an alkane can undergo? What conditions are necessary for this type of reaction to occur?
  
3. Define the terms:
  - a. Free radical
  
  - b. Homolytic fission
  
  - c. Mechanism
  
  - d. Nucleophile
  
  - e. Monomer
  
  - f. Polymer
  
  - g. Reflux
  
  - h. Catalyst
  
4. Name and describe each of the three steps that are necessary in the mechanism of a substitution reaction in order for an alkane to be turned in to a halogenoalkane.

5. Write the substitution reaction that would occur between propane and bromine.
6. Identify the necessary reactants for a nucleophilic substitution reaction and identify the class of compound that would be formed by a hydroxide nucleophile.
7. Each type of nucleophilic substitution involves two steps in its mechanism: nucleophilic attack and the halogen leaving. List the order of these two steps for  $S_N1$  and  $S_N2$ :
- $S_N1$  Steps— 1. \_\_\_\_\_ 2. \_\_\_\_\_
- $S_N2$  Steps— 1. \_\_\_\_\_ 2. \_\_\_\_\_
8. Explain what each symbol in the term  $S_N1$  stands for.
9. For each of the following classes of compounds, identify whether it would undergo  $S_N1$  or  $S_N2$ .
- |                        |                          |                         |
|------------------------|--------------------------|-------------------------|
| Primary halogenoalkane | Secondary halogenoalkane | Tertiary halogenoalkane |
|------------------------|--------------------------|-------------------------|
10. Why does an  $S_N1$  mechanism occur faster than an  $S_N2$  mechanism for most molecules?
11. Complete the blanks below for the following addition reactions. Be sure to add catalysts over the arrow when necessary.
- a. Ethene + Hydrogen  $\longrightarrow$  \_\_\_\_\_
- b. Ethene + \_\_\_\_\_  $\longrightarrow$  Ethanol
- c. Ethene + Hydrochloric acid  $\longrightarrow$  \_\_\_\_\_
- d. Ethene + \_\_\_\_\_  $\longrightarrow$  Dichloroethane
- e. LOTS of ethane  $\longrightarrow$  \_\_\_\_\_
12. For each of the following classes of compounds, identify the product(s) (if any) of its oxidation.
- |                 |                   |                  |
|-----------------|-------------------|------------------|
| Primary alcohol | Secondary alcohol | Tertiary alcohol |
|-----------------|-------------------|------------------|