

Name:

Date:

## ORGANIC CHEMISTRY REACTIONS

For each reaction, provide the expected products and explain the mechanism briefly.

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1. Reaction:



Products: **Ethanol ( $\text{CH}_3\text{CH}_2\text{OH}$ ) and bromide ion ( $\text{Br}^-$ )**

Mechanism: **The hydroxide ion ( $\text{OH}^-$ ) attacks the carbon bonded to the bromine, displacing the bromide ion in a backside attack, resulting in the substitution of the bromine atom with the hydroxyl group.**

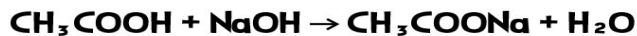
2. Reaction:



Products: **Ethyl chloride ( $\text{CH}_3\text{CH}_2\text{Cl}$ ) and water**

Mechanism: **This is a nucleophilic substitution ( $\text{S}_\text{N}1$  or  $\text{S}_\text{N}2$  depending on conditions).**

3. Reaction:



Products: **Sodium acetate ( $\text{CH}_3\text{COONa}$ ) and water**

Reaction Type: **Acid-Base Neutralization**

4. Reaction:



Products: **Ethanol ( $\text{CH}_3\text{CH}_2\text{OH}$ ) and hydrochloric acid ( $\text{HCl}$ )**

Mechanism: **The chloride ion leaves first, creating a carbocation, which is then attacked by the water molecule, leading to the formation of ethanol. The reaction proceeds via an  $\text{S}_\text{N}1$  mechanism.**