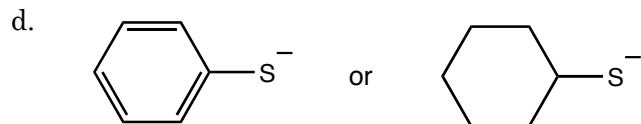
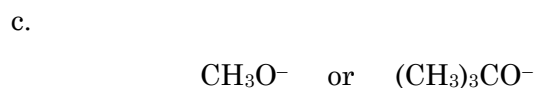
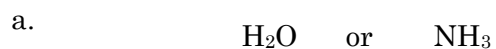
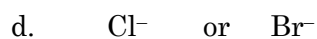
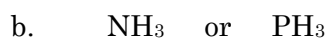


1. Assuming that the molecules below are dissolved in acetone, $\text{CH}_3\text{C}(\text{O})\text{CH}_3$, circle the more nucleophilic molecule/ion in each pair.



2. Assuming that the molecules below are dissolved in ethanol, circle the more nucleophilic molecule/ion in each pair.

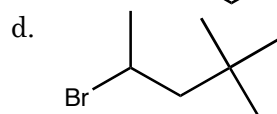
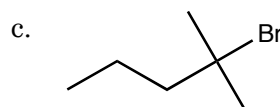
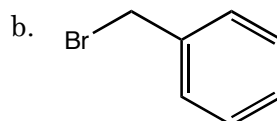
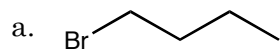


3. 1-bromopropane reacts with sodium methoxide to form 1-methoxypropane and NaBr .

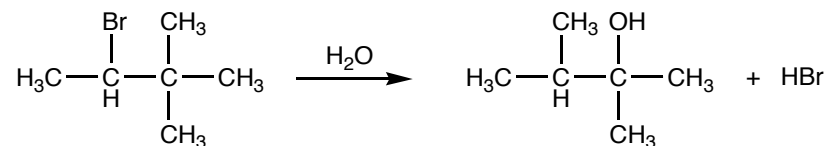
a. Using skeletal structures, draw a balanced equation for the reaction.

b. Draw a mechanism for the reaction.

4. Indicate whether the following molecules can react by $\text{S}_{\text{N}}1$ reactions, $\text{S}_{\text{N}}2$ reactions, or both.



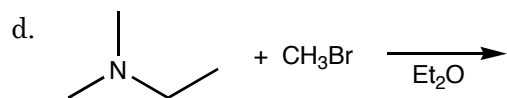
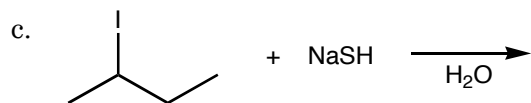
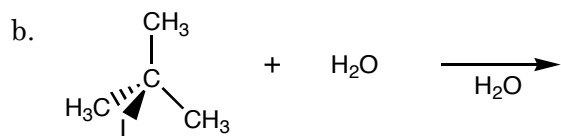
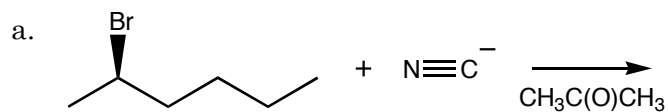
5. The following reaction is a nucleophilic substitution.



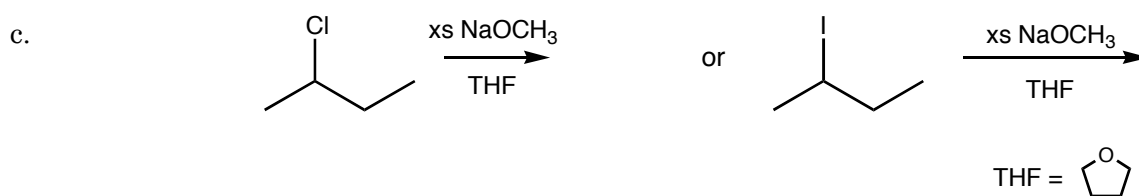
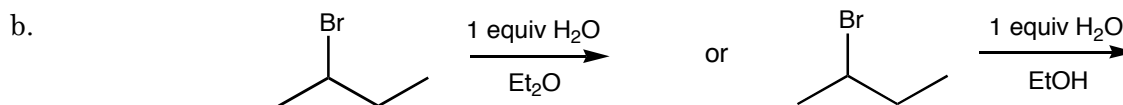
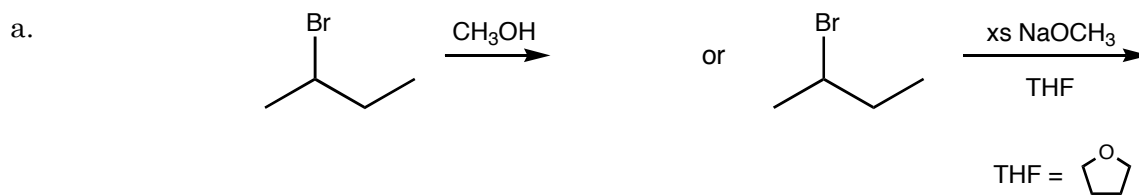
a. Did this reaction occur by an $\text{S}_{\text{N}}1$ or $\text{S}_{\text{N}}2$ reaction?

b. Draw a mechanism for the reaction.

6. Determine the products of the following reactions. Where appropriate, clearly indicate the stereochemistry of the products.



7. Which reaction conditions favor an S_N2 reaction more?



8. Depending on how the hydrolysis of 3-bromo-3-methylhexane is conducted a racemic mixture or a solution enriched in one enantiomer results. Explain how this could happen.

