1. The example below was given on the Ch. 9 Problem Set. Given what you now know, what product(s) would you expect to isolate from this reaction?
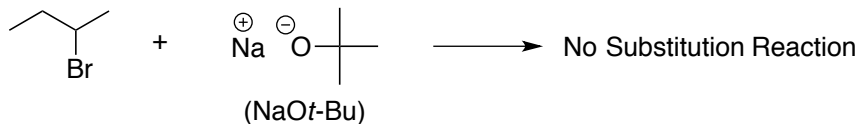
2. Specify how each of the following would affect the rate of an **E2** reaction.
   a. Increase changing the base from $NaOCH_3$ to $NaNH_2$.

   b. Increasing the concentration of base.

   c. Decreasing the concentration of alkyl halide.

   d. Changing the alky halide from 2-bromo-2-ethylpentane to 2-bromopentane.

   e. Changing the alkyl halide from 2-bromopentane to 2-iodopentane.

3. Specify how each of the following would affect the rate of an **E1** reaction.
   a. Changing the base from NaOH to H_2O.

   b. Decreasing the concentration of base.

   c. Changing the solvent from acetone to methanol.

   d. Changing the alky halide from 2-bromo-2-ethylpentane to 2-bromopentane.

4. Predict the product(s) for each of the E2 elimination reactions below. Identify the major product for each.
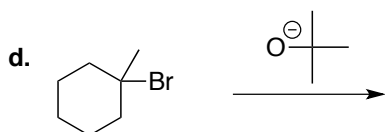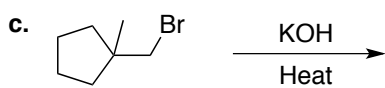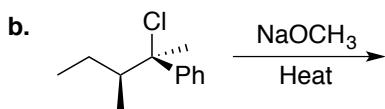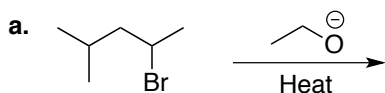
5. Show the complete electron pushing mechanism for the reaction in **question 4 part a**.

6. Predict the product(s) for each of the E1 elimination reactions below. Identify the major product for each.

   a.

   H_2O

   Heat

   b.

 CH_3OH

   Heat

   c.

   CH_3OH

   Heat
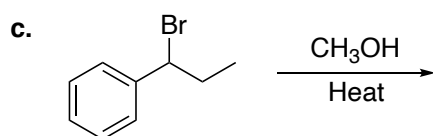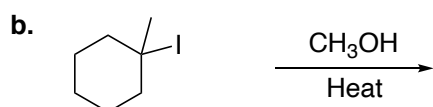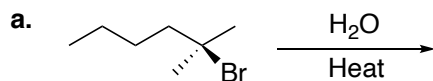
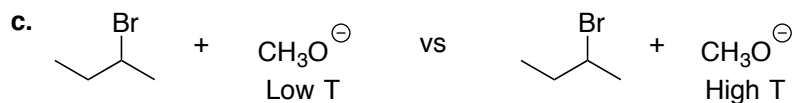7. Show the complete electron pushing mechanism for the reaction in **question 6 part c**.
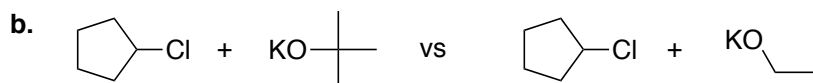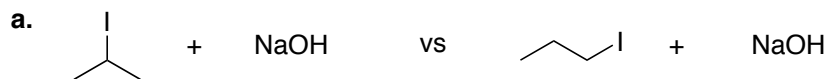
8. For each reaction below, predict the E2 elimination product with correct alkene stereochemistry where appropriate. Also, draw the reactive (anti-periplanar) conformation.

   a.

   NaOEt

   Heat

   b.

   $NaNH_2$
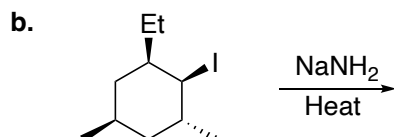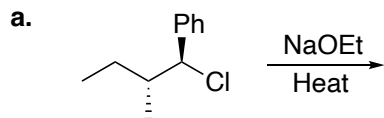
   Heat

9. The compound below can undergo two successive elimination reactions upon heating. Draw the product of the reaction.

   $NaNH_2$

   DMF
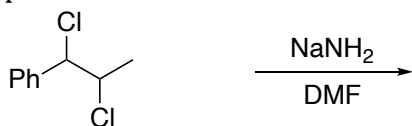
10. Circle the one in each of the following pairs that would be expected to give a higher yield of elimination over substitution.

a.

$+$ NaOH   vs $+$ NaOH

b.

—Cl $+$ KO—|—   vs   —Cl $+$ KO

c.

Br ... $+$ $CH_3O^{\ominus}$ vs   Br ... $+$ $CH_3O^{\ominus}$
Low T   High T

11. **Synthesis:** Propose a synthesis for each of the following starting with 2-bromobutane.
    a. 2-butene

    b. 2-butyne

    c. 2-butanol

    d. butane

12. Rank the following from fastest (1) to slowest (4) E2 elimination.

Br   Br   Br   Br