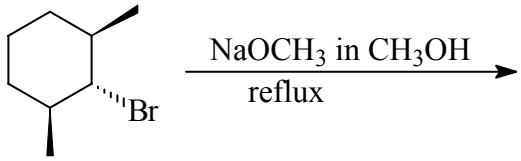
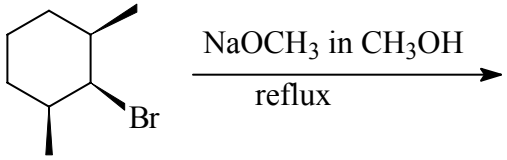
CHEM 241 Problems

1. A CHEM 241 class ran a bimolecular reaction with $NaOCH_3$ where the students had a choice of compound **A** or compound **B** as the substrates (see below). Both reactions afford a major product but **only one proceeds through the expected E2 mechanism**. With well-drawn diagrams of the substrates, identify and explain the different mechanistic pathways and determine the major product for the two reactions.

A



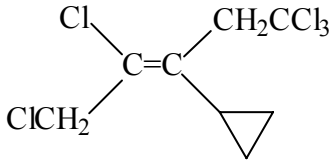
B



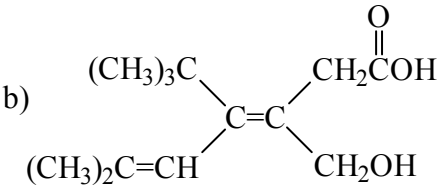
2. Treatment of **(*Z*) 3,4-dimethyl-3-hexene** under catalytic hydrogenation conditions results in the formation of a compound with **two chiral centers**. Draw the *product* in a **Fisher projection and determine the absolute configuration of both chiral centers**. Is the compound optically active? Explain how you know with your well-drawn pictures and well-chosen words.

3. **Assign** *E* or *Z* to the following alkenes. **Label** the higher priority substituents with an "H" and the lower priority groups with an "L".

a)



b)



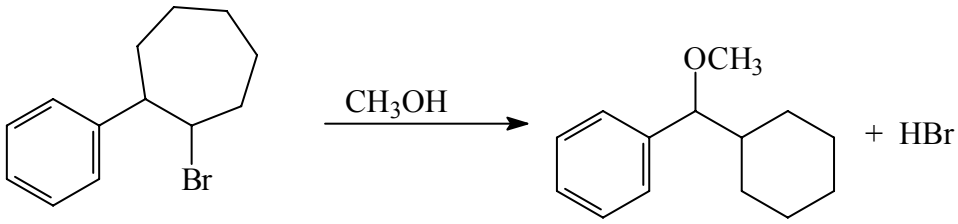
4. Determine the number of sites or elements of unsaturation in the following formulas:

a) $C_7H_{10}Cl_2O_2$ b) $C_{11}H_{12}N_2O$ c) C_3Br_8

5. Draw a **Fischer projection** of one compound with *all* four of the following criteria: 1) formula of $C_6H_{10}Cl_2$, 2) one primary and one secondary alkyl halide, 3) no rings, and 4) has 2 chiral centers with (R),(R) configuration.

6. Propose polar mechanisms for the following reactions. Use only the reagents provided or formed during the reaction. Use arrows to indicate electron flow and show *all* intermediates (other products are formed in these reactions).

a)



b)