

Given: $C_8H_{16}O$.

- I. Draw the most stable conformation of a chiral cyclohexanol (C) whose alcohol group is tertiary.
- II. Draw an alkene (A) and an alkyl halide (B) that could give (C) as the major reaction product. Provide the reactions conditions for how to do A-to-C and B-to-C, as well as the mechanisms.
- III. Draw the product from reacting C using the following sequence: (1) sodium hydride, (2) propargyl iodide (3-iodo-1-propyne), (3) hydrogenation using a poisoned catalyst, and (4) hydroboration-oxidation.
- IV. Draw the product from reacting C using the same sequence as in part III, but minus the hydrogenation step.
- V. Draw the product from reacting C using the same sequence as in part III but replaces the hydroboration-oxidation step with an ozonolysis step that includes the oxidative workup.