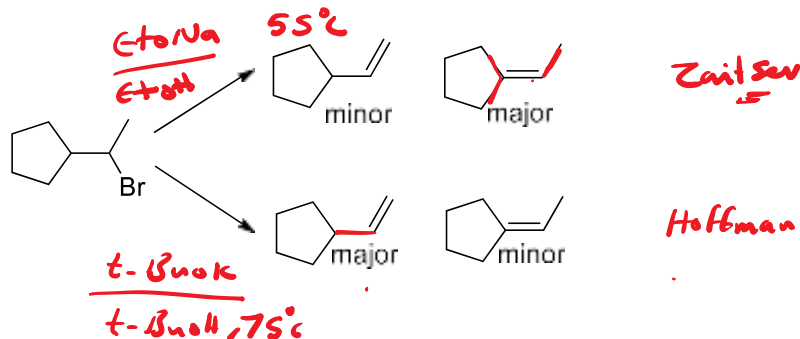
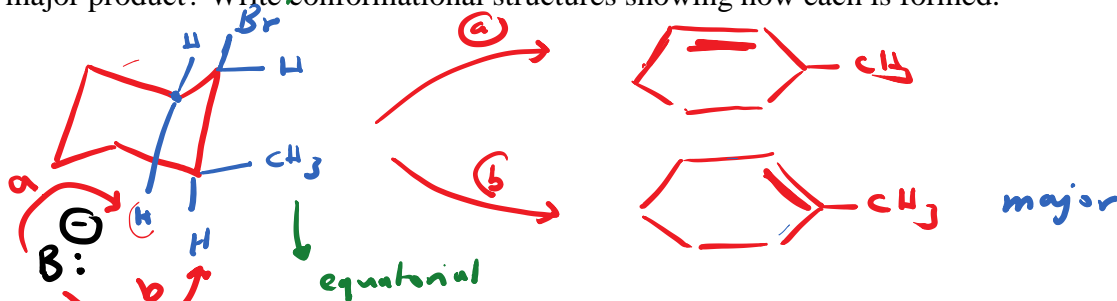


PROBLEM SET 2

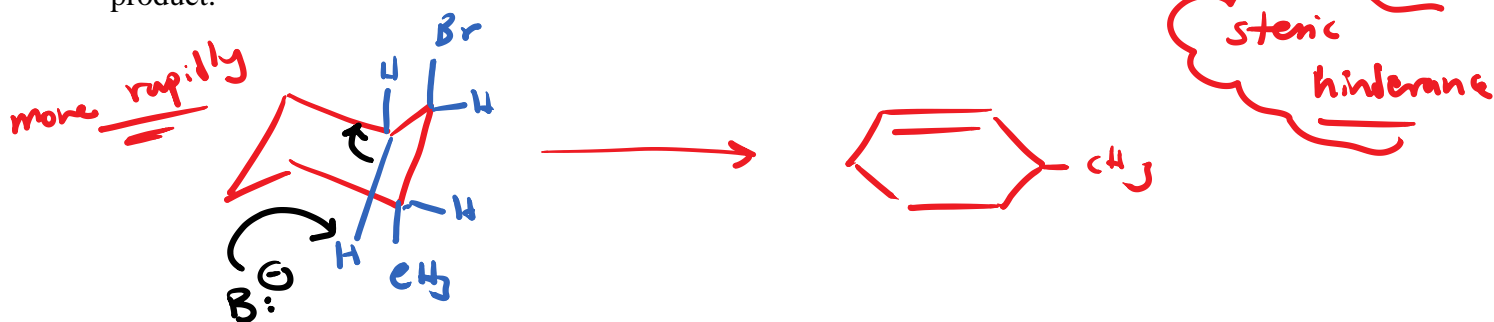
1. Write the appropriate reagents to obtain the following products:



2. A) When *cis*-1-bromo-2-methylcyclohexane undergoes an E2 reaction, two products (cycloalkenes) are formed. What are these two cycloalkenes, and which would you expect to be the major product? Write conformational structures showing how each is formed.

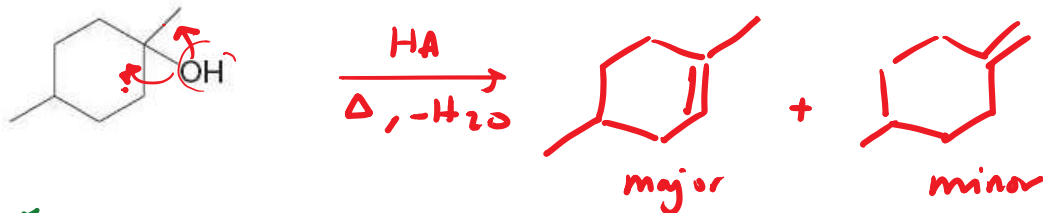
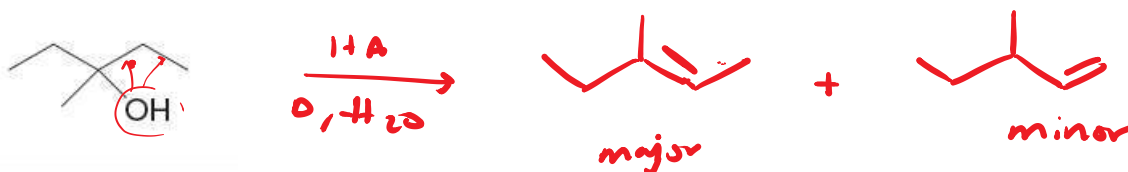
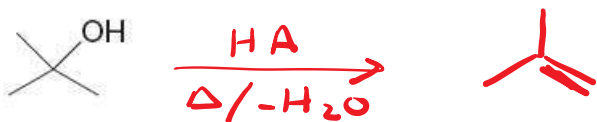


B) When *trans*-1-bromo-2-methylcyclohexane reacts in an E2 reaction, only one cycloalkene is formed. What is this product? Write conformational structures showing why it is the only product.

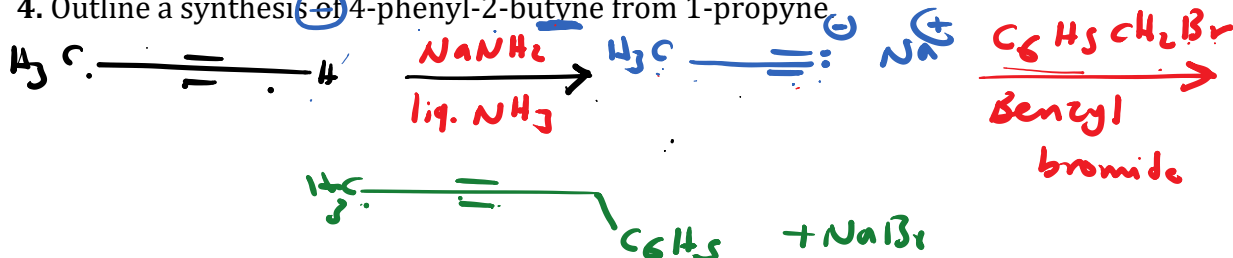


C. Would you expect *cis*-1-bromo-2-methylcyclohexane or *trans*-1-bromo-2-methylcyclohexane to react more slowly? Explain.

3. Give the products that would be formed when each of the following alcohols is subjected to acid-catalyzed dehydration. If more than one product would be formed, designate the alkene that would be the major product.



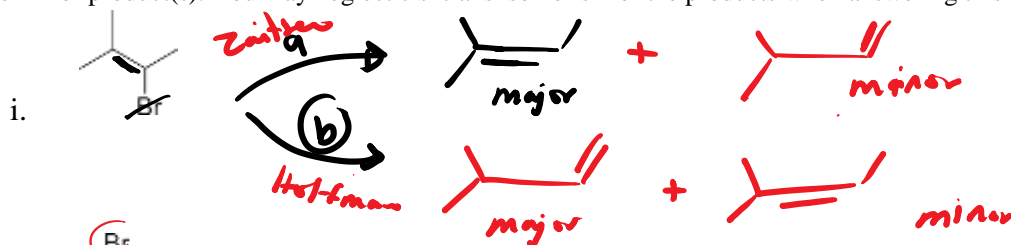
4. Outline a synthesis of 4-phenyl-2-butyne from 1-propyne.

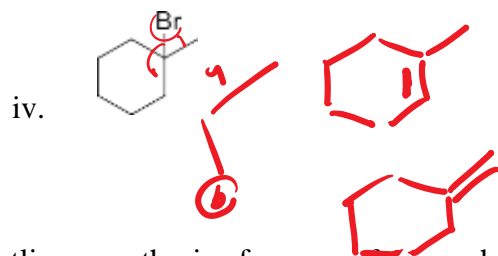
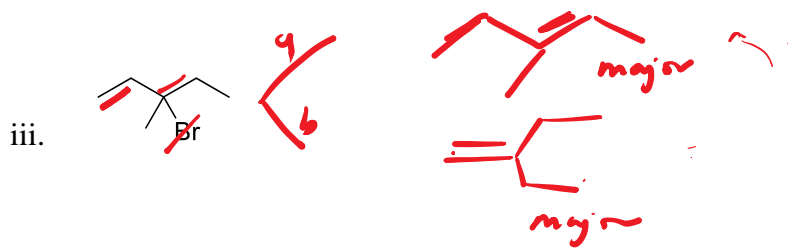


5. Write structural formulas for all the products that would be obtained when each of the following alkyl halides is heated with a. sodium ethoxide in ethanol b. potassium *tert*-butoxide in *tert*-butyl alcohol.

Zaitsev ← EtONa t-BuOK → Hoffmann

When more than one product results, you should indicate which would be the major product and which would be the minor product(s). You may neglect cis-trans isomerism of the products when answering this question.





6. Outline a synthesis of propene from each of the following:

- i. Propyl chloride
- ii. Isopropyl chloride
- iii. Propyl alcohol
- iv. Isopropyl alcohol

