

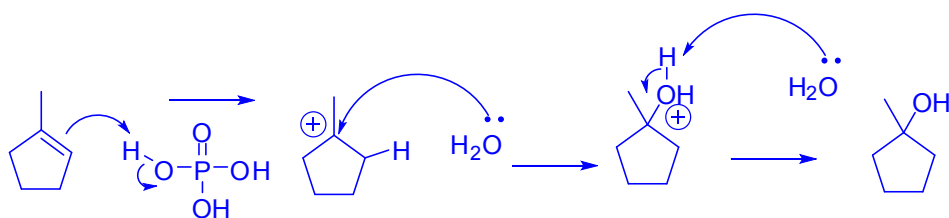
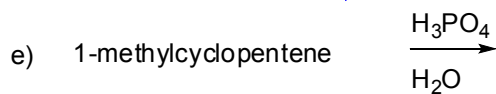
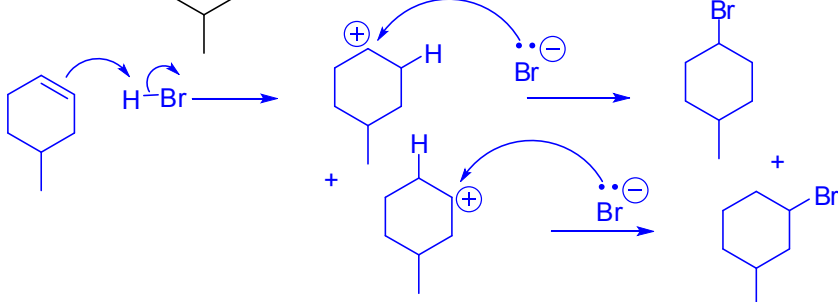
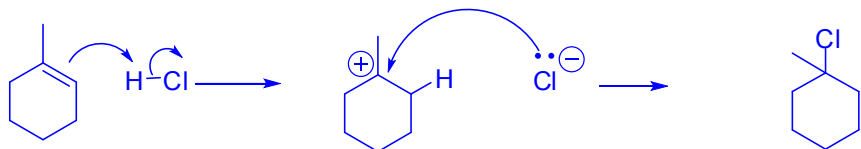
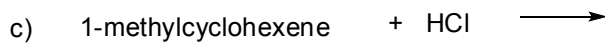
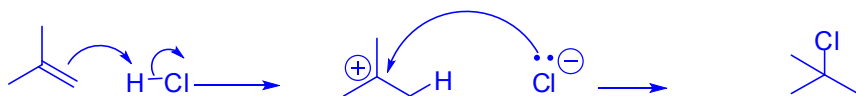
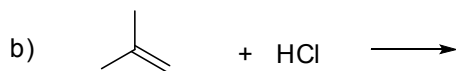
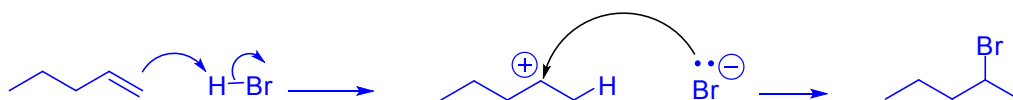
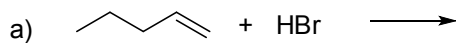
CHM 1321  
Problem set 8 – ANSWERS

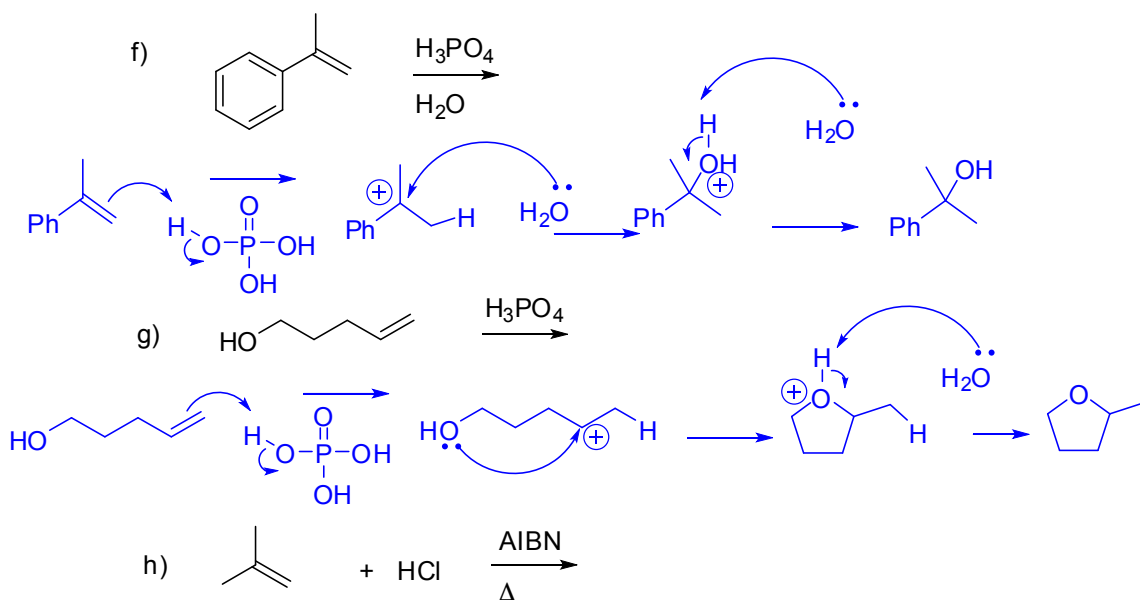
In this Problem set:

- Alkene addition reactions
- Synthesis

1. Predict the major product(s) of the following reactions and give a mechanism to account for its formation.

For radical reactions, chain termination steps are not shown

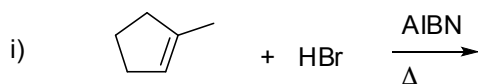
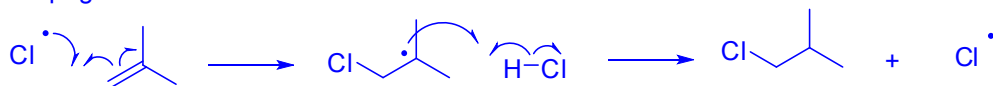




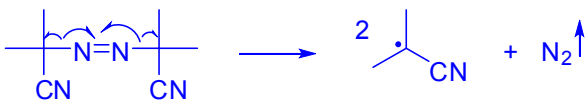
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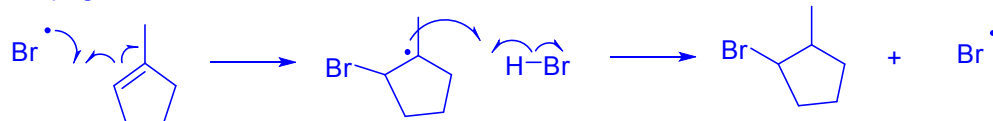
Propagation



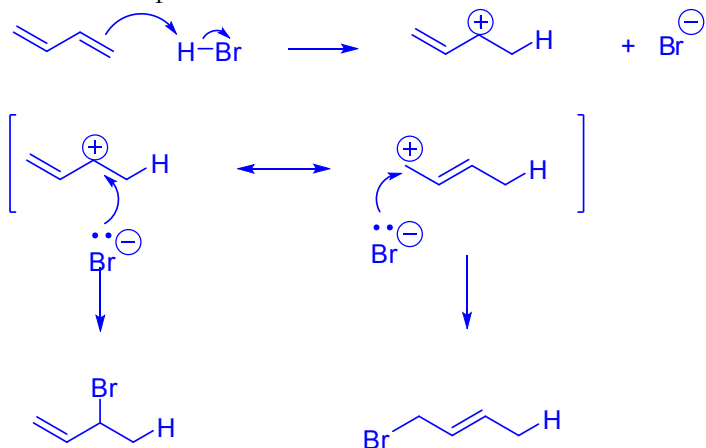
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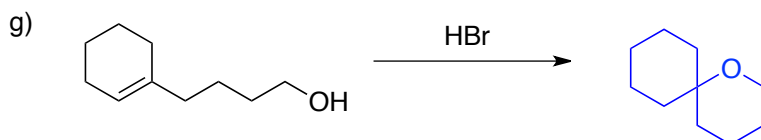
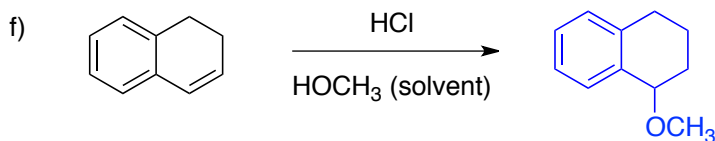
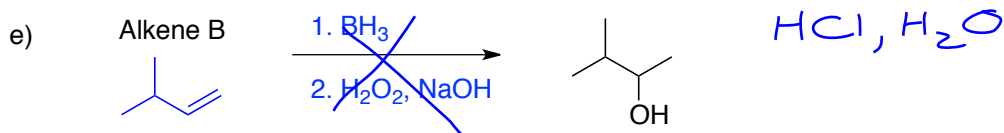
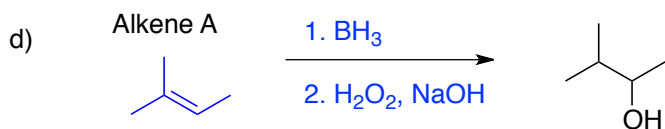
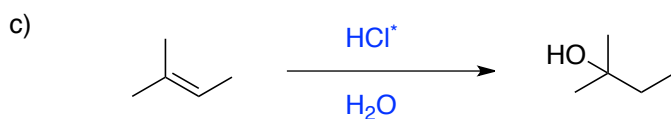
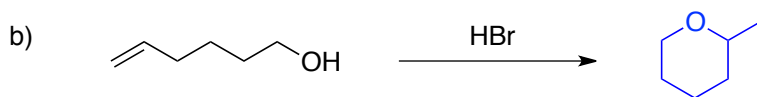
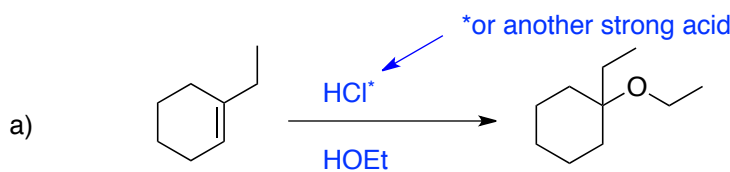
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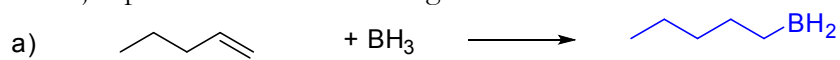
2. When 1, 3-butadiene reacts with HBr, a mixture of 3-bromo-1-butene and 1-bromo-2-butene is obtained. Propose a mechanism to account for this observation.



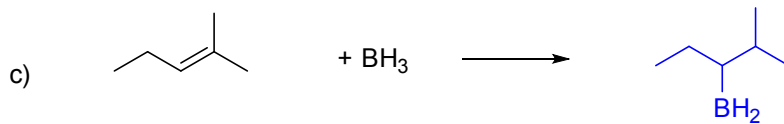
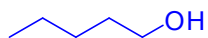
3. Supply the missing starting material, reagent(s), or products, as appropriate:



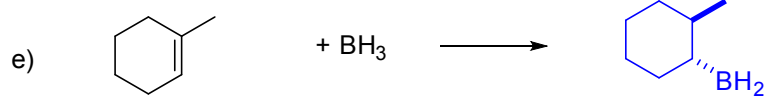
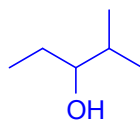
4. Predict the major products of the following transformations:



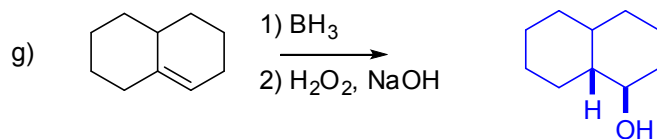
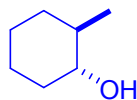
b) product from part (a) after treatment with H<sub>2</sub>O<sub>2</sub> and NaOH



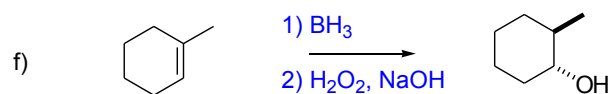
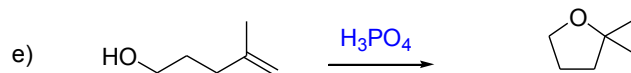
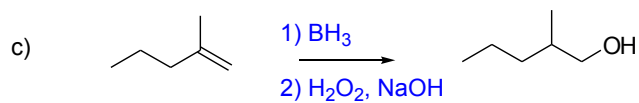
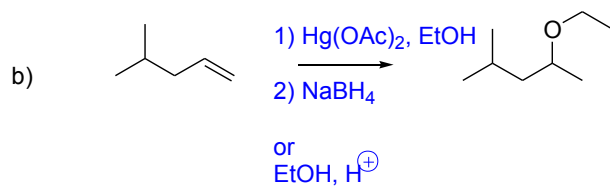
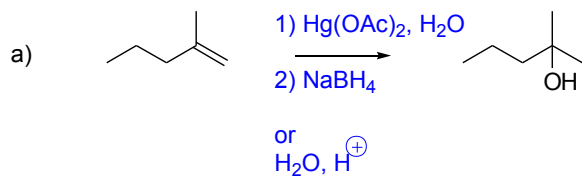
d) product from part (c) after treatment with H<sub>2</sub>O<sub>2</sub> and NaOH



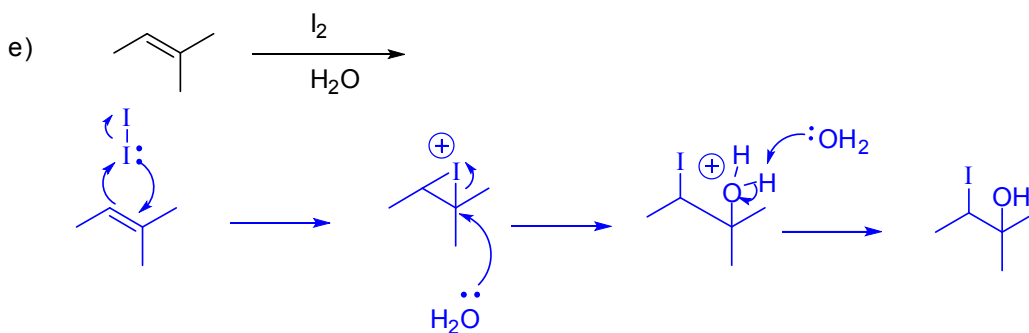
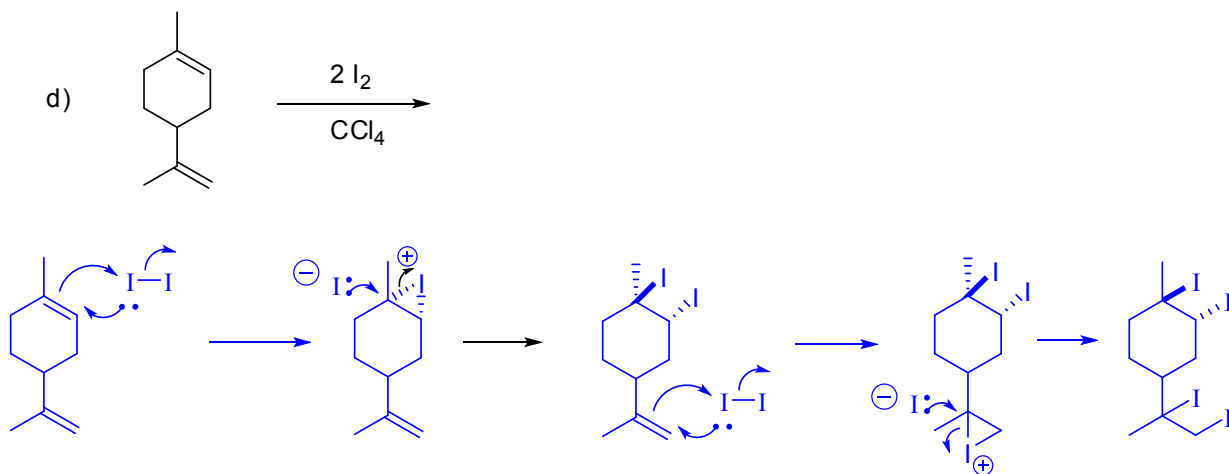
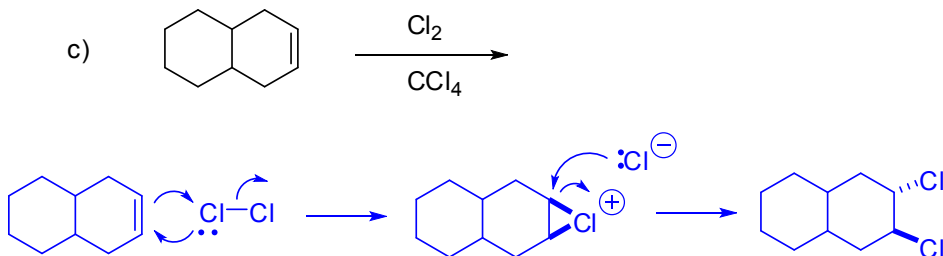
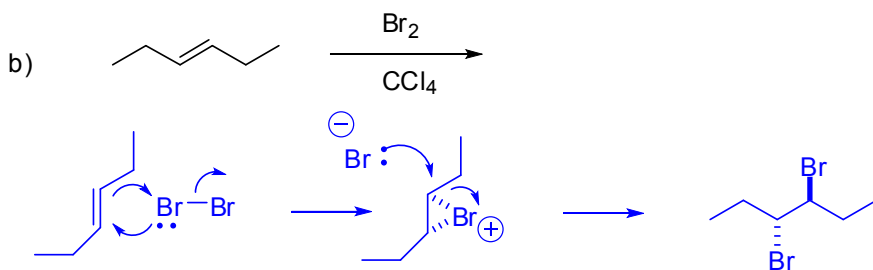
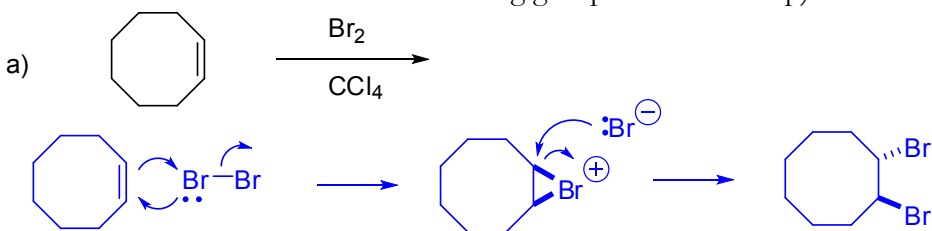
f) product from part (e) after treatment with H<sub>2</sub>O<sub>2</sub> and NaOH

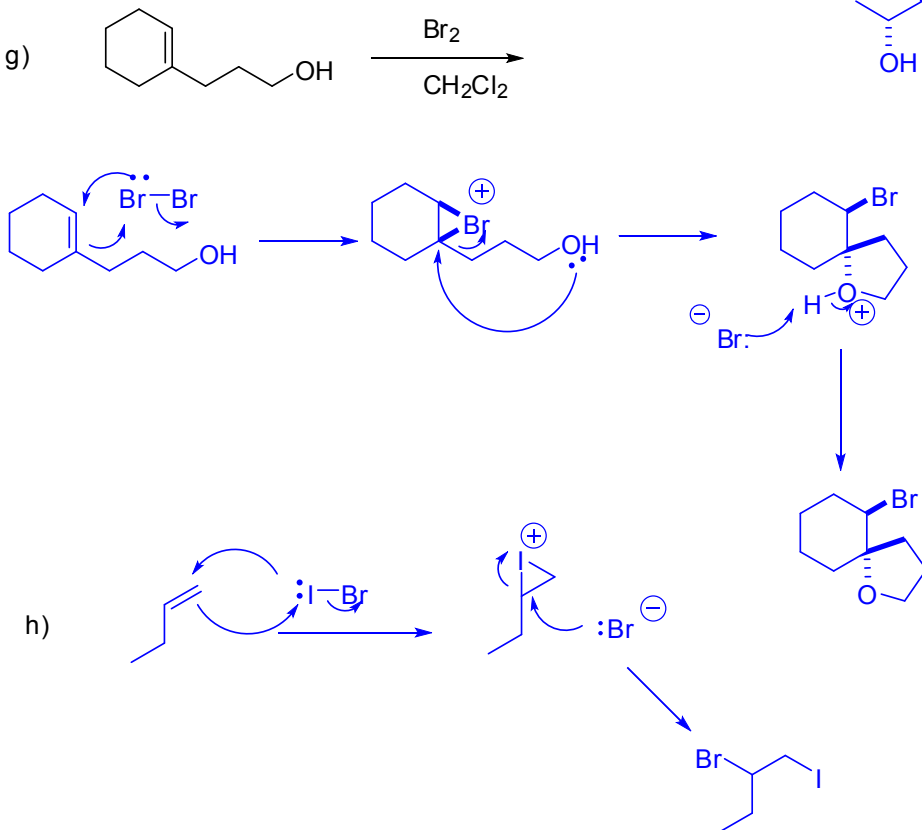
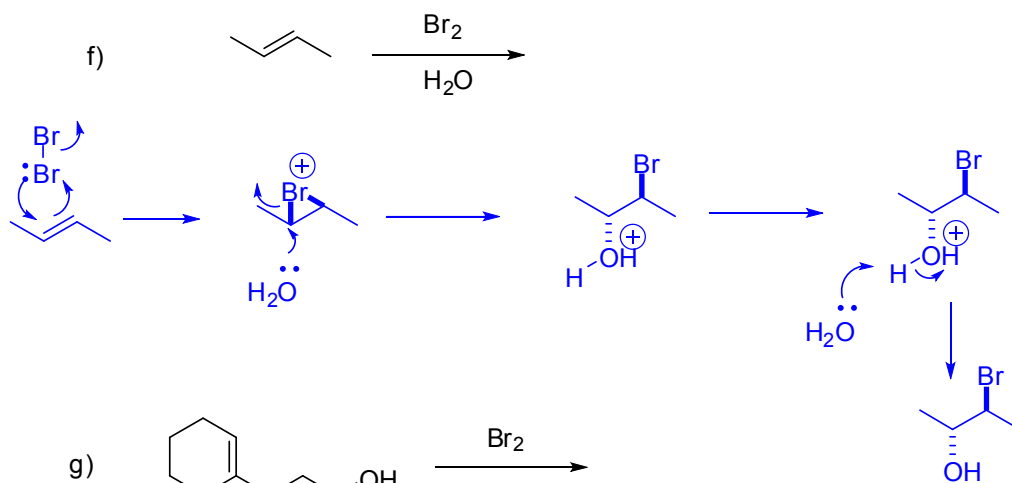


5. Show how you could effect the following transformations. Include stereochemistry where appropriate:

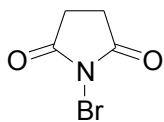


6. Predict the major products of the following reactions and give mechanisms to show how they are formed. Include stereochemistry where appropriate. (in part h, the electronegativity of the atoms will control which atom is the leaving group in the first step)

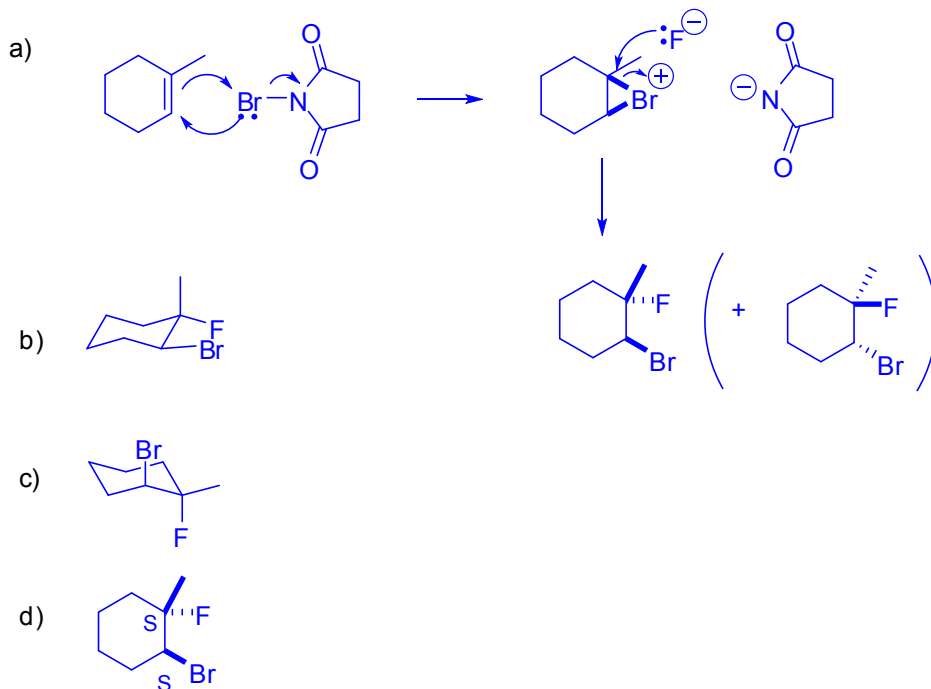




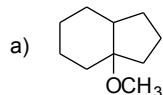
7. N-Bromosuccinimide (shown below) is a source of electrophilic bromine ( $\text{Br}^+$ ). When 1-methylcyclohexene reacts with N-Bromosuccinimide in the presence of fluoride ions, an addition reaction occurs to give a new product  $\text{C}_7\text{H}_{12}\text{BrF}$ .



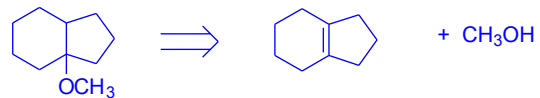
- Draw a mechanism for the reaction and predict the regiochemistry of the addition.
- Draw one of the enantiomers of the product in the chair conformation.
- Draw the same enantiomer in the other possible chair conformation.
- What are the configurations of the stereocentres in the product shown in parts b and c?



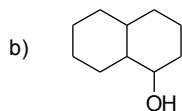
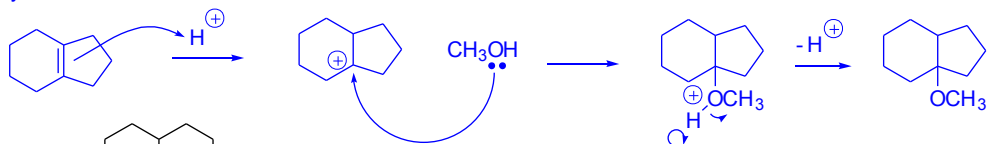
8. Propose a synthesis of each of the following starting with an alkene of your choice. A retrosynthesis must be included.



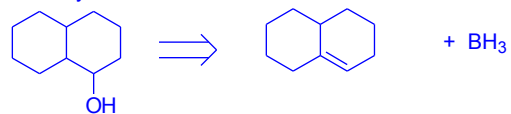
Retrosynthesis



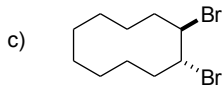
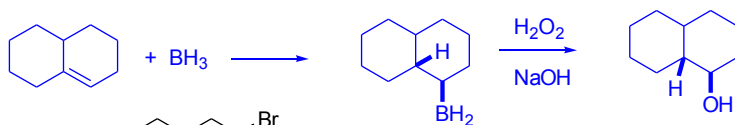
Synthesis



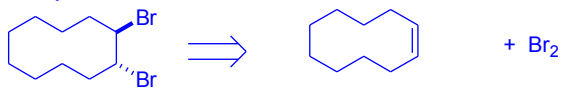
Retrosynthesis



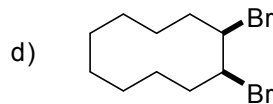
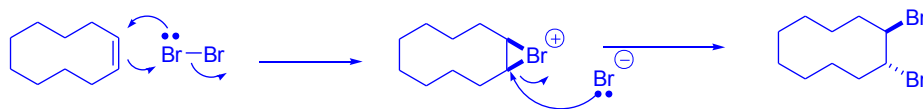
Synthesis



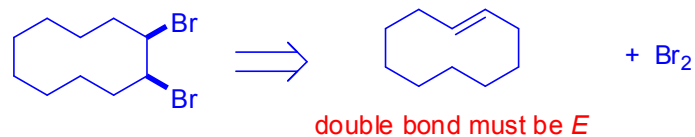
Retrosynthesis



Synthesis



Retrosynthesis



Synthesis

