Greenberg Final Pilot Review

12/11/2025

Things You Should Know!

- Exam 1:
  - MO Theory
  - VB Theory
  - Acid/Base
  - Representations of structures
  - Stereochemistry
- Exam 2:
  - Aromaticity
  - Alkene reactions
  - Alkyne reactions
  - Substitution reactions
  - Elimination reactions
- Exam 2 (cont.):
  - Reaction coordinate diagrams
  - Reaction mechanisms
- Post Exam 2 Content:
  - Other types of reactions
  - Spectroscopic methods
  - UV-vis
  - Mass spec.
  - IR
  - H/C NMR

This is NOT content review!

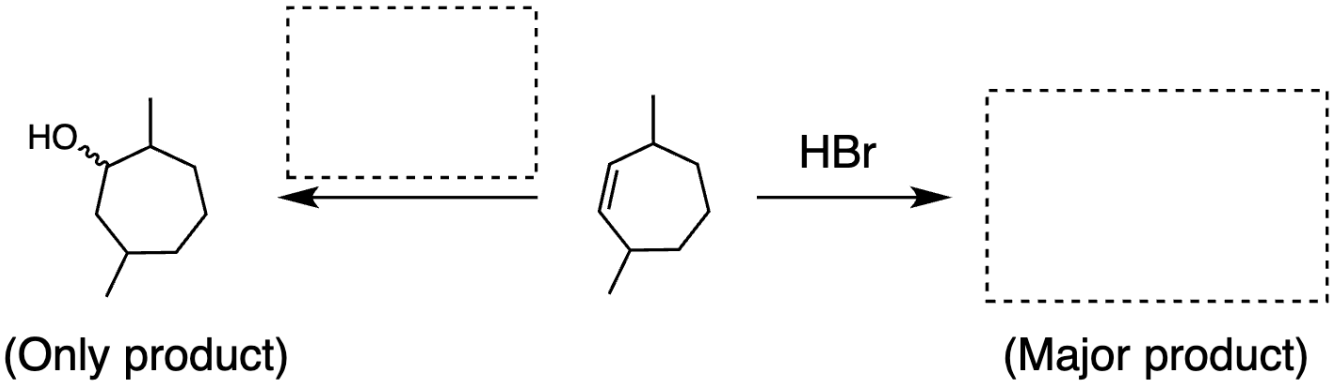
- For content review:
  - OCI: https://bit.ly/ocijhu
  - PILOT: https://jhu-orgo-pilot.github.io/FA25-Orgo-Greenberg/index.html
    - Go to resources
  - Textbook!
  - Your notes!

Almost all problems are pulled or adapted from Professor Tovar.

Tips for Reaction Questions

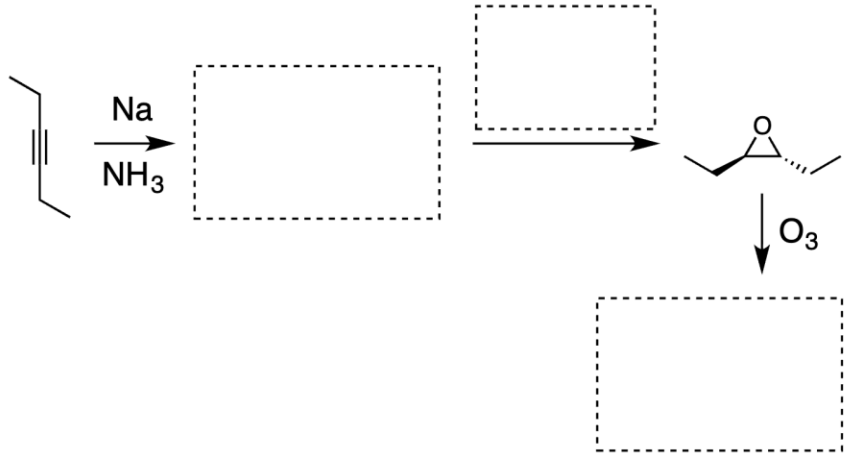
- For every reaction, you should know AT LEAST:
  - What is the product?
  - What are the intermediates?
  - What is the stereochemistry of the products?
  - What is the mechanism (not for all reactions but many)
  - What are the reagents?
  - Know conditions for each reaction (eg. SN1 vs SN2)
  - If I ask: How to turn X into Y? You should be able to tell me

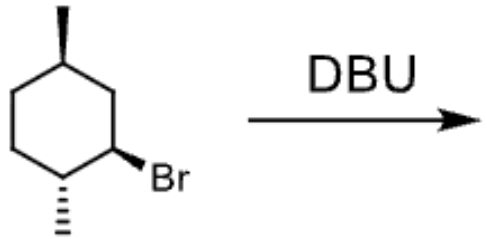
Reaction Practice 1

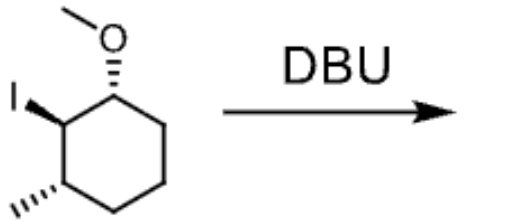


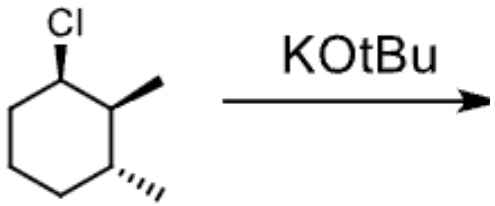
(Only product)

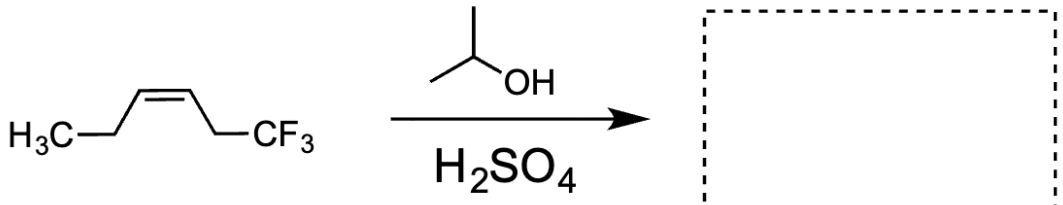
(Major product)





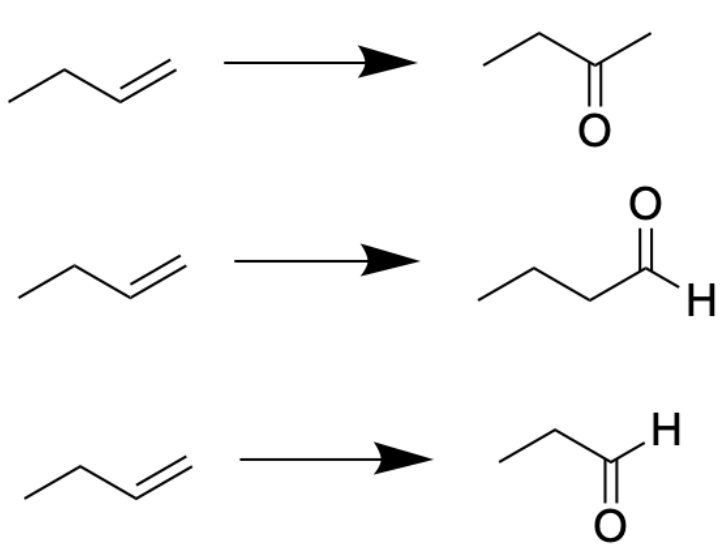


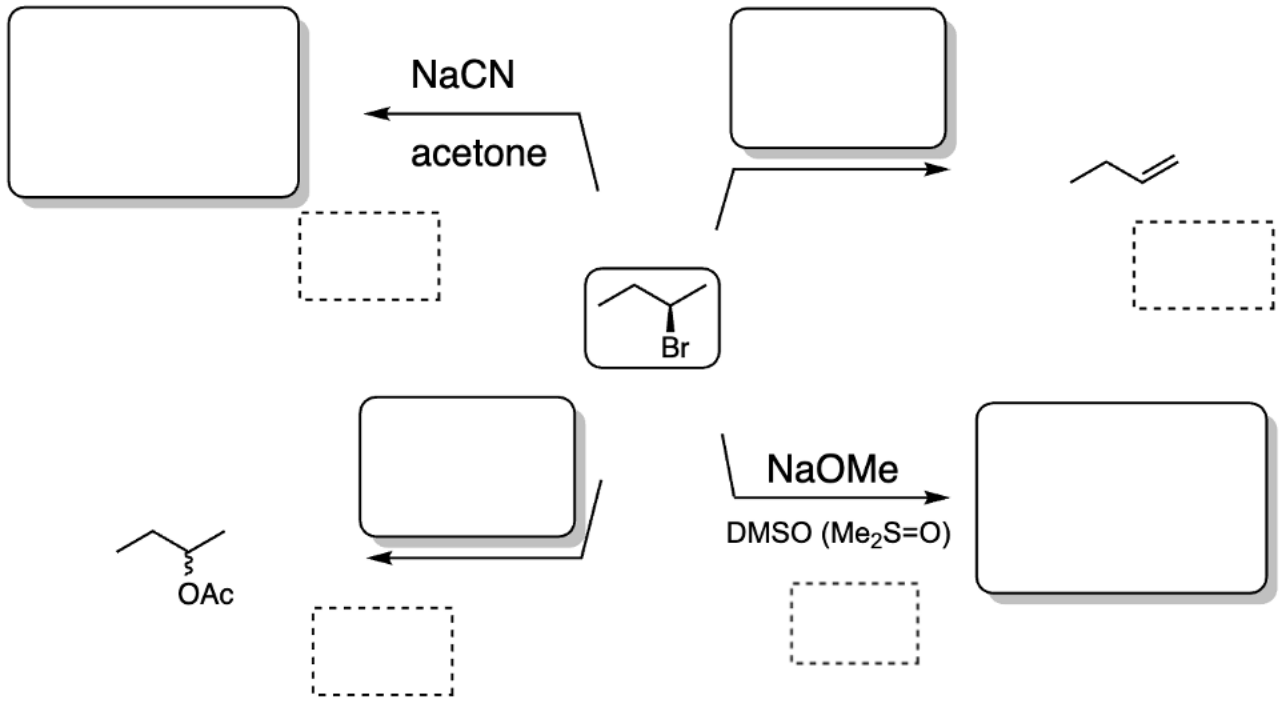


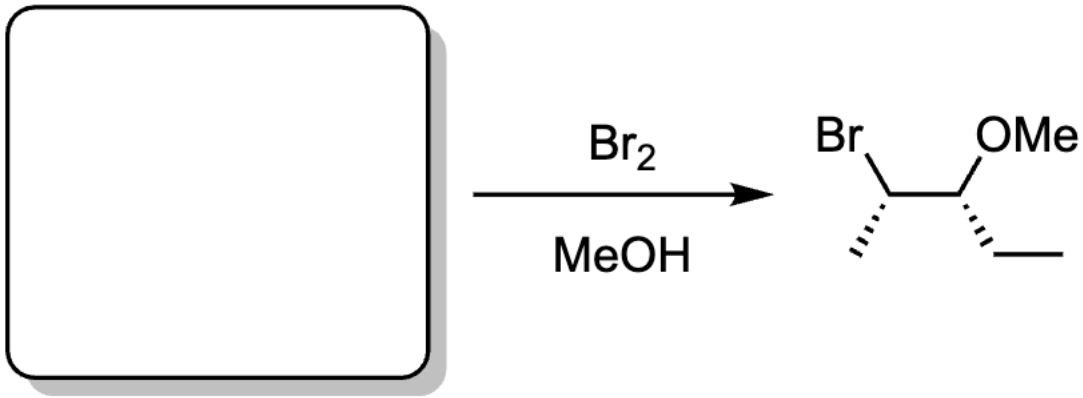


(Major product)

Reaction Practice 2

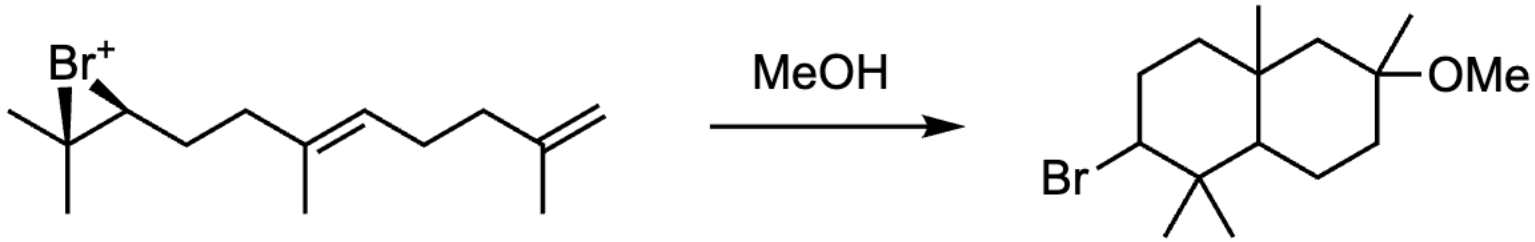






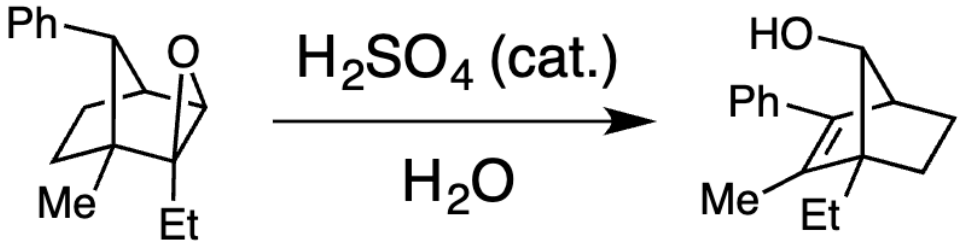
Reactions Practice 3

- Propose a mechanism for the following terpene rearrangement.



Reactions Practice 4

- Propose another mechanism.

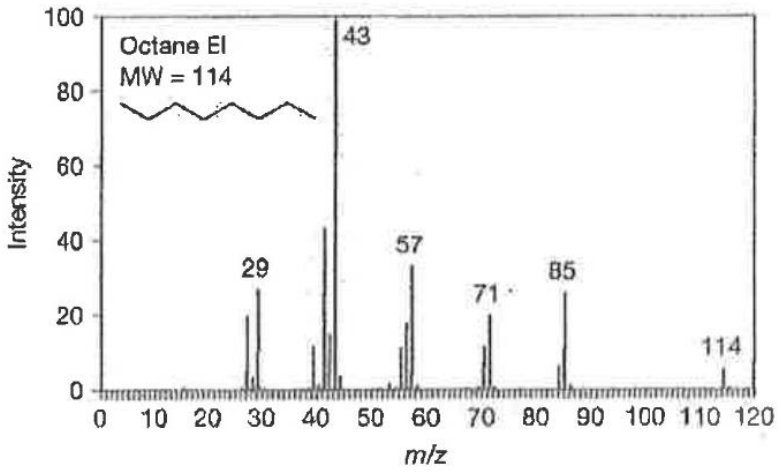


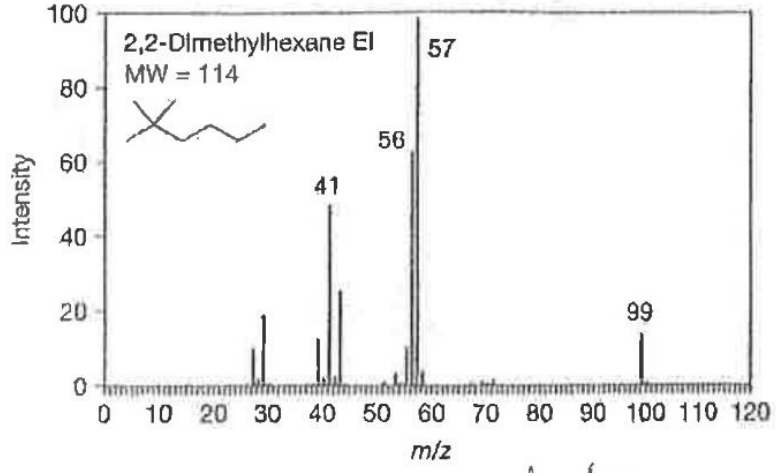
Tips for Structure Determination

- Calculate degrees of unsaturation
- Draw fragments of the molecule
- Use every spectrum. Sometimes just one is not enough
- Put molecule together based on spectral information

Mass Spectroscopy

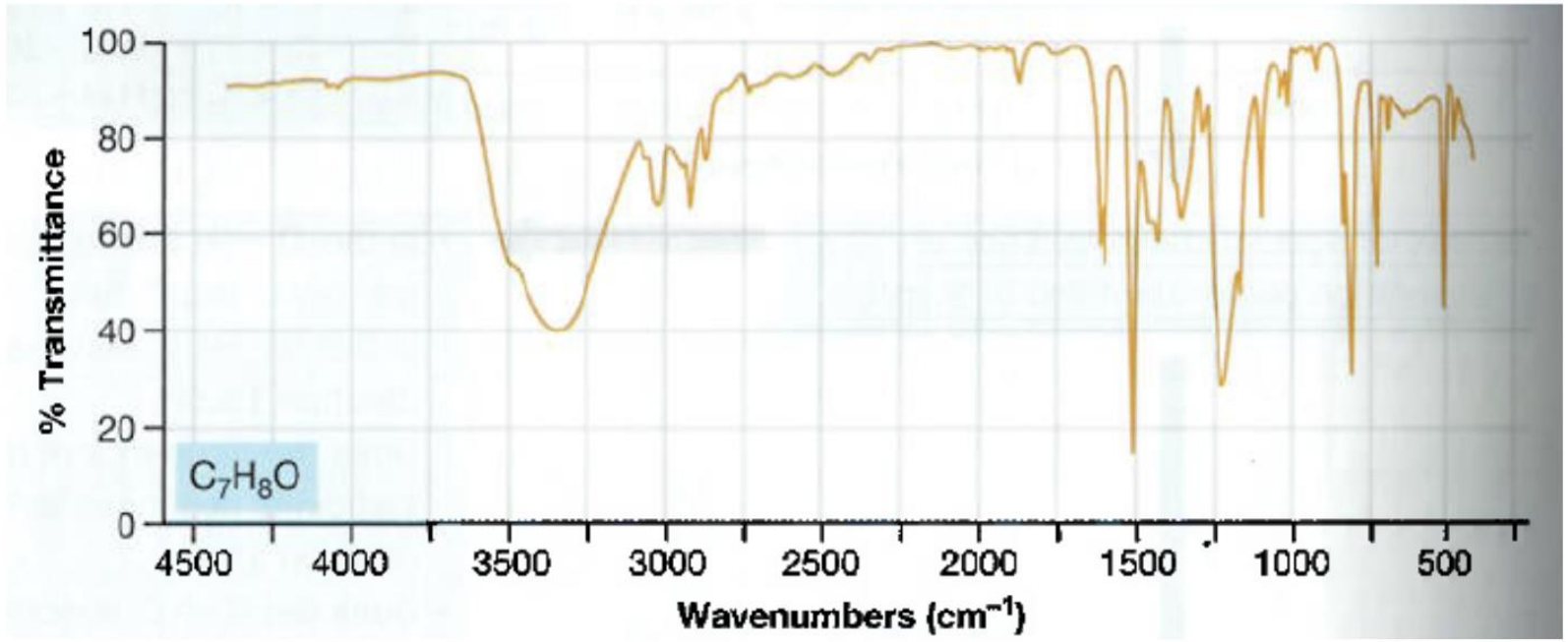
- Draw two possible fragments for the m/z 57 peak for 2,2-dimethylhexane. Then explain why the m/z 57 peak is smaller for octane.





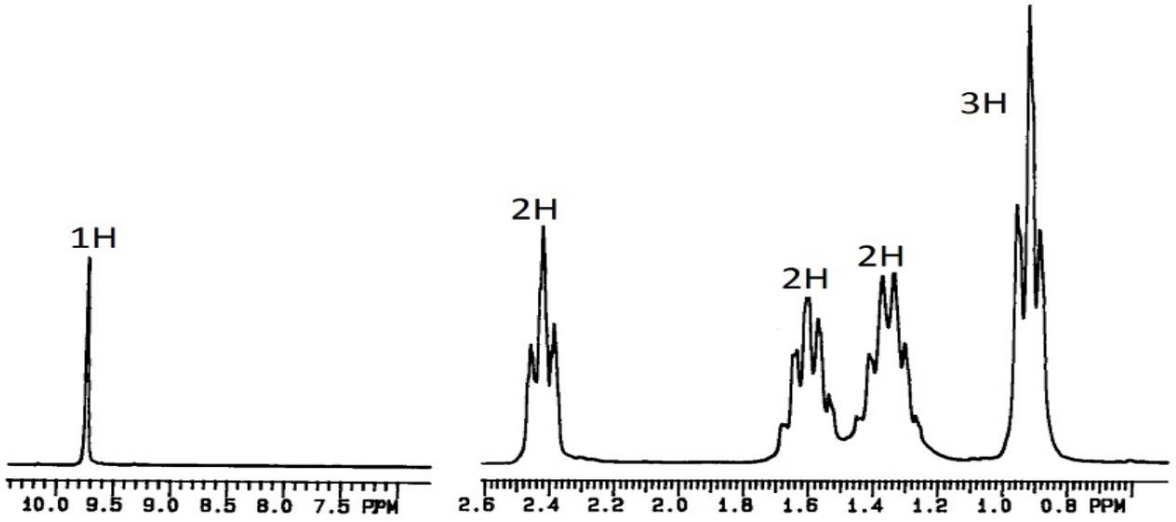
IR Spectroscopy

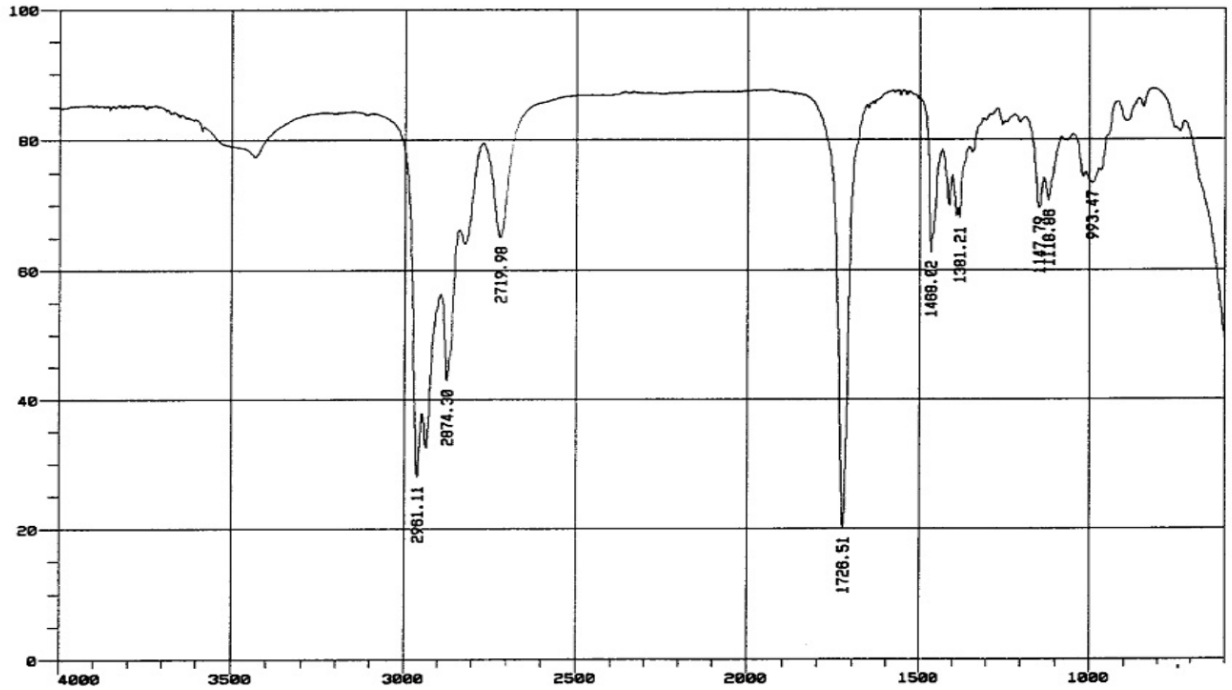
- Propose a structure for the following molecule.



Structure Practice 1

- $C_5H_{10}O$

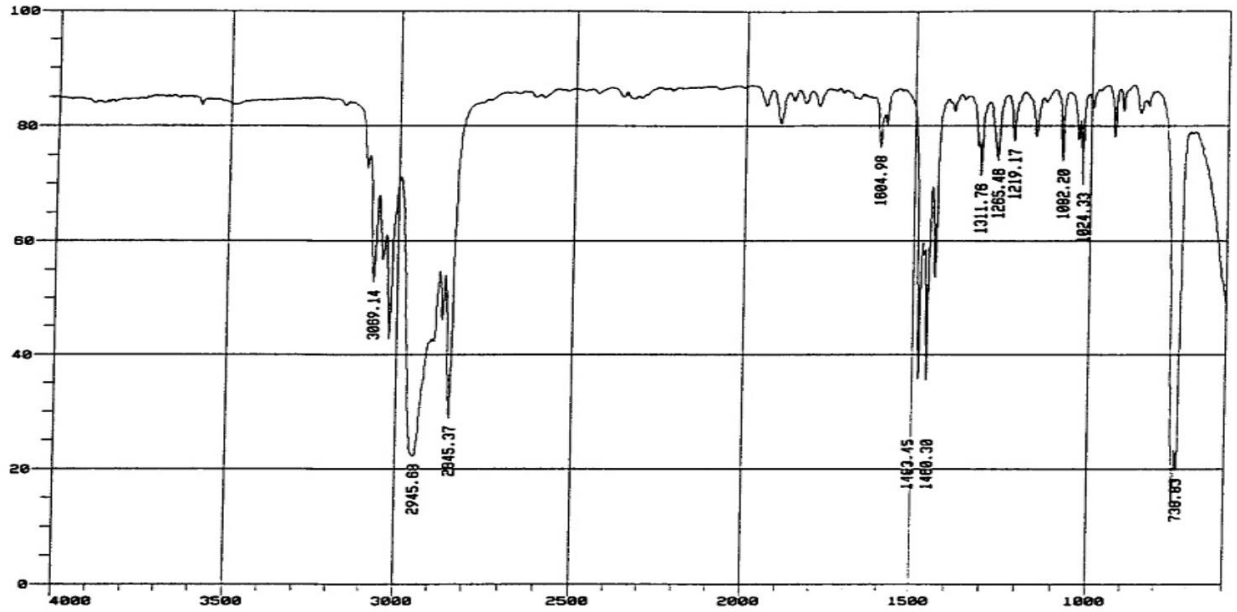


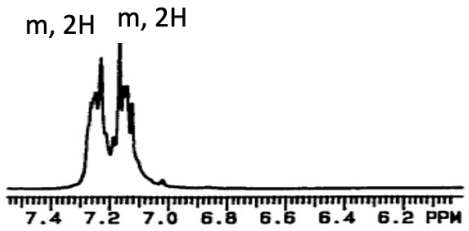


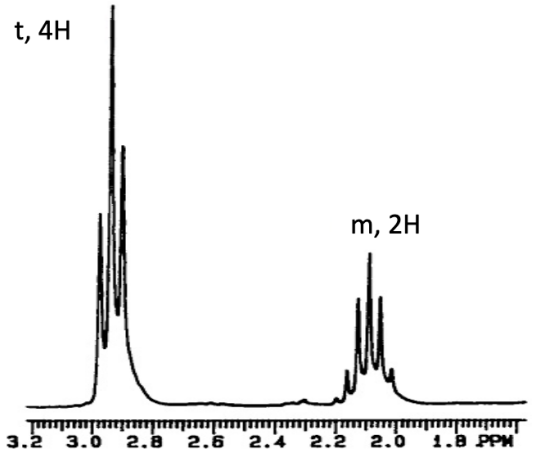
Structure Practice 1 Scratch Work

Structure Practice 2

- C_9H_{10}



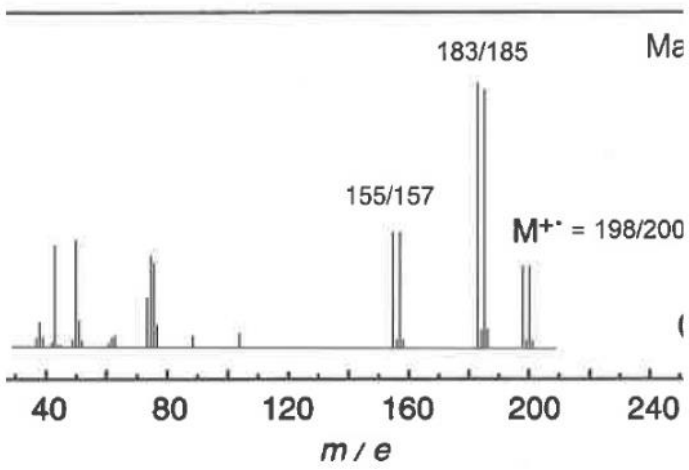


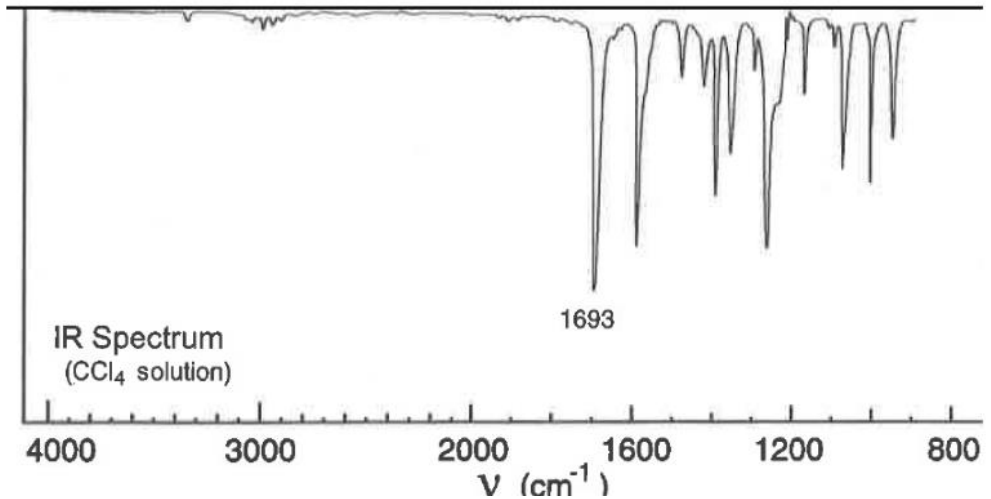


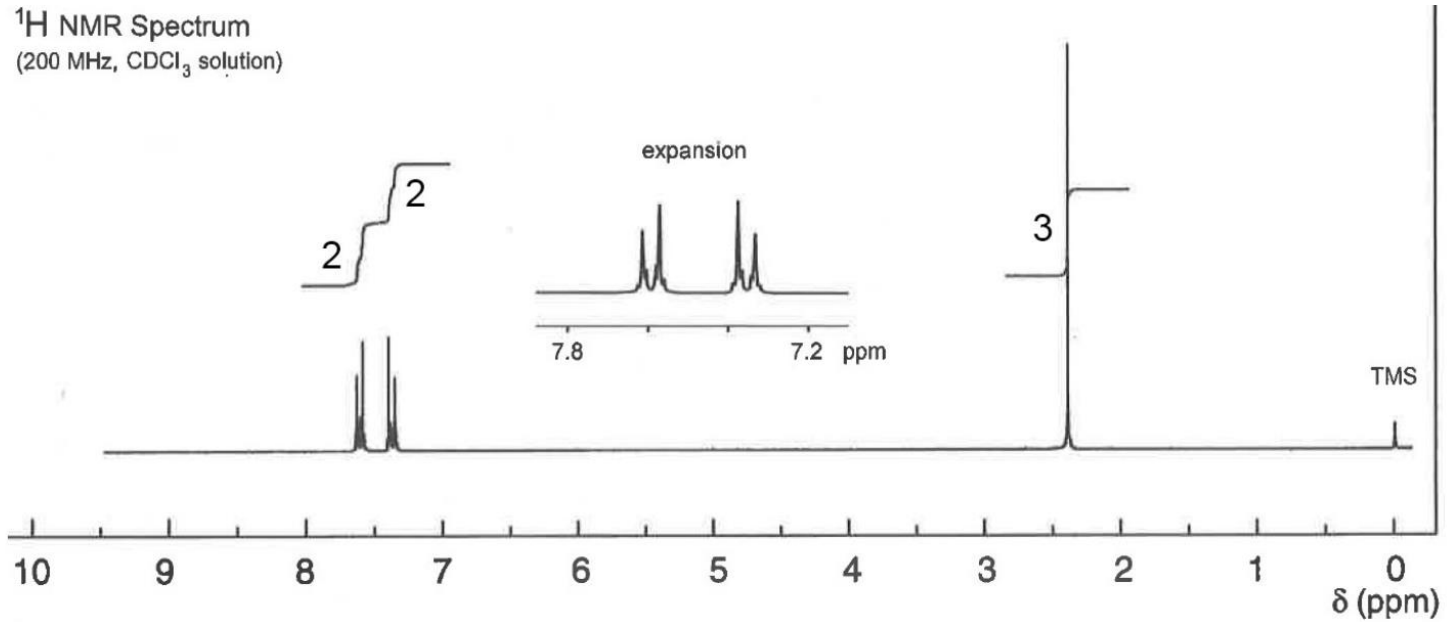
Structure Practice 2 Scratch Work

Structure Practice 3

- C_8H_7OBr







Structure Practice 3 Scratch Work

Good luck on your final!