

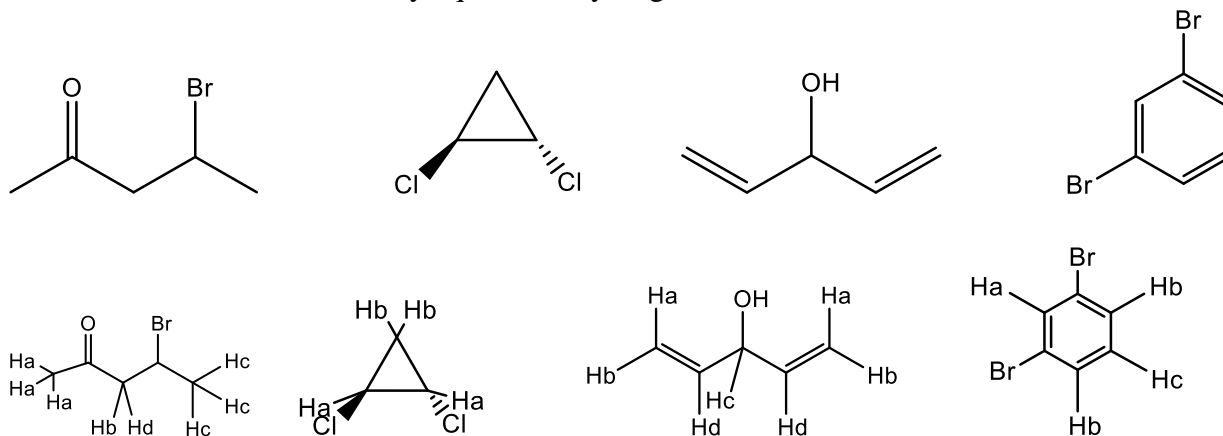
PILOT Learning
Organic Chemistry I – Townsend
Problem Set 11
Fall 2018

1. What causes shielding? In electron-rich environments, how would the frequency change? (To which side of the graph is this?)

Electron clouds partly shield nuclei from the applied magnetic field

Electron rich \rightarrow smaller effective magnetic field \rightarrow lower frequency = left

2. Draw and label the chemically equivalent hydrogens.



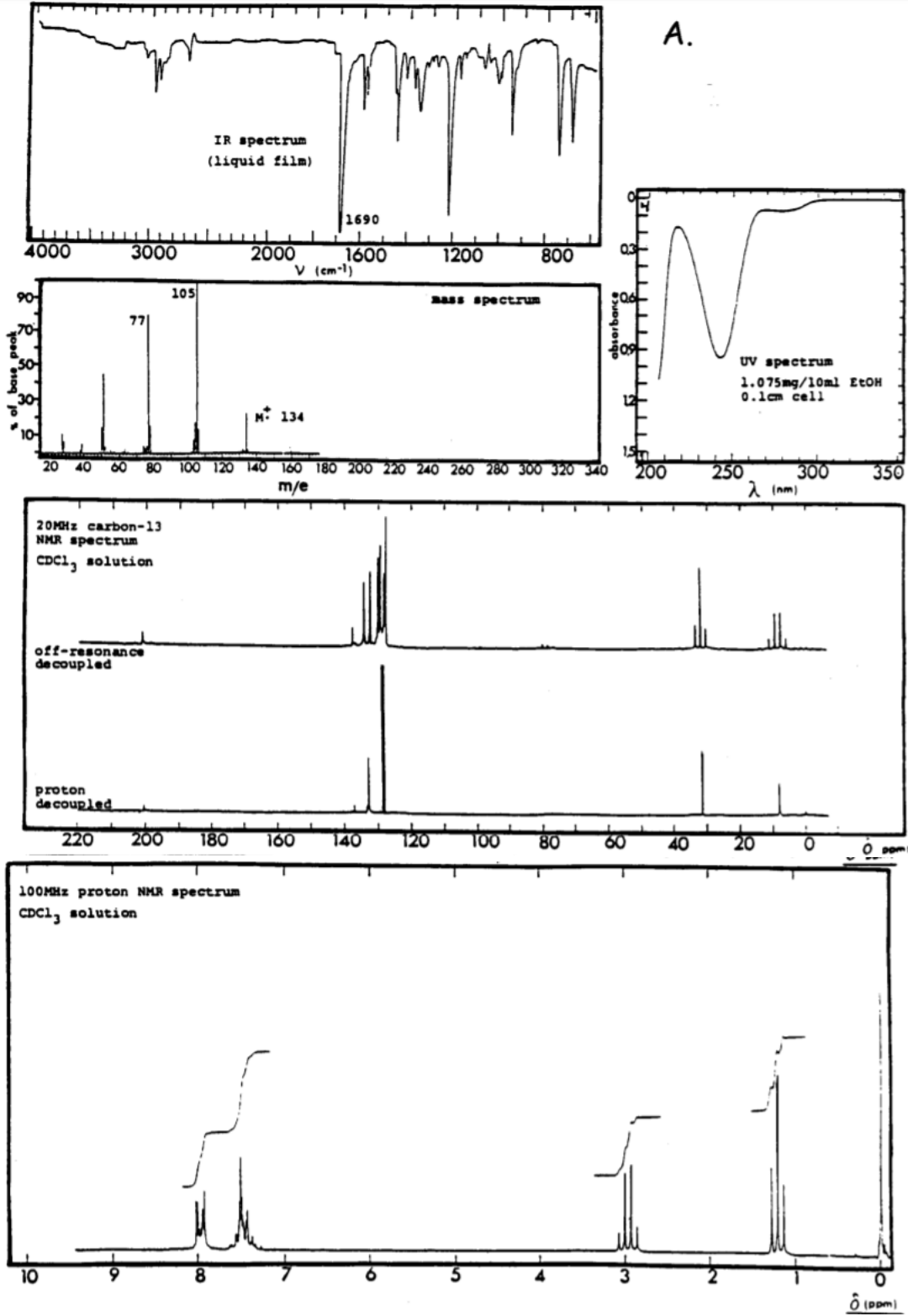
3. What causes splitting? How can you predict the pattern of splitting?

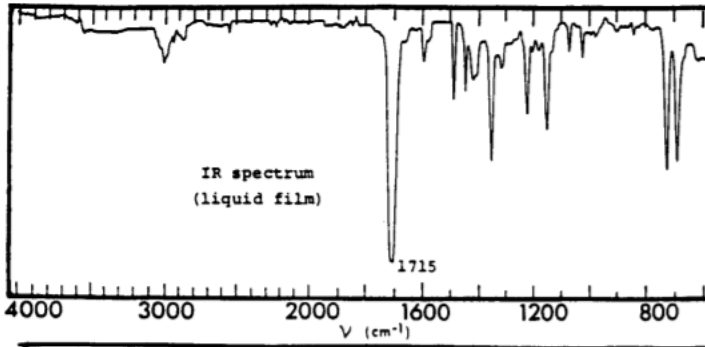
By protons bonded to same or adjacent carbons – b/c different kinds of H+ close enough to influence magnetic fields = spin-spin coupling

Pattern is N+1 (if split by more than 1C's Hs, do NxN)

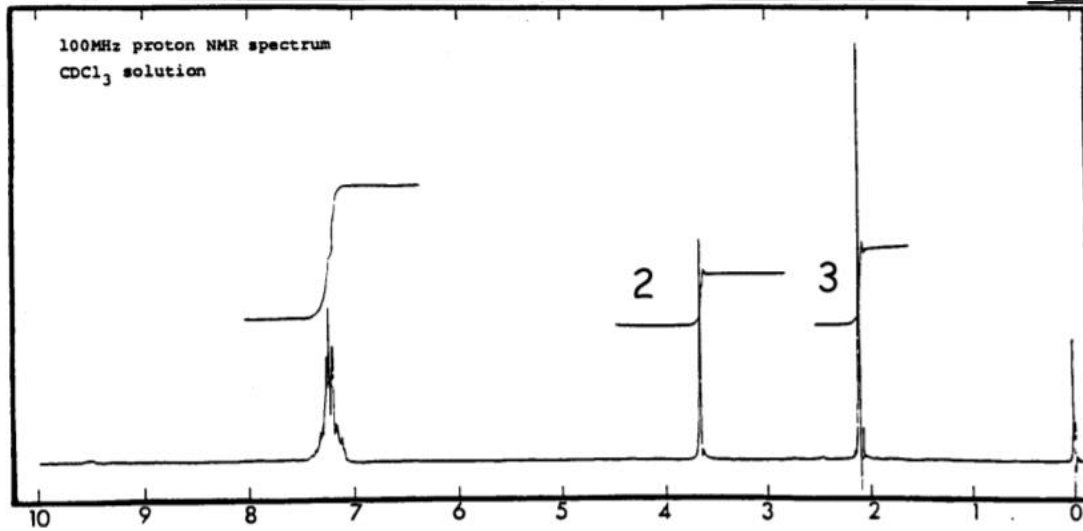
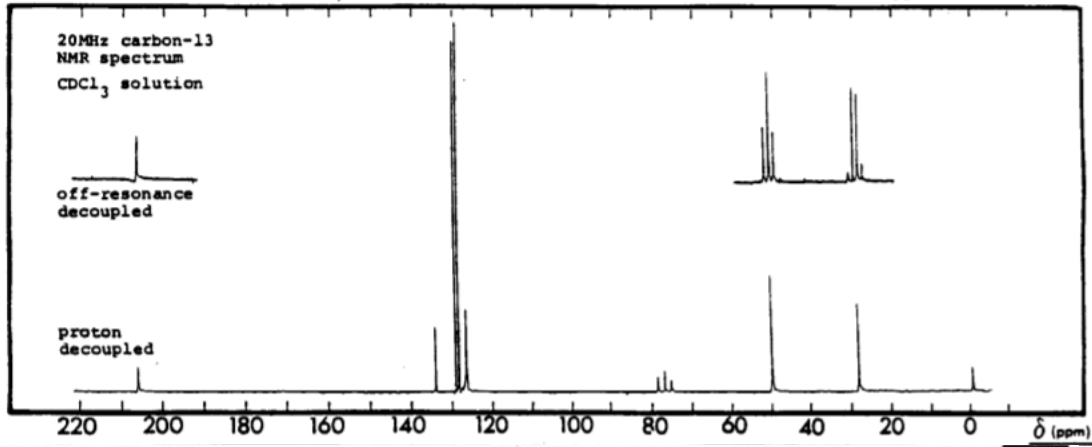
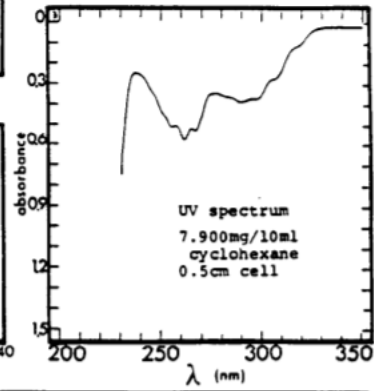
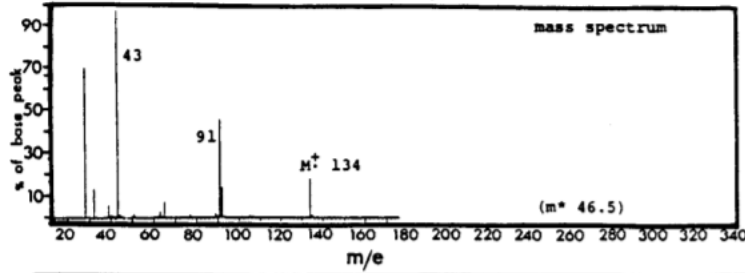
4. Predict the structure of the molecules based on the following spectra.

A.

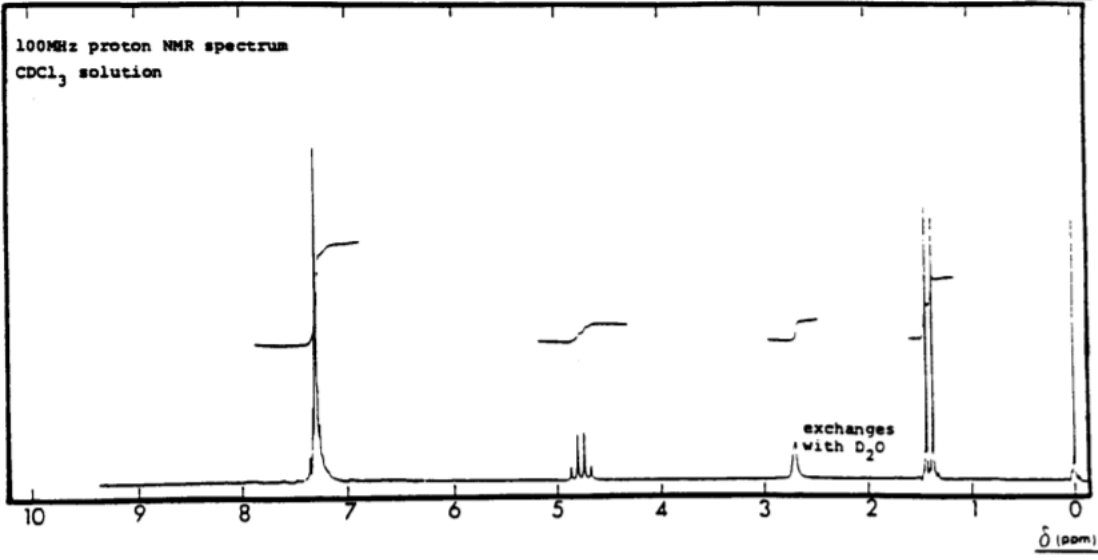
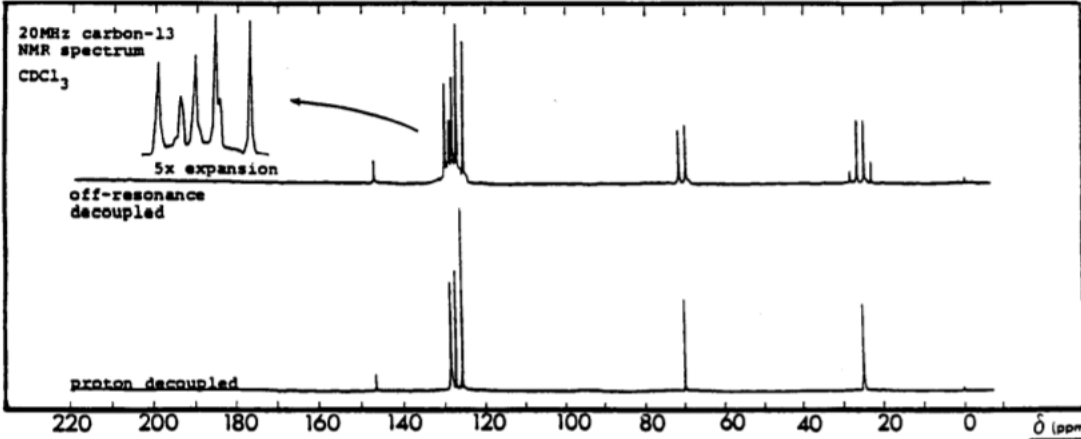
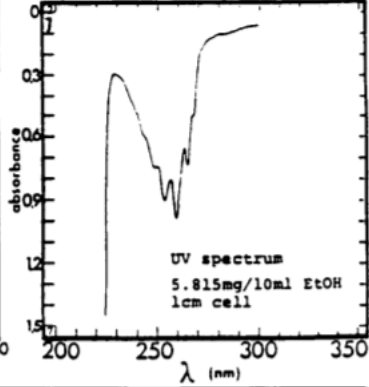
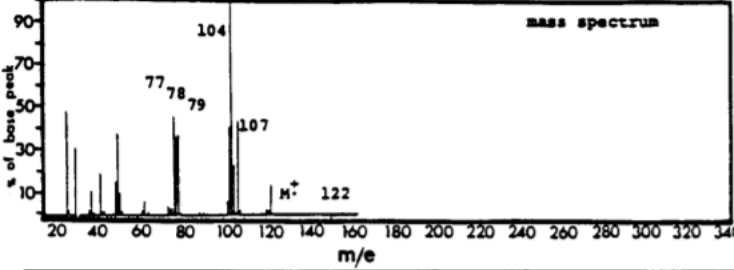
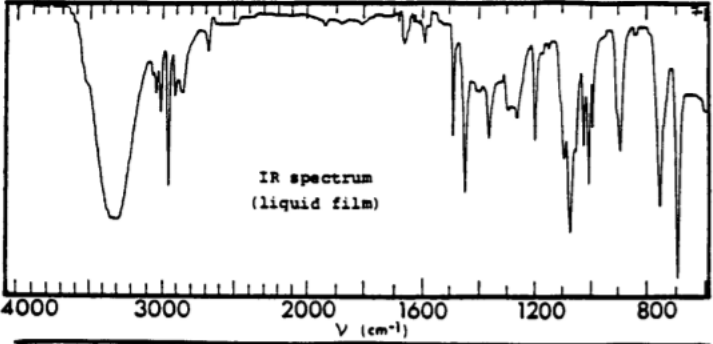




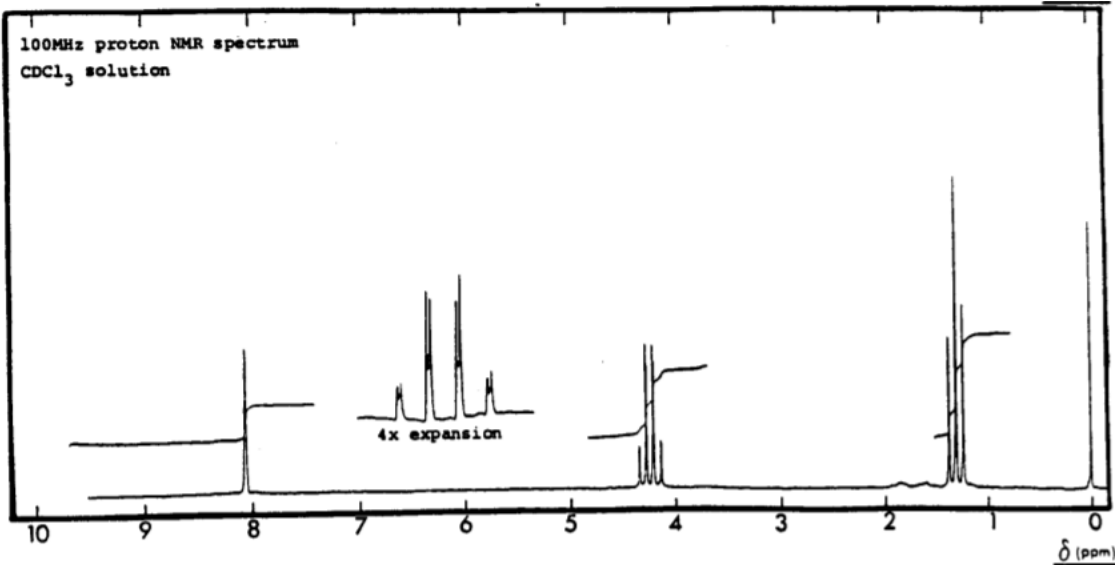
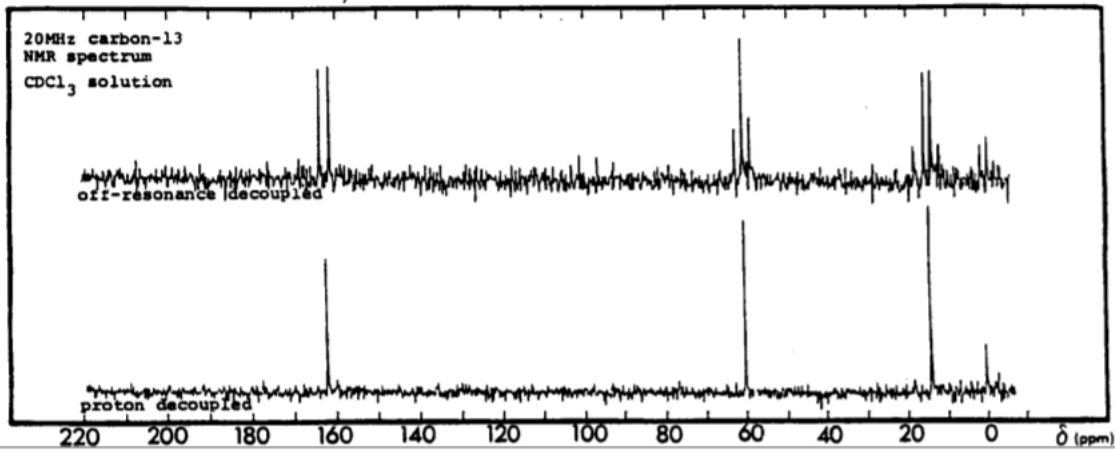
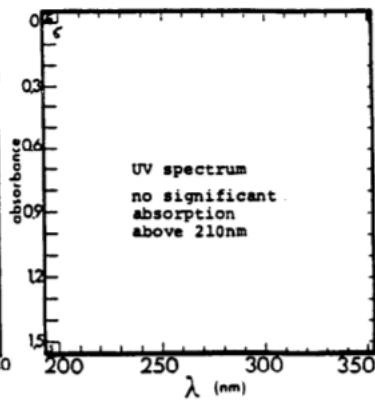
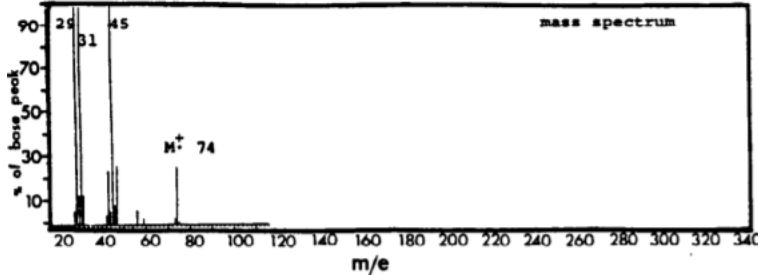
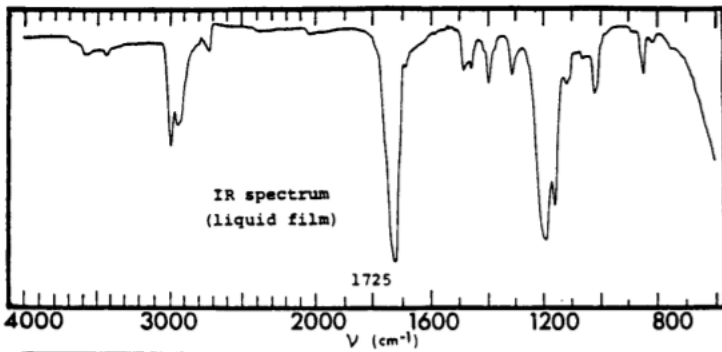
B.

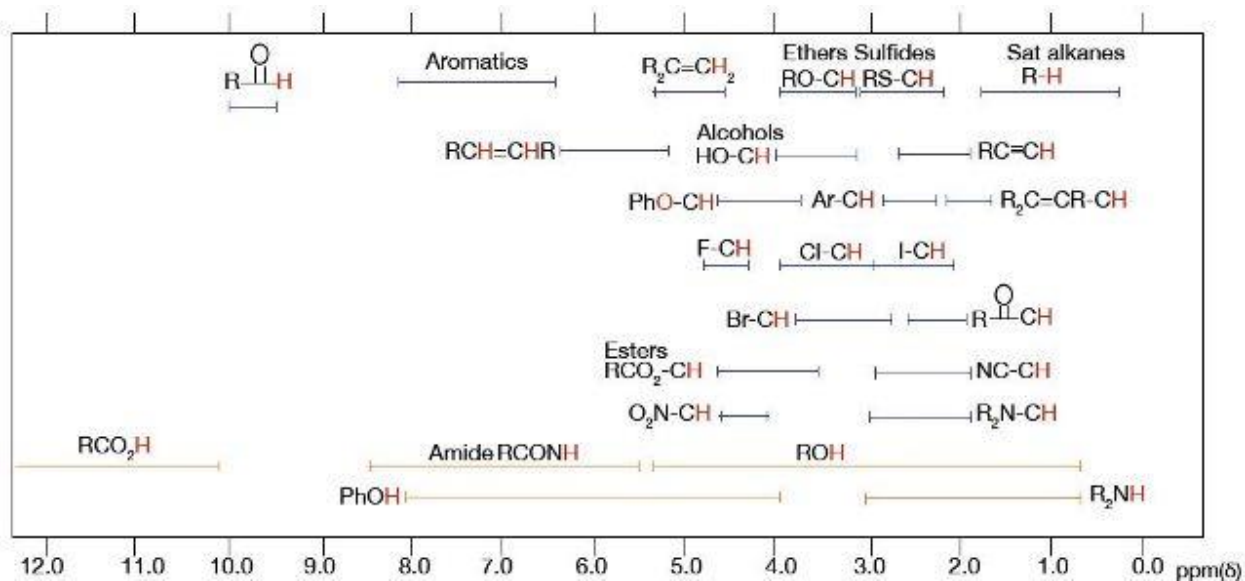
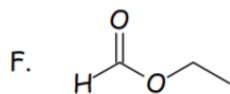
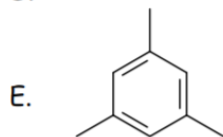
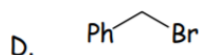
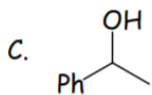
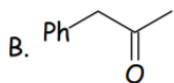
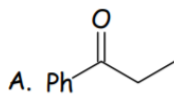


C.



F.





PILOT Learning – Tip of the Week

For the Spring 2019 semester, PILOT will be supporting the following courses:

- Introductory Chemistry II
- Organic Chemistry II
- Calculus I, II & III
- Differential Equations
- Linear Algebra
- Elements of Microeconomics
- Fundamentals of Epidemiology
- Physics I & II
- Statistical Analysis I & II
- Gateway Computing
- Discrete Math

Registration will open at 9pm on Monday, January 28, 2019. Please check out our website for updates:
<https://advising.jhu.edu/tutoring-mentoring/peer-led-team-learning-pilot/>