

CH328B Homework 3

Due: on 2/08/16 by 5PM....in the "box"

Read: Chapter 12

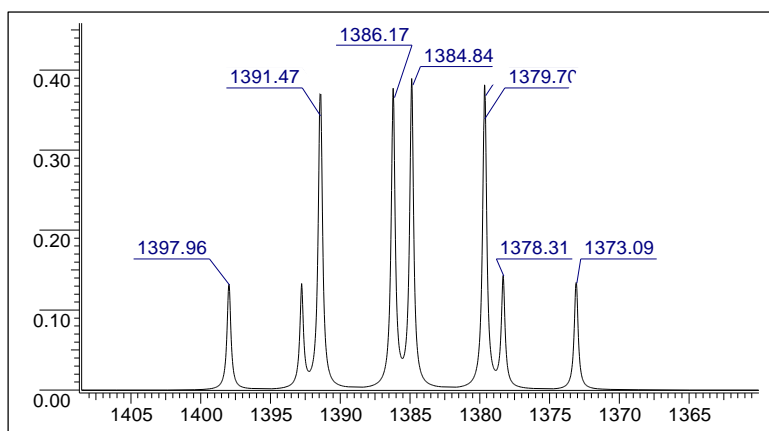
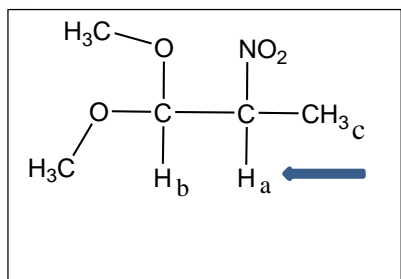
Do: 13.12, 13.13, 13.15, 13.21, 13.23; 13.24a, b, d, h; 12.2 and 12.3.

Supplemental Problems:

1. Michael recorded the mass spectrum of a compound with an M^+ at 293. This compound not only has an $M+2$ peak, but also an $M+4$ and an $M+6$ peak!! These peaks have the following relative intensities: 12.9%, 37.9%, 37.1%, and 12.1%, respectively. The ^1H -NMR spectrum consists of only a singlet at 4.4 ppm. The ^{13}C -NMR spectrum is equally simple, it has only a single resonance at 58 ppm. The singlet in the ^{13}C -NMR flipped downward when Garret collected the DEPT spectrum. Draw the structure of this compound. If you cannot piece together the whole molecule, please draw any fragments or elements of the structure that you can identify.

2. The ^1H nmr spectrum of the nitro compound below includes a multiplet that is assigned to the proton designated with an arrow and the label "a" in the drawing. The spectrum was well resolved because it was measured using a spectrometer with an 8.0 Tesla magnet.

- Please calculate the chemical shift of proton a in ppm and
- Please calculate the a-b and a-c coupling constants. *Show your work.*



3. The ^1H nmr of 1,3-dichloropropane consists of a triplet and a pentet as shown below. Calculate the relative areas (A/B) of the peaks marked explicitly within the multiplets

