

S343 Quiz 6
12/4/14

Name Key

AI (or Lab Section) _____

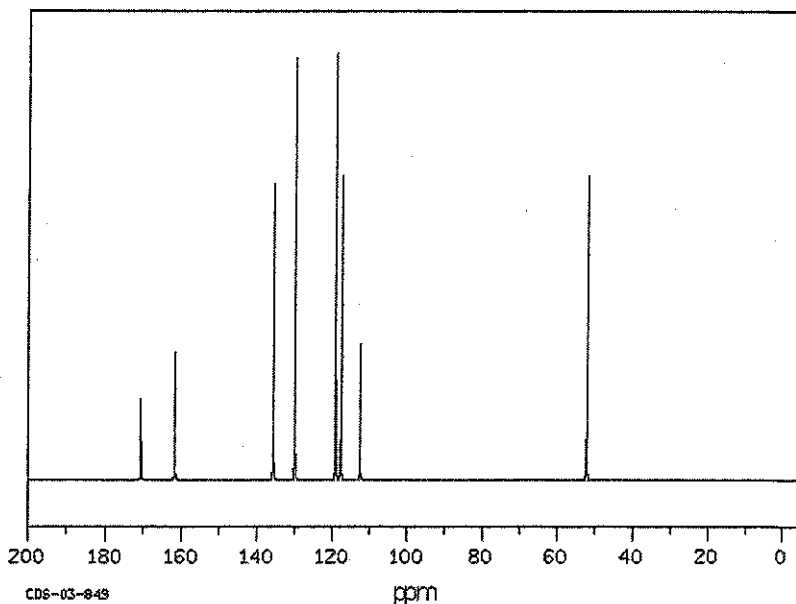
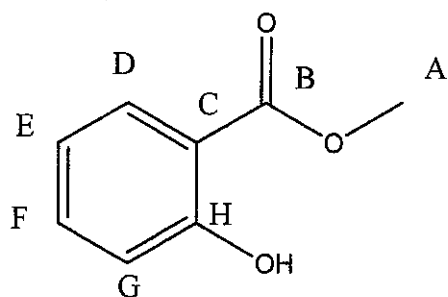
1. (8pts) The carbon-13 nMR of the compound below has 8 signals. Match the frequency of each signal to the appropriate letter on the structure. Use the spectra given on the next page to help. Be sure to consider resonance effects on the chemical shift in the proton NMR. (Note: the carbon peaks at 169 and 161 ppm do not show up on the HETCOR scale.)

Shift (ppm)	letter
52	A
112	C
116	G
118	E
129	D
136	F
161	H
169	B

+1 each

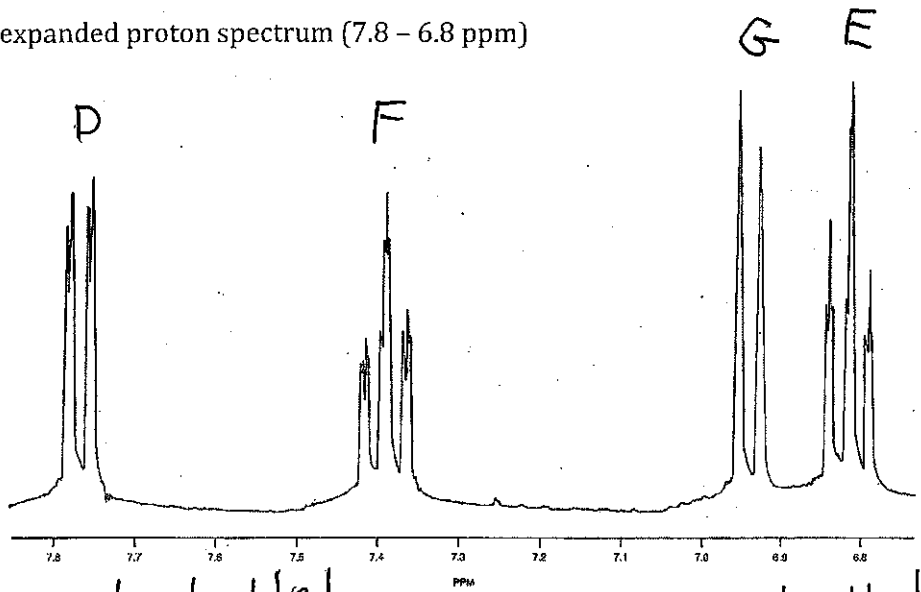
This quiz contains
21 points, so it
is possible to
earn bonus.

> also accept B
H



Problem 1 continued.

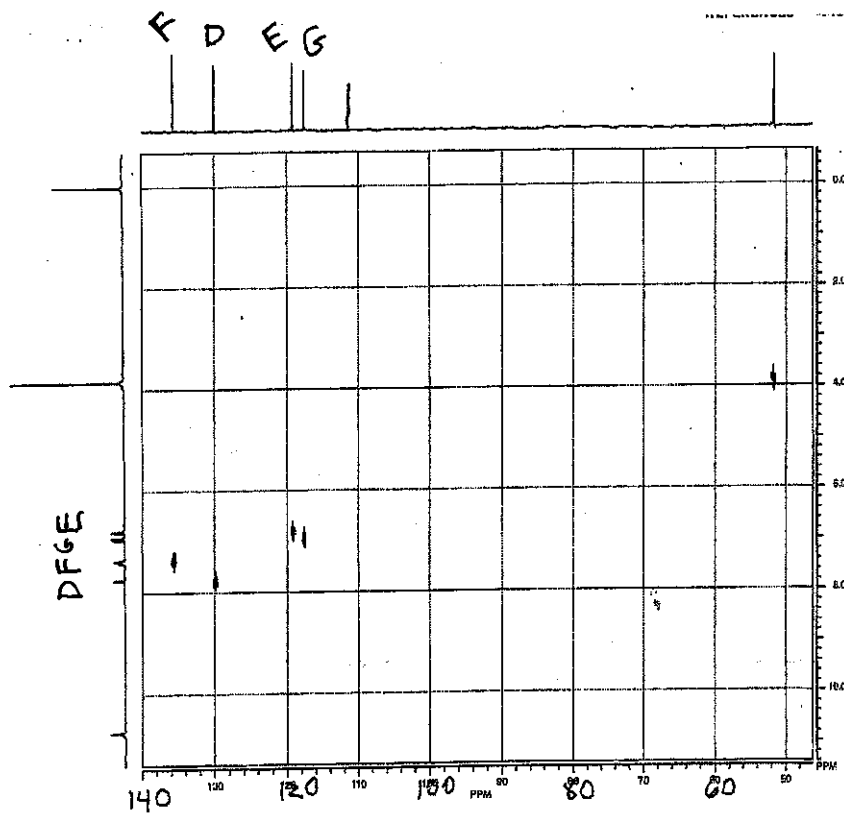
The expanded proton spectrum (7.8 – 6.8 ppm)



deshielded

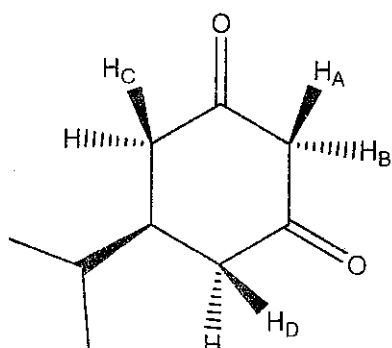
shielded

HETCOR



2. (6pts) The protons labelled A and B in the compound you made in the multistep synthesis are expected to give two proton signals that are both doublets. Instead, they give what appears to be only one signal, perhaps a distorted quartet. Explain why this signal is observed.

(+2)



(+2) discussion of strong coupling

or

(+1) if answer only vaguely discusses second order effects

(+2) Are the protons labelled C and D in this compound chemically equivalent? yes (+1) Explain:

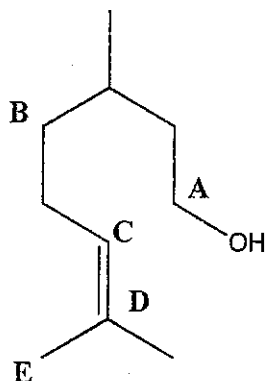
(+1) plane of symmetry

(+2) Are the protons labeled C and D in this compound magnetically equivalent? No (+1) Explain:

(+1) H_c and H_d don't couple to each proton in the same way

(+7)

3. (6pts) A. Fill in the boxes in the table below with the letters A-E that corresponds to each C-13 signal's chemical shift. The C-13 NMR and DEPT 135 of the compound are given on the next page.



Shift (ppm)	Letter
18	E
38	B
60	A
125	C
131	D

+1 each

B. The carbon NMR of this compound only shows 9 peaks, but based on the structure, it might be expected to have 10 peaks. Refer to the data to explain why only 9 peaks are observed in the C-13 spectrum:

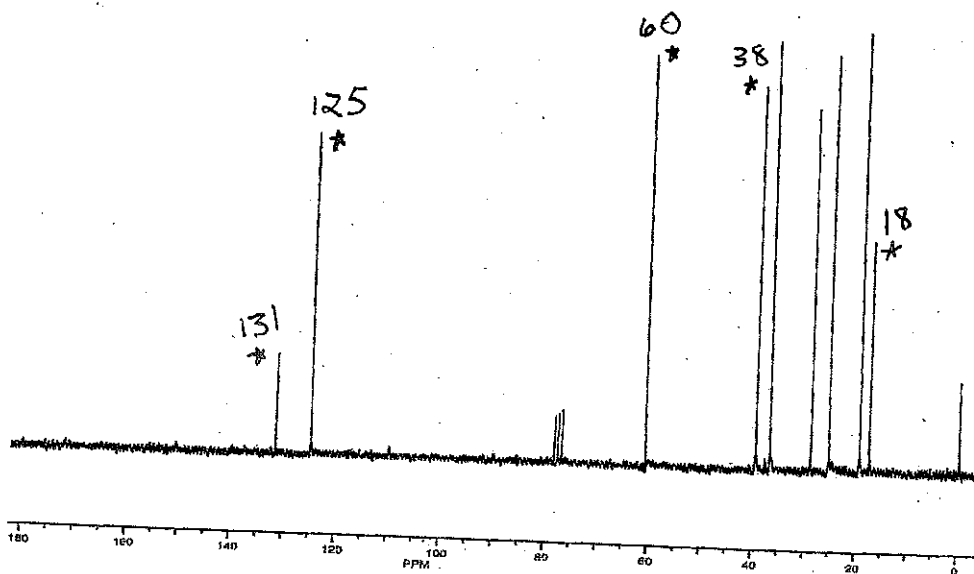
(+2)

(+1) The peak at 28 ppm is an overlap of two C-13 signals

(+1) The DEPT shows both overlapping peaks - one up and one down.

Problem 3 continued.

C-13 Spectrum



DEPT-135 spectrum

