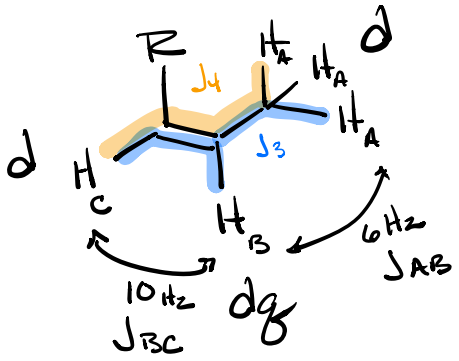
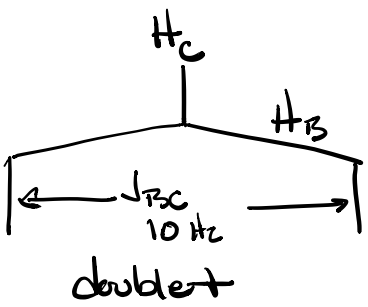
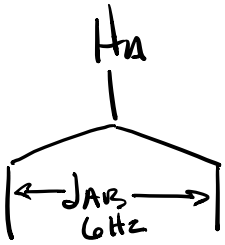
Spin - Spin Coupling



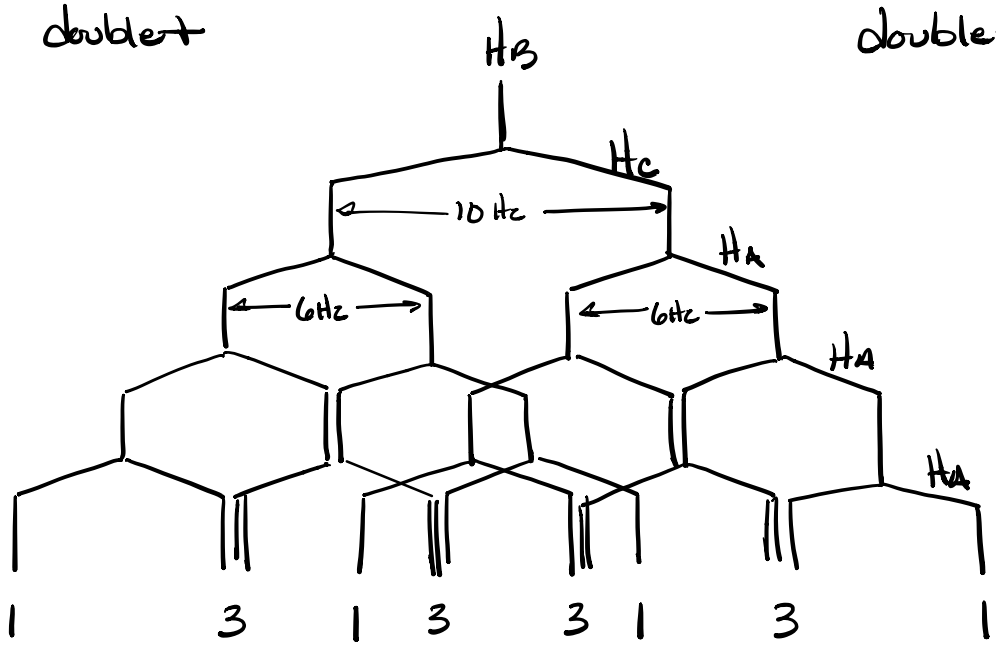
$J_3 >> J_4$

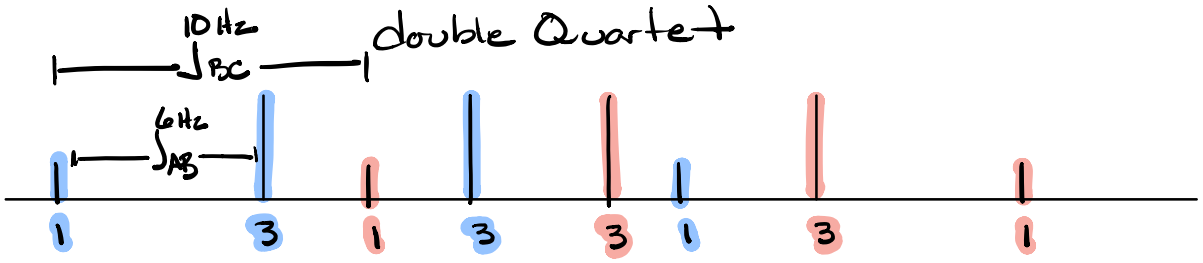


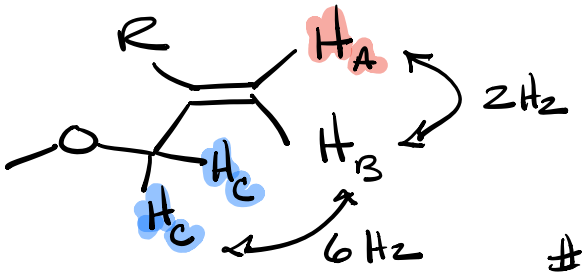
doublet



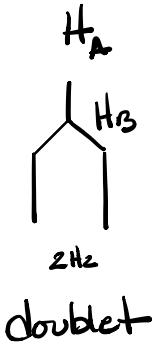
doublet

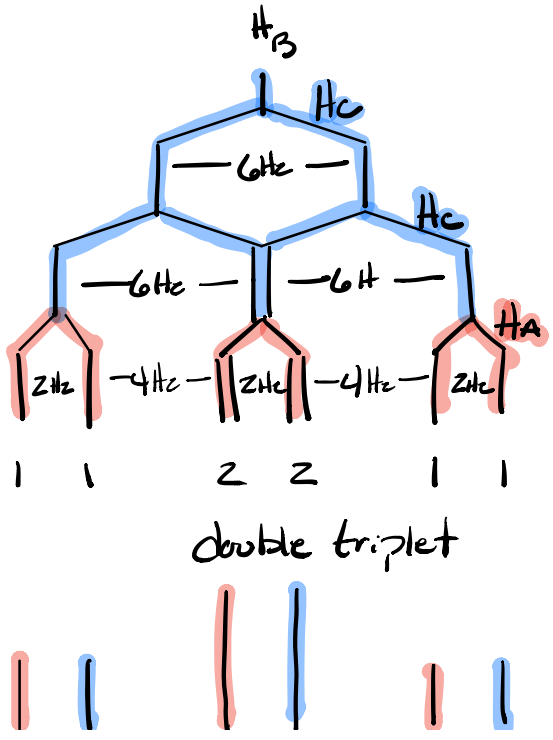


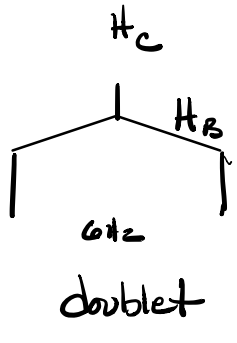




# of lines in diagram
= intensity of signal







Pascal's Triangle

Where all J-values are equal in the tree diagram

1

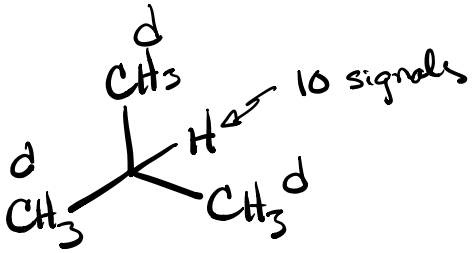
1 1 doublet

1 2 1 triplet

1 3 3 1 quartet

1 4 6 4 1 Pentet

1 5 10 10 5 1 sextet



#2 on Webspectra

Keys to problem solving:

- Units of unsaturation

$C_nH_{2n+2+N-X}$ formula for saturation

$C_8H_8O_2$

$2(8)+2 = 18$ hydrogens if saturated

-8 hydrogens in molecule

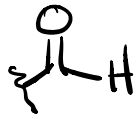
$2\overline{)10}$ hydrogen missing

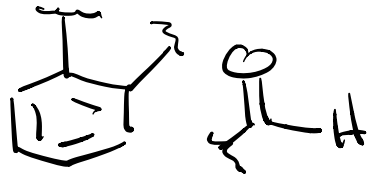
5 units

4 units

$+$  or $=$ or ring

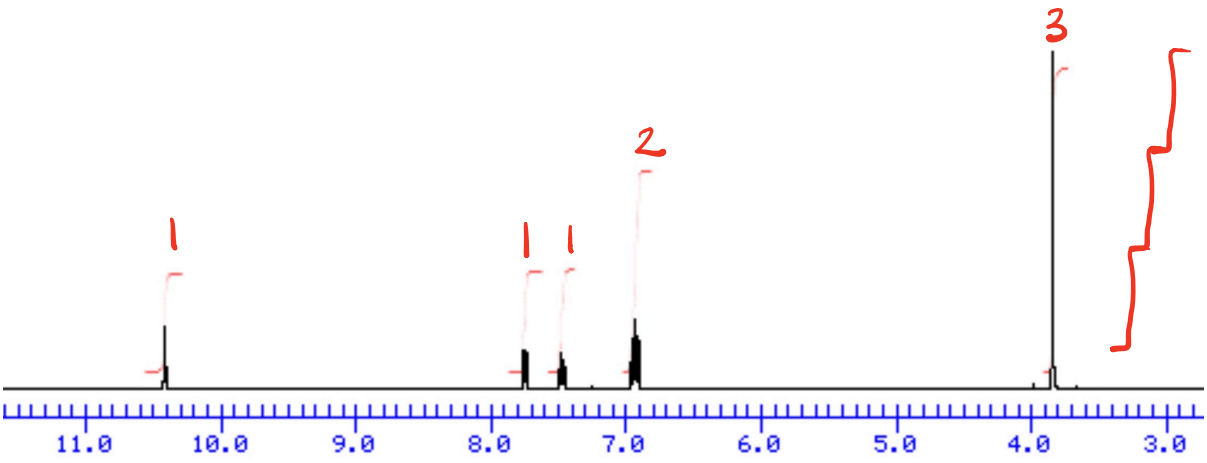
Data Table

ppm	Int	Splitting	# of Neighbors	Assignment
3.85	3	s	0	EWG–CH_3 –O–CH_3
6.93	2	mult	?	Ar
7.48	1	t	2	Ar
7.75	1	d	1	Ar
10.42	1	s	0	



–O–CH_3

$C_8H_8O_2$ ✓



to ppm Zoom

Spectrum may be r

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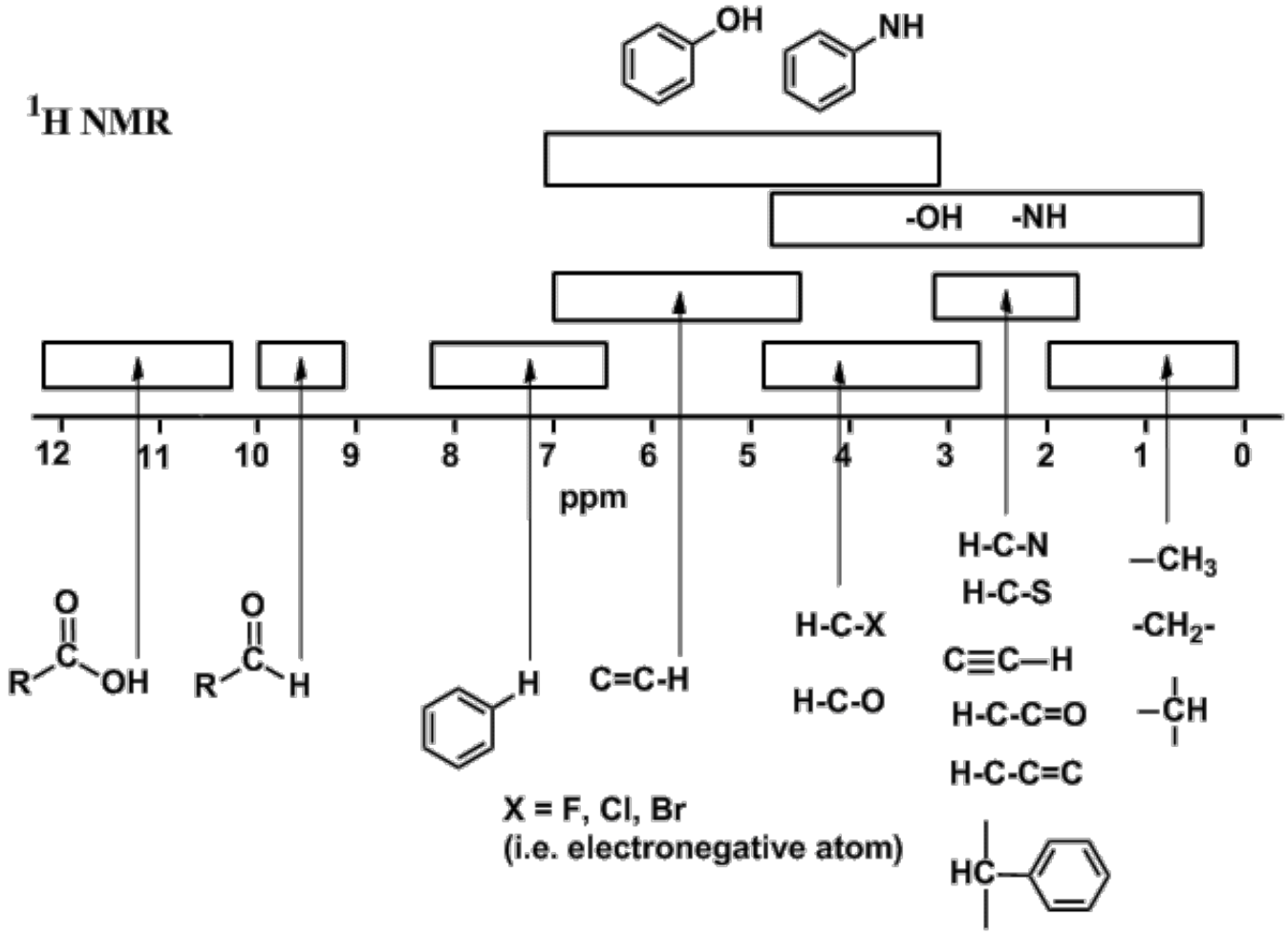
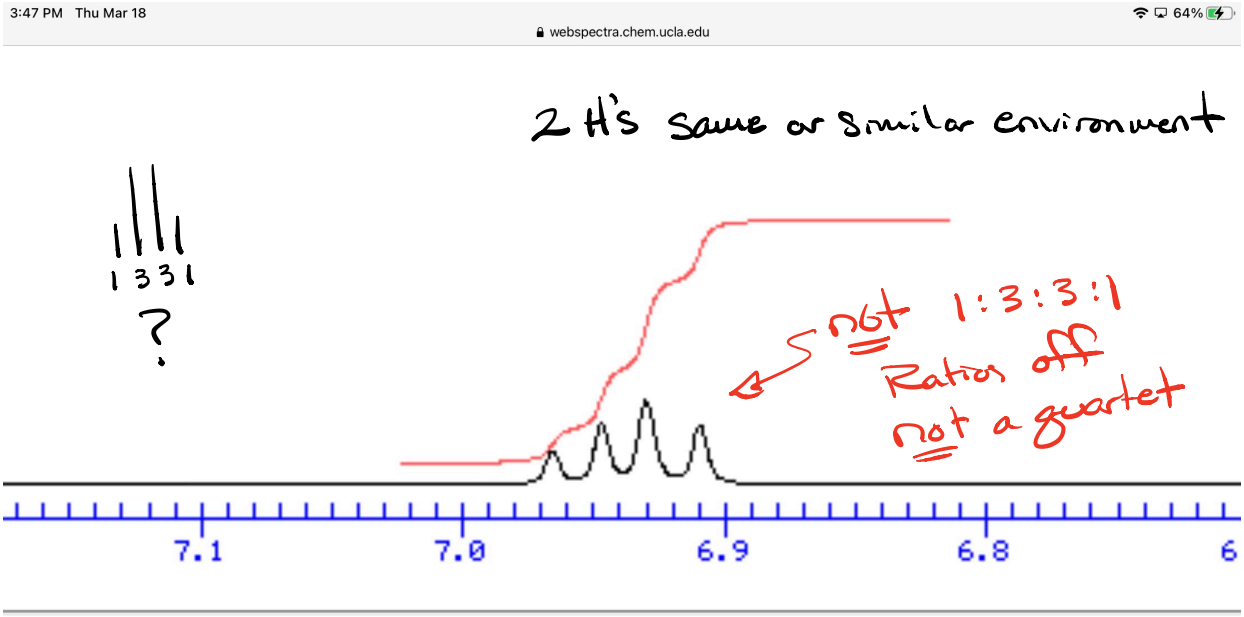
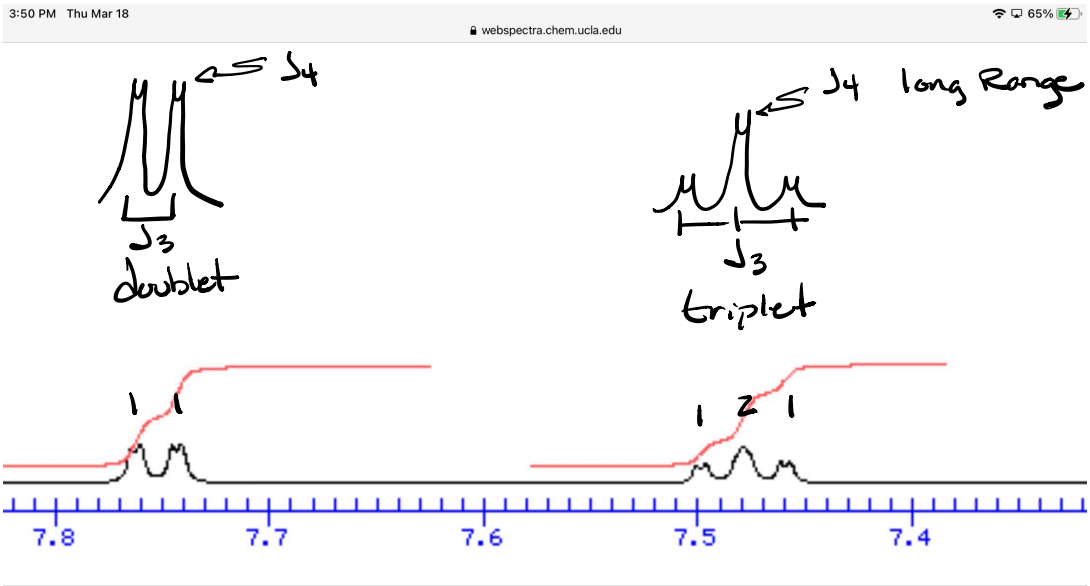
^{1}H NMR

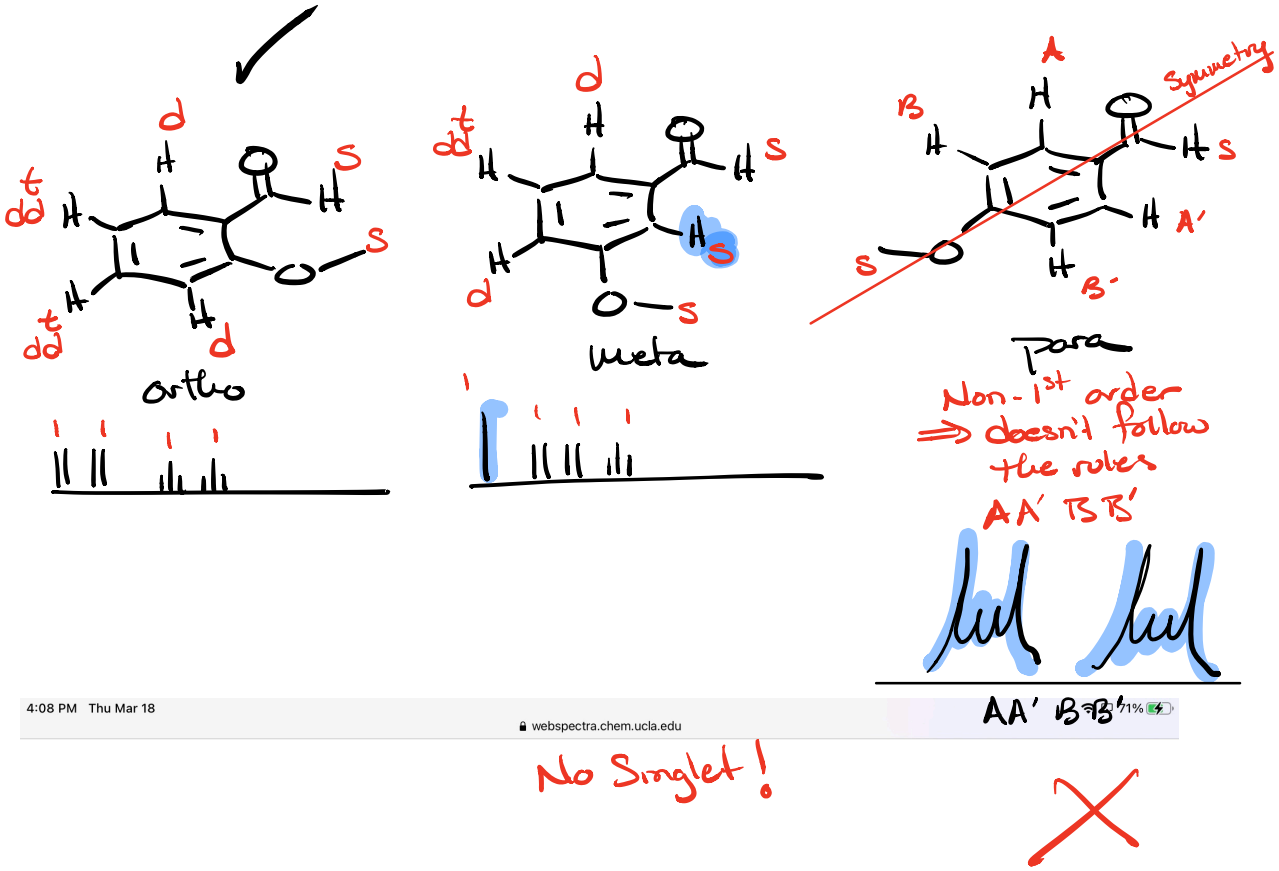

OH
NH
-OH -NH
12
11
10
9
8
7
6
5
4
3
2
1
0
ppm
O
C
R
OH
O
C
R
H
H
C=C-H
H-C-X
H-C-O
H-C-N
H-C-S
C≡C—H
H-C-C=O
H-C-C=C
—CH3
-CH2-
—CH
X = F, Cl, Br
(i.e. electronegative atom)
HC



[Back to WebSpectra Home Page]



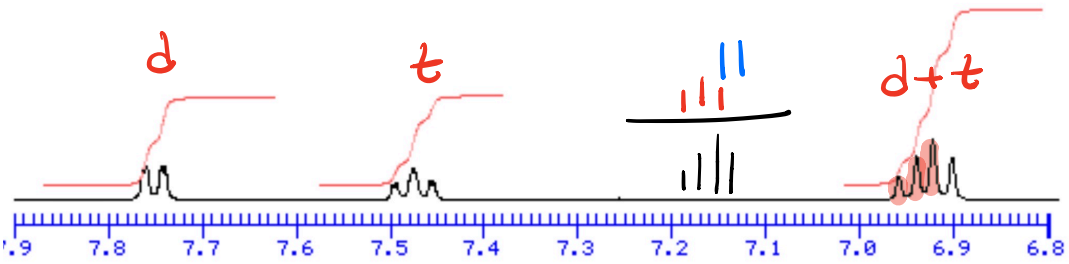
[Back to WebSpectra Home Page]



4:08 PM Thu Mar 18

webspectra.chem.ucla.edu

No Singlet!



ppm Zoom Zoom Out

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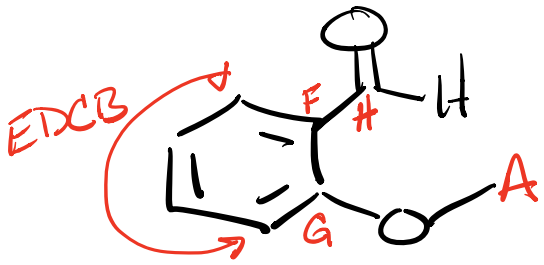
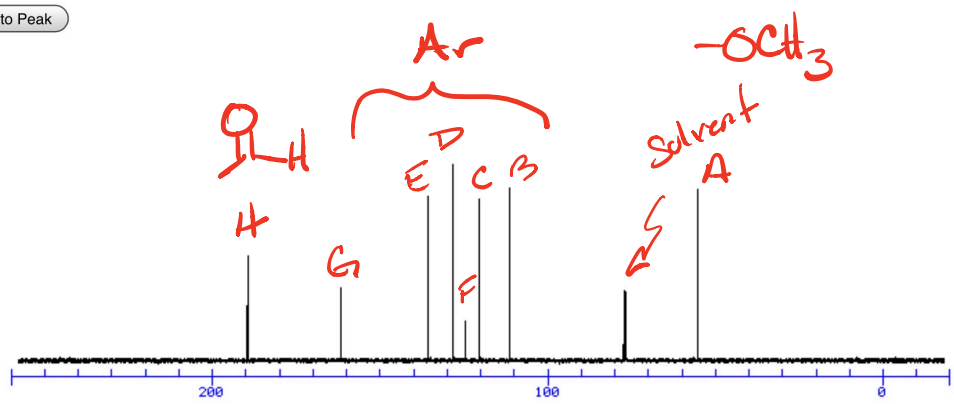


R Spectrum - $C_8H_8O_2$

^{1}H NMR Spectrum
Back to Problem

8 ppm | Zoom to Peak



Zoom to range: [ ] to [ ] ppm Zoom

Spectrum may be magnified 16X by clicking on peaks of in

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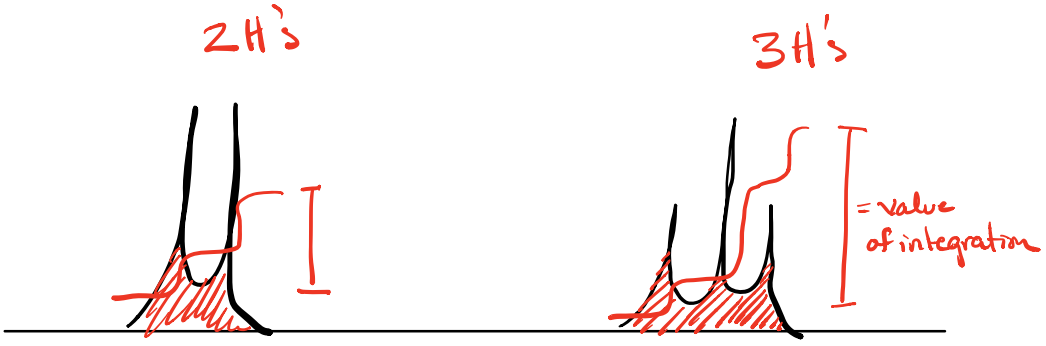

$$\frac{32,796.41}{32796.41} = 1 \times 2 = 2$$

$$\frac{46230.72}{32796.41} = \sim 1.5 = 3$$