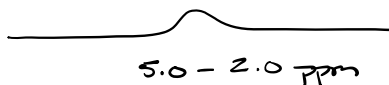
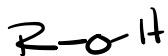
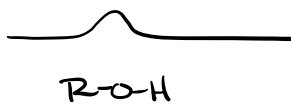
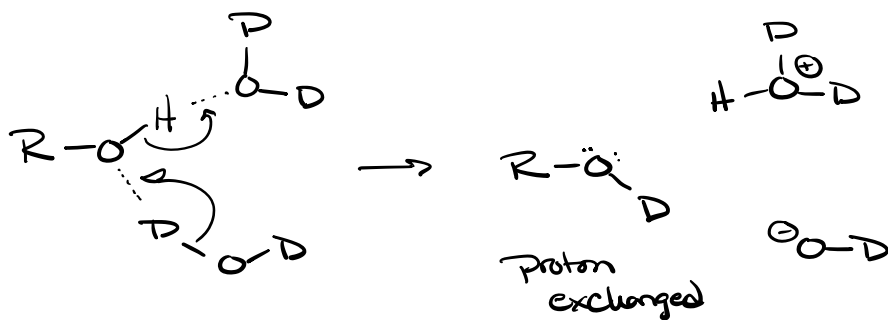


# NMR Practice Problems

## Protic vs Aprotic in $^1\text{H NMR}$

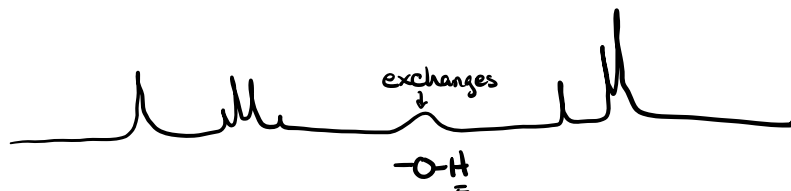


### Exchanges experiment w/ $\text{D}_2\text{O}$

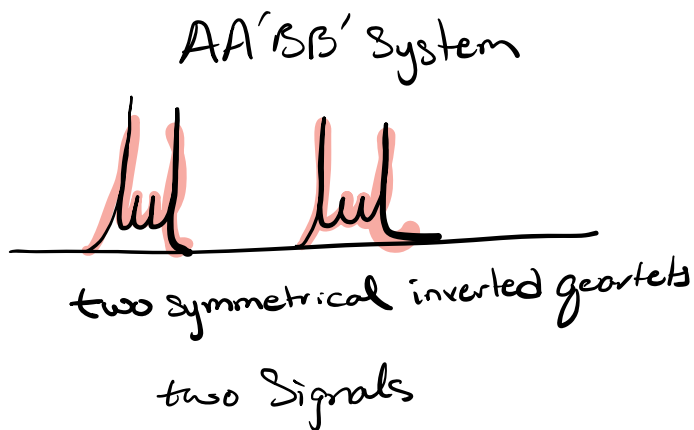
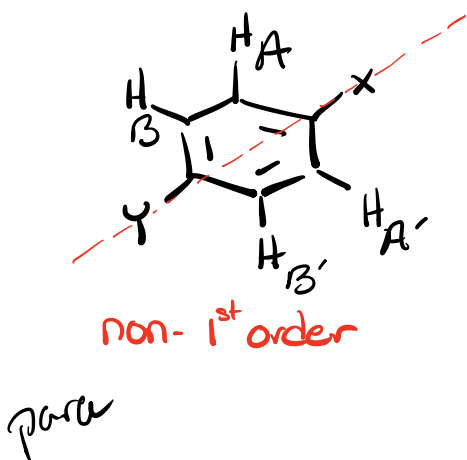
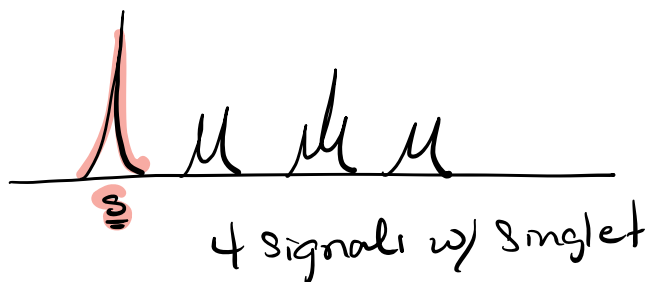
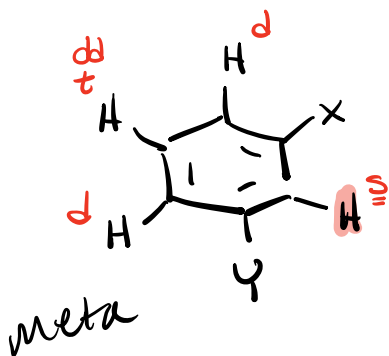
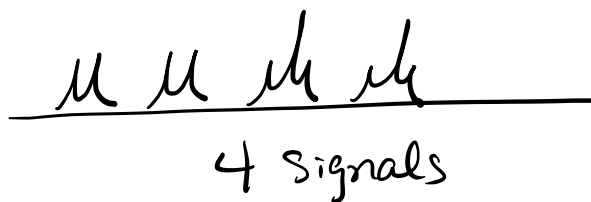
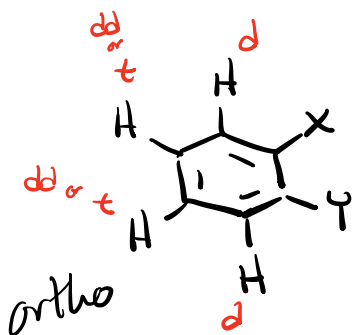
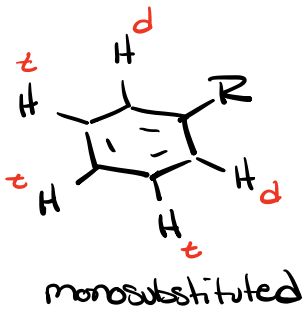


R-OH

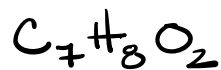
dissapears



Aromatic patterns

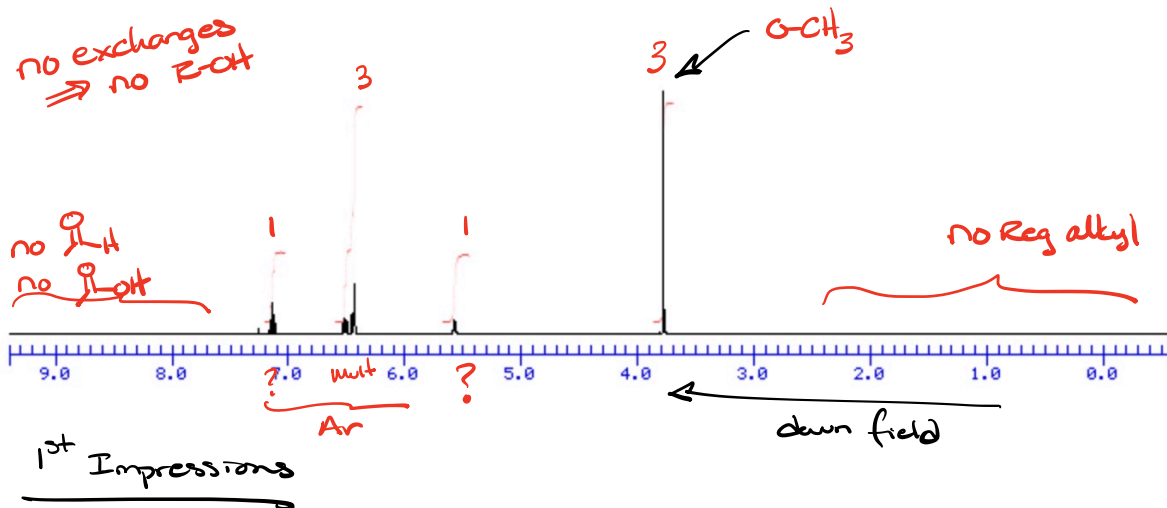


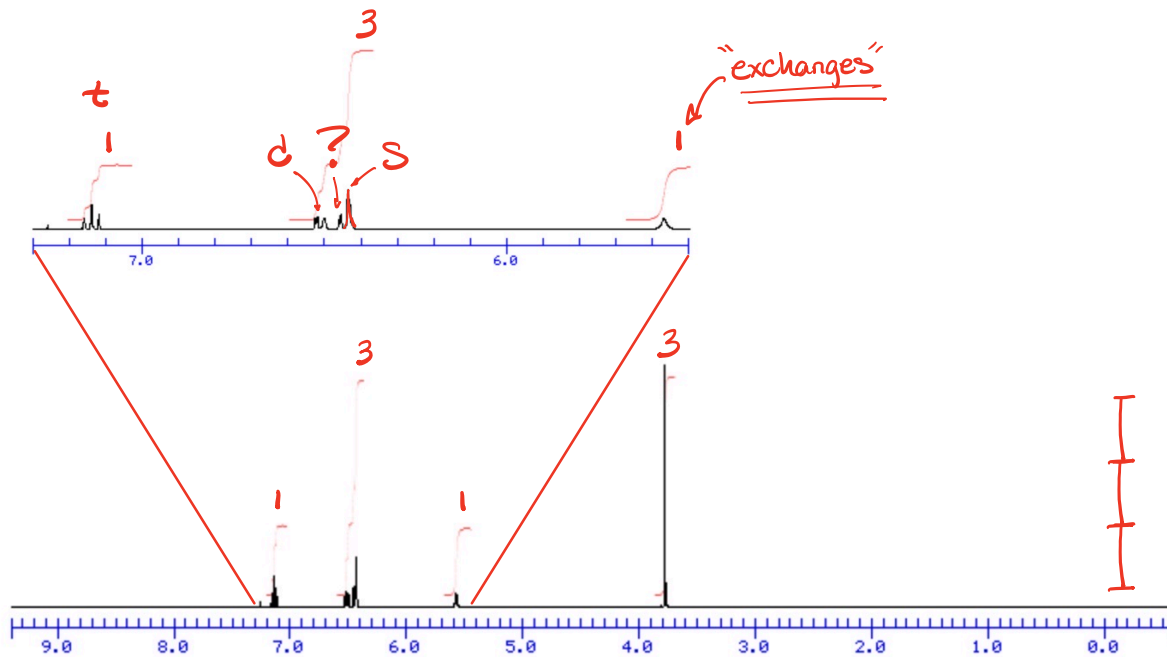
# Compound 5 webspectra

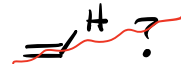
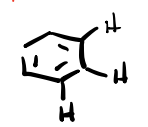


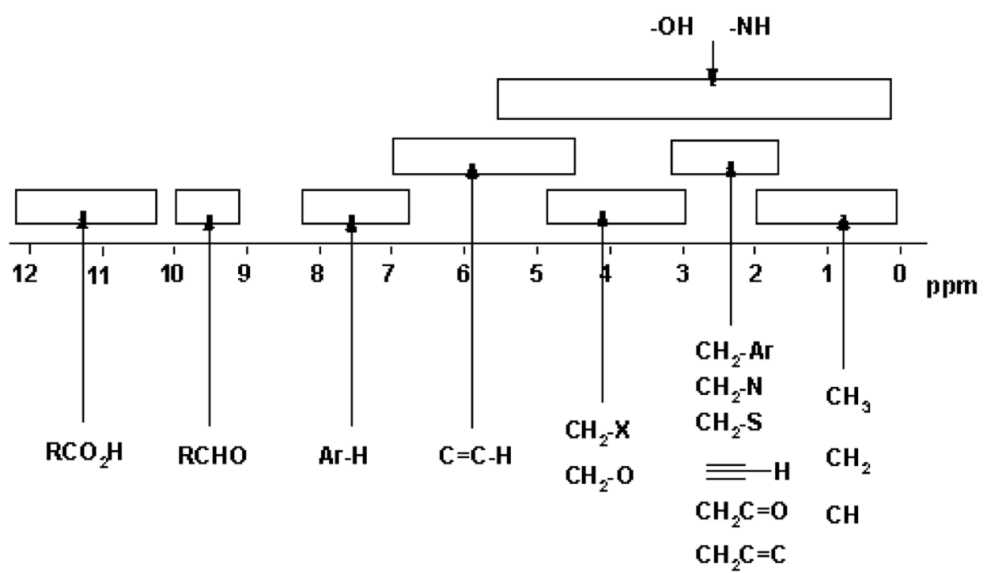
$$\begin{array}{r}
 2(7) + 2 + 0 - 0 = 16 \\
 \underline{-8} \\
 2 \overline{) 8} \\
 \quad 4 \text{ units unsat}
 \end{array}$$

Small molecule +  $\geq 4$  units  
unsat = aromatic Ring

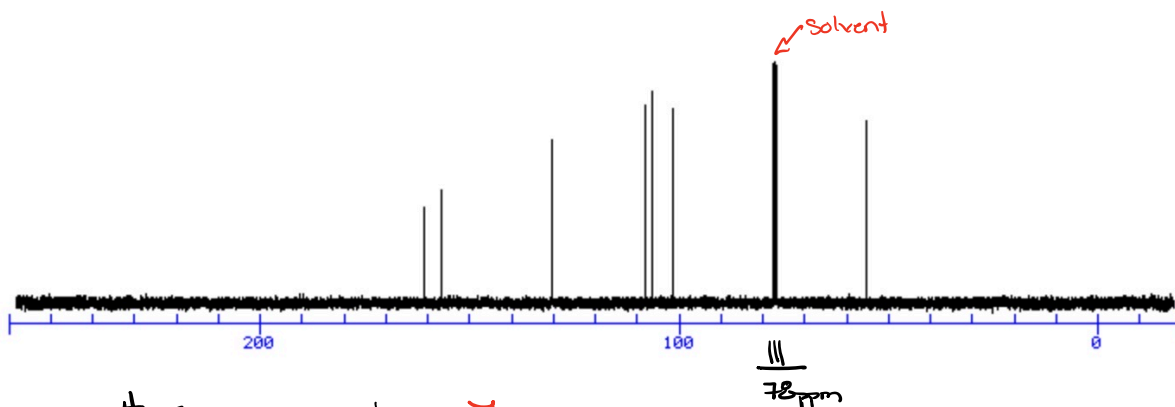




<u>Ppm</u>	<u>Int</u>	<u>mult</u>	<u># neighbors</u>	<u>Assignment</u>
3.8	<u>3</u>	s	∅	CH <sub>3</sub> - <sup>Strong</sup> EWG
5.6	1	s	∅	CH <sub>3</sub> -O 4.0ppm
6.5	3	Ar-H	?	 -OH
7.15	1	t	2	 } <u>4 Ar</u> Ar-H } <u>drsubs</u>



# $^{13}\text{C}$ -NMR

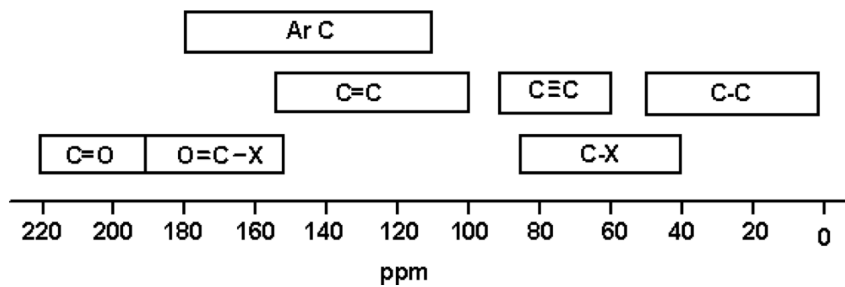


# Environments  $7 \Rightarrow$  no symmetry

ppm

Assignments

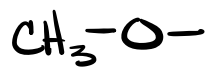
55	C-EWG $\leftarrow$	$\text{C}_7$ 6 Ar 1 Aliphatic
105	C=	
108	C=	
109	C=	
130	Ar	
157	Ar	
161	Ar-EWG	



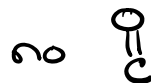
# Pieces



no symmetry

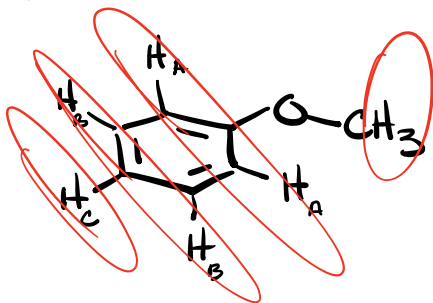


O missing



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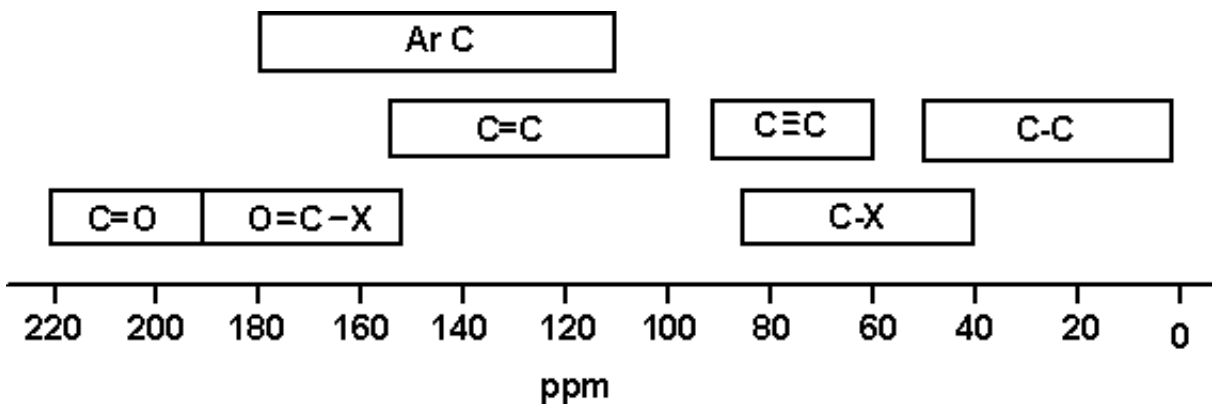
## problem



4 proton environments

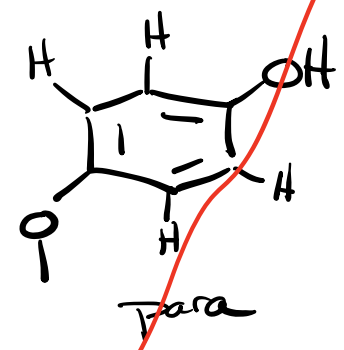
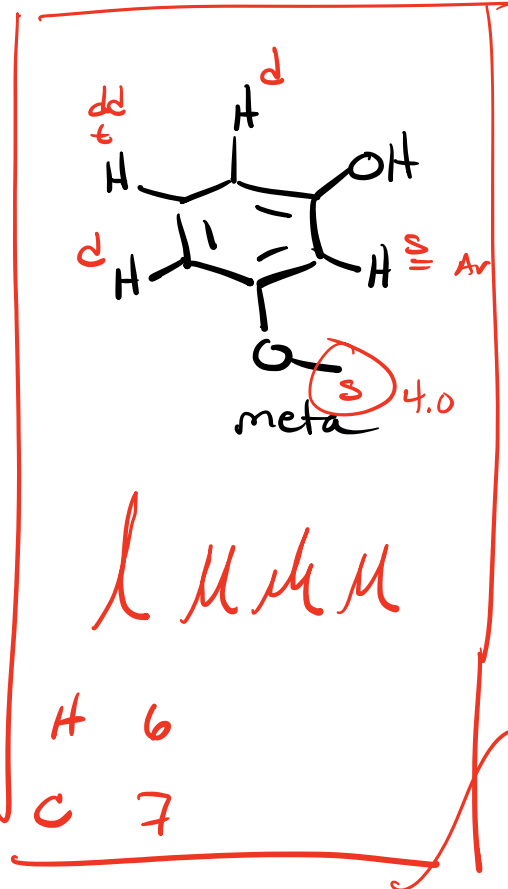
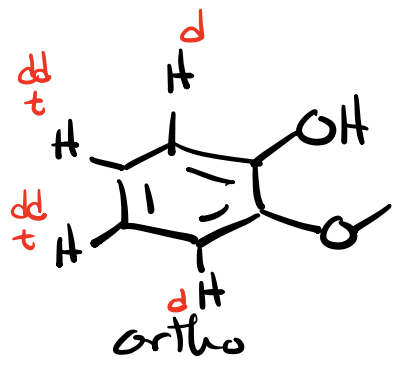
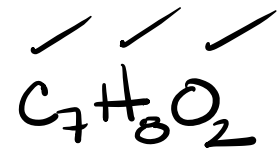
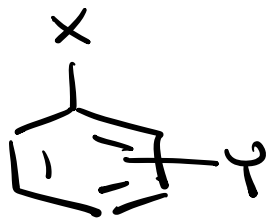


5 C environments



Pieces

-OH  
-O-CH<sub>3</sub>



ll ll ll ll

l ll ll ll

ll ll ll ll

H 6  
C 7

H 6  
C 7

H 4  
C 5