

Web Spectra # 11



$$C_n H_{2n+2+N-x} \text{ for Saturation } \left. \vphantom{C_n H_{2n+2+N-x}} \right\} n = \#C$$

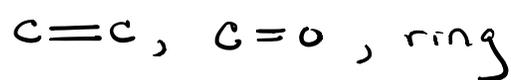
$$2(6) + 2 + 0 - 0 = 14 \text{ for Sat}$$

$$\underline{- 12} \quad \# \text{ we have in formula}$$

$$2 \overline{) 2}$$

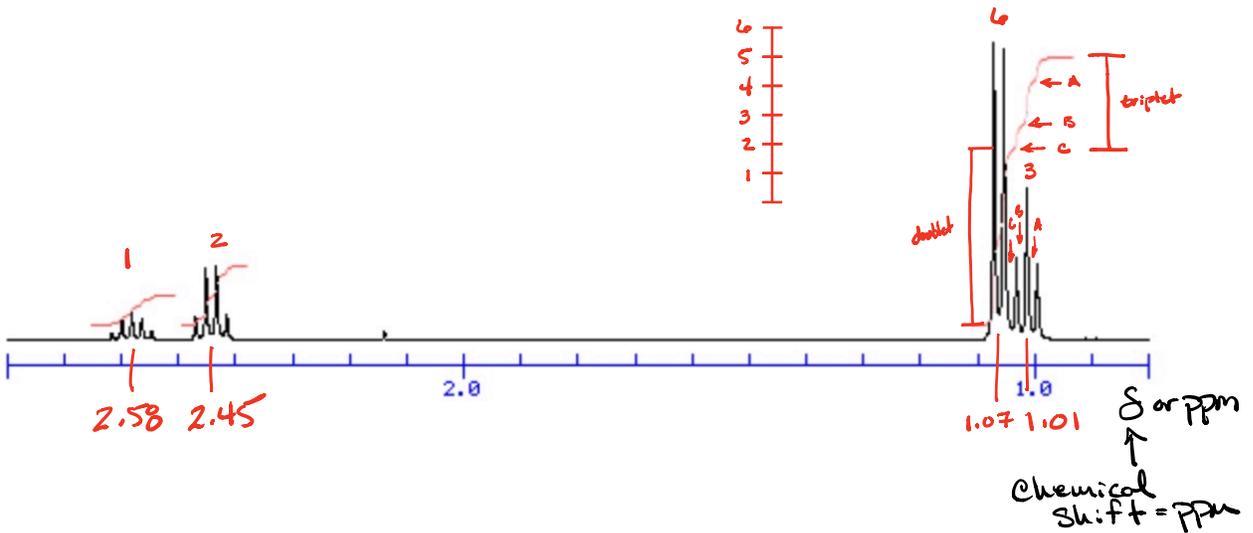
$$1 \text{ Unit unsat}$$

options

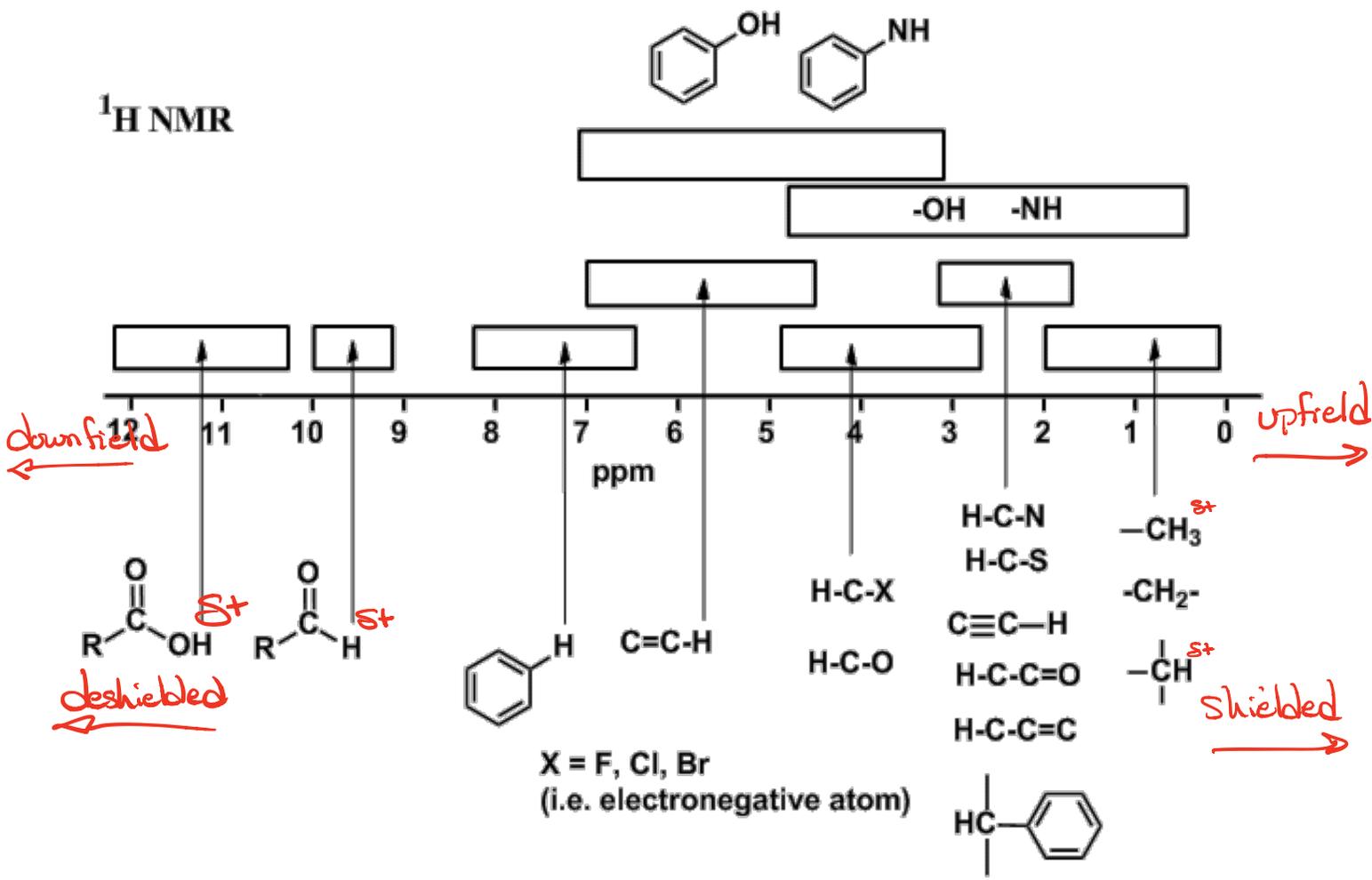


¹H-NMR Table *4 Chemical Environments

<u>Chemical shift</u> <u>δ or ppm</u>	<u>Int</u>	<u>Splitting</u> <u>molt</u>	<u>n</u> <u># neighbors</u>	<u>assignment</u>
1.01	3	triplet (t) $n+1=3$	2	-CH ₃
1.07	? 6	doublet (d) $n+1=2$	1	-CH ₃ × 2
2.45	2	quartet (q) $n+1=4$	3	EWG-CH ₂ -
2.58	1	pentet (p) $n+1=5$	4 ? <u>Issue</u>	EWG-C-H
+ ----- 12H ✓				



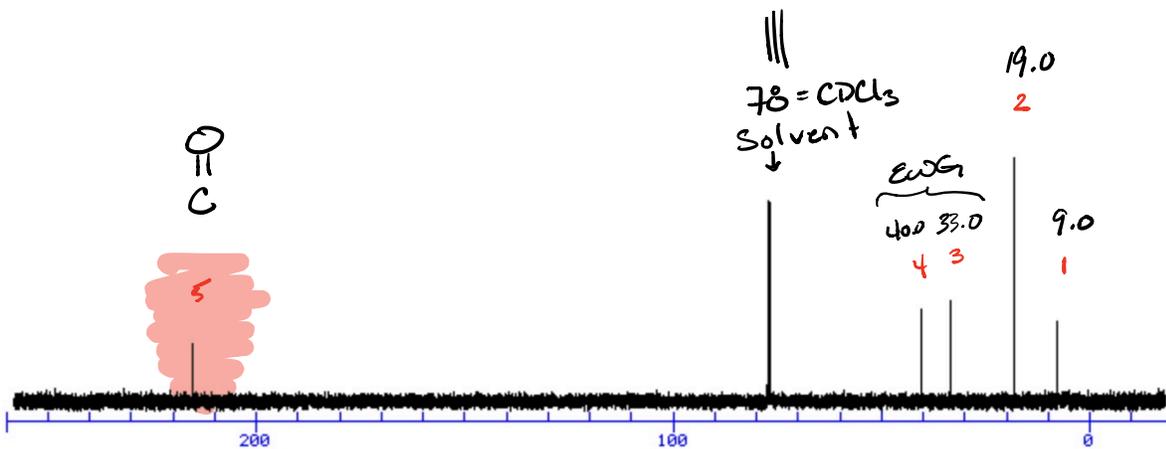
$^1\text{H NMR}$



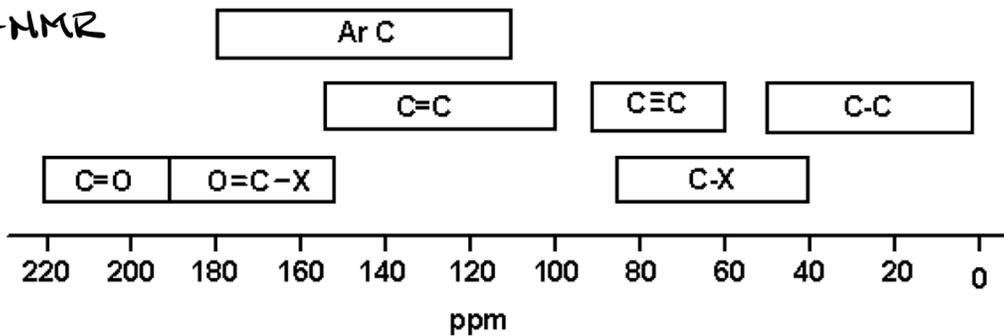
¹³C-NMR Table

Chemical Environments = 5

δ ppm	Int	Sometimes Multiplicity	# of H's on C	assignment
9.0				C
19.0				C
33.0				C-EWG
40.0				C-EWG
215.0				 = EWG

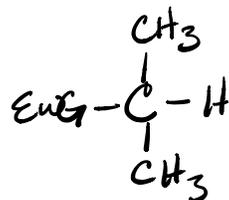


¹³C-NMR



1 unit unsaturation

4 ¹H NMR Environments

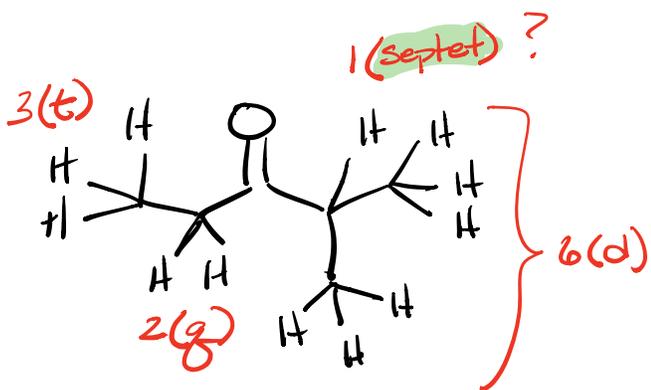
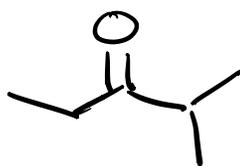


5 ¹³C NMR Environments

4 - alkyl

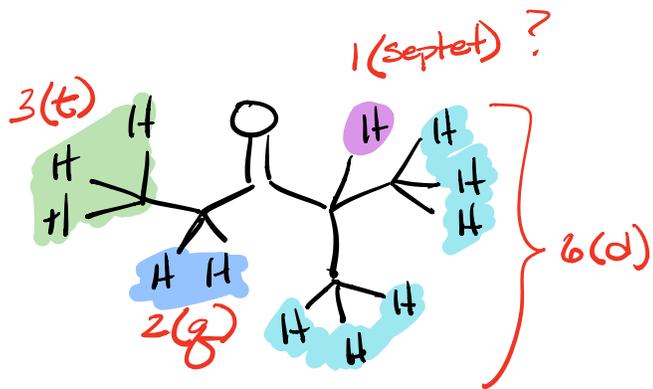
2 normal

2 - EWG



1 s
 1 1 d
 1 2 1 t
 1 3 3 1 8
 1 4 6 4 1 P
 1 5 10 10 5 1 sextet
 1 6 15 20 15 6 1 septet

1 4 6 4 1 pentet ratios
~~6 15 20 15 6~~ septet ratios
 Super Small



¹H-NMR Table * 4 Chemical Environments

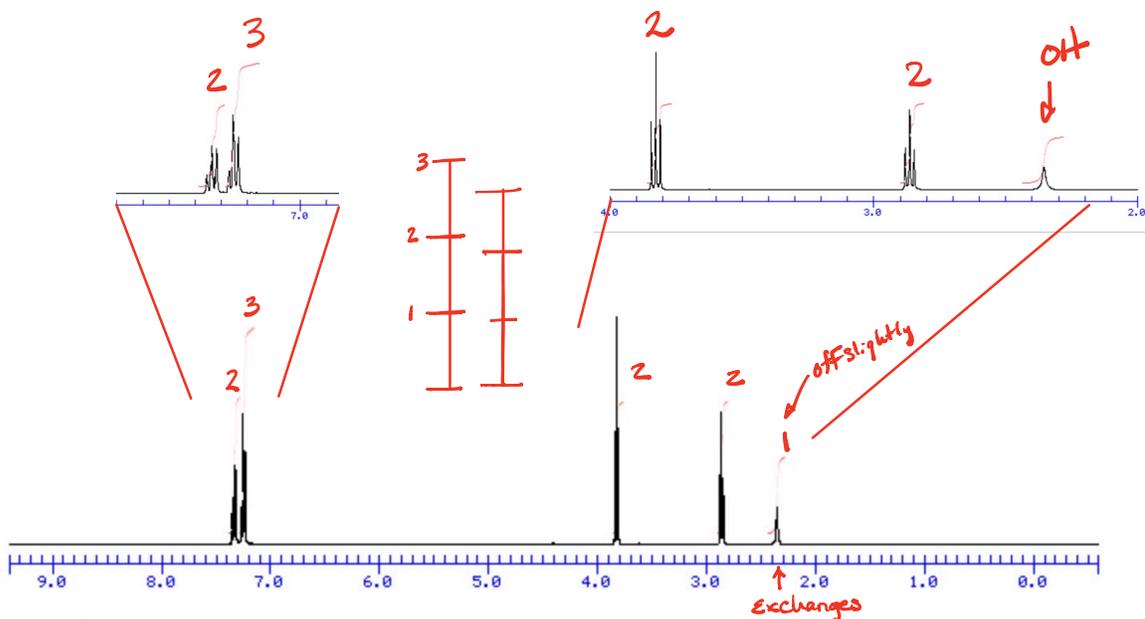
<u>Chemical shift</u> <u>δ or ppm</u>	<u>Int</u>	<u>Splitting</u> <u>mult</u>	<u>n</u> <u># neighbors</u>	<u>assignment</u>
1.01	3	triplet (t) $n+1=3$	2	-CH ₃
1.07	? 6	doublet (d) $n+1=2$	1	-CH ₃ × 2
2.45	2	quartet (q) $n+1=4$	3	EWG-CH ₂ -
2.58	1	pentet (p) $n+1=5$	4	EWG-C-H
+ ----- 12H ✓			? <u>Issue</u>	

Web spectra # 19



4 units of unsaturation

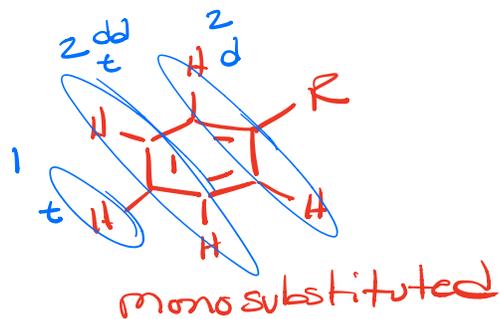
$$\begin{array}{r} 18 \\ -10 \\ \hline 2 \overline{) 8} \\ 4 \text{ units} \end{array}$$

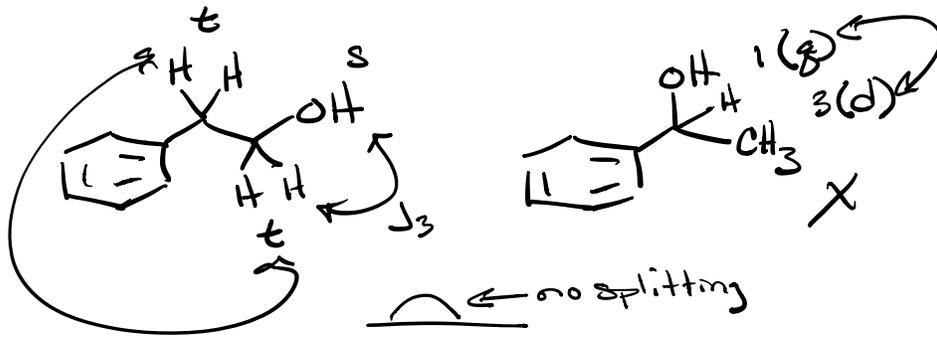


¹H NMR table # Environments = 5-7

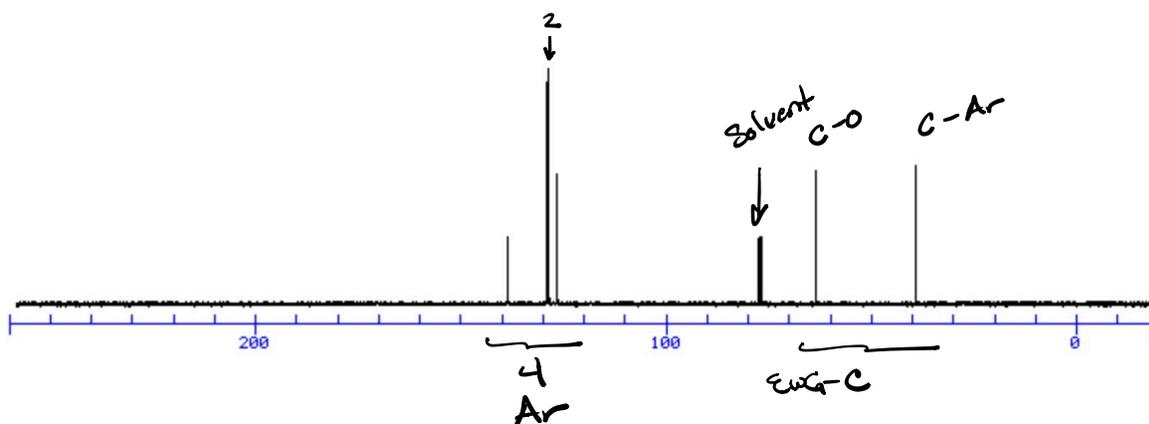
<u>ppm</u>	<u>Int</u>	<u>mult</u>	<u>#n</u>	<u>assignment</u>
2.35	1	s	ϕ	-OH
2.87	2	t	2	EWG-CH ₂ -
3.83	2	t	2	EWG-CH ₂ -
7.25	3	?	?	Ar-H
7.35	2	?	?	Ar-H

} 5 Ar H's



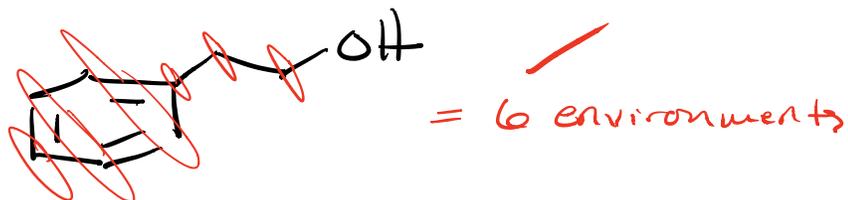


CNMR Environments = 6

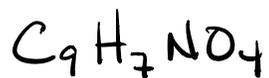


CNMR Table

<u>ppm</u>	<u>assignment</u>
39	C-Ar
63	C=O
127	} Ar
129	
129.5	
139	



19 on Organic Structure Elucidation



$$H_{2n+2+N-x}$$

$$2(9) + 2 + 1 = 21$$

7

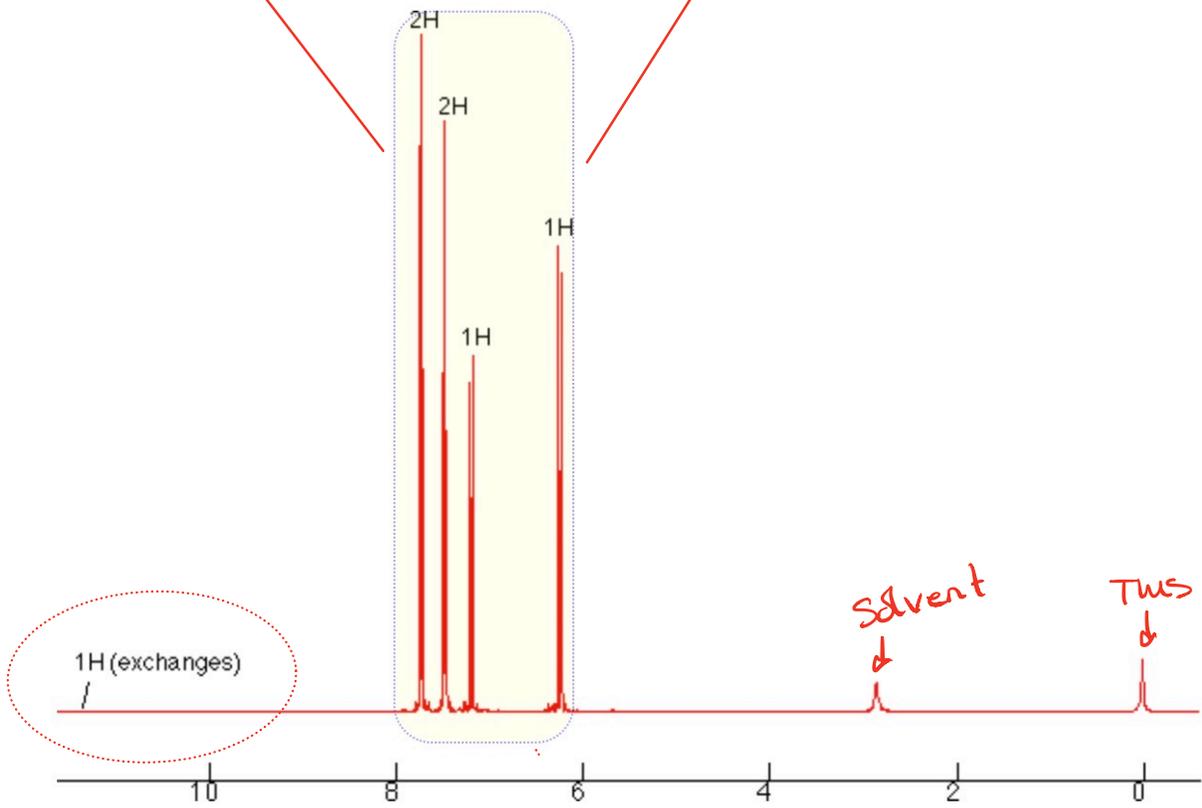
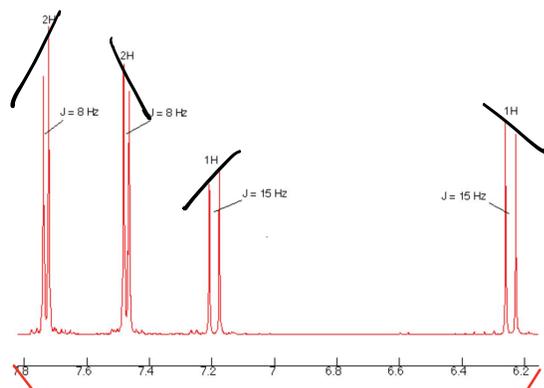
$$2 \overline{) 14}$$

7 units

Aromatic



4 units + 3 more



HNMR Table 5 Environments

<u>ppm</u>	<u>Int</u>	<u>mult</u>	<u>#n</u>	<u>assignment</u>
6.2	1	d 15Hz	1 ←	}
7.2	1	d 15Hz	1 ←	
7.44	2	d 8Hz	1 ←	}
7.66	2	d 8Hz	1 ←	
11.5	1	s exchanges		