
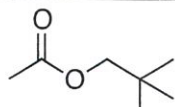

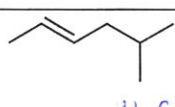
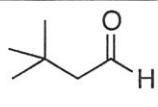
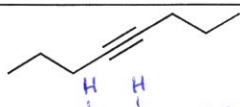
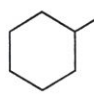
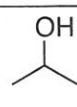
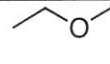
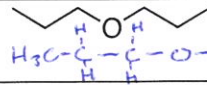
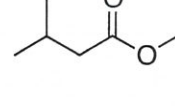


Splitting Key: s \Rightarrow singlet q \Rightarrow quartet
 d \Rightarrow doublet m \Rightarrow multiplet (>4)
 t \Rightarrow triplet

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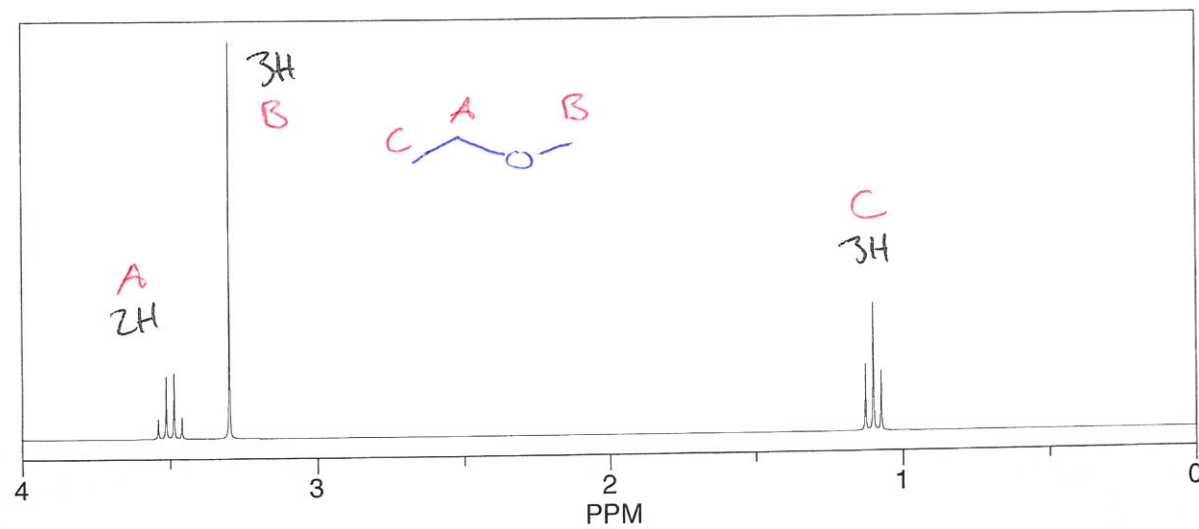
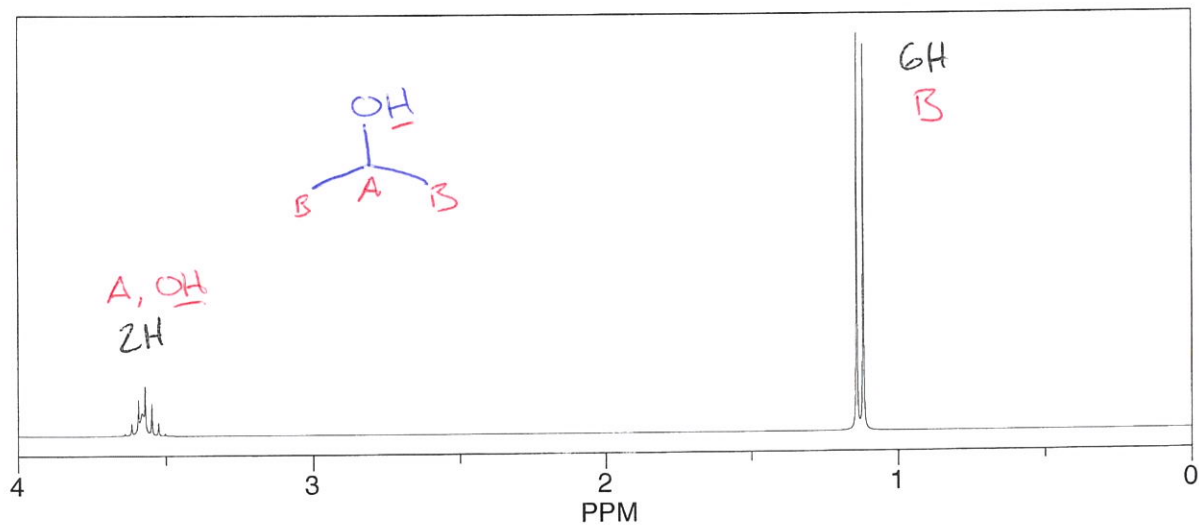
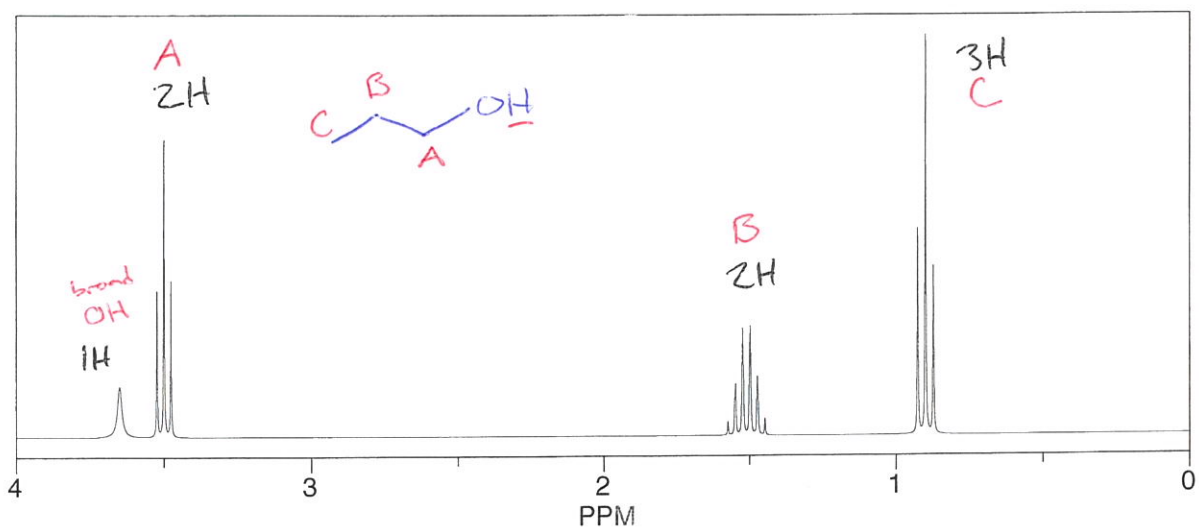
^1H NMR Problems

(# of signals)

Molecule	# of Sets of Equivalent H Atoms	Ratio of Signal Integrations	Splitting Patterns	Other Notes
 $\text{H}_3\text{C}-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\text{OH}$	4	3:2:2:1	t, m, t, s	Alcohol \Rightarrow broad $-\text{OCH}_2-$ 3-4 ppm
 $\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}-\text{CH}_3$	3	3:2:9	s, s, s	t-butyl group (large singlet) $-\text{OCH}_2-$ 3-4 ppm
 $\text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H}$	1	-	s	symmetric
 $\text{H}_3\text{C}-\overset{\text{H}}{\text{C}}=\overset{\text{H}}{\text{C}}-\overset{\text{CH}_3}{\text{C}}-\overset{\text{CH}_3}{\text{C}}-\text{CH}_3$	6	3:1:1:2:6:1	d, m, q t, m, d	Alkene Hs 5-5.7 ppm
 $\text{H}_3\text{C}-\overset{\text{H}_3\text{C}}{\text{C}}-\overset{\text{H}}{\text{C}}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$	3	9:2:1	s, d, t	t-butyl group (large singlet) Aldehyde 9.5-10.1 ppm
 $\text{H}_3\text{C}-\overset{\text{H}}{\text{C}}-\overset{\text{H}}{\text{C}}-\text{C}\equiv\text{C}-\overset{\text{H}}{\text{C}}-\overset{\text{H}}{\text{C}}-\text{CH}_3$	3	3:2:2 (6:4:4)	t, m, t	Symmetric alkyne
 $\text{H}-\text{C}-\overset{\text{HO}}{\text{C}}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H}$	5	1:1:4:4:2	s, m, q m, m	alcohol, broad $-\text{OCH}_2-$ 3-4 ppm
 $\text{H}_3\text{C}-\overset{\text{OH}}{\text{C}}-\text{CH}_3$	3	1:1:6	s, m, d	alcohol broad $-\text{OCH}_2-$ 3-4 ppm
 $\text{H}_3\text{C}-\overset{\text{H}}{\text{C}}-\text{O}-\text{CH}_3$	3	3:2:3	t, q, s	$-\text{OCH}_2-$ 3-4 ppm $-\text{OCH}_3$ 3-4 ppm
 $\text{H}_3\text{C}-\overset{\text{H}}{\text{C}}-\text{O}-\overset{\text{H}}{\text{C}}-\overset{\text{H}}{\text{C}}-\text{CH}_3$	3	3:2:2 (6:4:4)	t, q, t	symmetric $-\text{OCH}_2-$ 3-4 ppm
 $\text{H}_3\text{C}-\overset{\text{CH}_3}{\text{C}}-\overset{\text{H}}{\text{C}}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OCH}_3$	4	6:1:2:3	d, m d, s	$-\text{OCH}_3$ 3-4 ppm

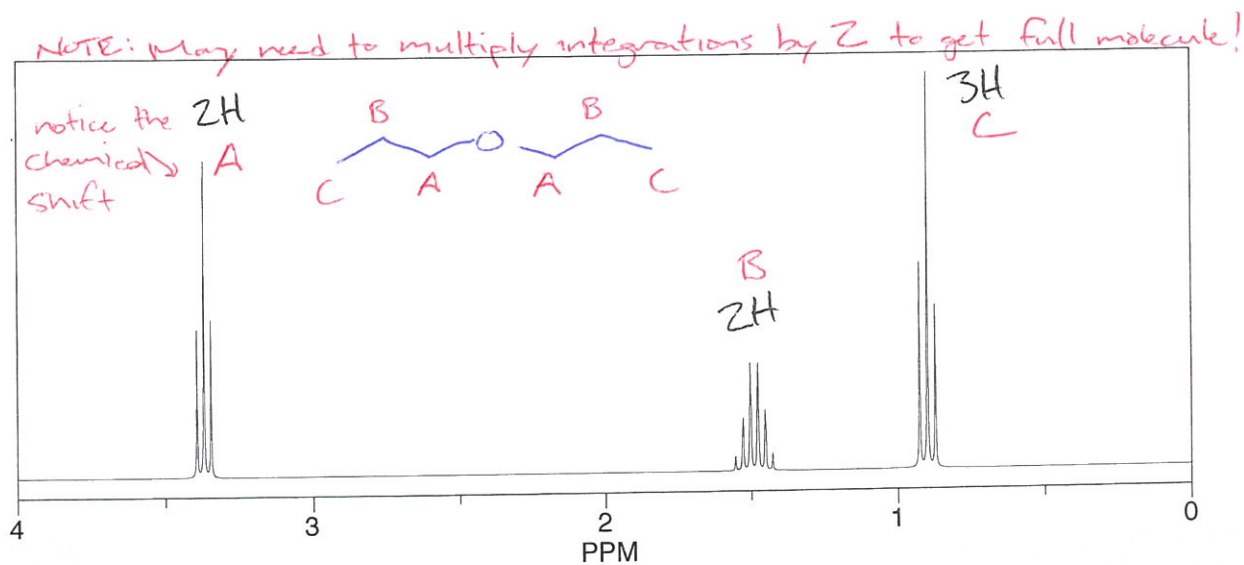
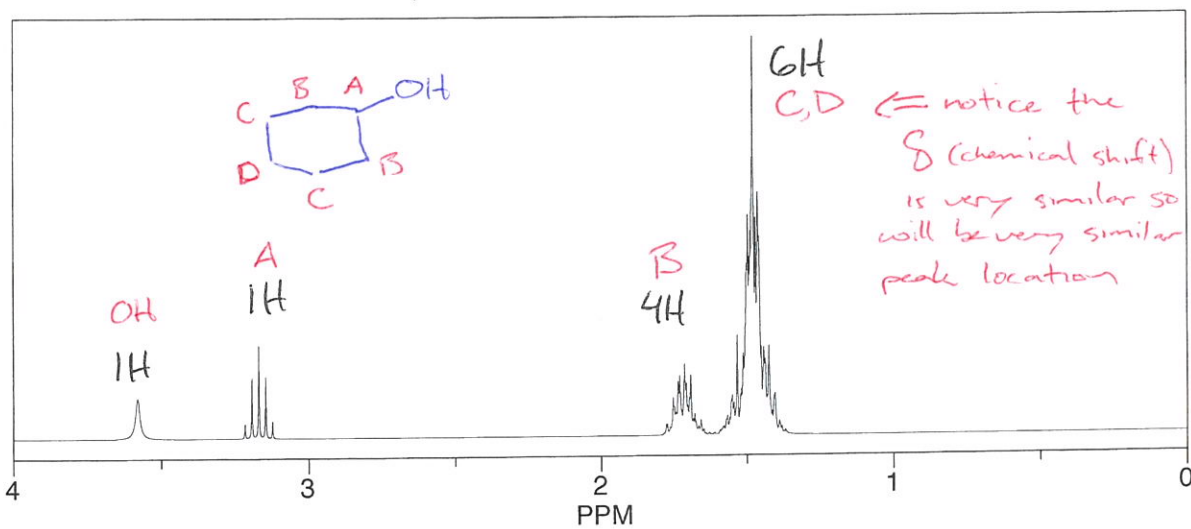
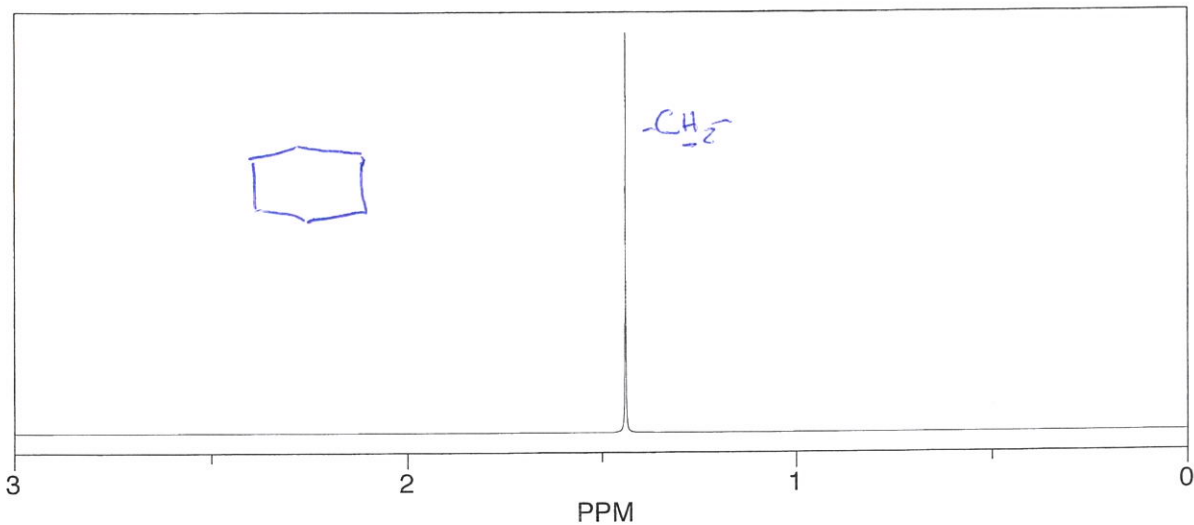
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^1H NMR Problems



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¹H NMR Problems



¹H NMR Problems

