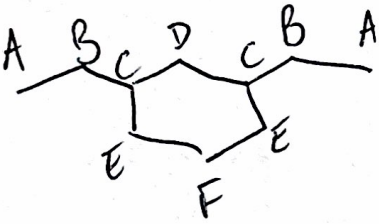
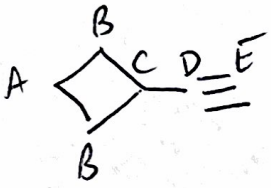
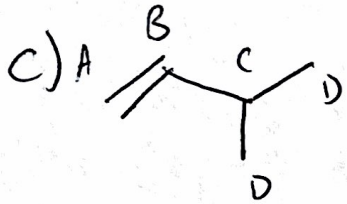
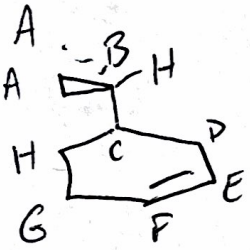
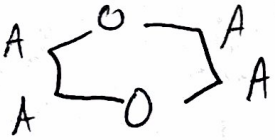
Chapter 12

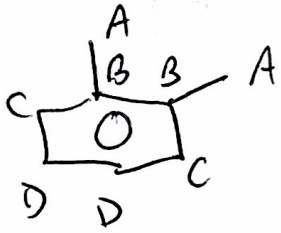
12) a)  = 6 C's

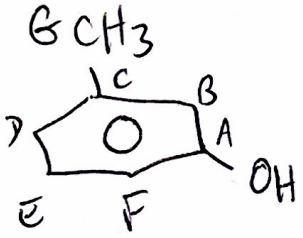
b)  = 5 C's

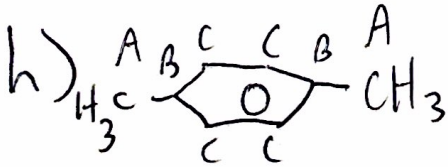
c)  = 4

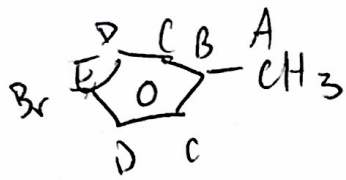
D)  = 8

E)  = 1

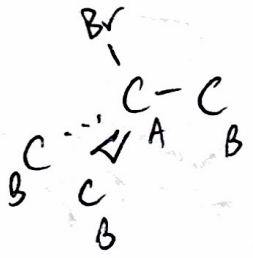
F)  = 4

G)  = 7

h)  = 3

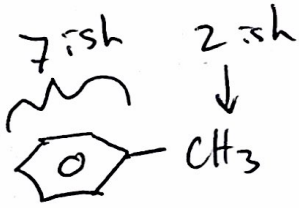
12) i)  = 5

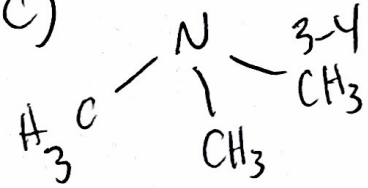
j) C-C-C-Br = 3

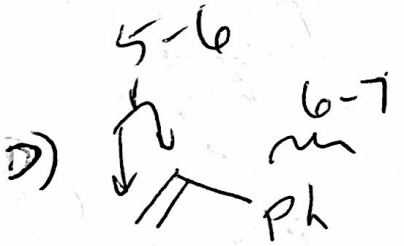
k)  = 2

13) a) $CH_3\ CH_2-C(=O)-H$

0-1 2-3 9-10

b) 

c) 

d) 

e) $CH_3\ CH_2-C(=O)-OH$

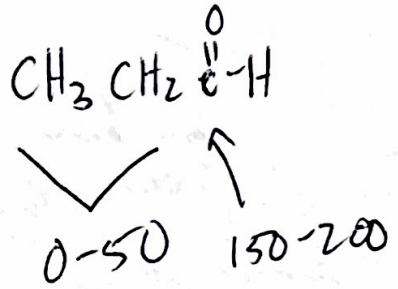
0-1 2-3 10-11

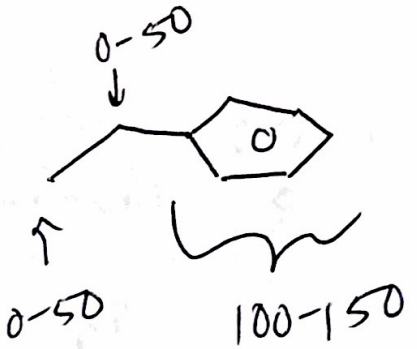
f) CH_3-O-CH_3

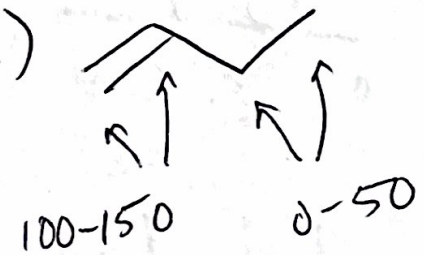
3-4

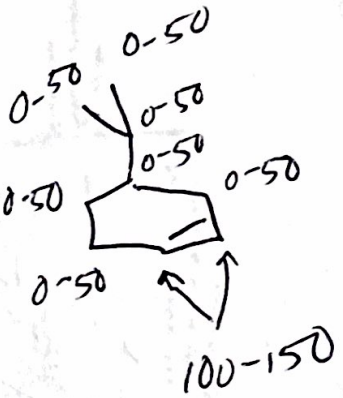
g) $CH_3\ CH_2\ Br$

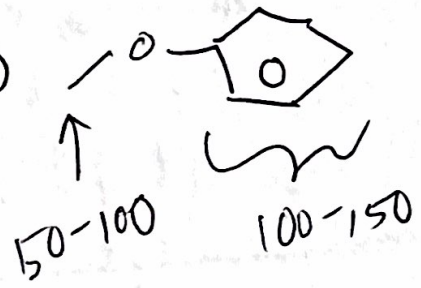
0-1 2-sh

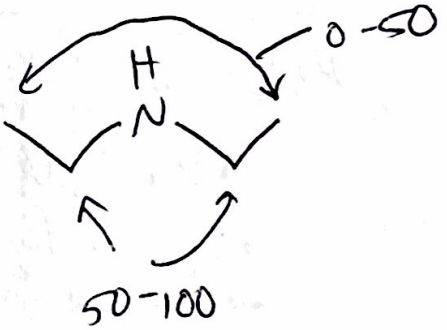
14) a) 

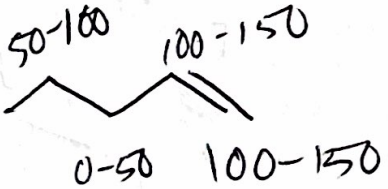
b) 

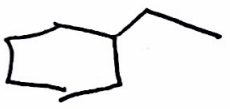
c) 

D) 

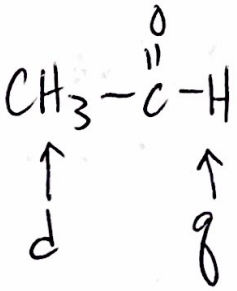
e) 

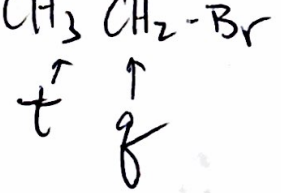
f) 

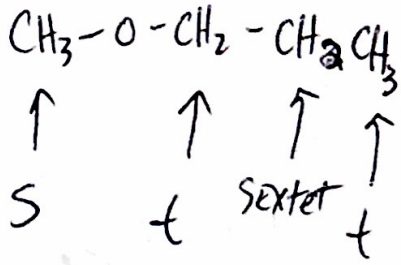
g) 

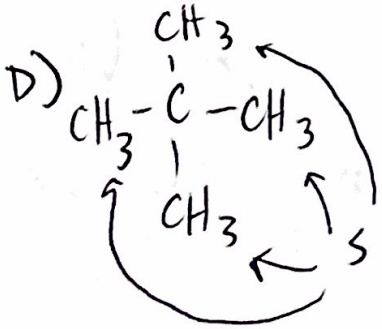
h) 

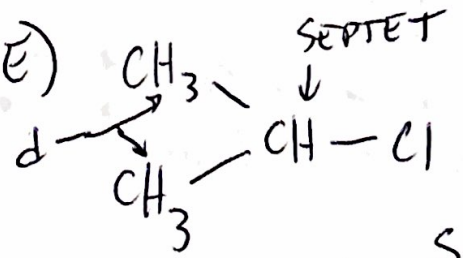
all 0-50

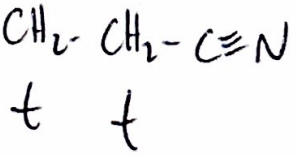
15) a) 

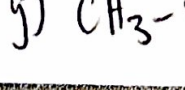
b) 

c) 

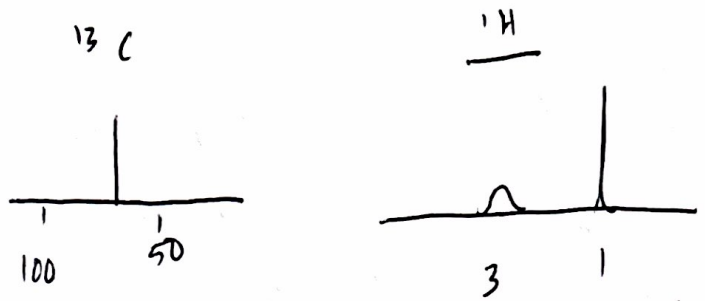
D) 

E) 

f) 

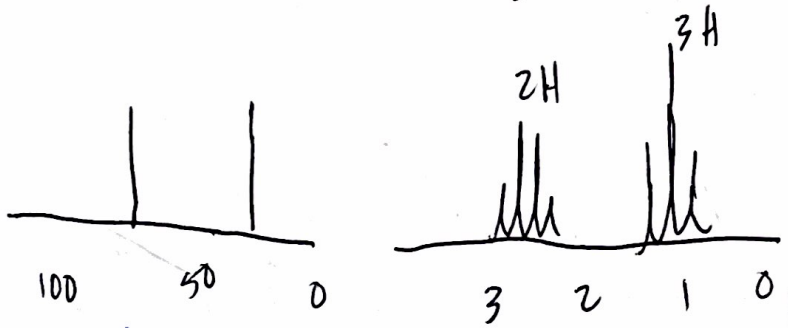
g) 

16) a)



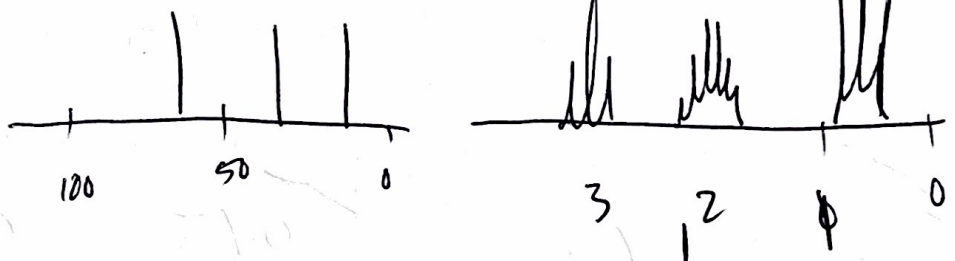
CH_3OH
S

b)



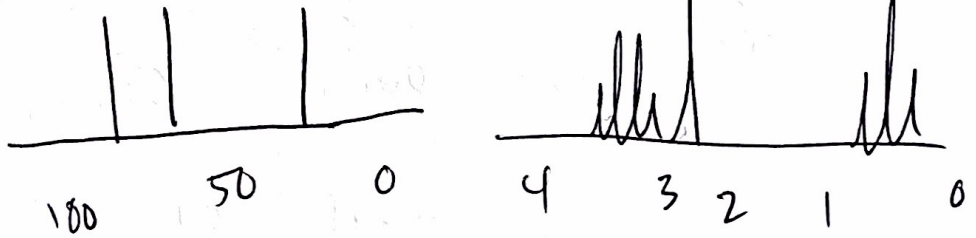
$Cl-CH_2CH_3$
q t

c)



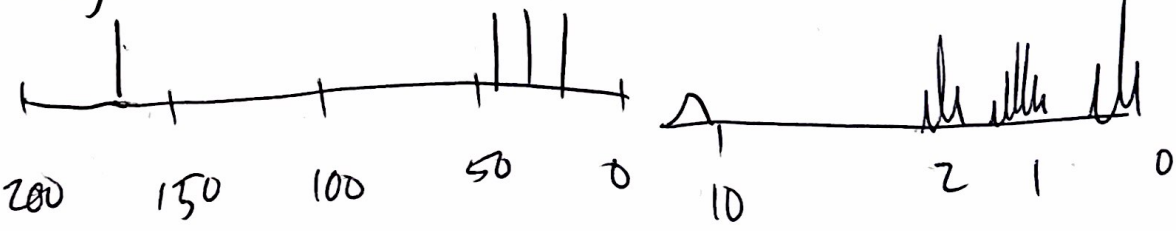
t sext t
$Br-CH_2-CH_2-CH_3$

D)



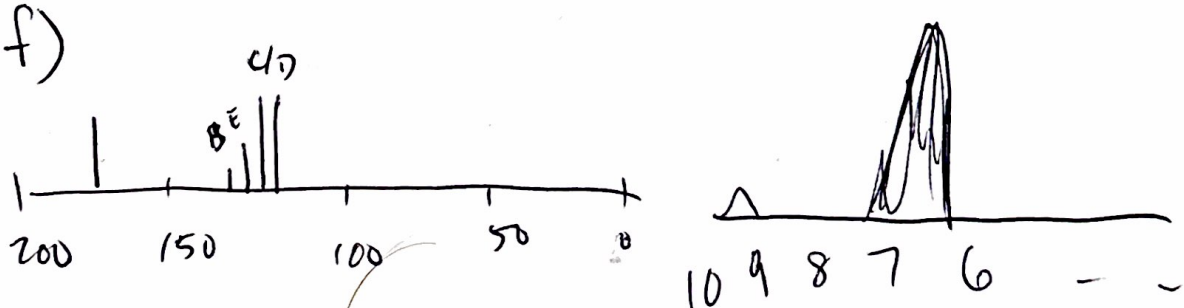
$CH_3CH_2OCH_3$
t q s

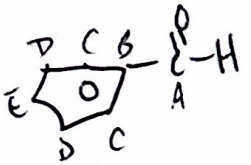
e)



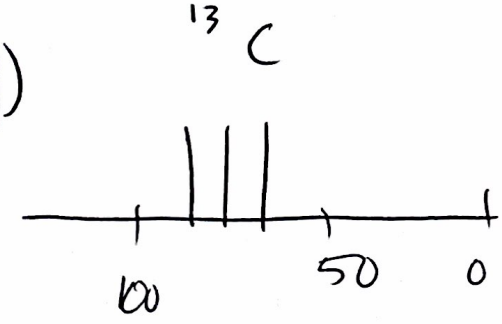
$CH_3CH_2CH_2-\overset{O}{\overset{\|}{C}}-OH$
t sext t
0-1 2.5L 10-11

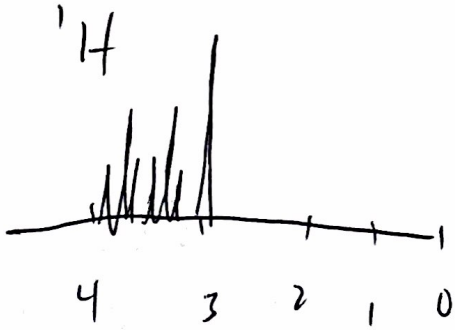
f)

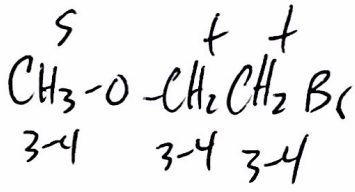




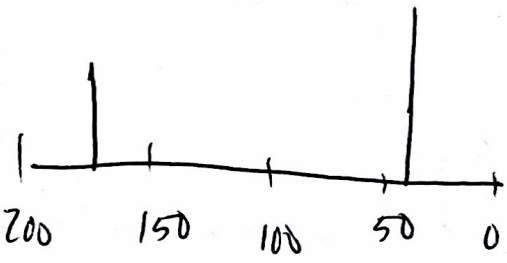
16 g)

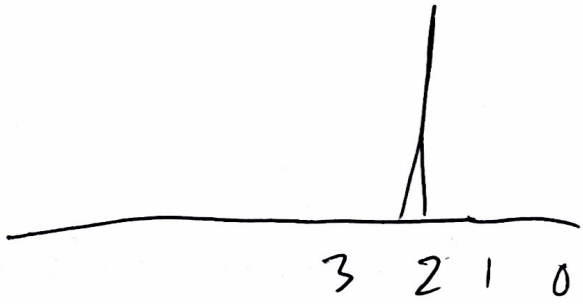

^{13}C
100
50
0


^{1}H
4
3
2
1
0


s
t
t
$CH_3-O-CH_2CH_2Br$
3-4
3-4
3-4

h)


200
150
100
50
0


3
2
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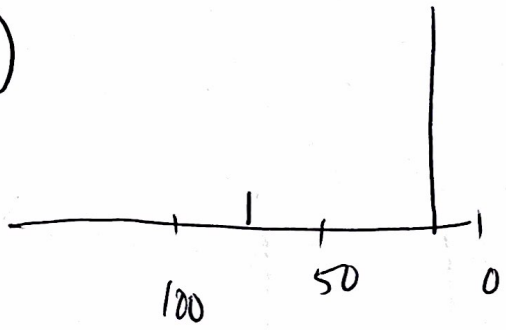
0


O

i)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50
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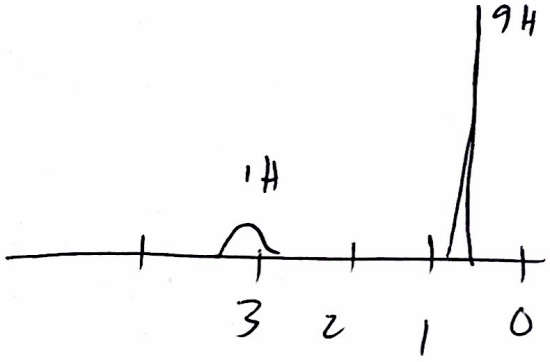
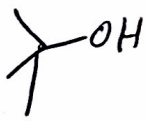
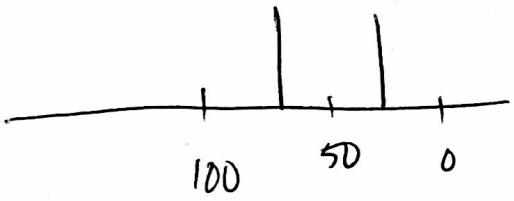
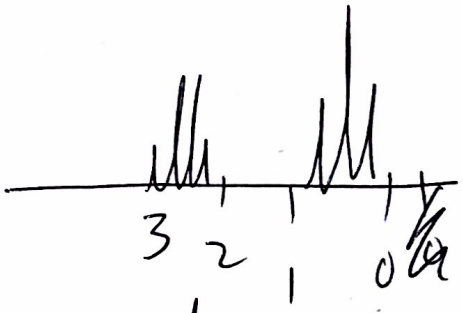

9H
1H
3
2
1
0


OH

j)


100
50
0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k)


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100
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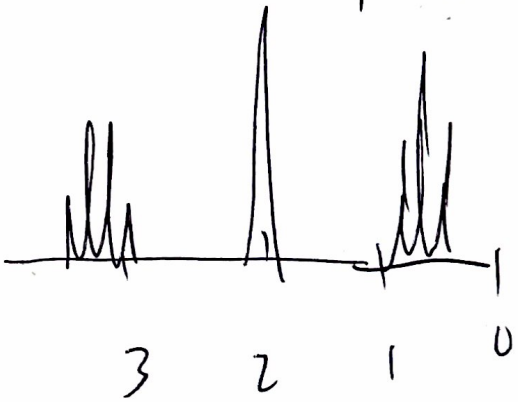
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2
1
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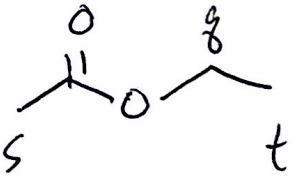
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s
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100
50
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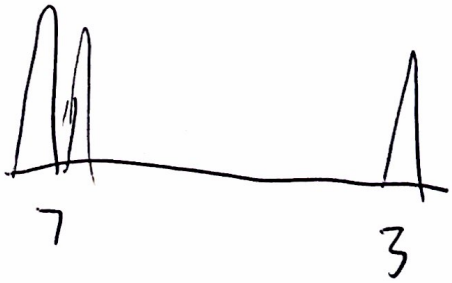
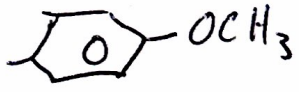
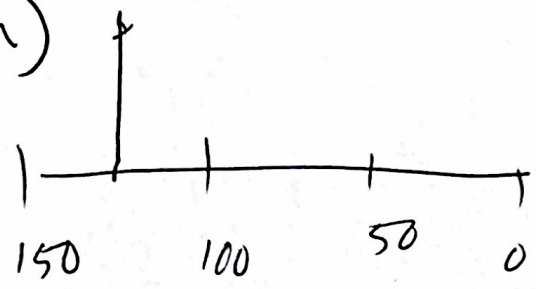
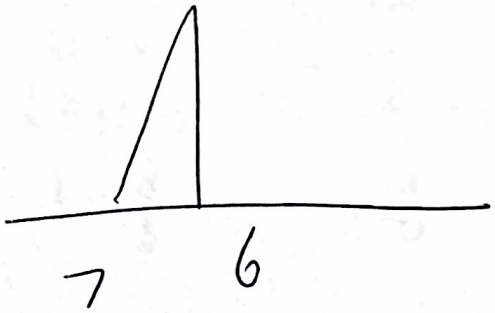

7
3


Cl
O
OCH_3

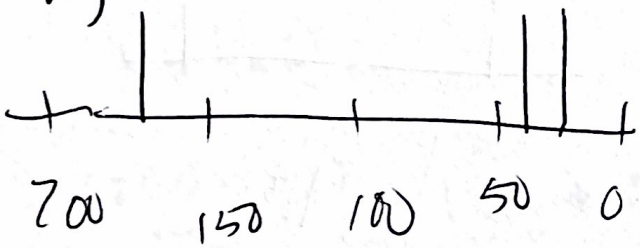
16 m)

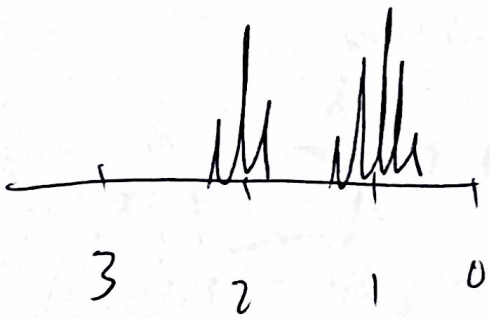

150
100
50
0

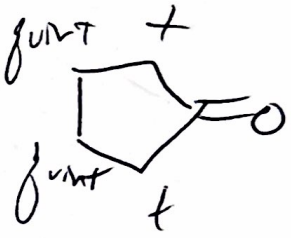

7
6


O

n)


200
150
100
50
0


3
2
1
0


quint
+
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quint
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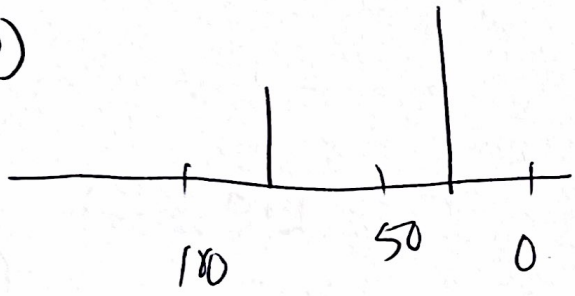
o)


150
50
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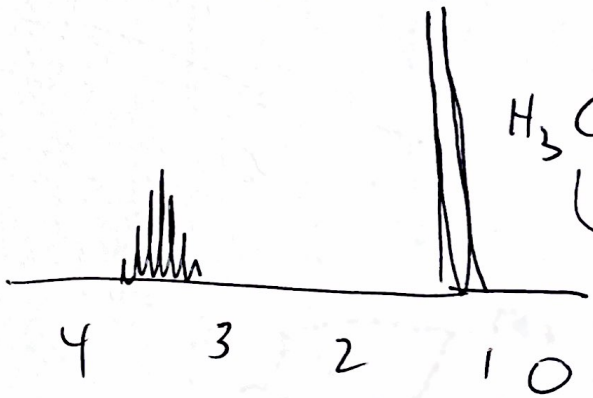
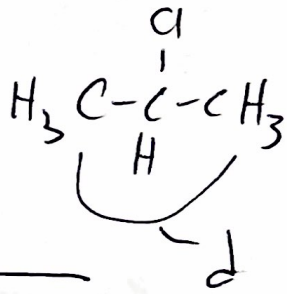
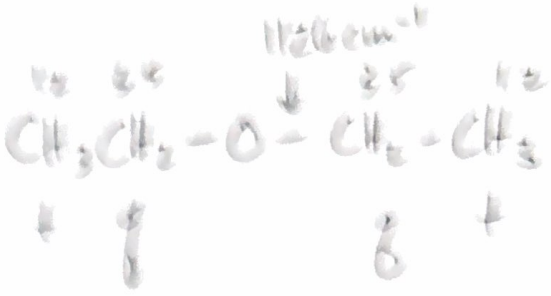

4
3
2
1
0


Cl
H3C-C-CH3
H
d

17) C_4H_8O

8 degrees of unsat.

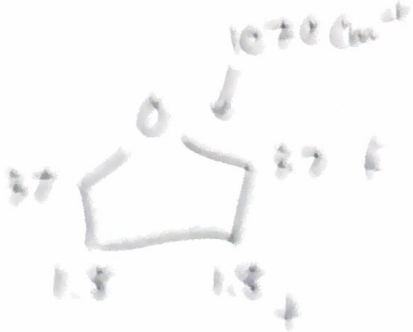
$\left(\frac{2(4)+2-8}{2}\right)$



C_4H_5O

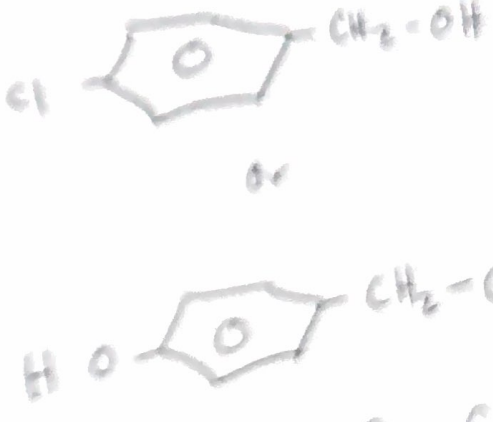
$\left(\frac{2(4)+2-5}{2}\right)$ = 1 degree of unsat

(C=O)



C_6H_7OCl

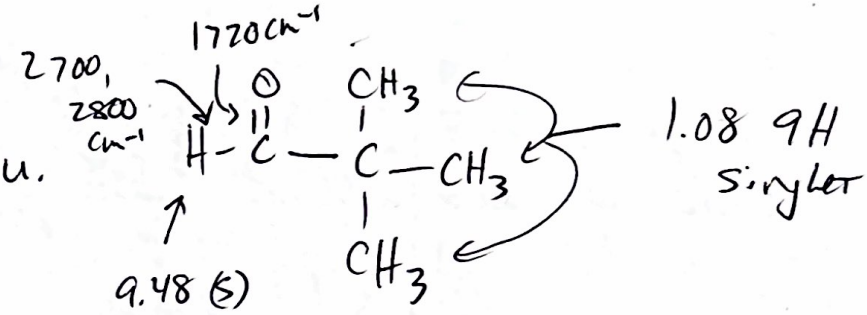
$\left(\frac{2(7)+2-7}{2}\right)$ = 4 degrees of unsat



All Both Good Guesses

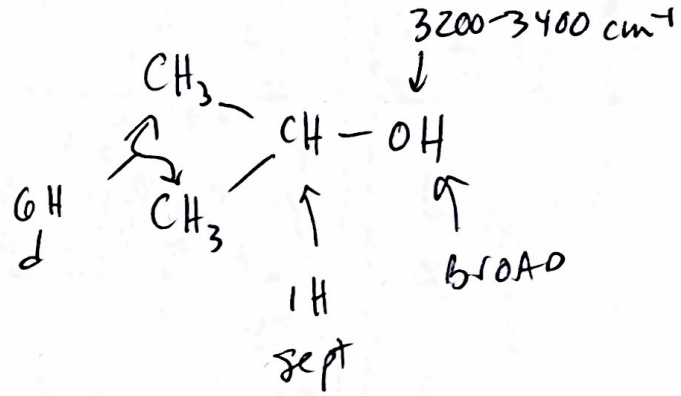
17) $C_5H_{10}O$

$$\frac{2(5)+2-10}{2} = 1 \text{ d.u.}$$



C_3H_8O

$$\frac{2(3)+2-8}{2} = 0 \text{ d.u.}$$

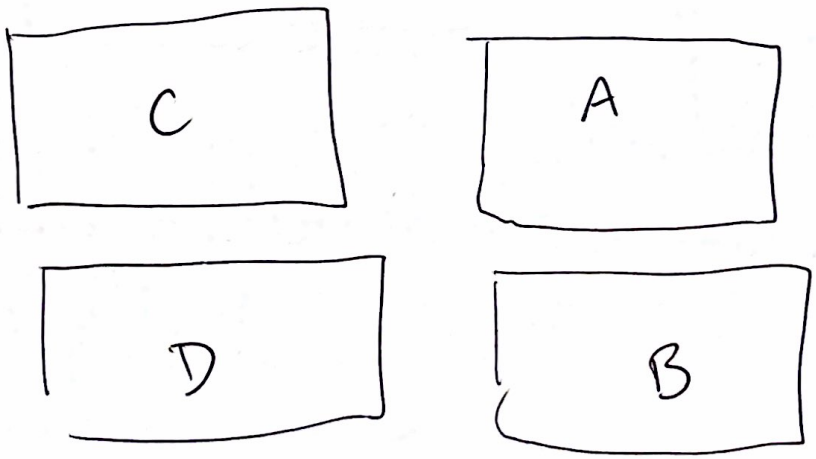


18) Blue peak is to OH proton

New Red peak is peak for H in HOD.

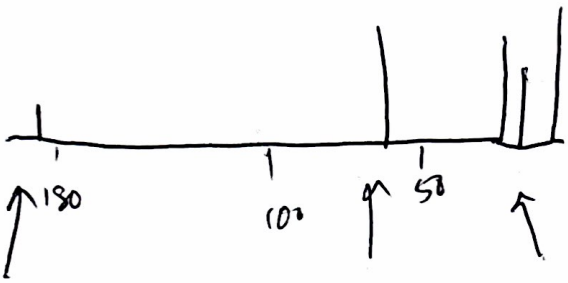
The D of heavy water is replaced with H of the alcohol.

19)



20)

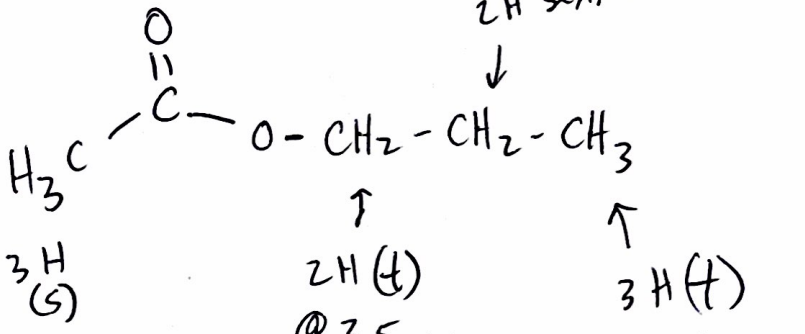
a)



1 C=O carbon

1 C Next to something special

3 Regular C's

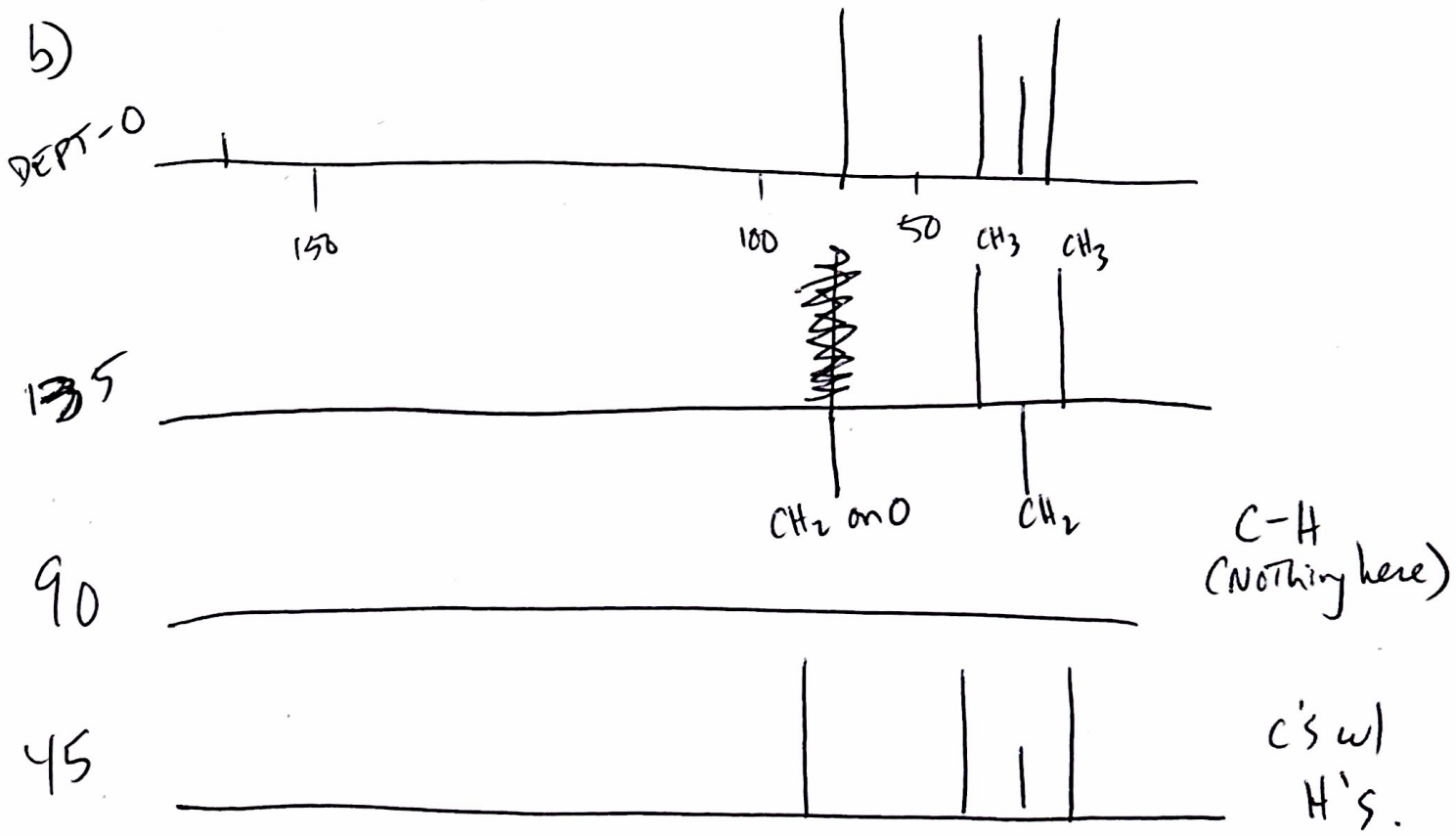


3H (s)

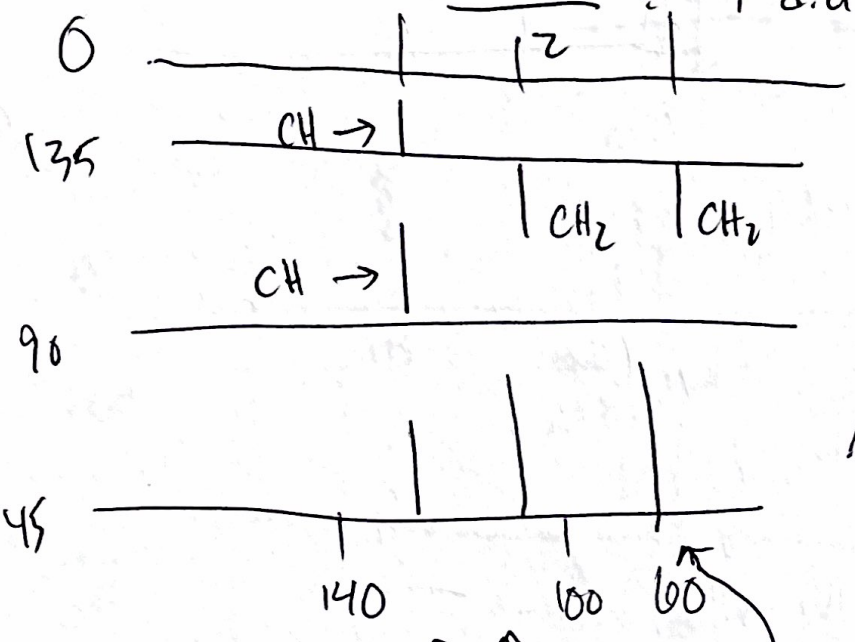
2H (t) @ 3.5 ppm

3H (t) 0-1 ppm

b)



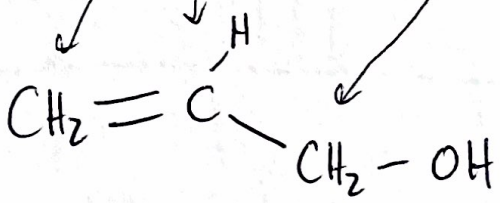
21) C_3H_6O = $\frac{2(3)+2-6}{2}$ = 1 d.u.



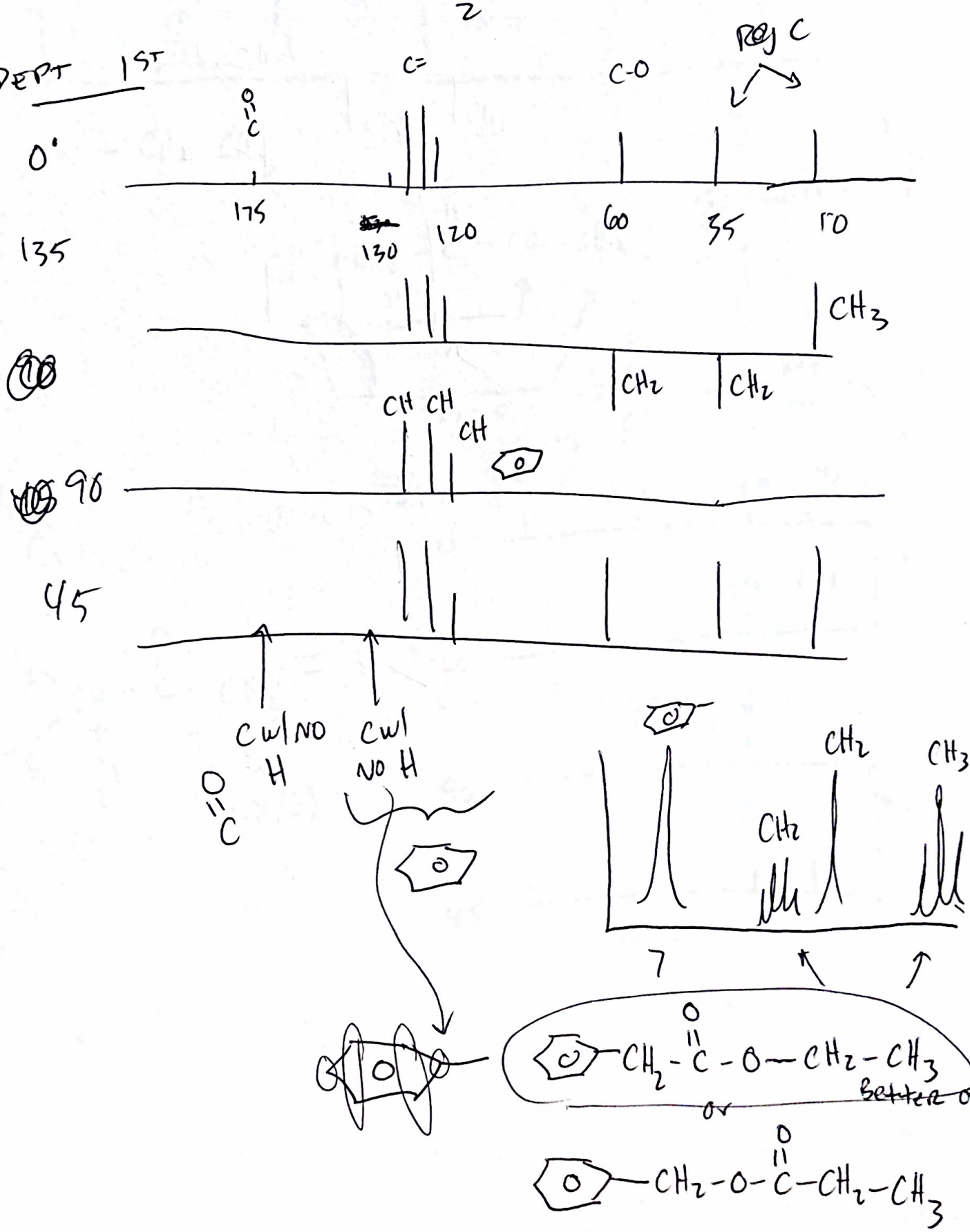
All 3 C's have H's on Them

C Next to O.

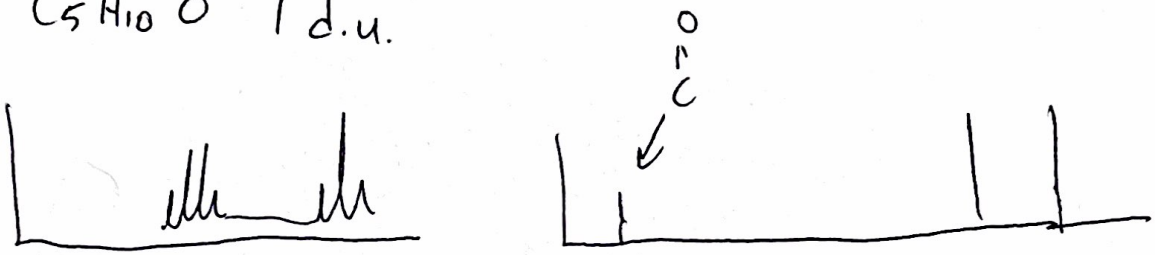
Double Bonded C's



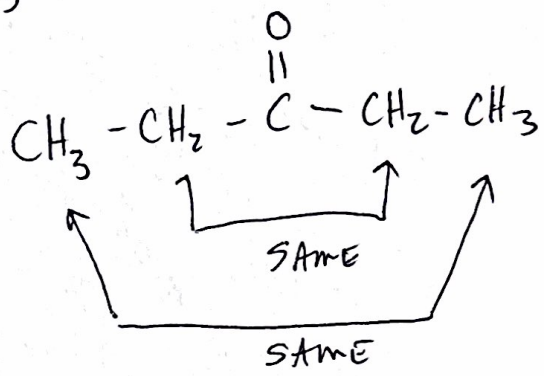
22) $C_{10}H_{12}O_2$ $\quad \frac{2(10)+2-12}{2} = 0$ d.u.



23) $C_5H_{10}O$ 1 d.u.



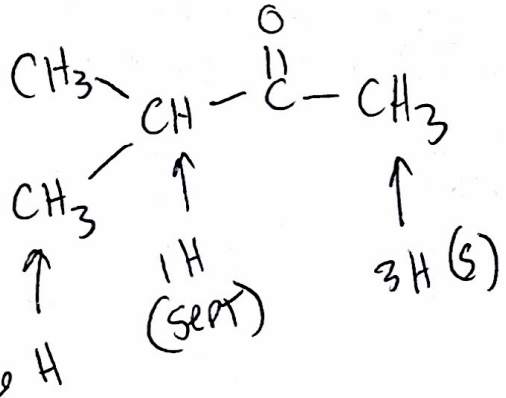
$-CH_2-CH_3$



Symmetrical!

24) IR 

86 = $C_5H_{10}O$



(d)

DEPT