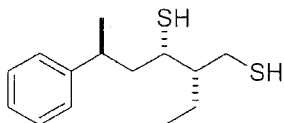


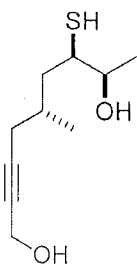
Organic Chemistry 335
Exam 2
February 27, 2013

In-class # Key
Name _____
(Last, First)

1. Name the following compounds (10 points)

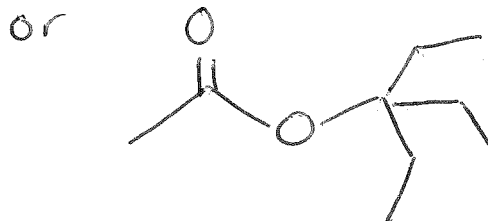
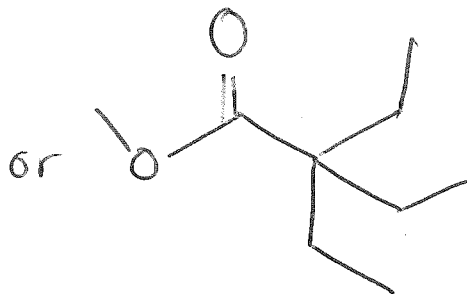
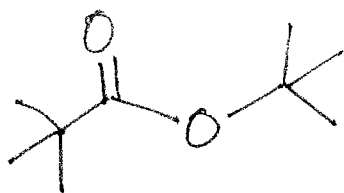


(2S, 3S, 5S)-2-ethyl-5-phenyl hexane-1,3-dithiol



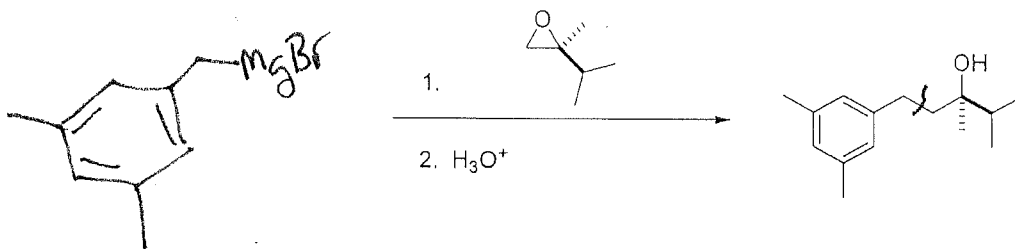
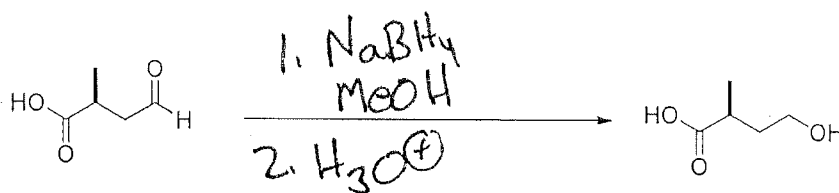
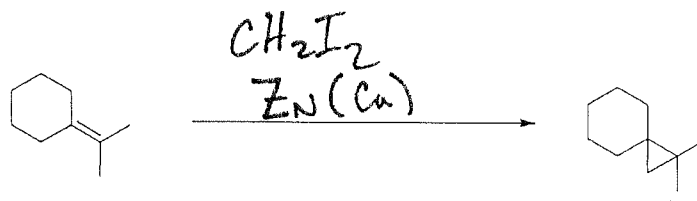
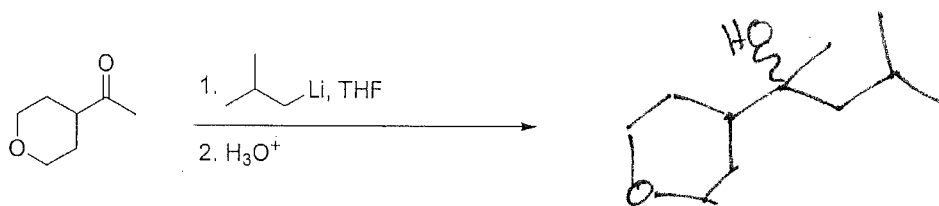
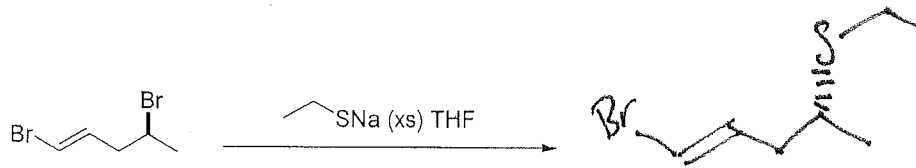
(5R, 7R, 8R)-7-mercapto-5-methyl non-2-yne-1,8-diol

2. Draw, in bond line, an ester with the chemical formula $C_9H_{18}O_2$ that would only have 5 peaks in a ^{13}C NMR (3 pts)

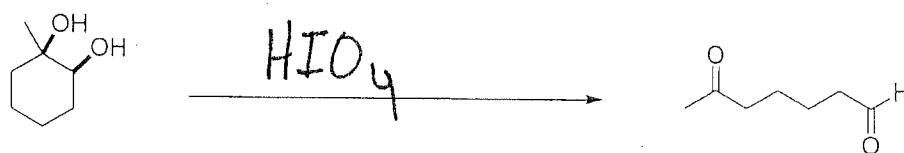
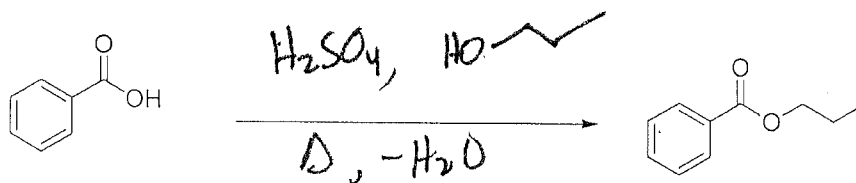
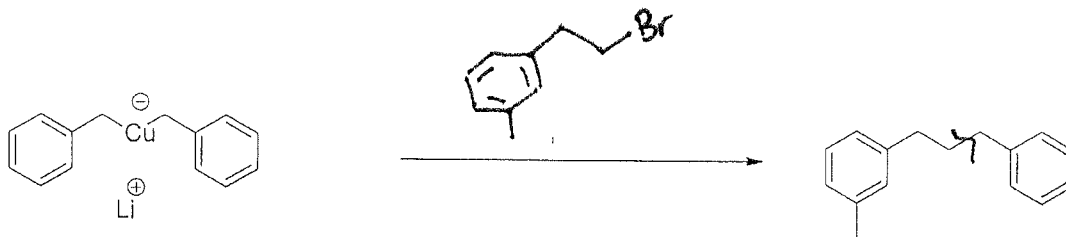
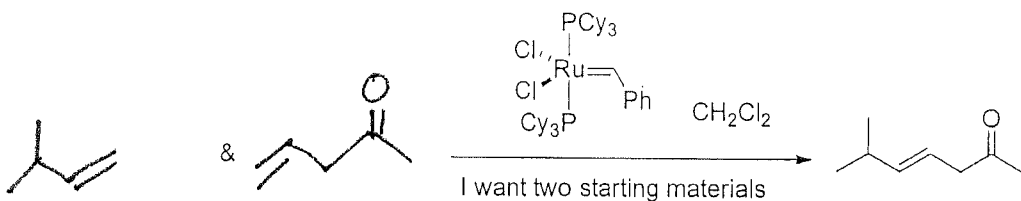
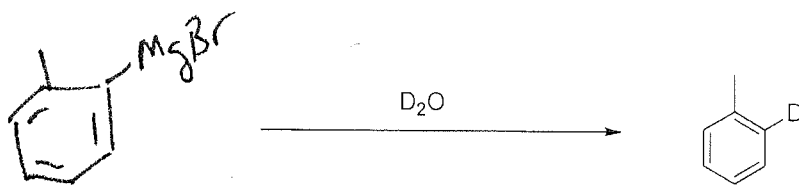
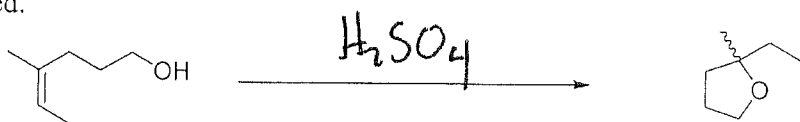


3. What was the starting material, reagents, or product/s for the following chemical transformations? If there is no reaction write "no reaction"

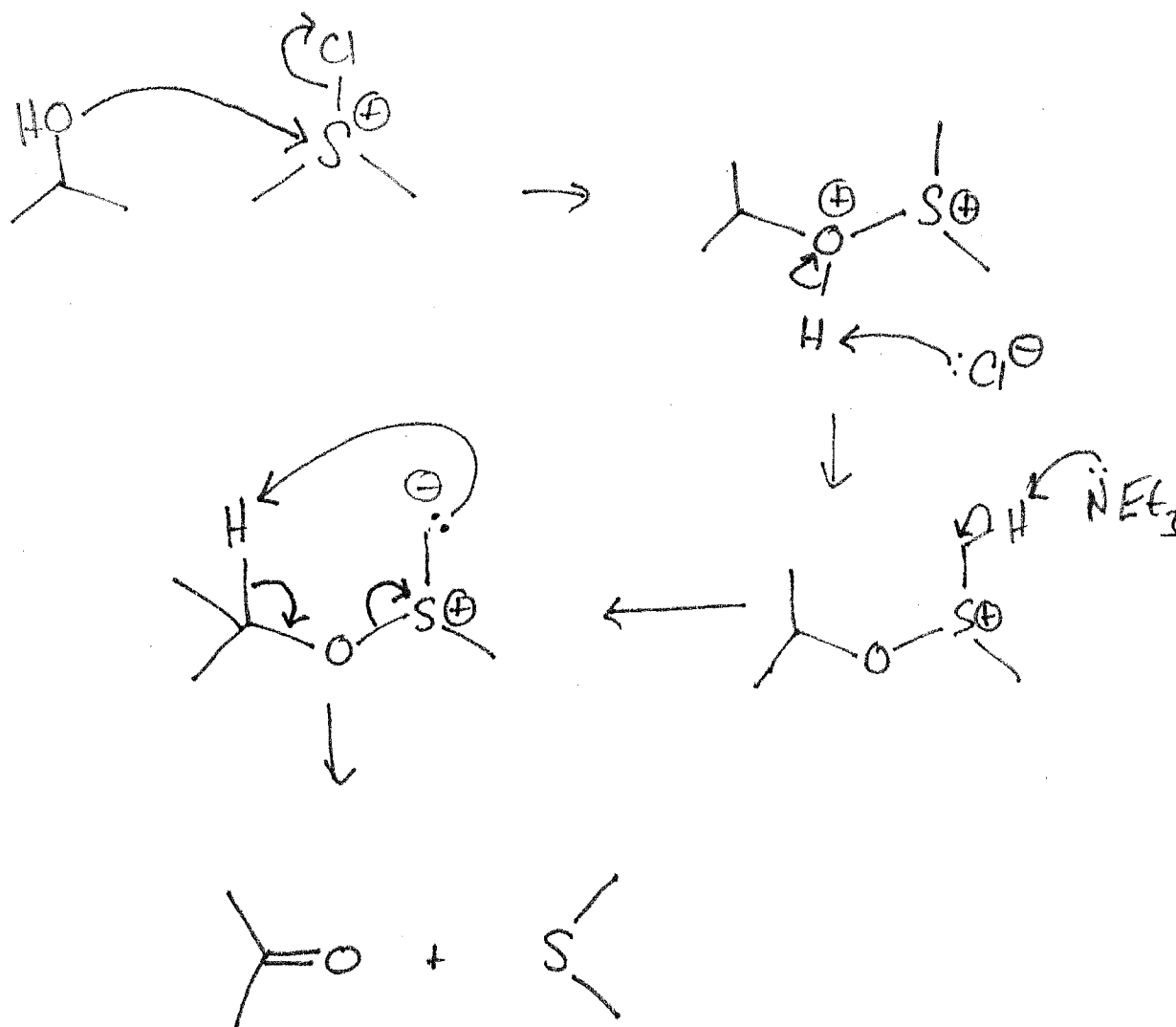
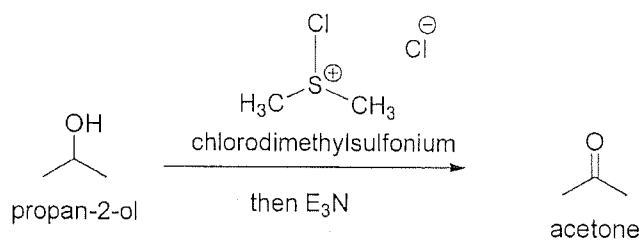
Do not forget about stereochemistry (40 points)



3. Continued.

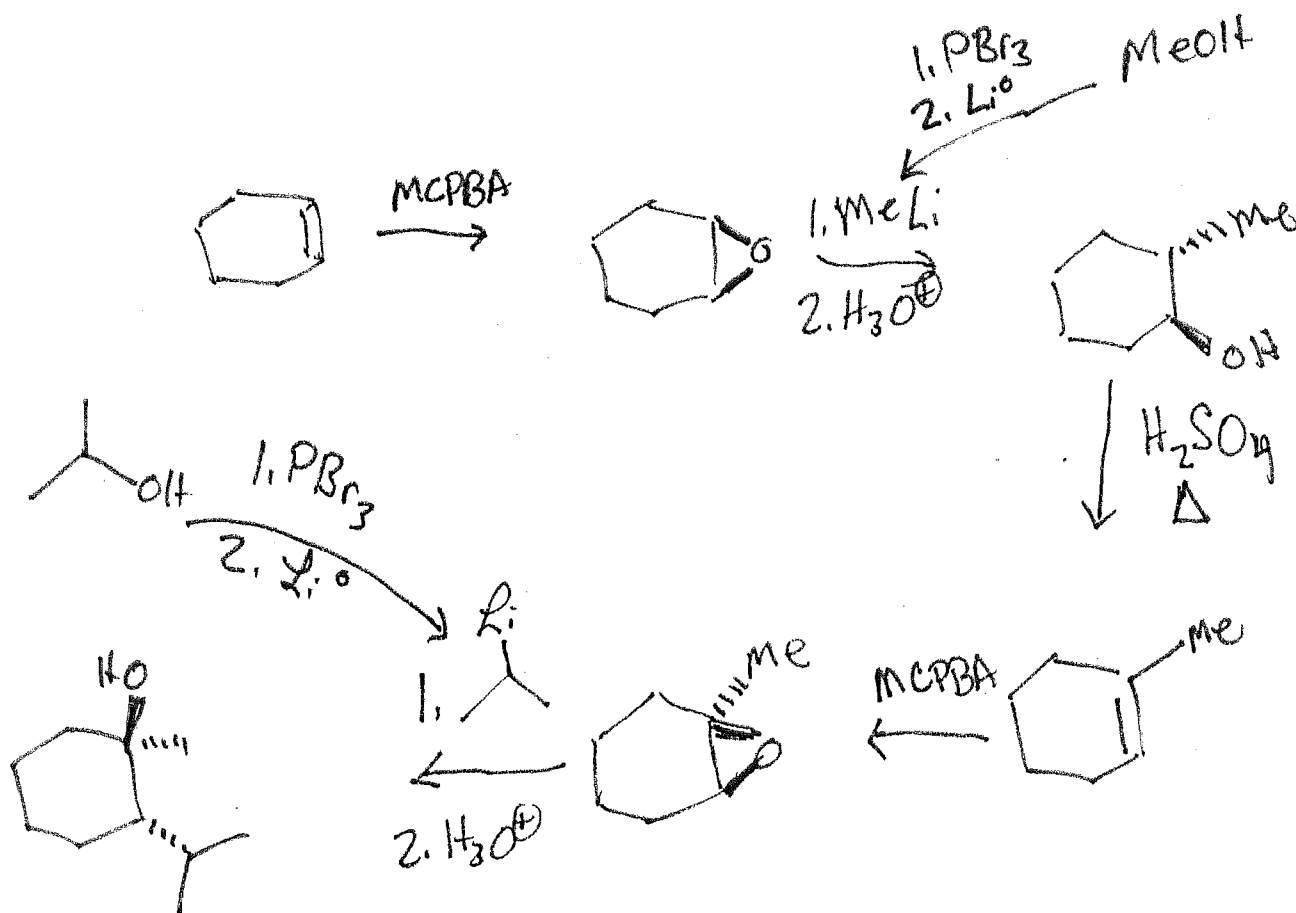
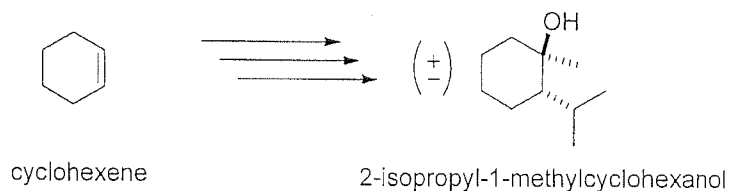


4. Draw the complete mechanism of taking propan-2-ol to acetone using the premade chlorodimethylsulfonium species in a Swern oxidation. (11 points)



5. Design a racemic synthesis of 2-isopropyl-1-methylcyclohexanol. (10 points)

- * The synthesis must start with cyclohexene.
- * You can use any reaction you have learned this year.
- * You may use any alcohol that has three carbons or less to add more carbons.
- * You need to show the how you make the reagents and intermediate products.
- * The major product must be carried on to the next step.
- * You do not need to show the mechanisms.



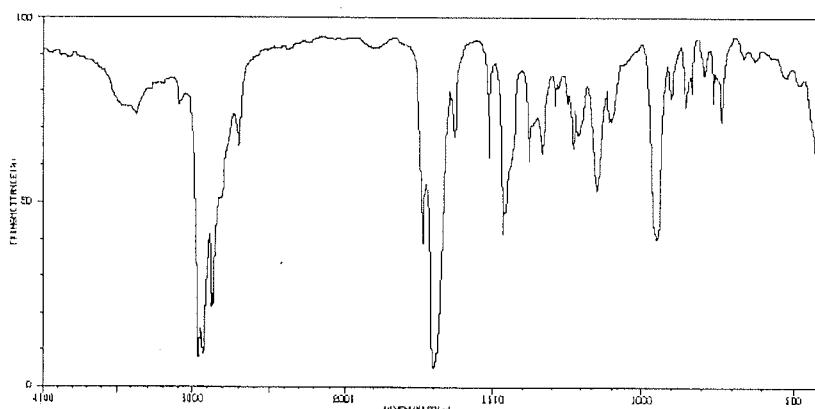
6. What is the following $C_8H_{12}Cl_2O$ structure ?
 (20 points: these 20 point are broken up in the problem)

What are the degrees of unsaturation or IHD? (3 point)

degrees of unsaturation
or IHD

2

IR: 3082, 2959, 1721, 1627 cm^{-1}



^{13}C NMR
in ppm
206
133
116
68
51
39
24
13

List four types of bonds the IR show this molecule has. (4 points)

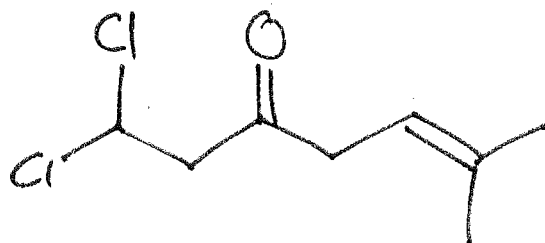
1. $sp^2 C-H$ 2. $sp^3 C-H$ 3. $C=O$ 4. $sp^2 C=C$ sp^2

Please tell me what you think each peak in the 1H NMR represents
 (CH_x , OH , NH_x ...) and how you get its splitting pattern (6 points)

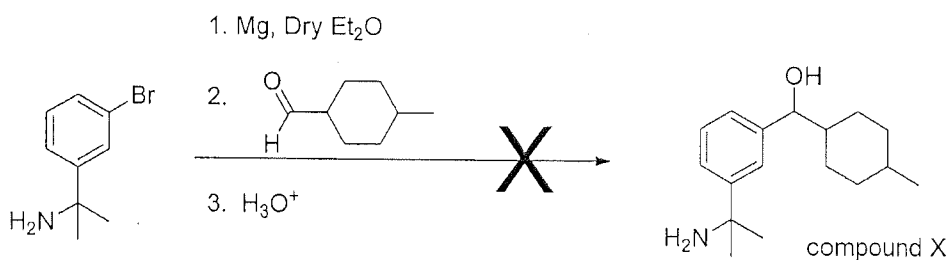
1H NMR

- 5.7 (t, 1H) CH next to CH_2
- 5.4 (t, 1H) CH next to CH_2
- 3.5 (d, 2H) CH_2 next to CH
- 3.0 (d, 2H) CH_2 next to CH
- 1.8 (s, 3H) CH_3 with no vicinal H's
- 1.7 (s, 3H) CH_3 with no vicinal H's

6 Continued: Draw the structure that best fits all the data. (7 pts)
Write ONLY ONE structure



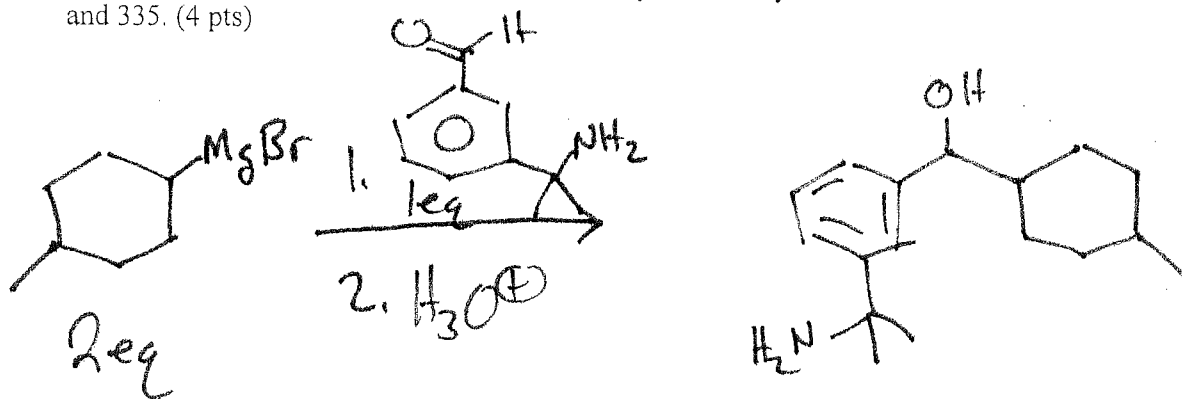
7. Victor Drangir attempted the following reactions to make compound X (see below).
 However, the reaction did not work. You do not need to worry about stereochemistry.



7a. What is the problem with Victor reaction? (2 pts)

your grignard reagent got quenched by the NH₂

7b. Provide an alternative synthesis of compound X using a Grignard reagent.
 You may use any necessary reagents and use any reactions you have learned in 334
 and 335. (4 pts)



***** (Insurance question 5 points) *****

Fill in the necessary reagents for the following reaction sequence.

