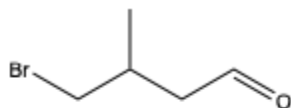
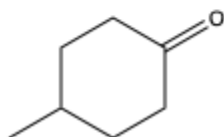


CHEM 2300 Exam 3 Review Solution

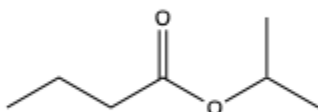
1. Name/Draw the following molecules.



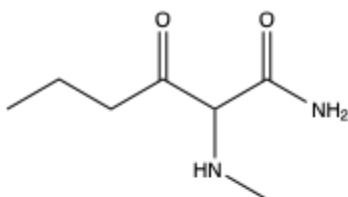
4-bromo-3-methylpentanal



1-methylcyclohexanone

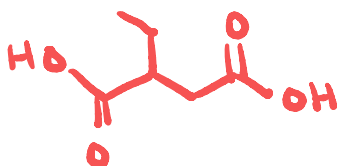


isopropyl butanoate

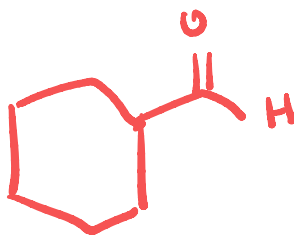


2-amino-N-methyl-3-oxohexanamide
or
2-methylamino-3-oxohexanamide

2-ethylbutanedioic acid



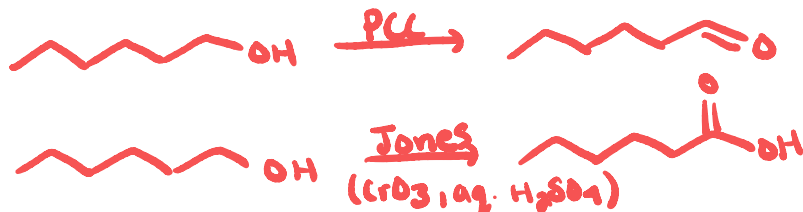
cyclohexanecarbaldehyde



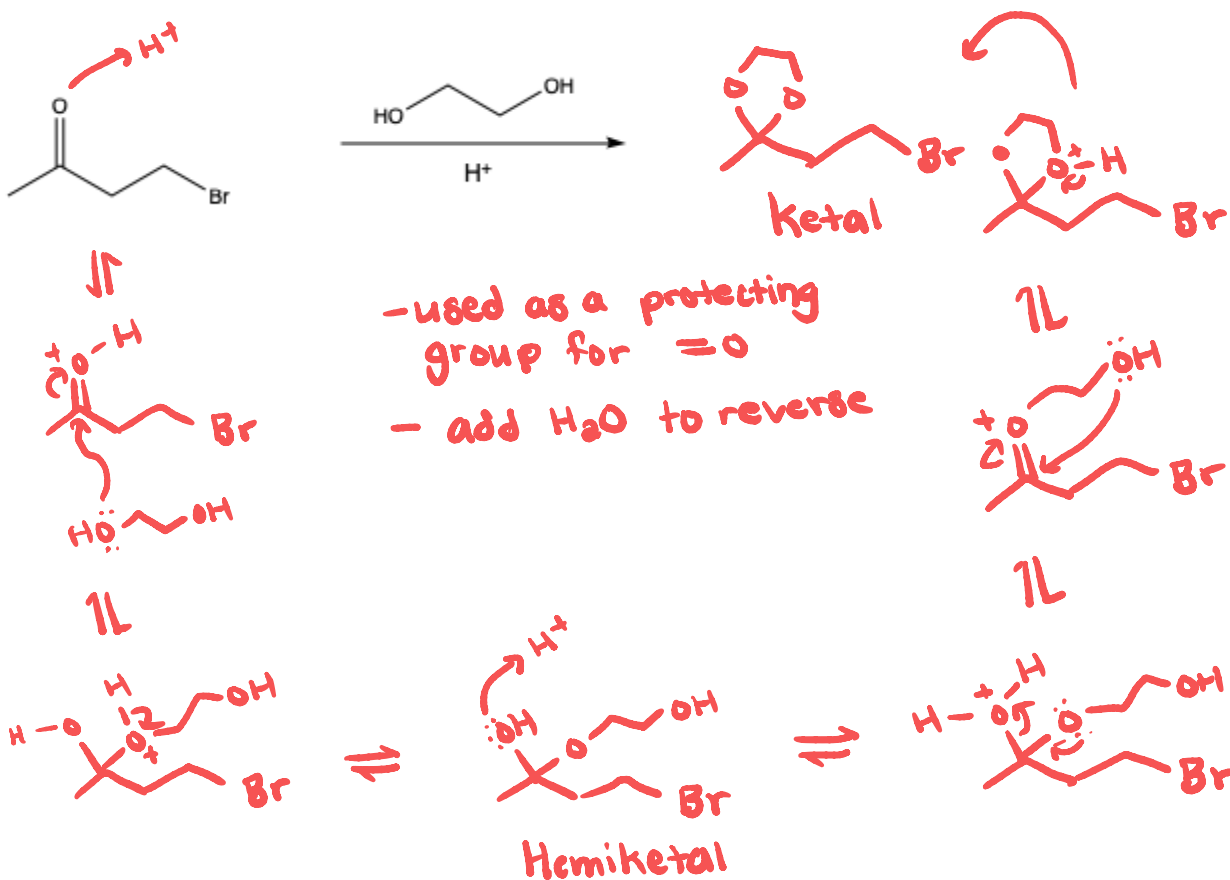
sodium 3-methylhexanoate



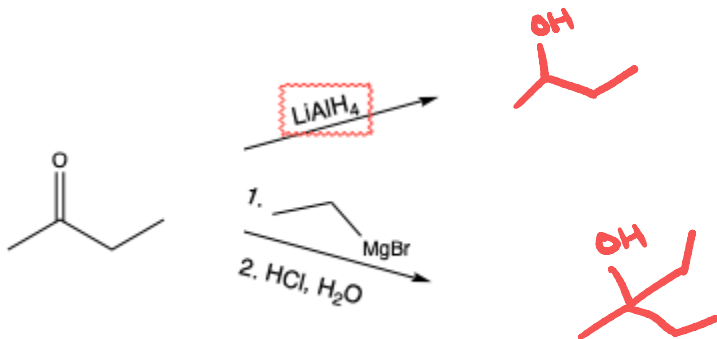
2. How would we turn 1-hexanol into hexanal? Would the reagent be different if we wanted to turn 1-hexanol into hexanoic acid, if so what would it be?



3. Draw the mechanism for the following reactions. Label which is the hemiketal and which is the ketal. What is this reaction used for? How could we reverse this reaction?

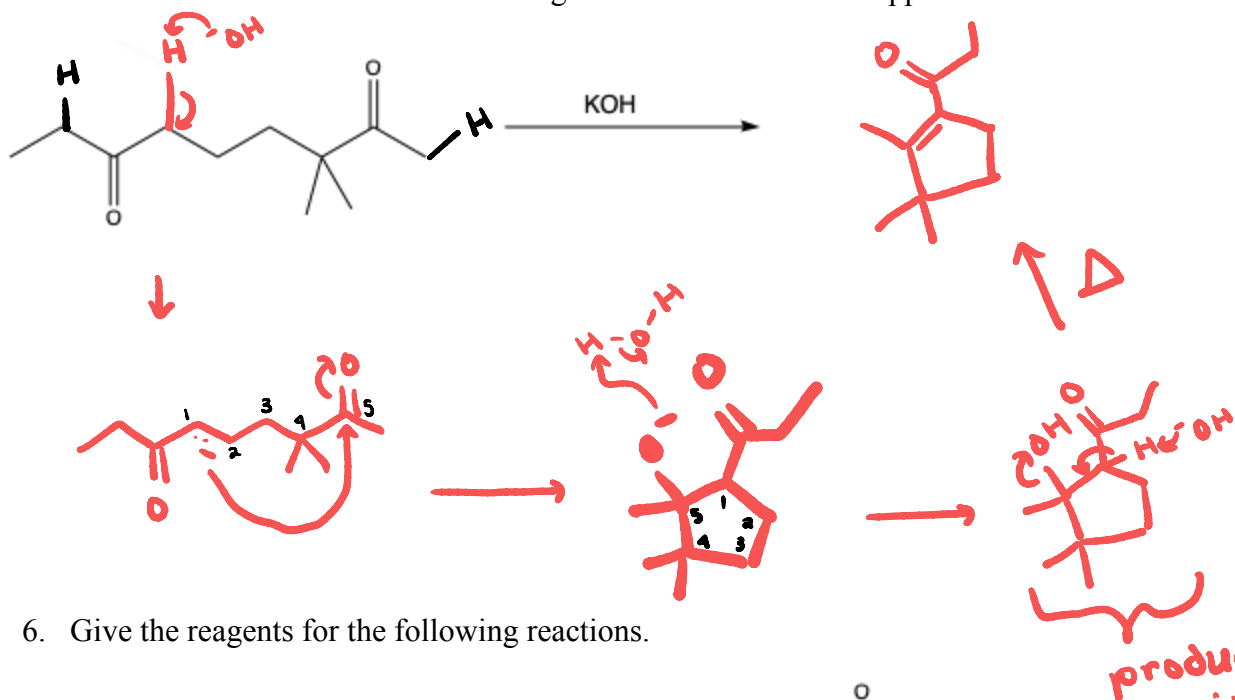


4. Give the major product(s) for the following reactions.

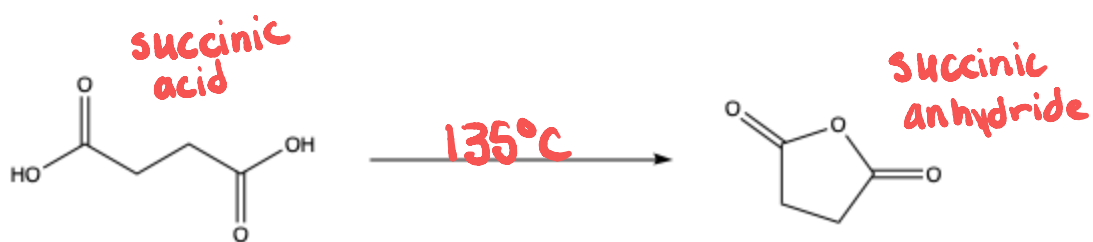
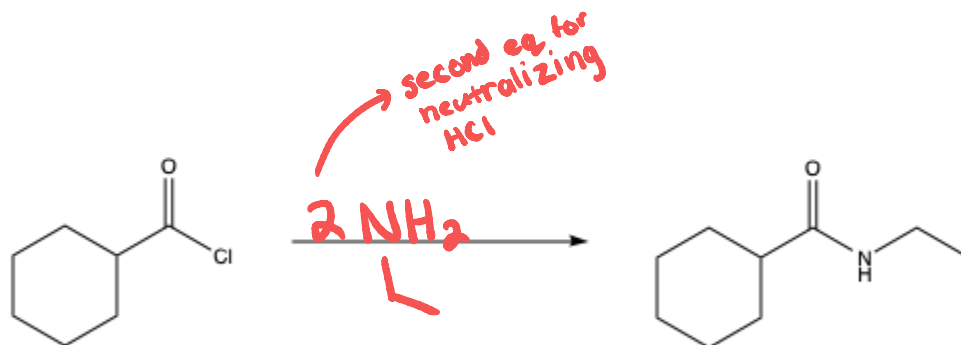
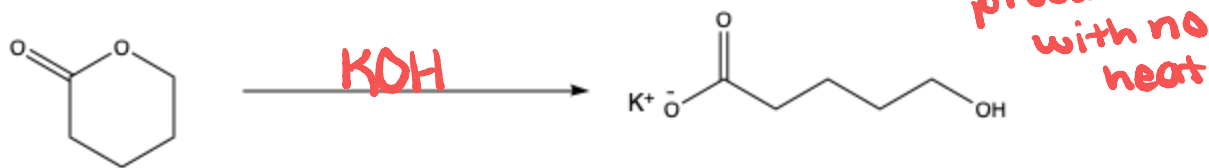


- makes 7 membered ring
- makes 5 membered ring (more stable)

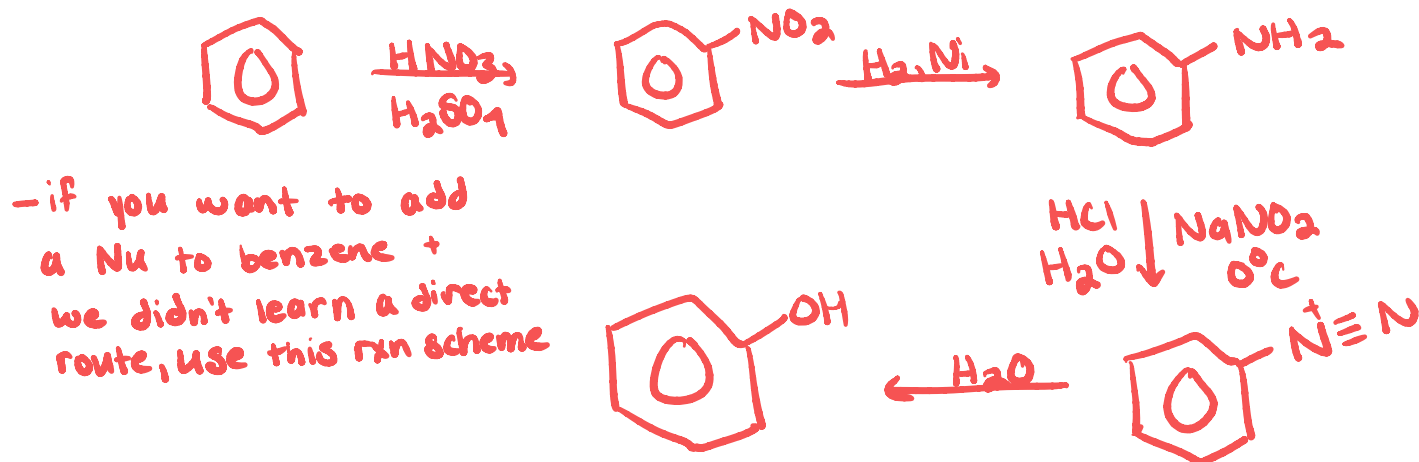
5. Draw the mechanism for the following reaction. What would happen if we added heat?



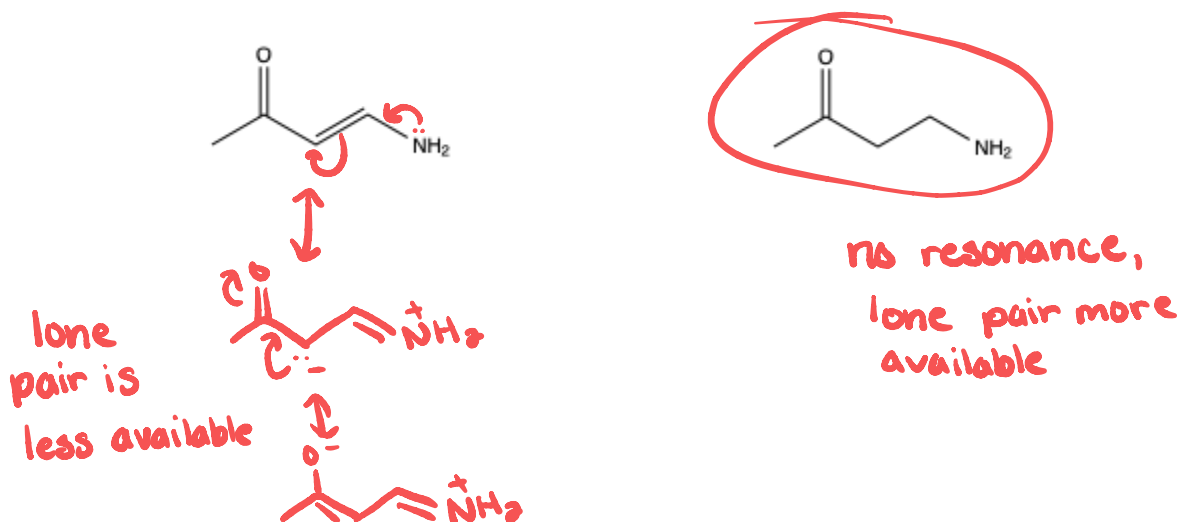
6. Give the reagents for the following reactions.



7. How could we synthesize phenol starting with benzene? Give a reaction scheme.

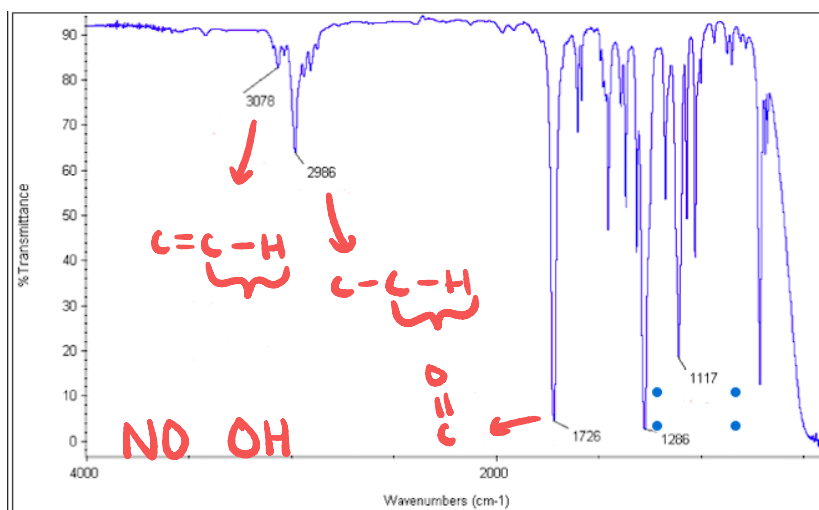


8. Which compound is more basic and why?

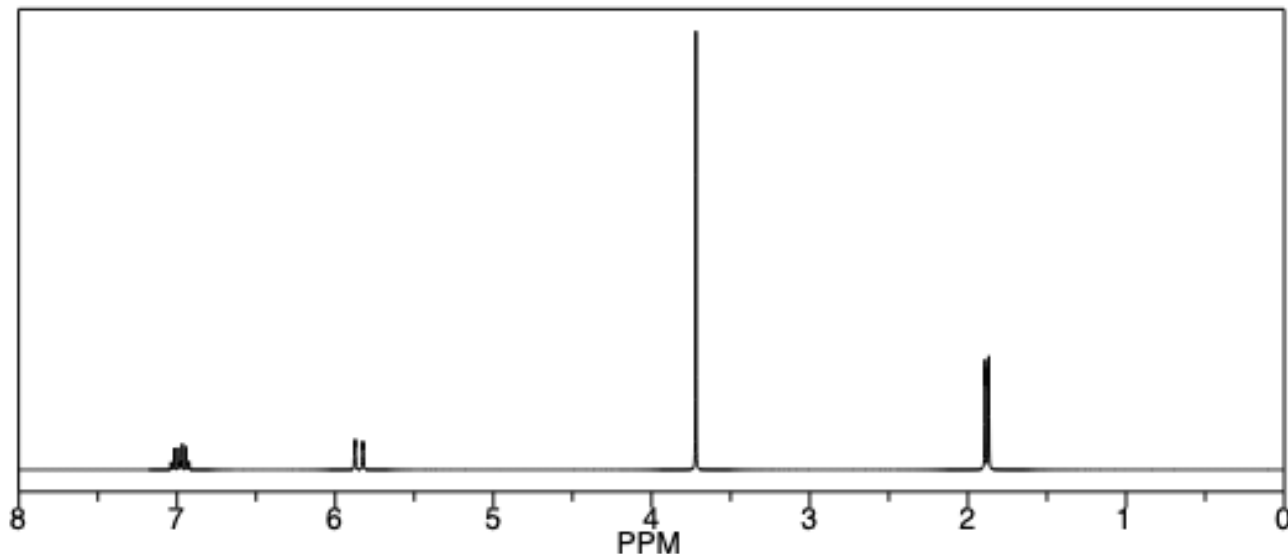


9. Given the IR, H-NMR, and molecular formula of $\text{C}_5\text{H}_8\text{O}_2$ draw the compound they represent. The integration is 1.9: 2H, 3.7: 3H, 5.9: 1H, and 7: 1H.

IR



H-NMR



1.9 ppm doublet C=C

3.7 ppm singlet O-CH3

5.9 ppm doublet CH=CH

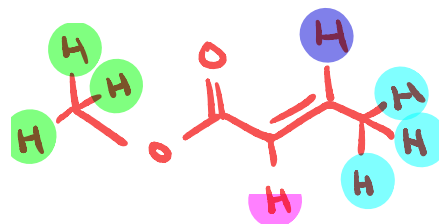
7 ppm multiple CH=C-CH3

SO downfield
due to resonance
structure



$$\text{degree unsat.} = 5 - \frac{8}{2} + 1 = 2$$

C=C
and
C=O



values higher
than normal,
prob. EN atom
close by

→ conjugated
system