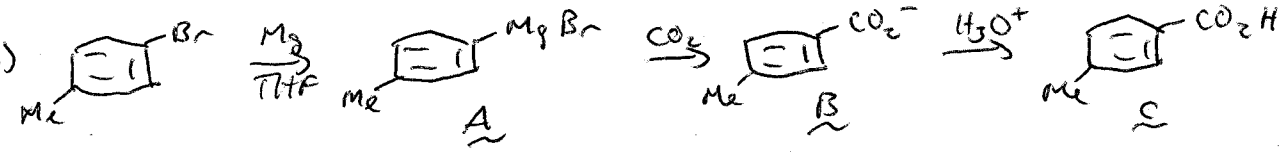
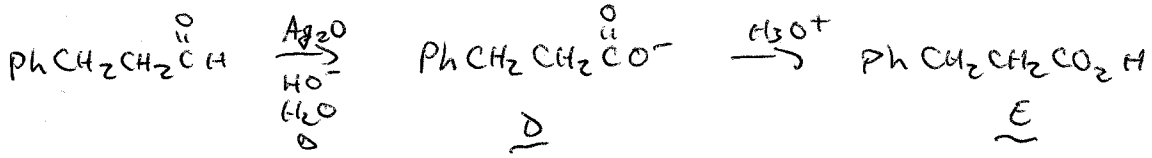
Homework Set #5 Answer key

1) (a) 2-hydroxybenzoic acid (b) Ethyl 3-methylbutanoate

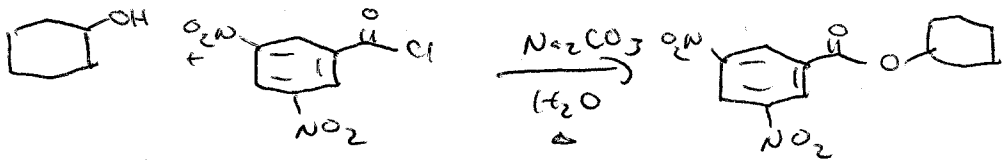
(c) 2-phenyl propane nitrile

2) (a) 

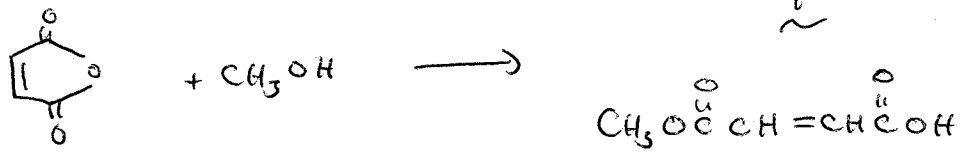
A B C

(b) 

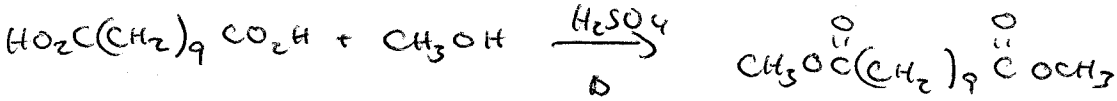
D E

(c) 

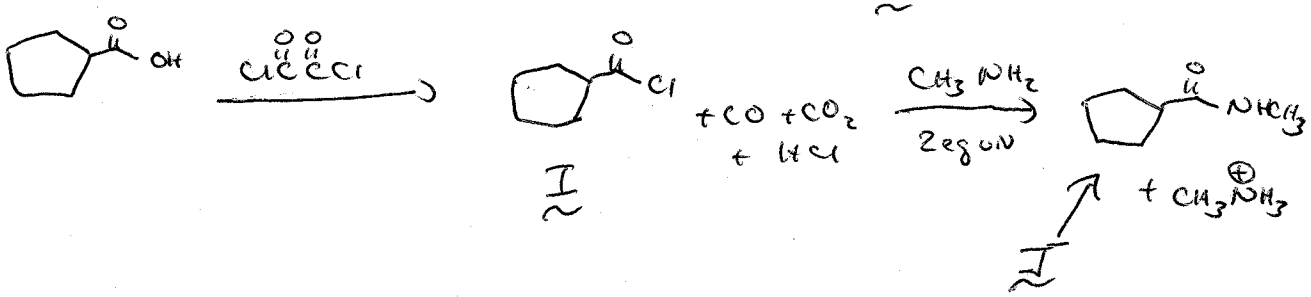
F

(d) 

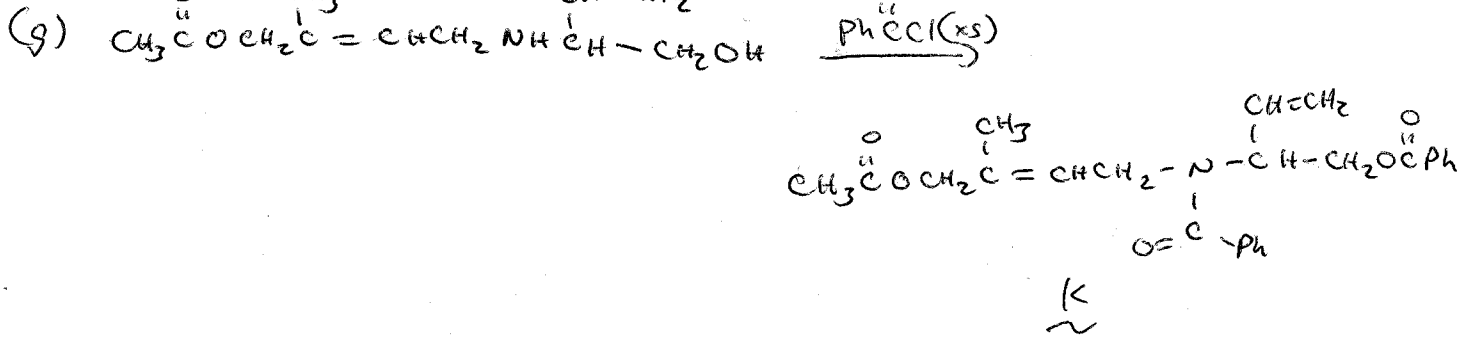
G

(e) 

H

(f) 

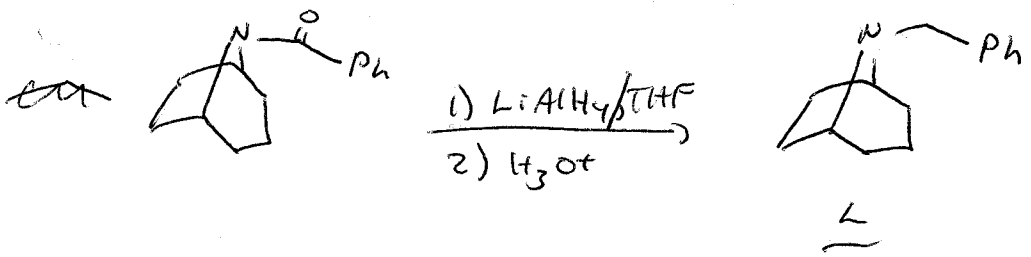
I J

(g) 

K

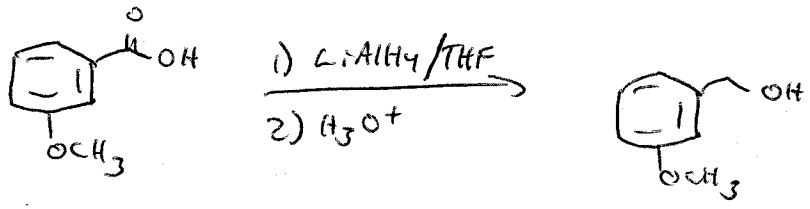
2) contd

(h)

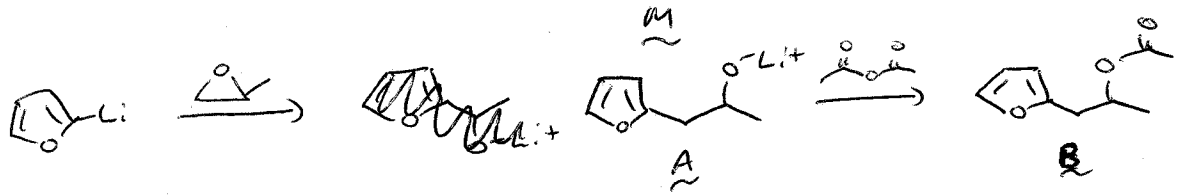


L

(i)



3) (a)

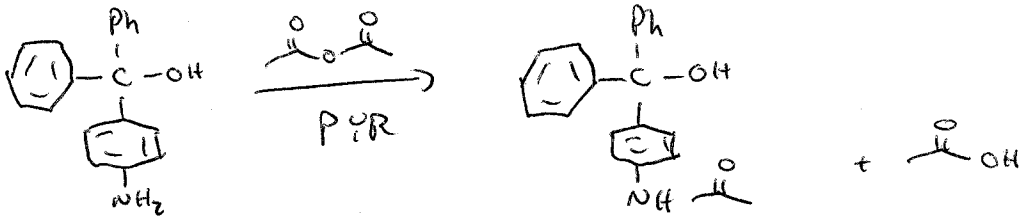


M

A

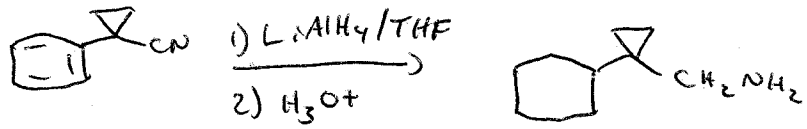
B

(b)



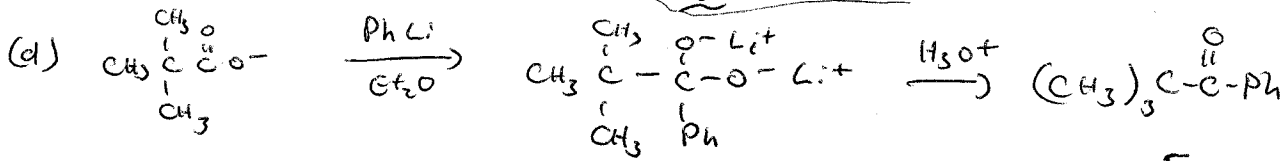
C

(c)



D

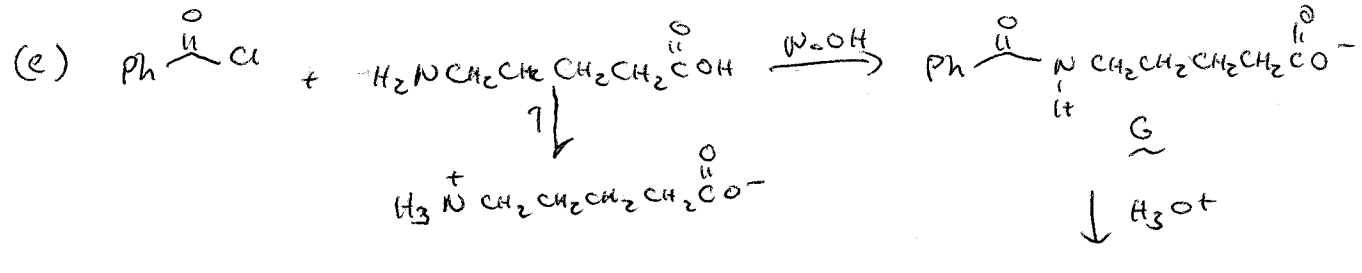
(d)



E

F

(e)



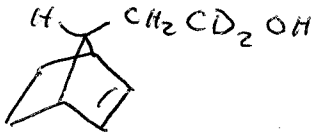
G

H

NOTE: NaOH deprotonates $R\overset{+}{N}H_3$ to form RNH_2 → a much better Nucleophile than the resonance-stabilized RCO_2^- group ☺

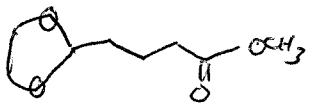
4) (9)

1) $LiAlD_4$, THF
2) H_3O^+



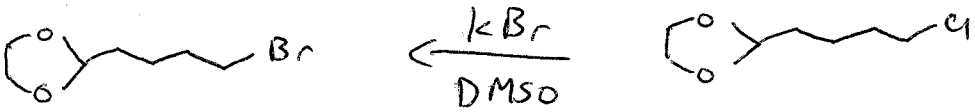
use deuterated LAH

(6)



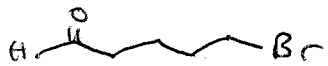
1) $LiAlH_4$, THF
2) NH_4Cl
↳ NOTE: very weak acid

$SOCl_2$ or PCl_3



KBr, DMSO

HCl
H_2O



NOTE: if HCl is used in step 1 to protonate the alcohol, it will likely also deprotect the aldehyde group, as shown in the last step.