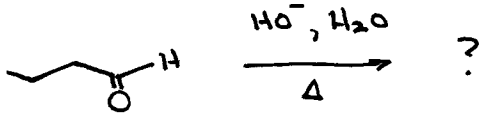
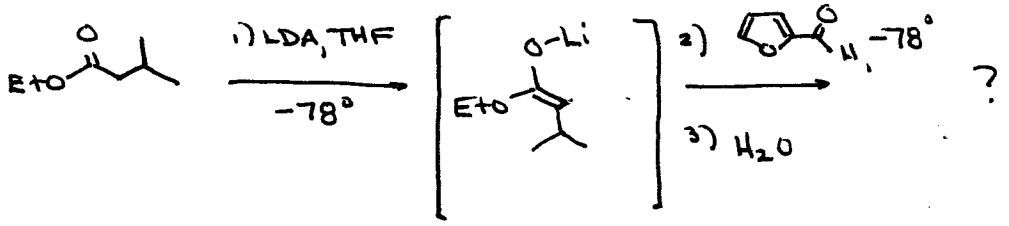
59-331 / 333 JAN. 23, 2004

ASSIGNMENT # 1 DUE JAN. 30, 2004

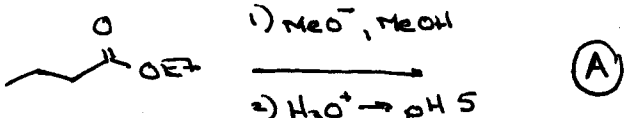
1. WRITE THE COMPLETE MECHANISM FOR THE BASE (HYDROXIDE) CATALYZED ALDOL CONDENSATION BETWEEN TWO MOLECULES OF BUTANAL (BUTYRALDEHYDE), INCLUDING THE ELIMINATION STEPS. BE SURE TO INDICATE ANY SMALL MOLECULES USED OR GIVEN OFF IN ANY OF THE STEPS, AND INDICATE WHETHER EACH STEP IS REVERSIBLE OR IRREVERSIBLE.



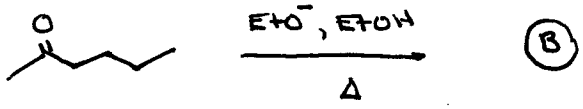
2. SHOW THE PRODUCT (AND NAME THE TYPE OF DIASTEREOMER) FOR THE FOLLOWING REACTION. DRAW THE TRANSITION STATE FOR THE CONDENSATION



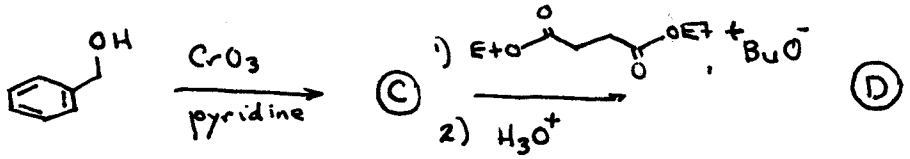
3. GIVE THE PREDOMINANT PRODUCTS FOR THE FOLLOWING REACTIONS. MECHANISMS ARE NOT NECESSARY, BUT SHOWING YOUR WORK MAY BE A HELP. SHOW ANY INTERMEDIATE COMPOUNDS THAT COULD BE ISOLATED. NOTE: SOME REACTIONS FROM PREVIOUS ORGANIC COURSES MAY BE REQUIRED.

a) 

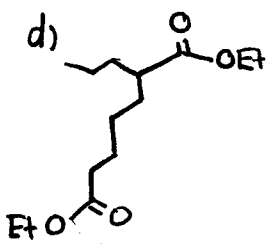
(A)

b) 

(B)

c) 

THIS MAY REQUIRE A SMALL 59-230 REVIEW

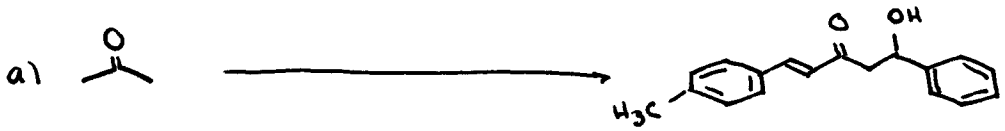
d) 

1) EtO^-, EtOH
2) $H_3O^+ \rightarrow$ pH 5

(E) $\xrightarrow{LiAlH_4}$ (F)

THIS WILL REQUIRE SOME 59-230 REVIEW

4. SHOW HOW YOU WOULD ACCOMPLISH THE FOLLOWING TRANSFORMATIONS. THE SOLUTIONS ARE LIKELY > 1 STEP; SHOW ALL REAGENTS, CONDITIONS AND ANY INTERMEDIATES THAT COULD BE ISOLATED. YOU MAY EMPLOY ANY REAGENTS YOU DEEM FIT, AS LONG AS THE MAKE CHEMICAL SENSE AND ARE CAPABLE OF EXISTENCE.

a) 

b) 

THIS MAY REQUIRE A BIT OF 59-235 REVIEW

c) 

LOOK CLOSELY AND COUNT YOUR # OF CARBONS