

Answers to Ch3 Problems

*Please only use these to check **your** answers – there is no better way to get good at organic problems than trying to do them yourself.*

The struggle to figure out the right answer is training you to be able to answer the questions on examinations.

Being lazy and cheating yourself by not attempting these problems yourself will cause you to do horribly on my quizzes and exams.

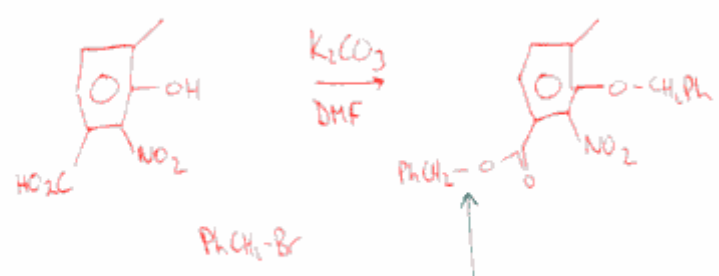
BEAR IN MIND, the problems are VERY relevant to the text they follow.

E.g. if we cover the Favorskii rearrangement, the problems directly after that in the text ***MAY involve some sort of similar mechanistic process.***

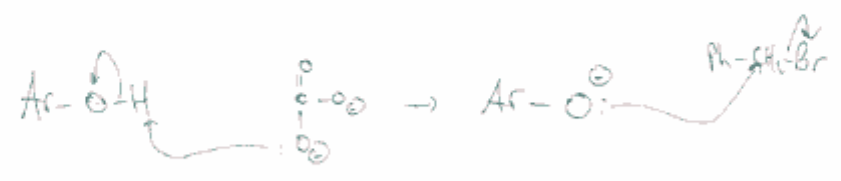
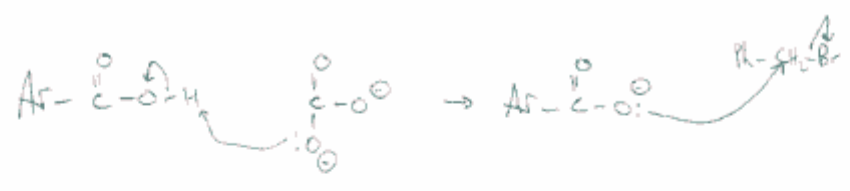
(If you are stuck, read the section in the notes directly before that problem).

For the mechanisms I did not write out all possible resonance structures, I just put a resonance arrow to indicate that you can (*and should*) write other resonance structures.

Problem

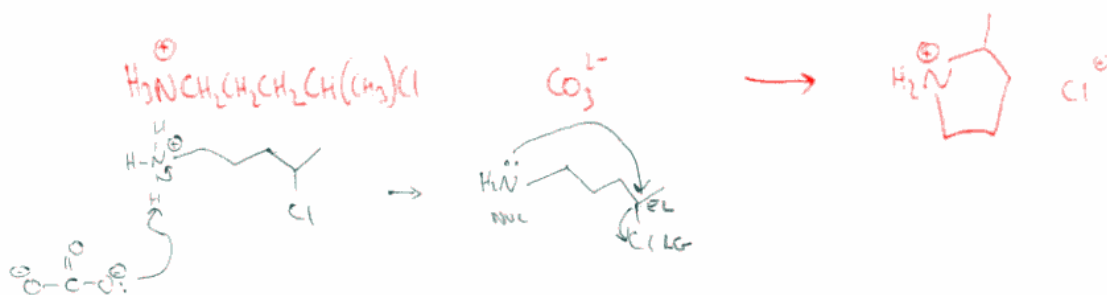
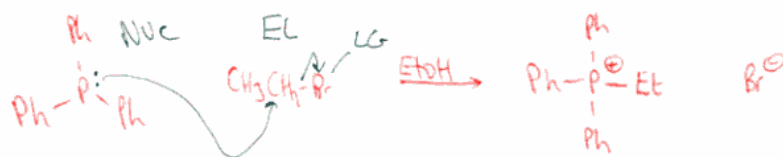


Which of the two substitutions occurs 1st?

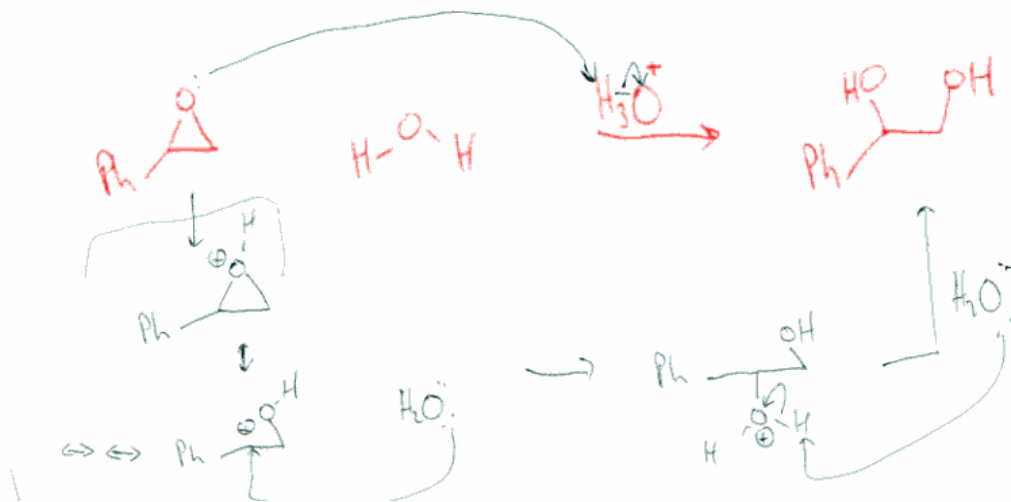
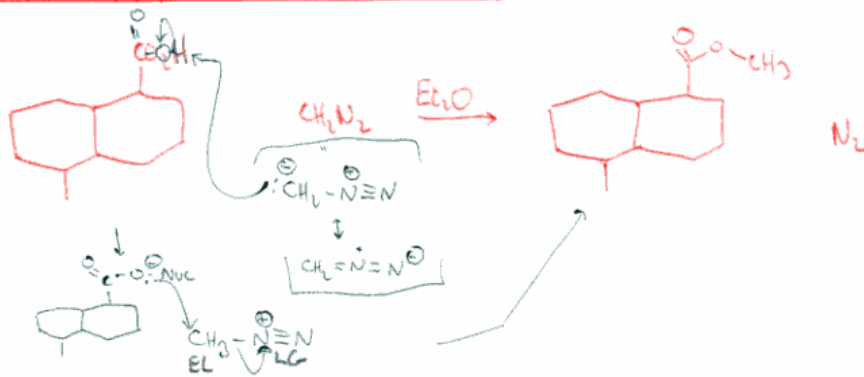


Problems (i)

Identify the Nucleophile, Electrophile & leaving Group.
Then write the mechanism.

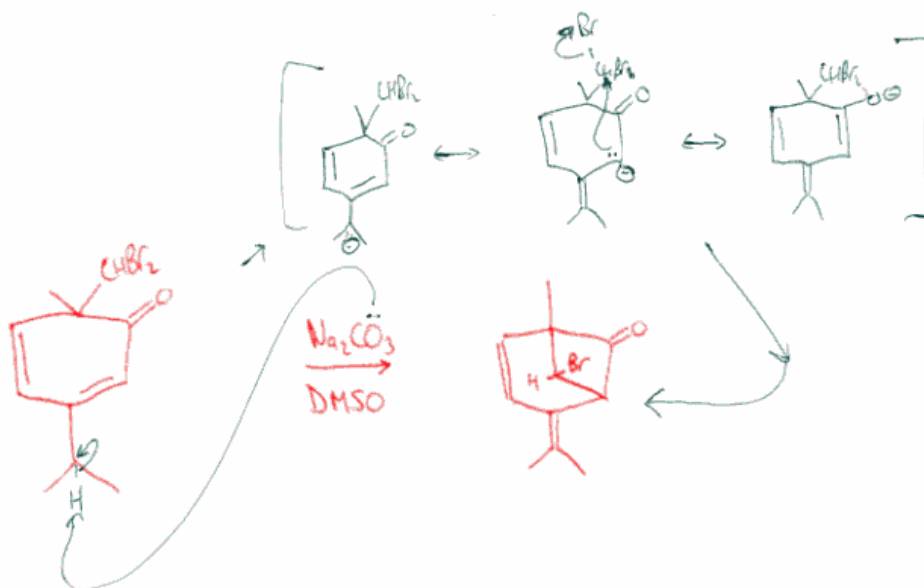
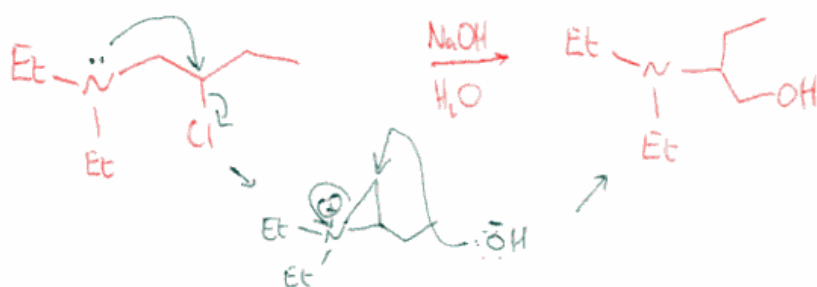


Problems (ii) (Nuc, E⁺, LG then Mech)



Problem

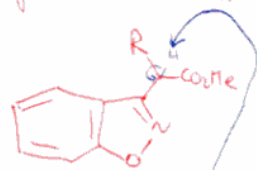
Write mechanisms for:



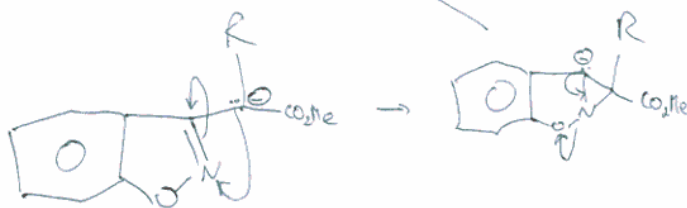
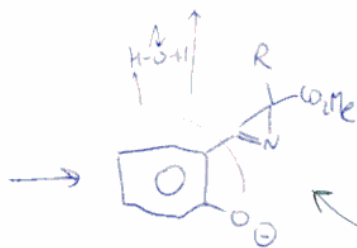
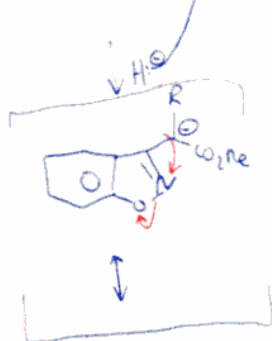
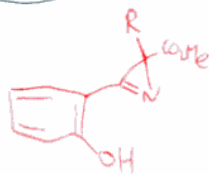
Problem

Why is this mechanism wrong?

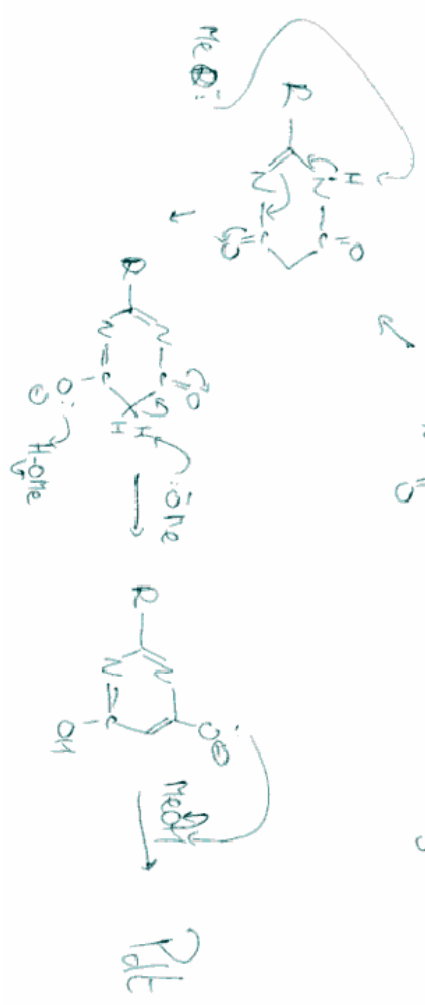
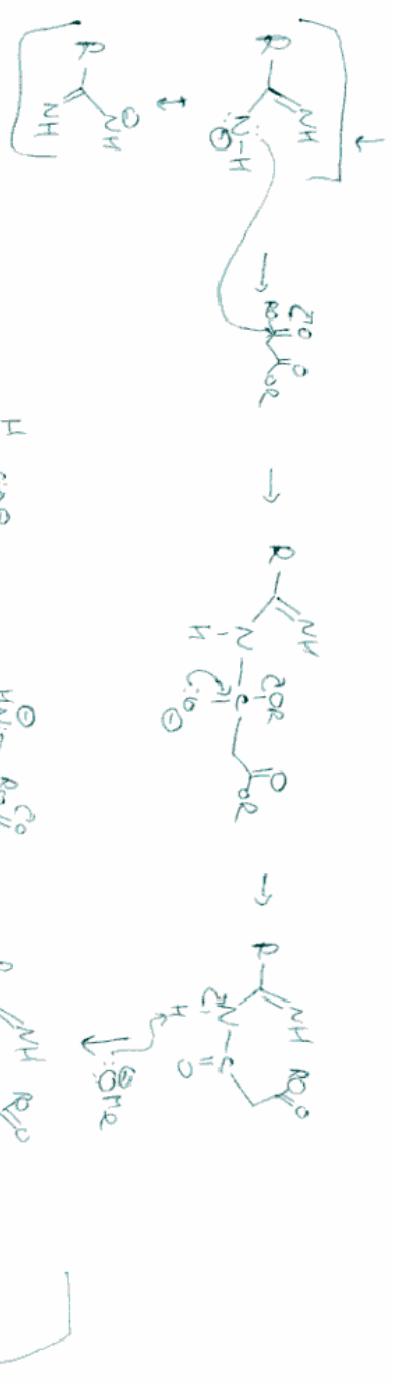
No sp^2 at sp^2



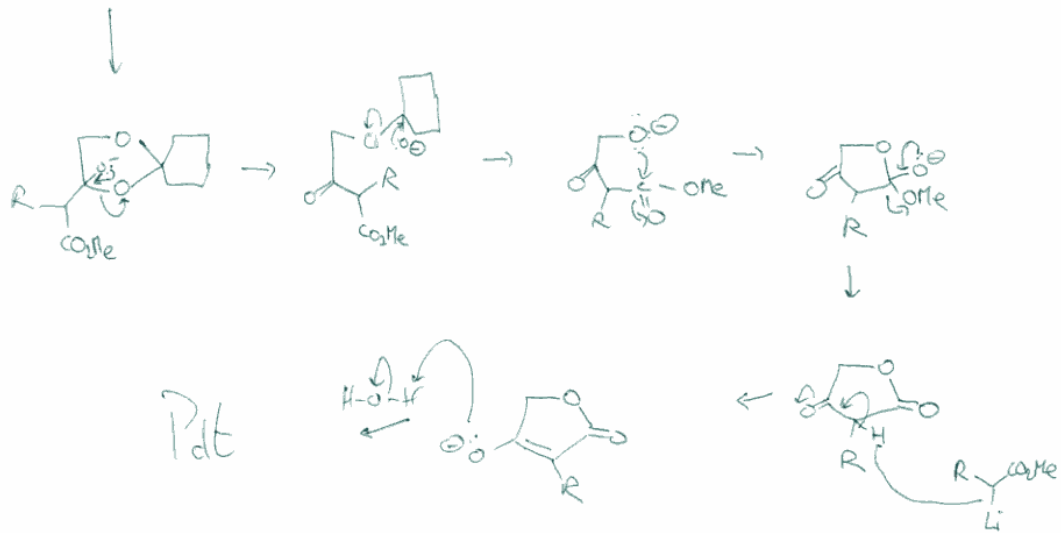
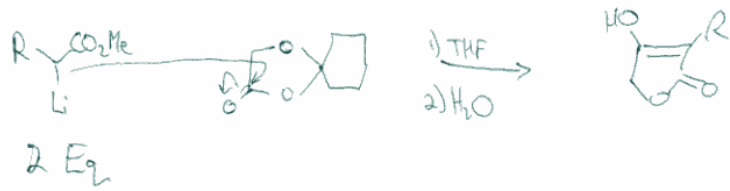
1) NaH
2) H₂O



Write the correct step.

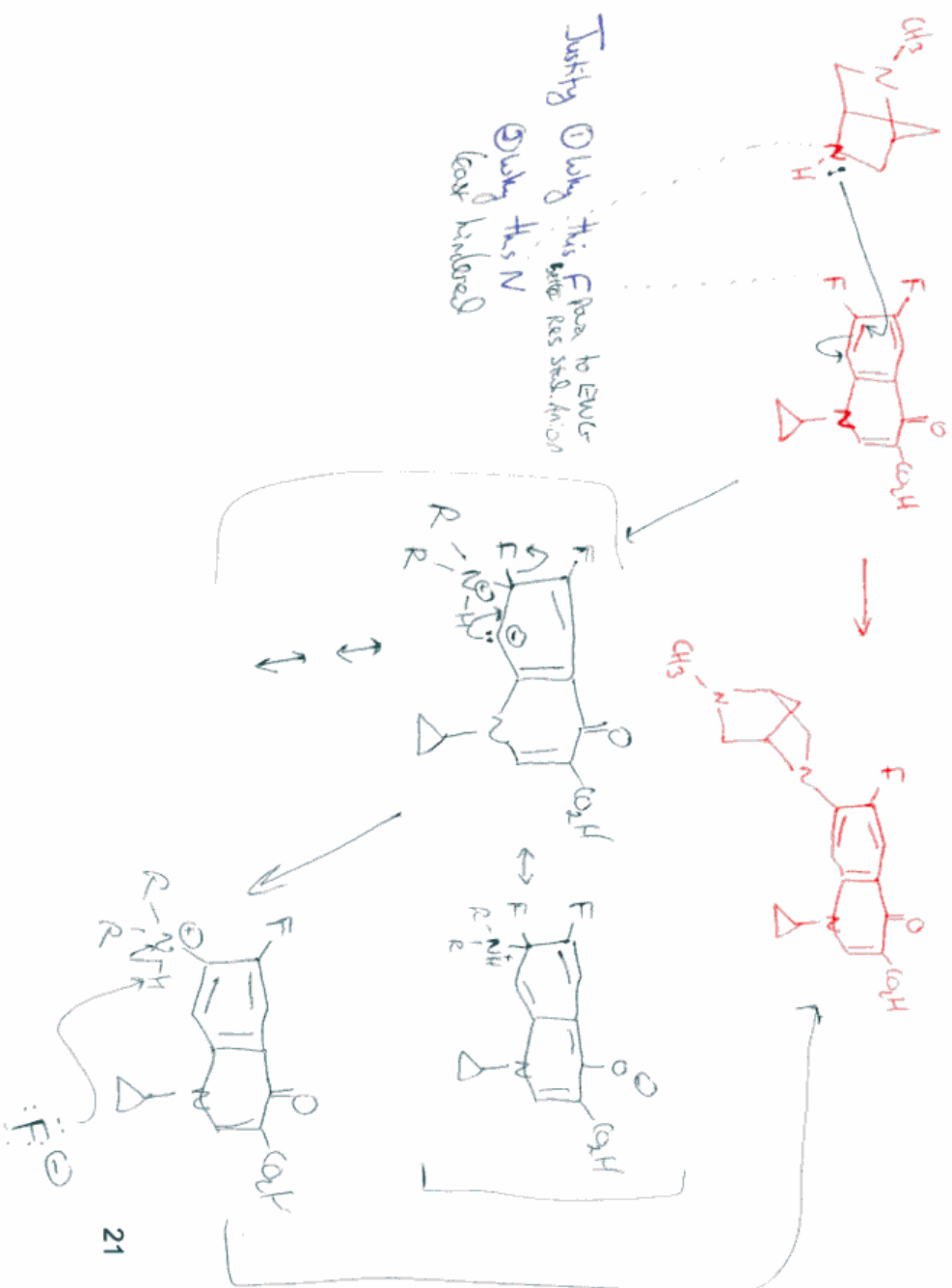


Rf



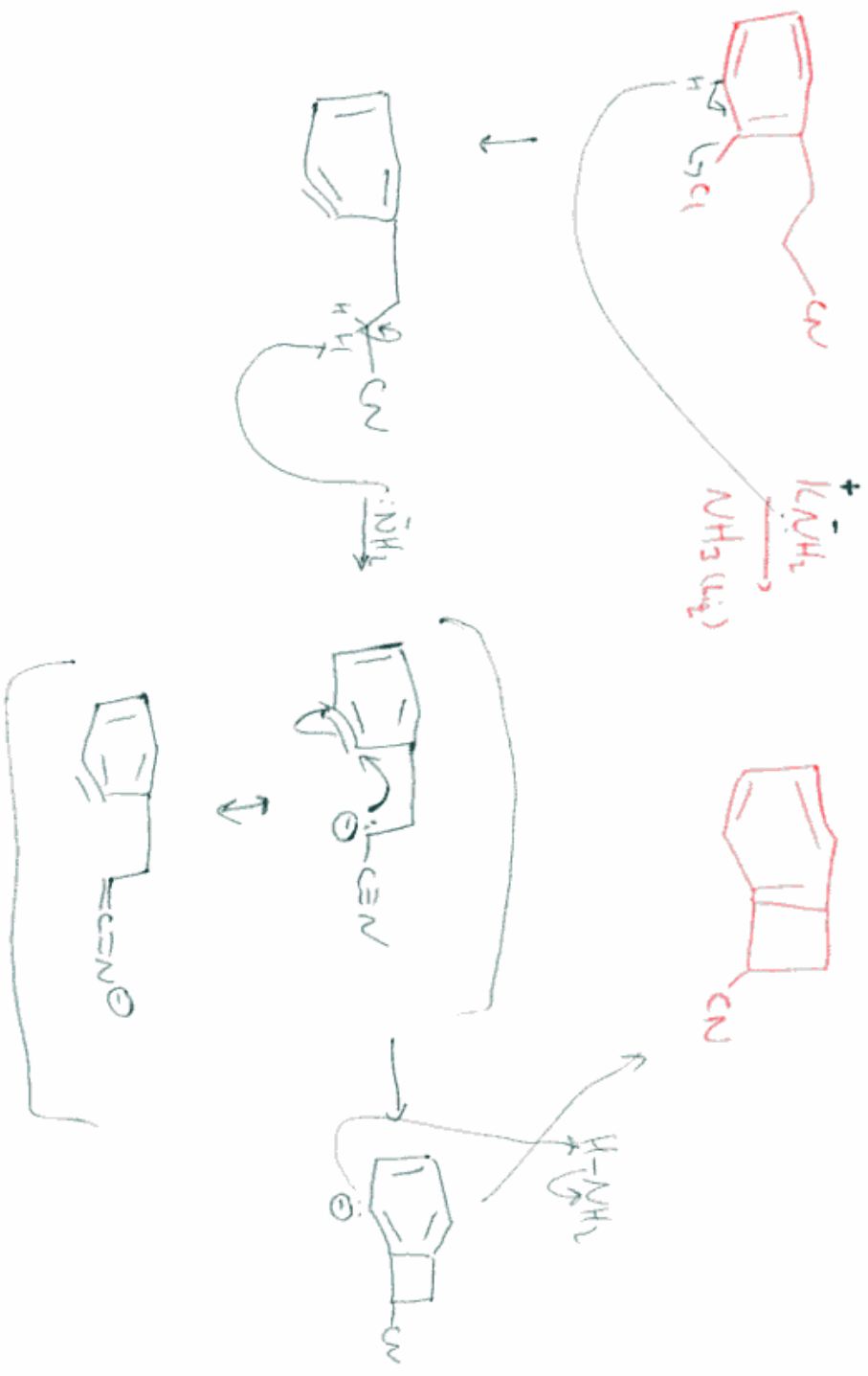
Problem

Write a mechanism (and justifications) for this reaction:



Problem

Write a mechanism for:



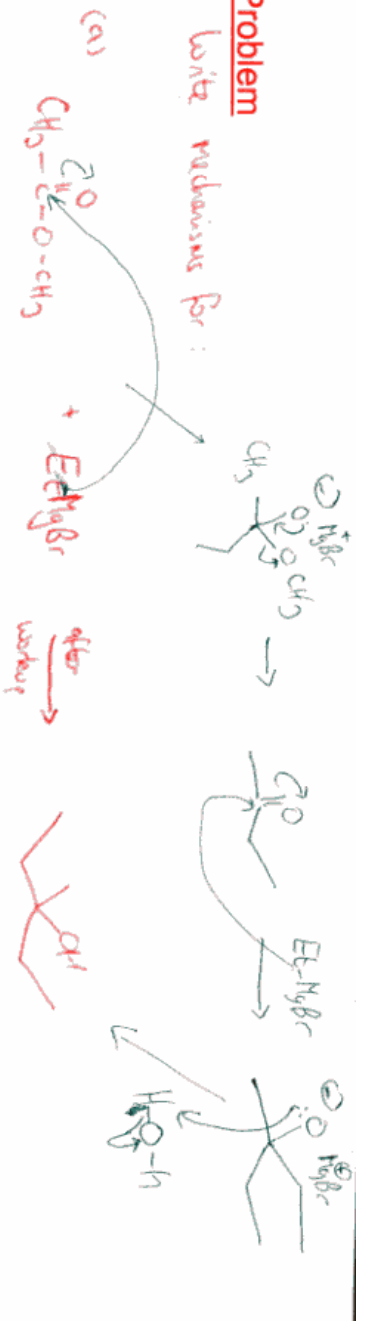
Problem

Write a mechanism for this elimination:

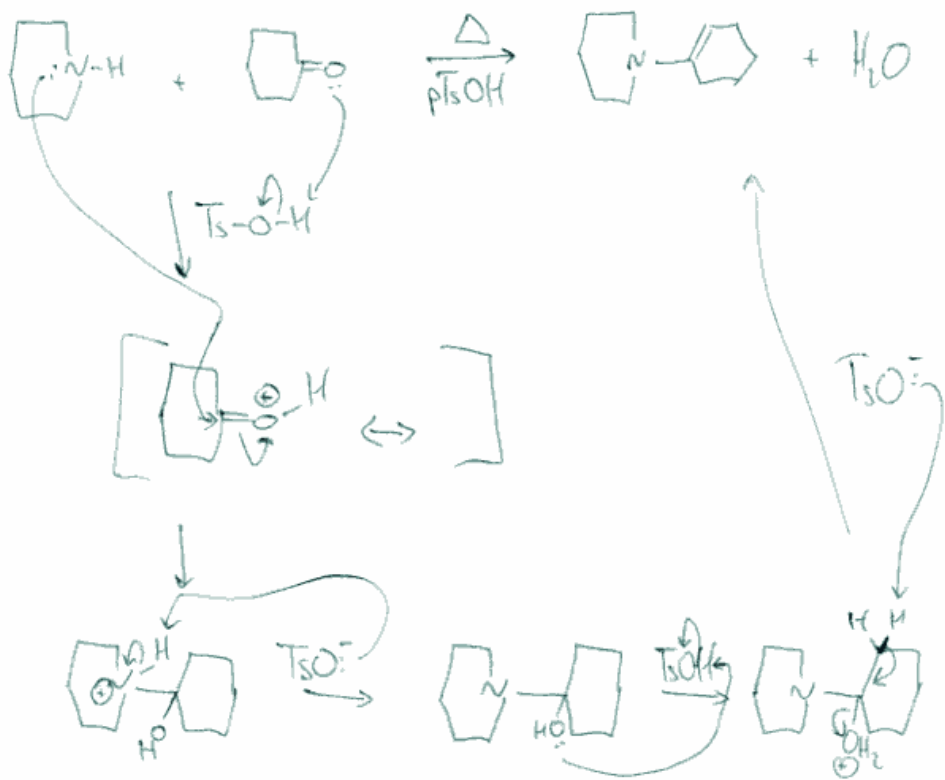


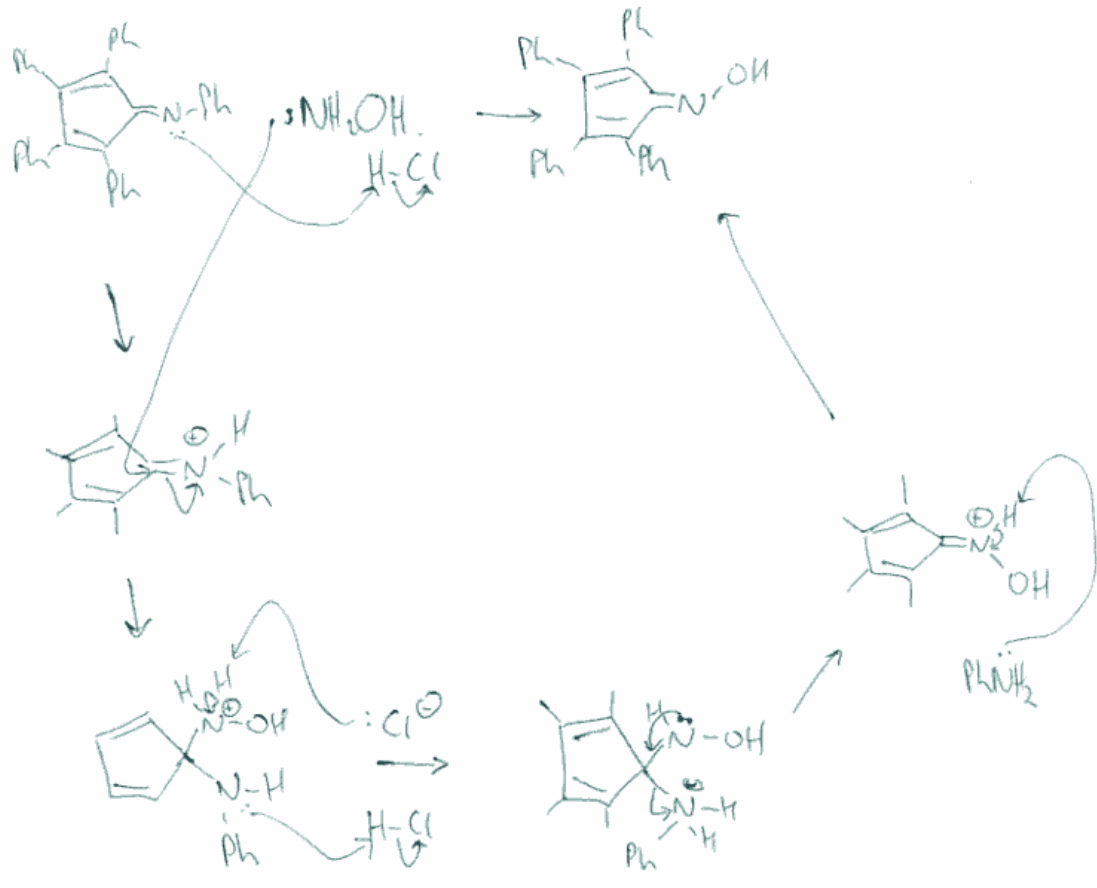
Problem

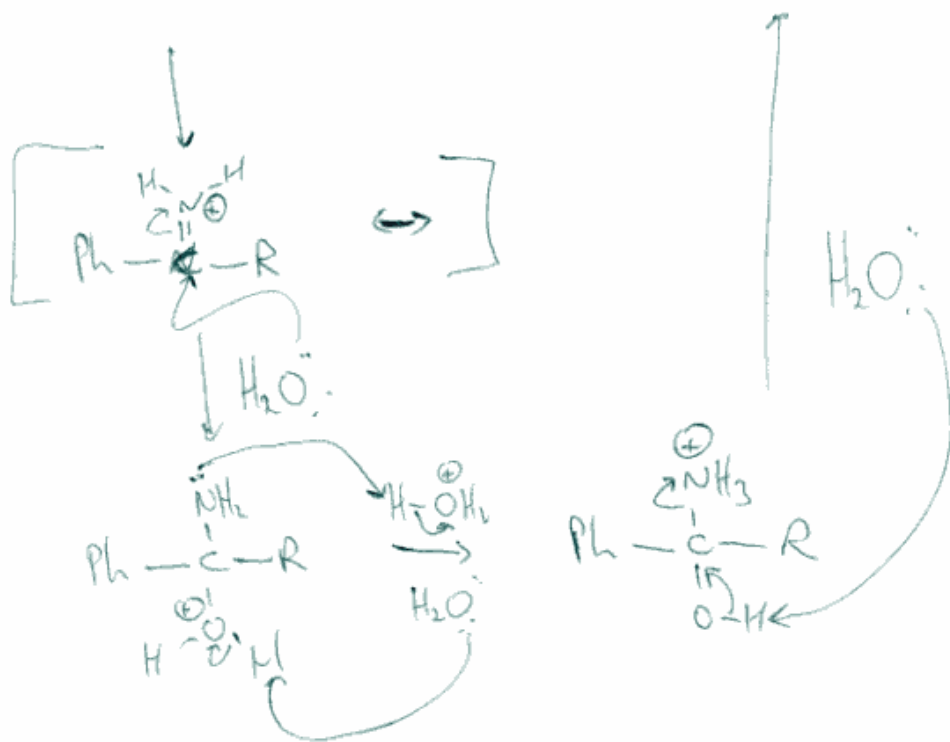
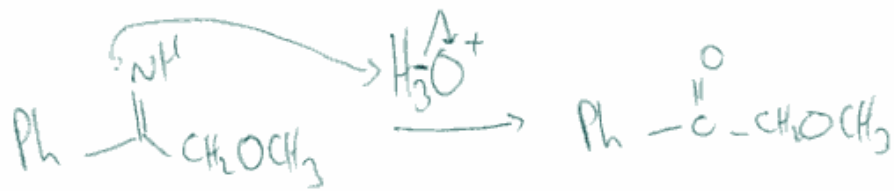
Write mechanism for :



BIT Aorekz

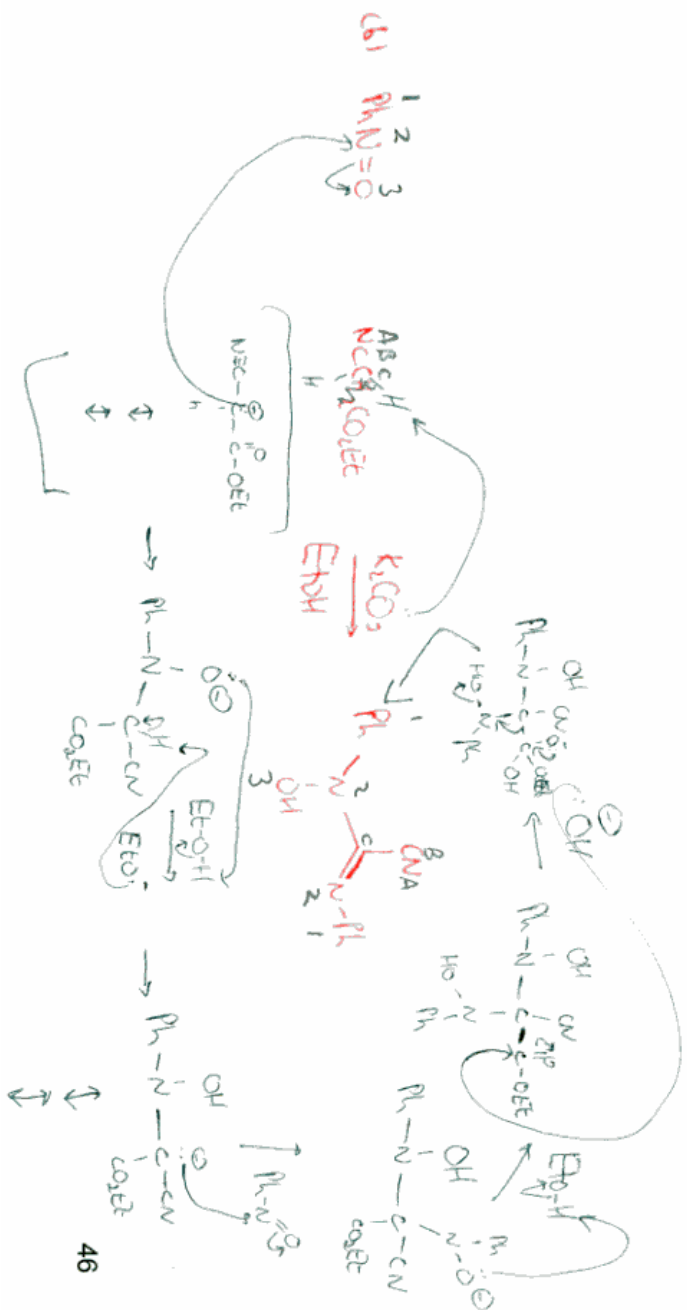
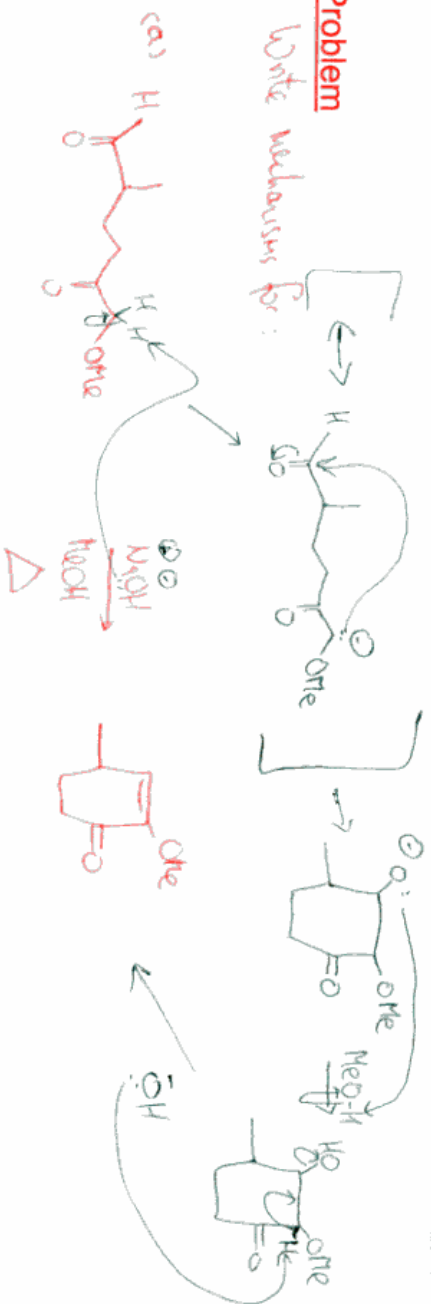






Problem

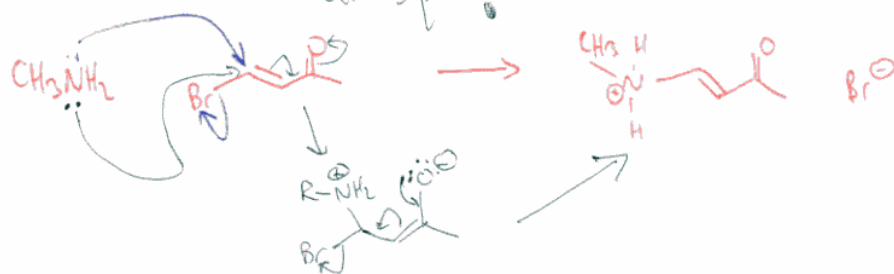
Write mechanism for:



Problem

Why is this wrong?

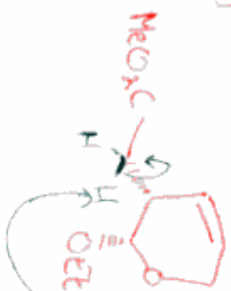
NO SN2!
at sp^2 !



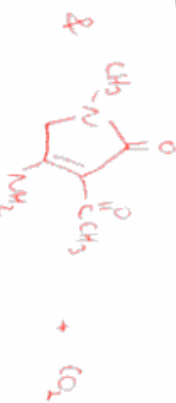
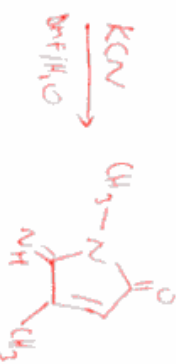
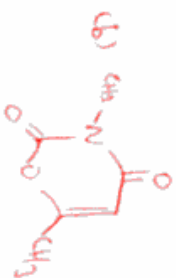
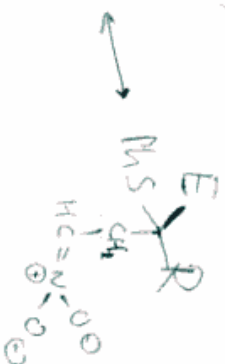
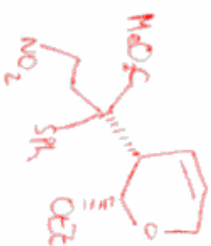
Problems

Wittig mechanism for:

(a)

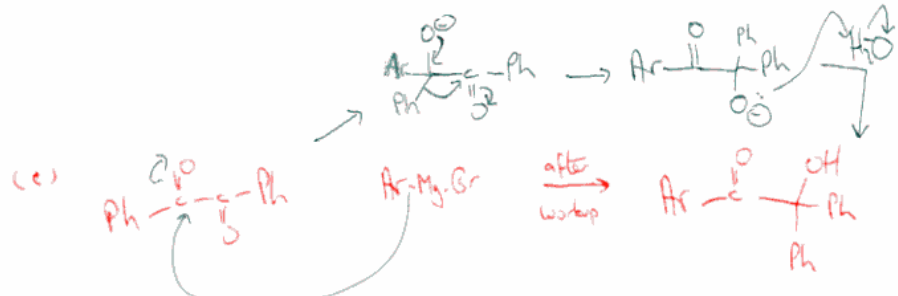
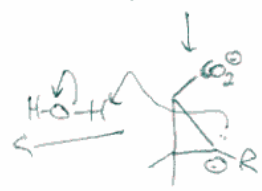
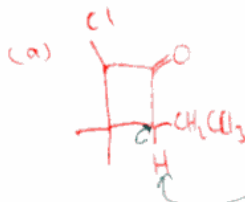


1) LDA, PhSSPh
2) LDA, $\text{CH}_2=\text{CHNO}_2$



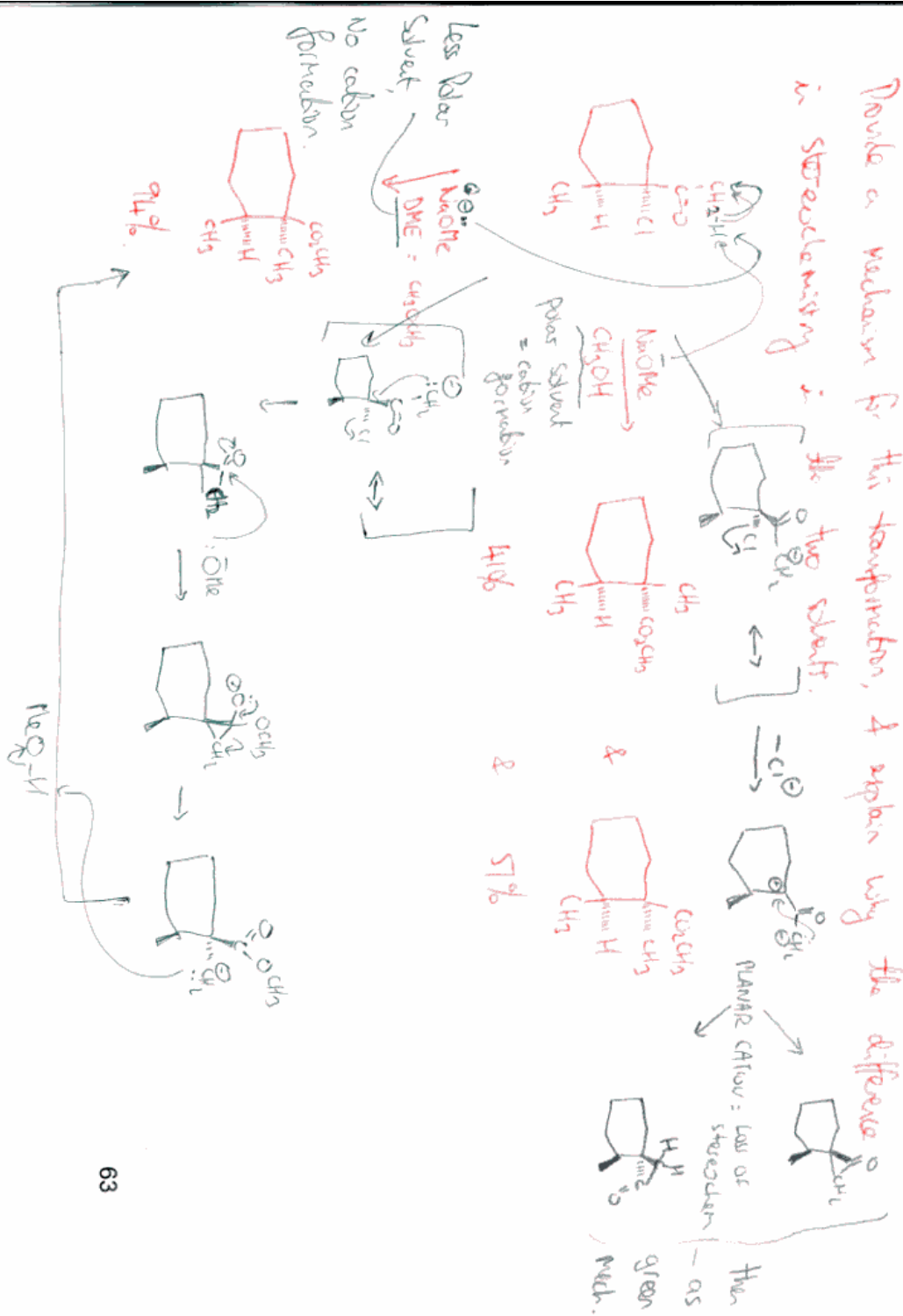
Problems

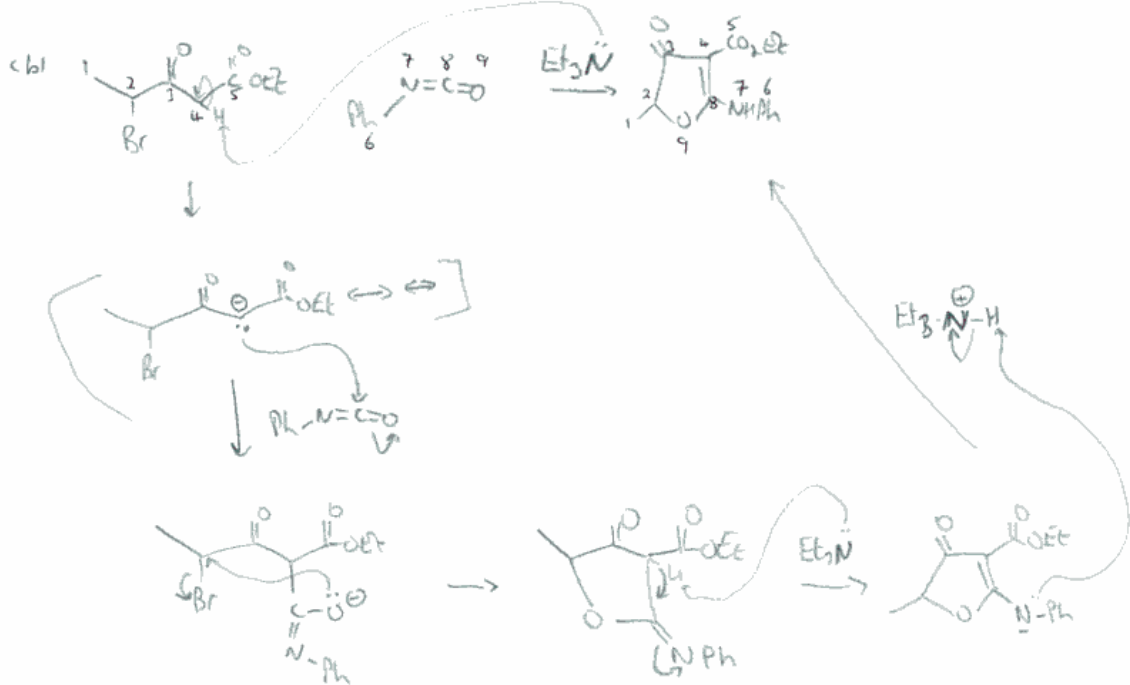
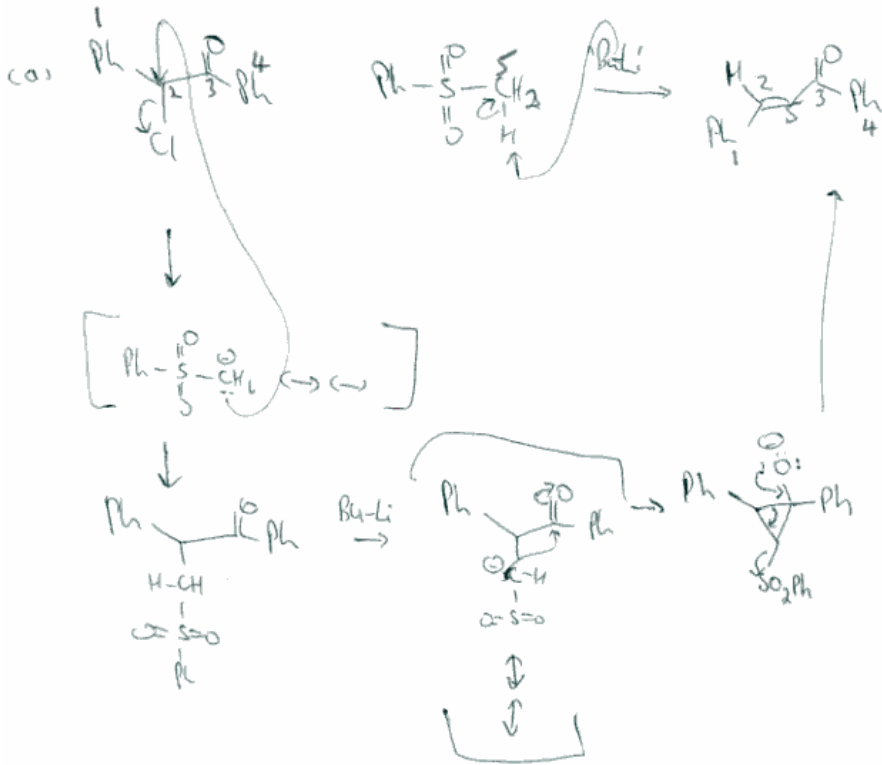
Write mechanisms for.

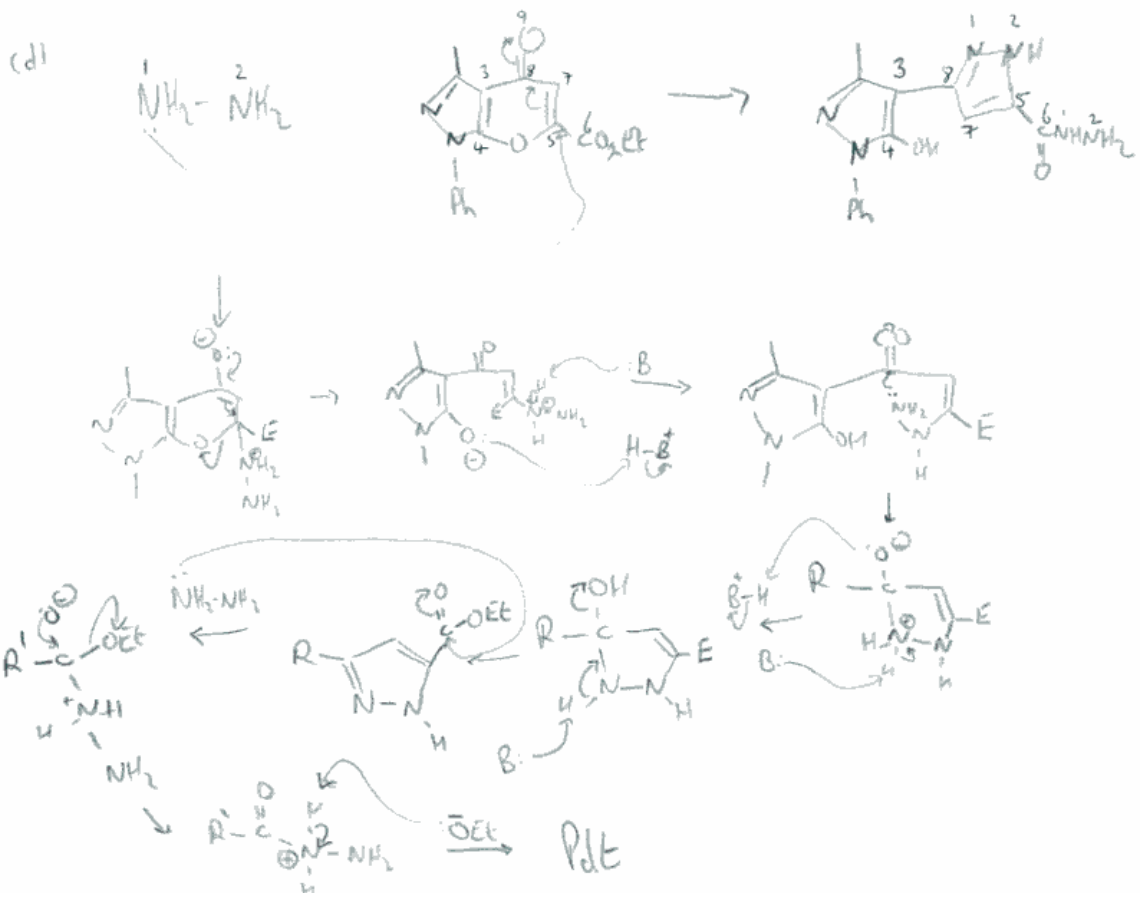
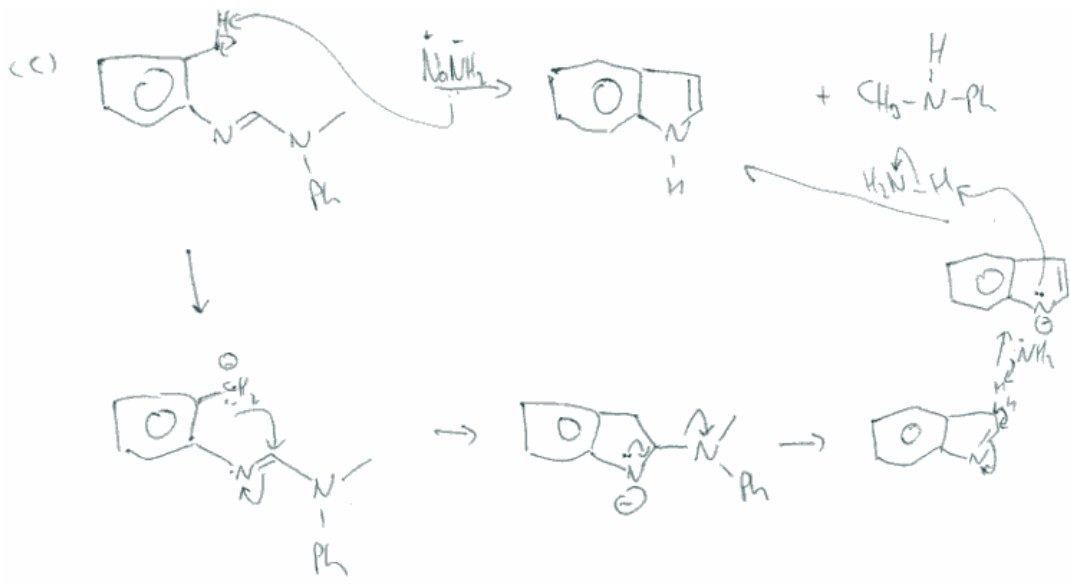


Problem

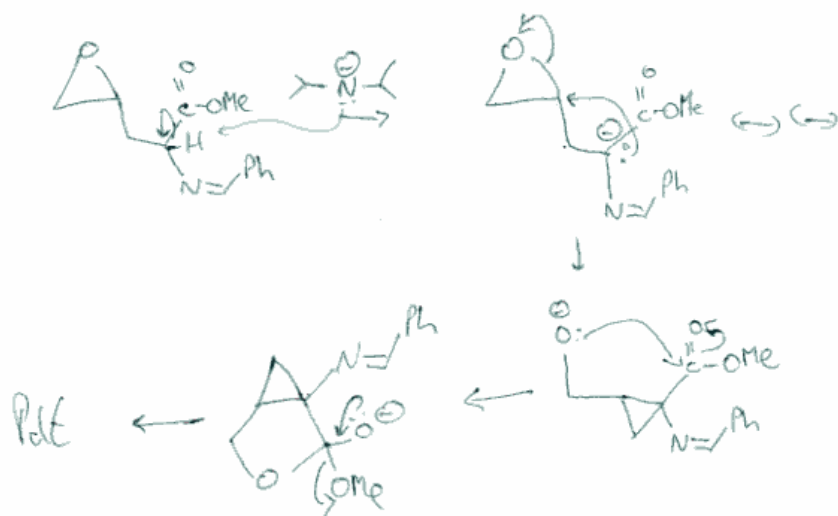
Provide a mechanism for this transformation, & explain why the difference in stereochemistry is the two shafts.







(e)



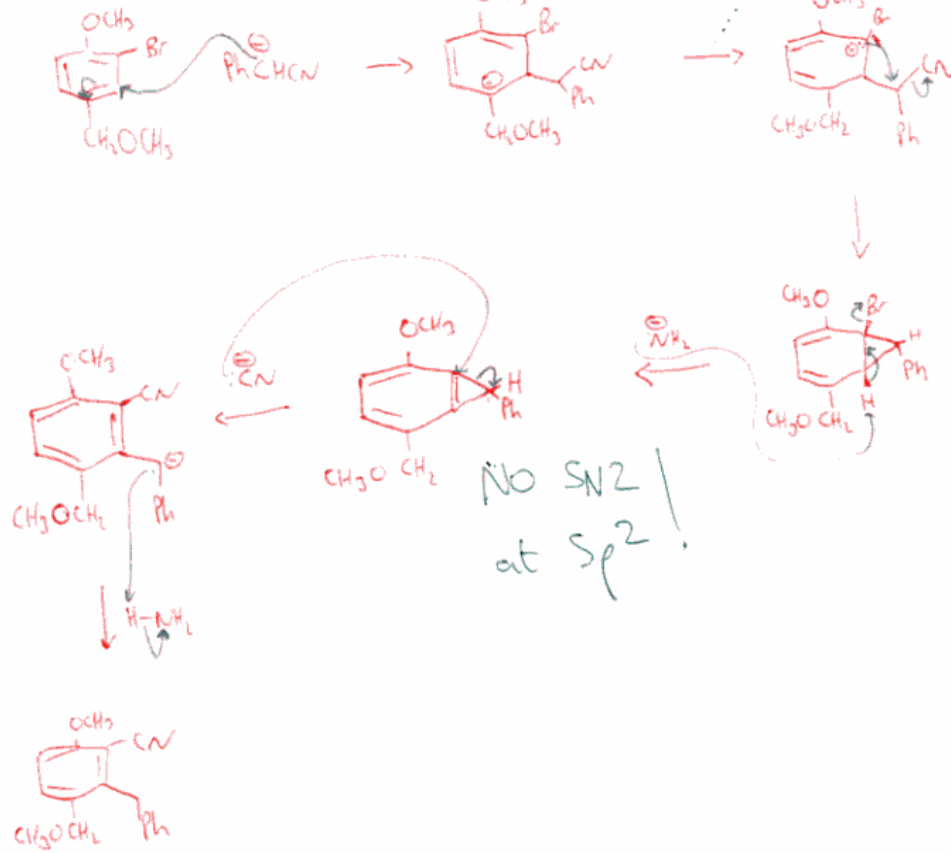
PdE

Mech 1

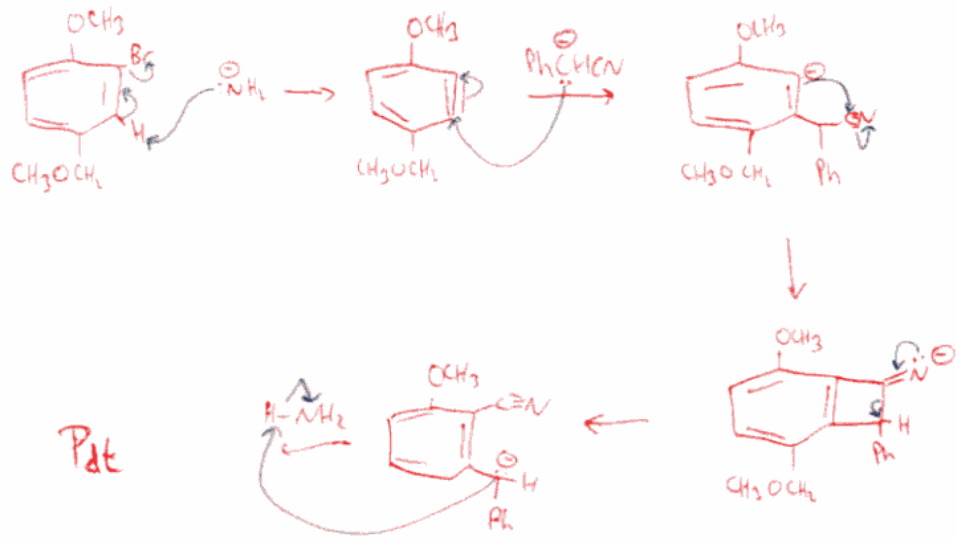
Mech ①

NO EWG
to stabilize Anion.

Should
be \leftrightarrow



Mech 2

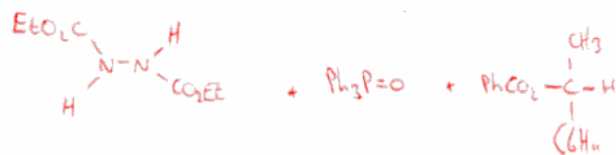
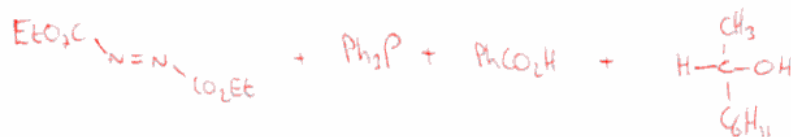


Pdt

I like this one

Mitsunobu Problem

Write a mechanism for the MITSUBUNOBU REACTION, that always gives inversion of the alcohol group with a Nucleophile



See My

talk

example

HINTS:

- ① Triphenyl Phosphine reacts with DEAD, followed by Protonation by RCO_2H
- ② Alcohol attacks sp³ from ① (at $-\text{P}^-$)
- ③ Protonation of N^-
- ④ RCO_2^- does $\text{S}_\text{N}2$ giving INVERSION