Right now!

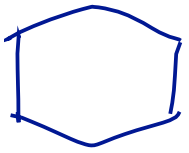
try doing page 123

Friday review today 3-5

M SC B.

Exam: bring models

OK to pre-build

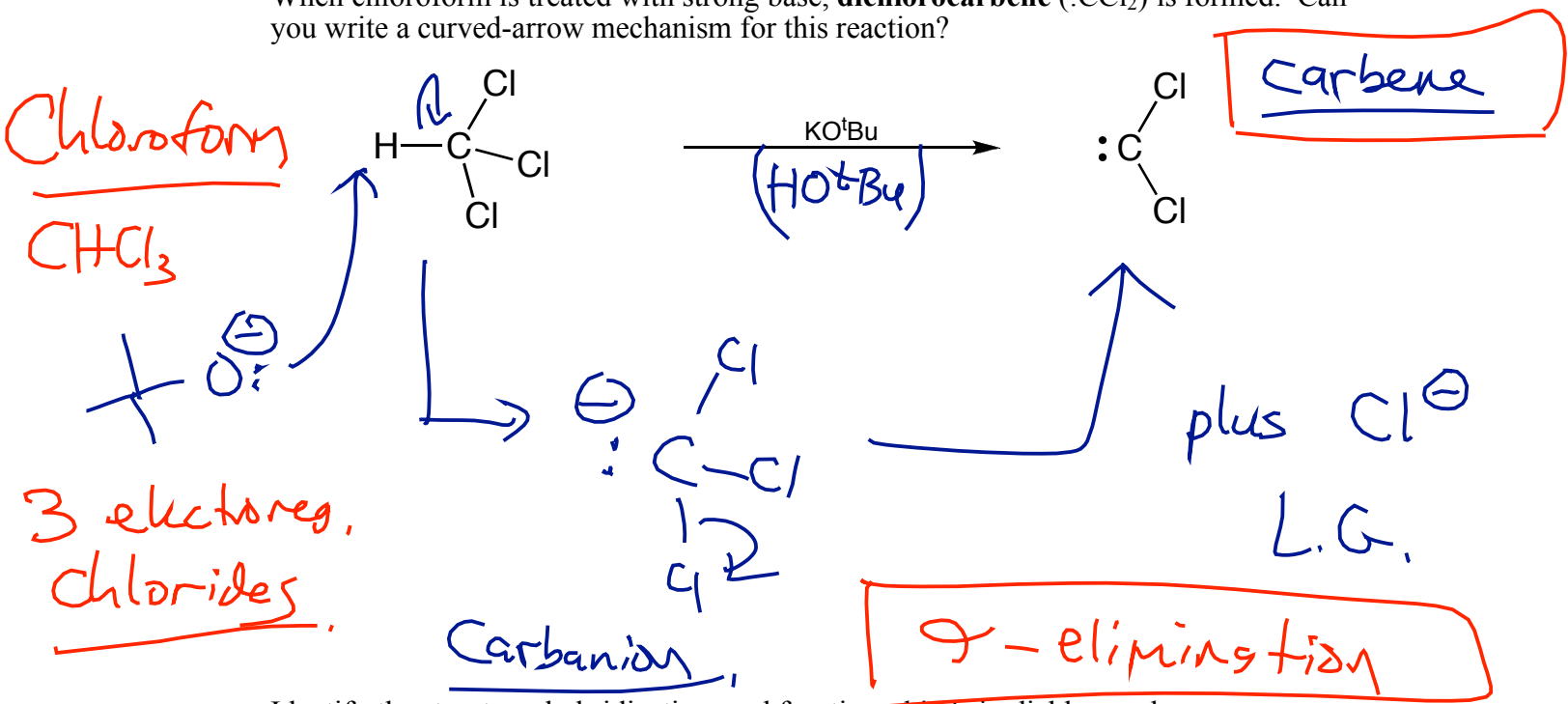


,

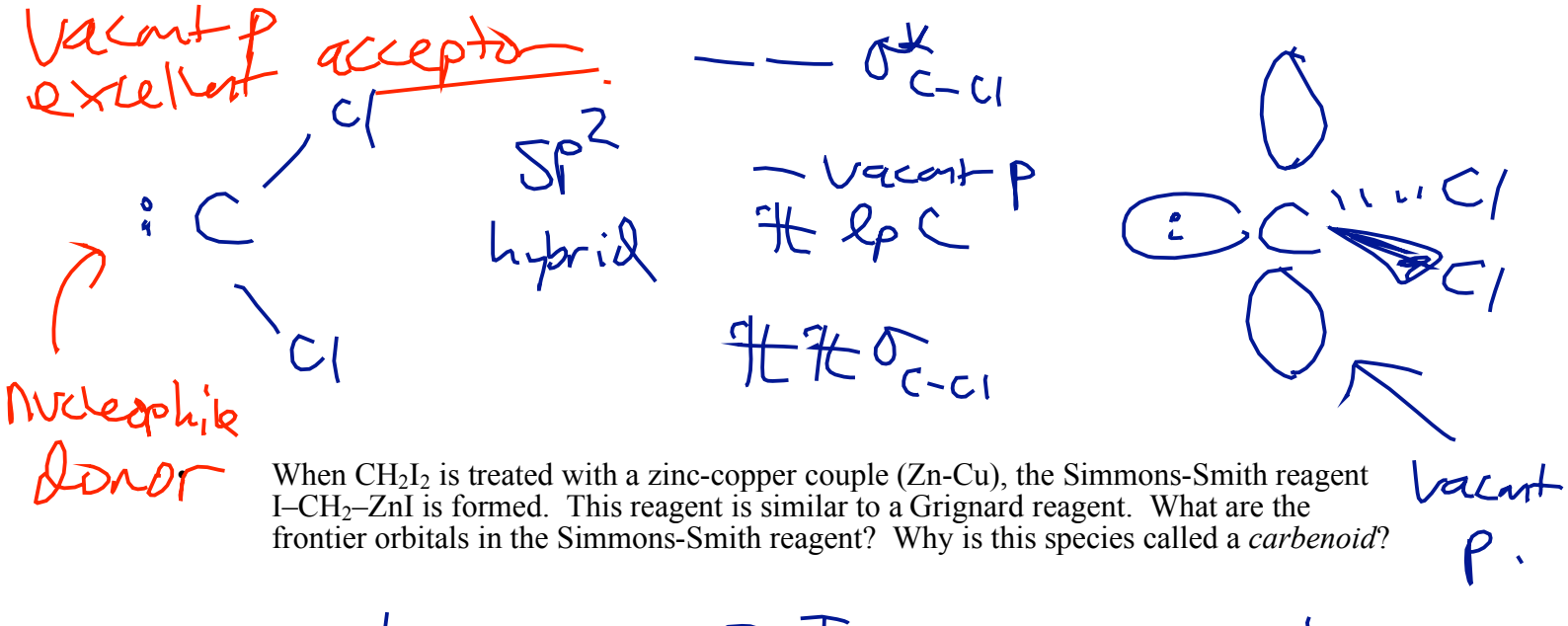
di halides gem

Carbenes and Carbenoids: Alpha-Elimination

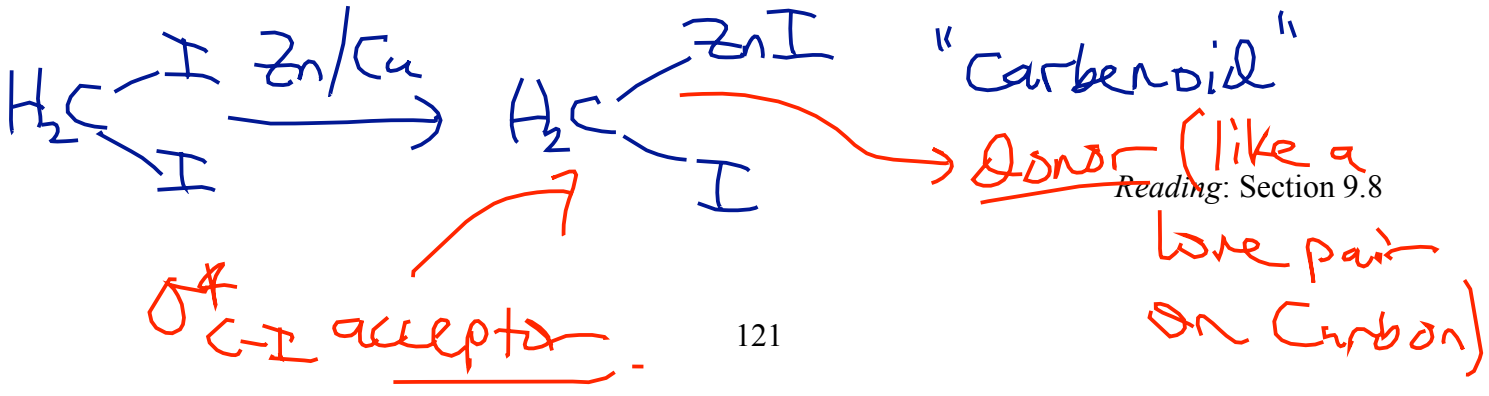
- When chloroform is treated with strong base, **dichlorocarbene** ($:CCl_2$) is formed. Can you write a curved-arrow mechanism for this reaction?



- Identify the structure, hybridization, and frontier orbitals in dichlorocarbene.



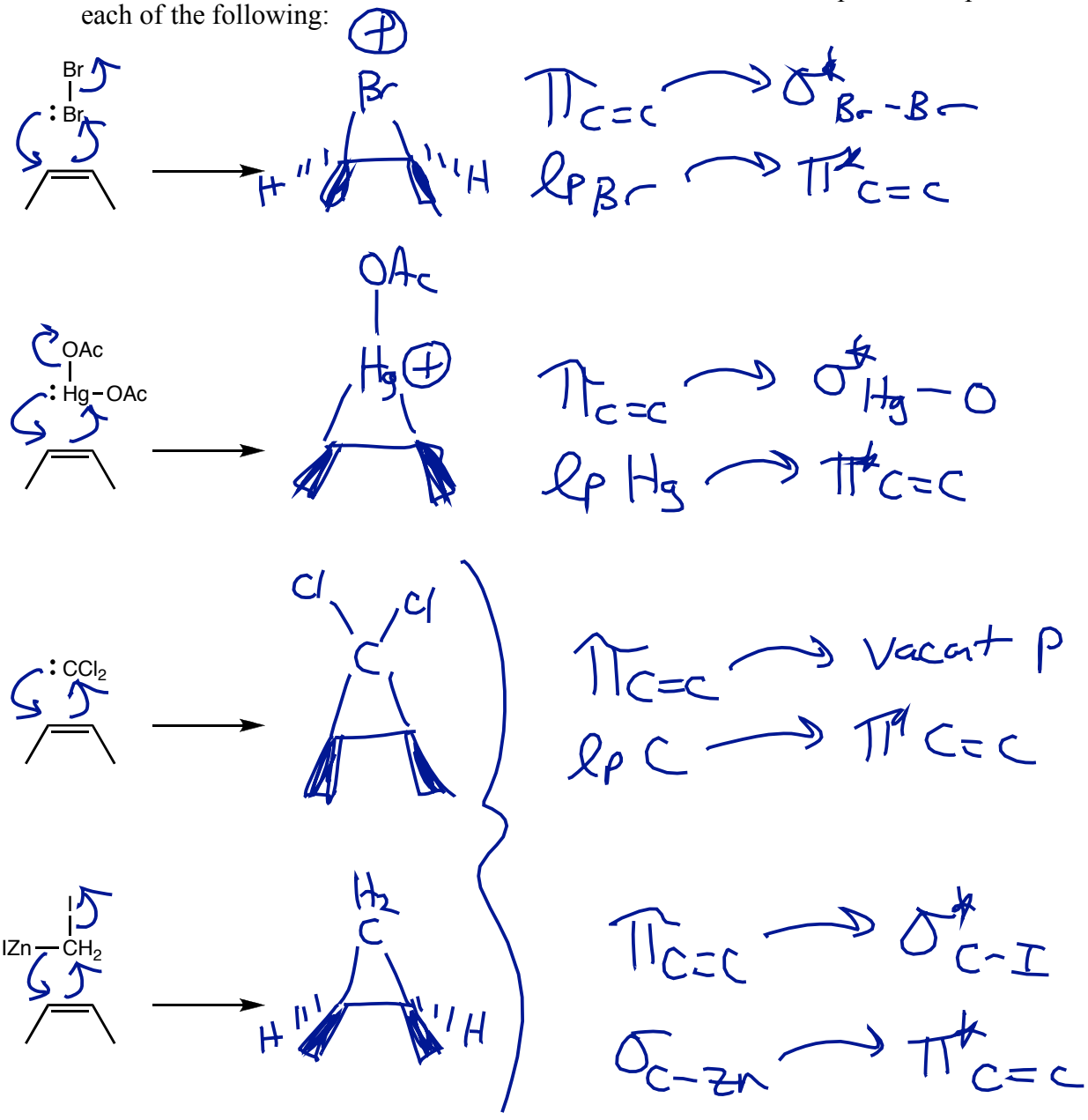
When CH_2I_2 is treated with a zinc-copper couple (Zn-Cu), the Simmons-Smith reagent I–CH_2–ZnI is formed. This reagent is similar to a Grignard reagent. What are the frontier orbitals in the Simmons-Smith reagent? Why is this species called a *carbenoid*?



Reading: Section 9.8

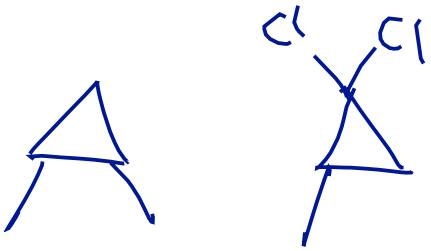
Reactions of Carbenes with Alkenes

- Carbenes react with alkenes in a reaction that is highly reminiscent of the reaction of bromine with alkenes. Draw in the curved-arrow mechanisms and predict the products of each of the following:



- What structures are formed by the addition of carbenes (or carbenoids) to alkenes?

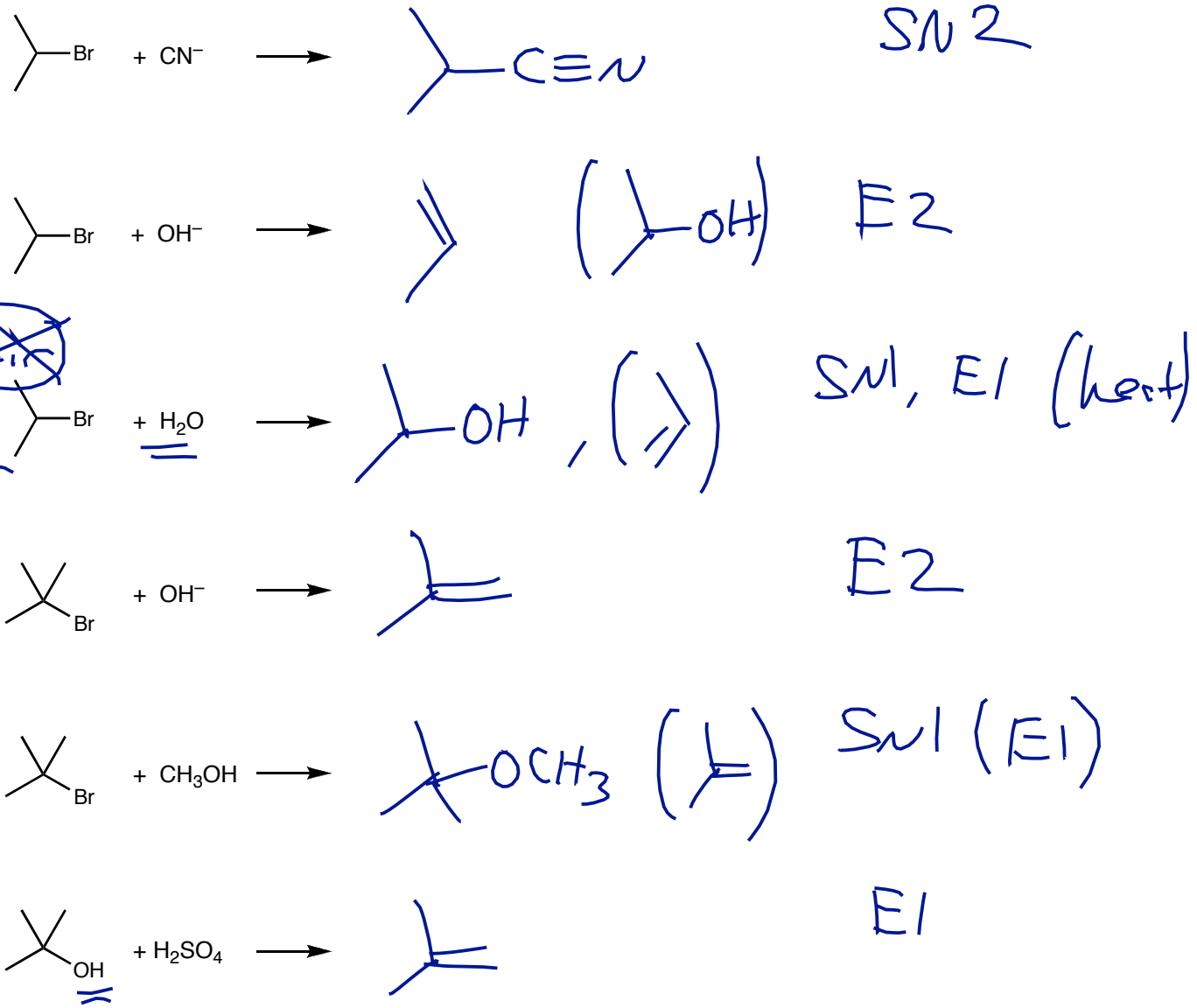
Cyclopropanes



Reading: Section 9.8

Test Yourself Now!

- Determine the primary product and identify any secondary products for each of the following reactions:

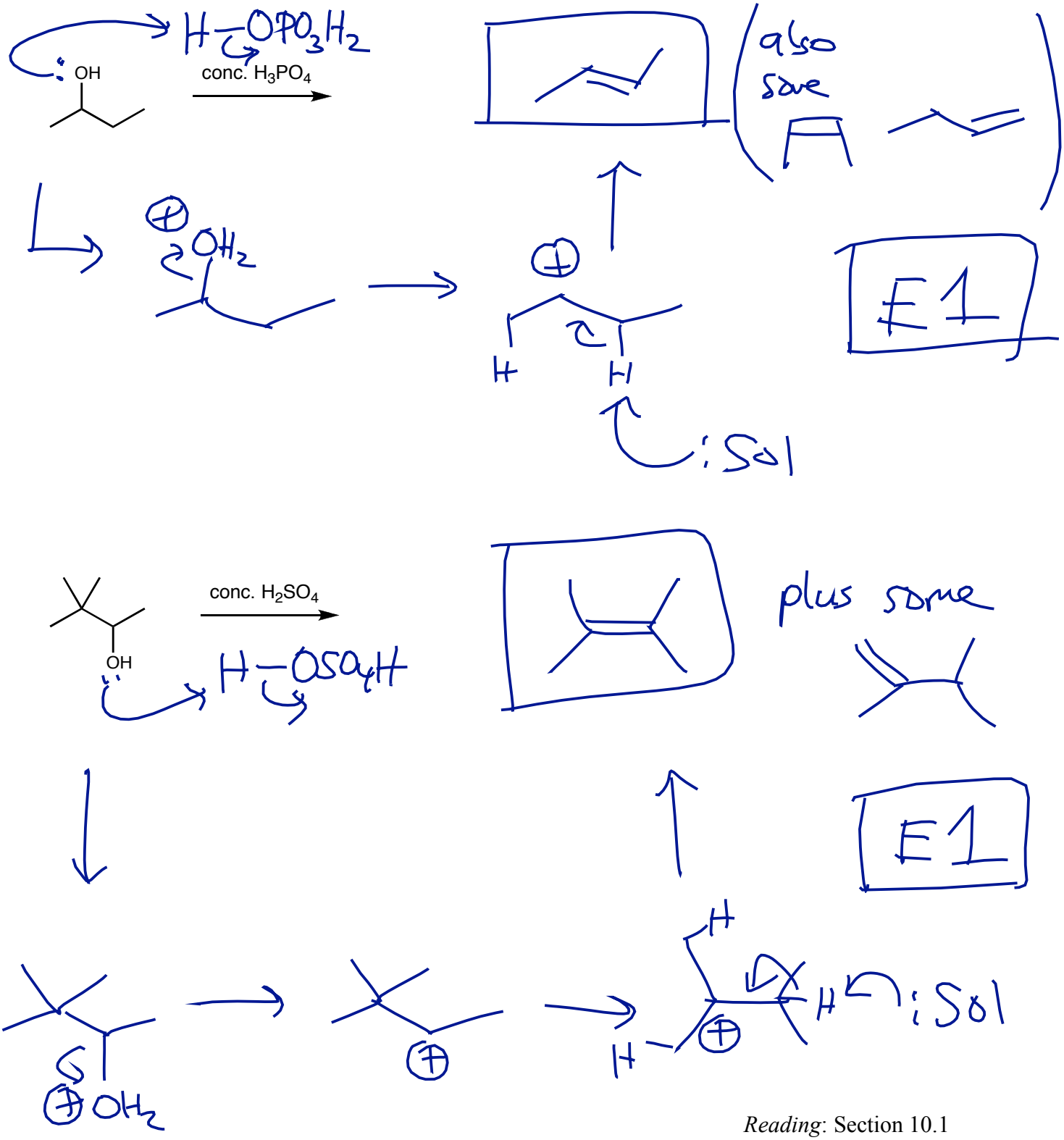


CH3OH not a base! NOT NaOH

Alcohols with concentrated acids.

Dehydration of Alcohols

- Predict the product and show a mechanism for each of the following reactions:

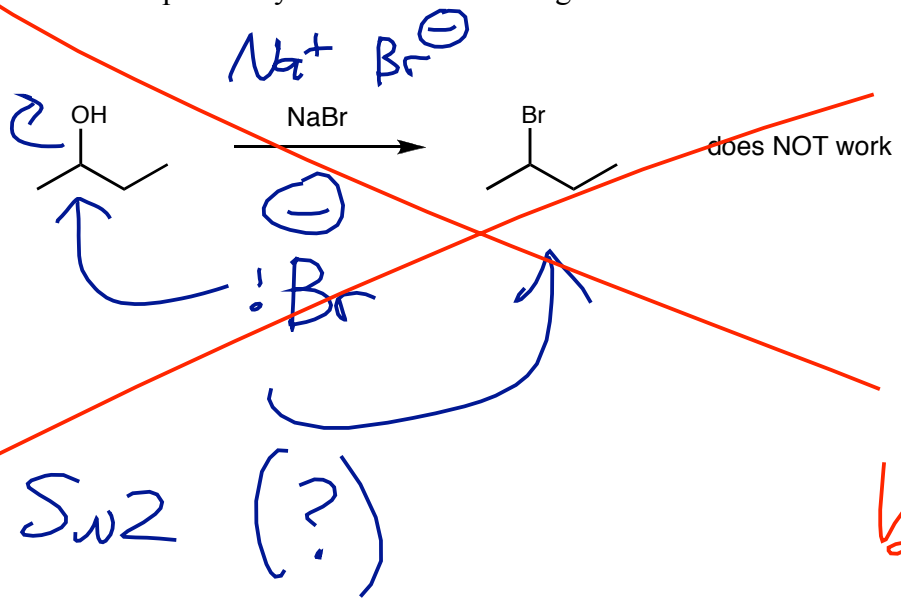


Reading: Section 10.1

3°

Making Alcohols Leave: Part 1–The Problem

- Explain why each of the following reactions is not effective:

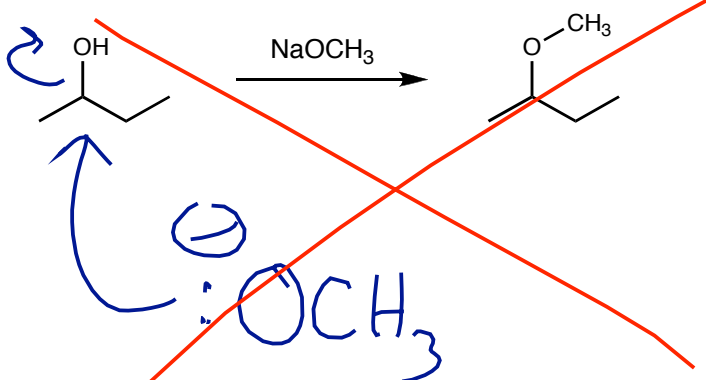


Na^+ $Br^\ominus$

$:Br^\ominus$

S_N2 (?)

OH^- very poor L.G. because it's a strong base



$:OCH_3^\ominus$

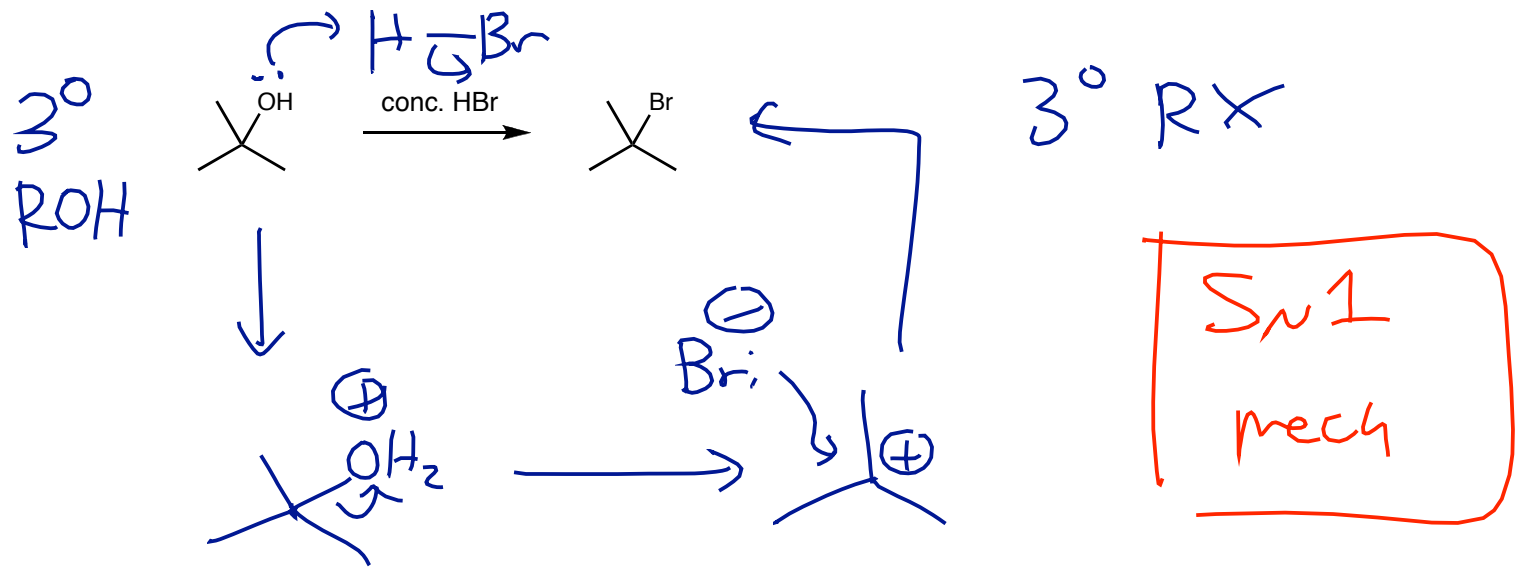
S_N2 (?)

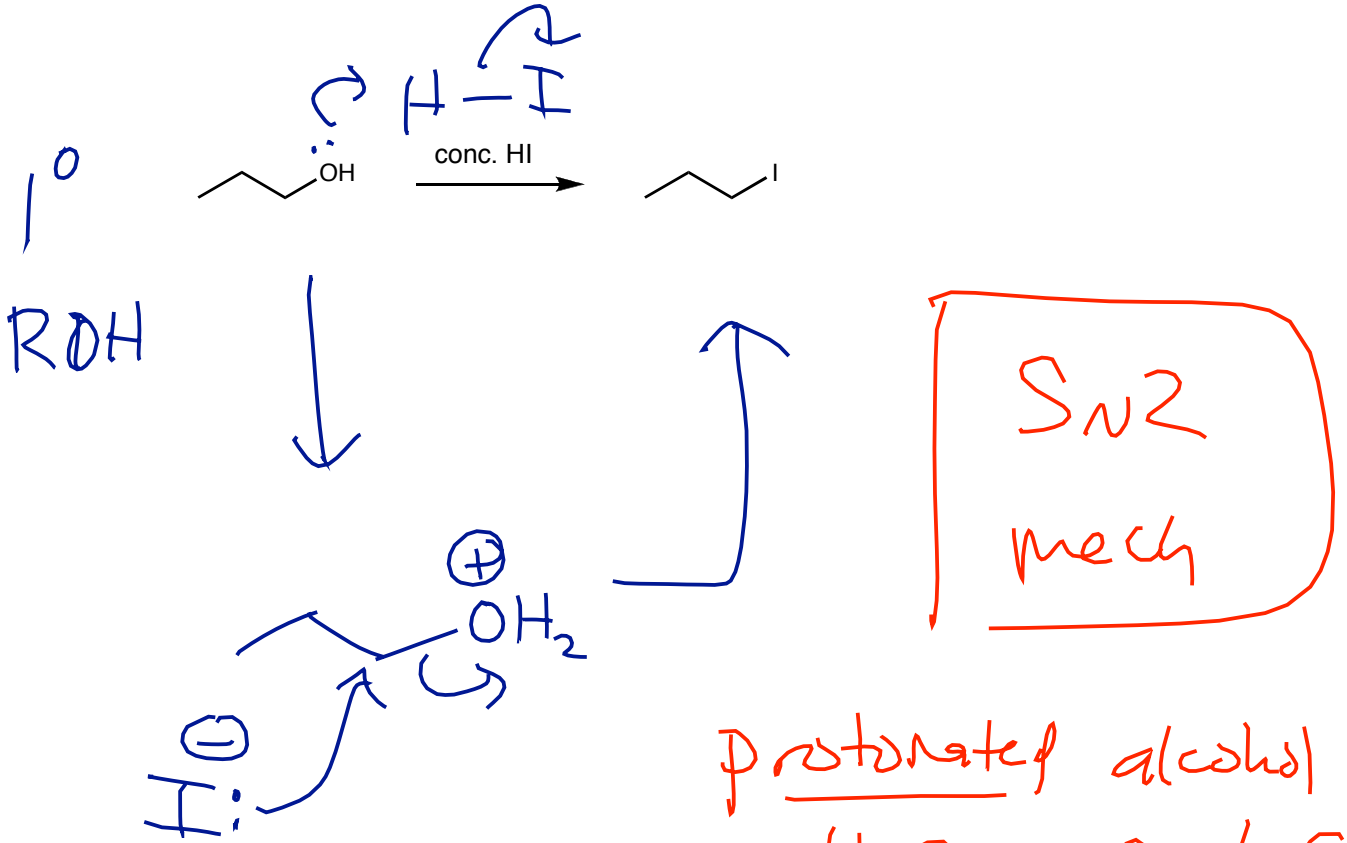
Still OH^- not good L.G.

Reading: Section 10.2

Making Alcohols Leave: Part 2–Using Acid

- We can convert an alcohol into a good leaving group by **protonating** the alcohol in strong acid. Let's see how this works:



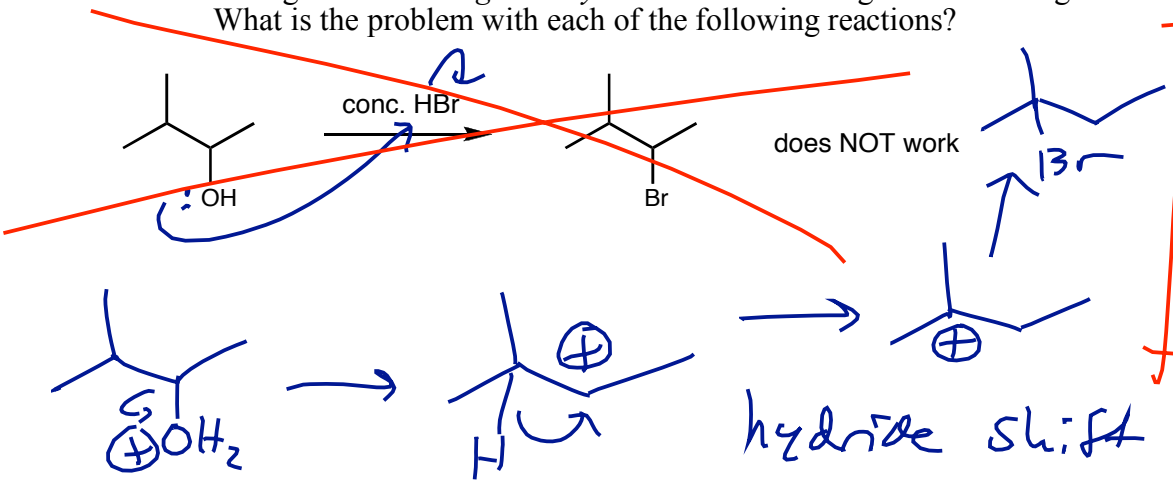


Reading: Section 10.2

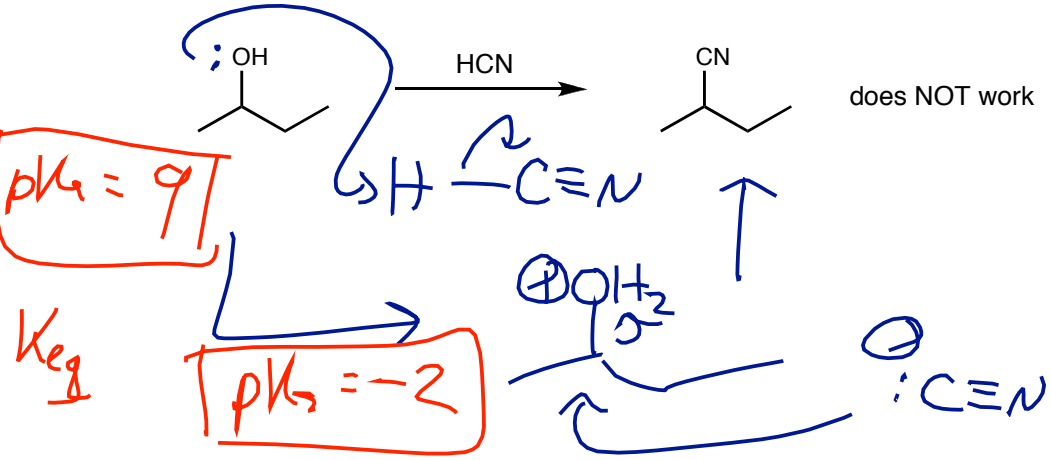
Protonating alcohols is not a general strategy.

Making Alcohols Leave: Part 2–Acid Is A Problem

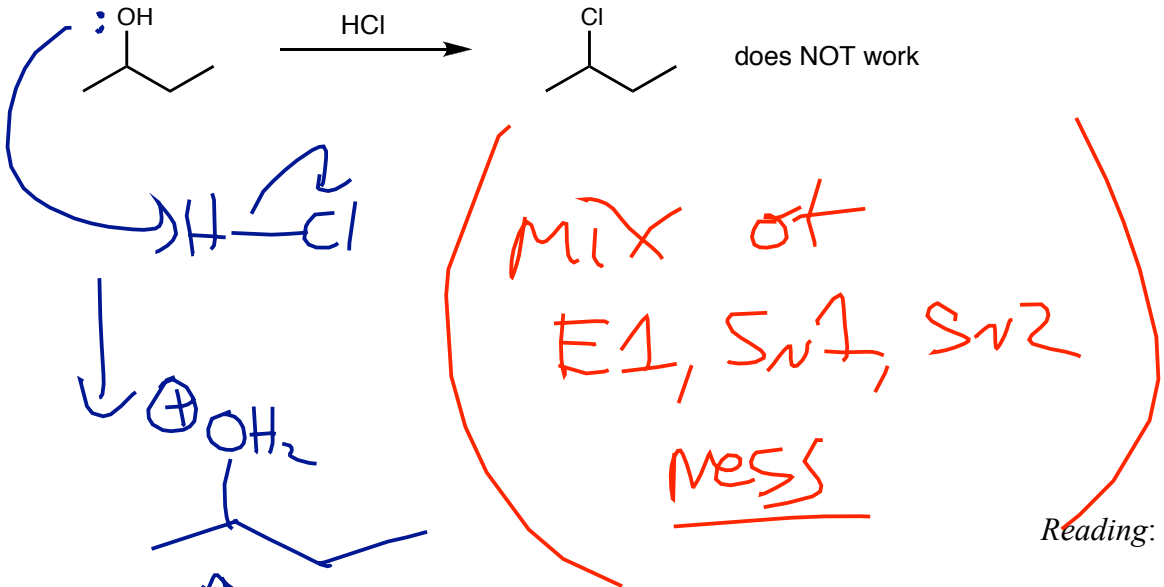
- Strong acids are not *generally* useful for converting alcohols into good leaving groups. What is the problem with each of the following reactions?



Problem: Rearrangements



first step
$K_{eq} = 10^{-11}$



mix of E1, Sn1, Sn2 mess

poor nucleophile

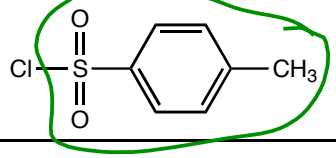
Reading: Section 10.2

example of sulfonate.

Making Alcohols Leave: Part 3–Using Tosylates

- Show the mechanism for the following reaction, in which an alcohol is converted into a good leaving group known as a *tosylate*:

Tosyl Chloride "Ts"

TsCl =  = $ClSO_2R$

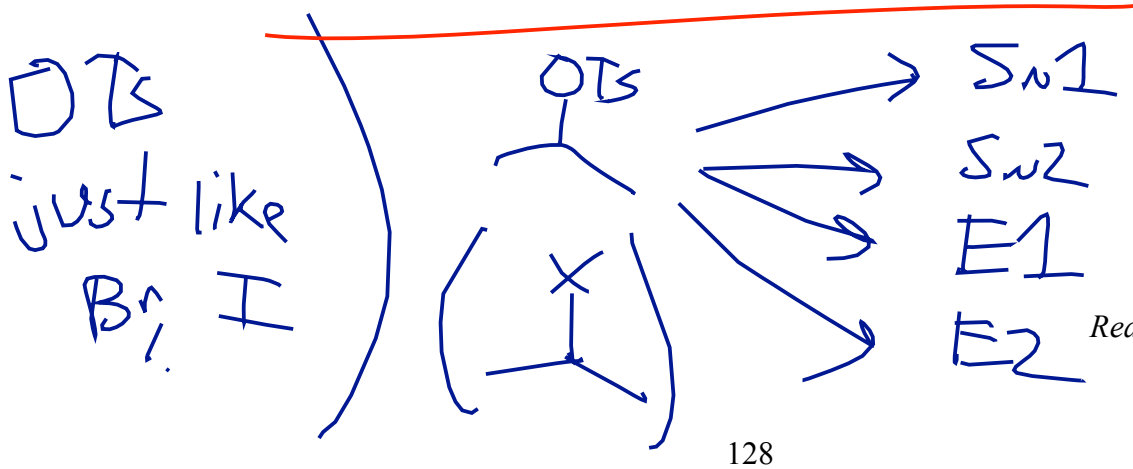
para-toluenesulfonate

- What can we do with a tosylate?

Overall

$$ROH \xrightarrow[pyr]{TsCl} ROTs$$

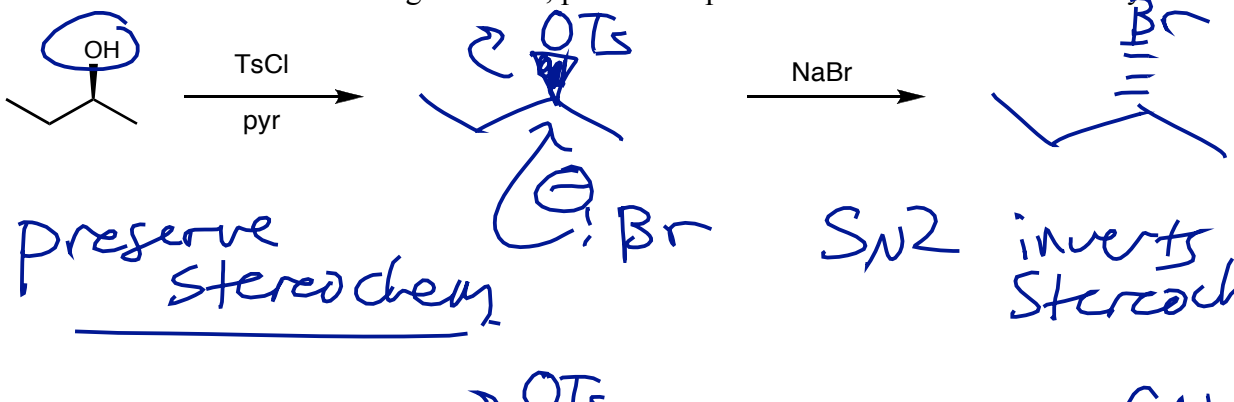
tosylate

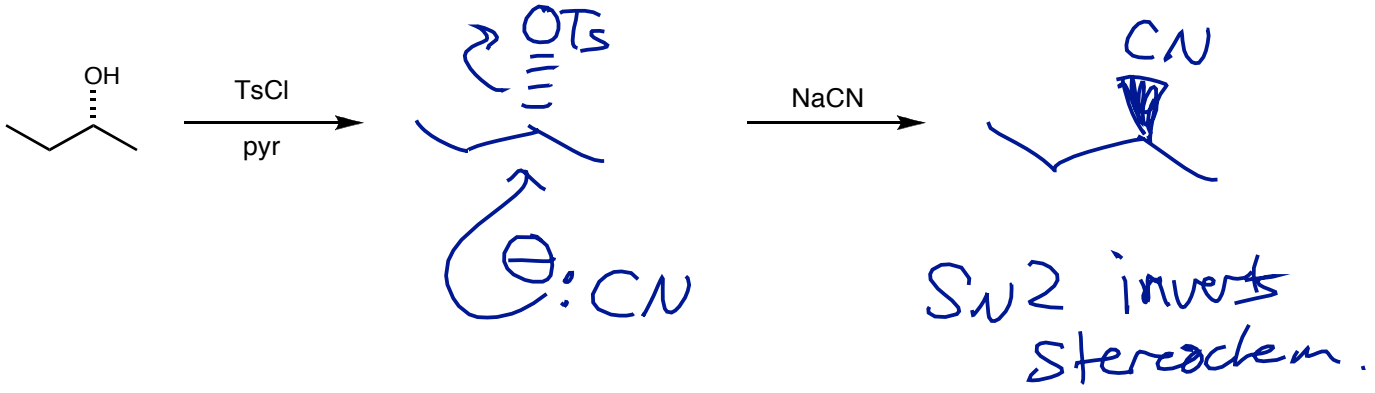


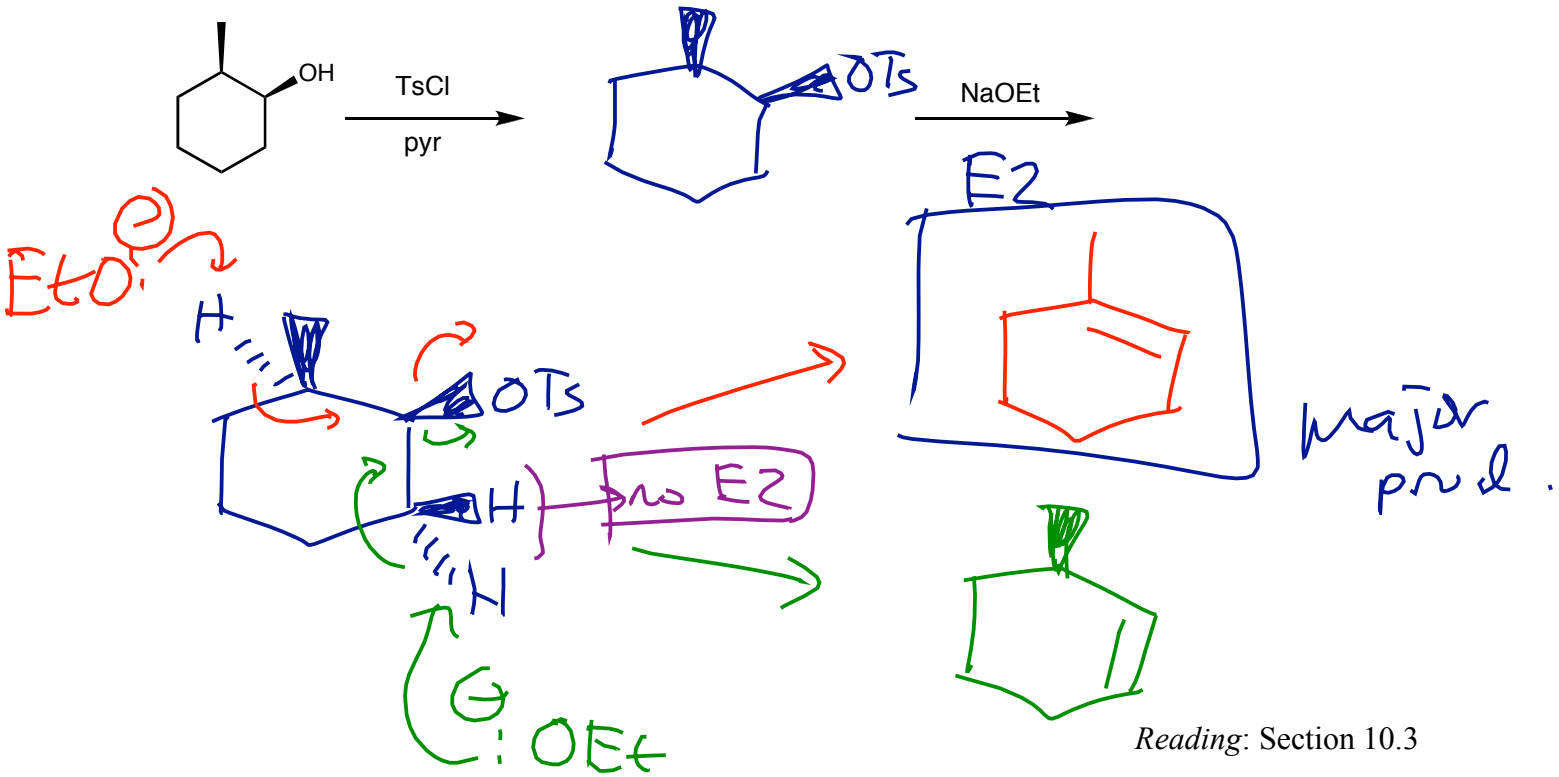
Reading: Section 10.3

Making Alcohols Leave: Part 3–Reactions of Tosylates

- For each of the following reactions, predict the product and show stereochemistry:





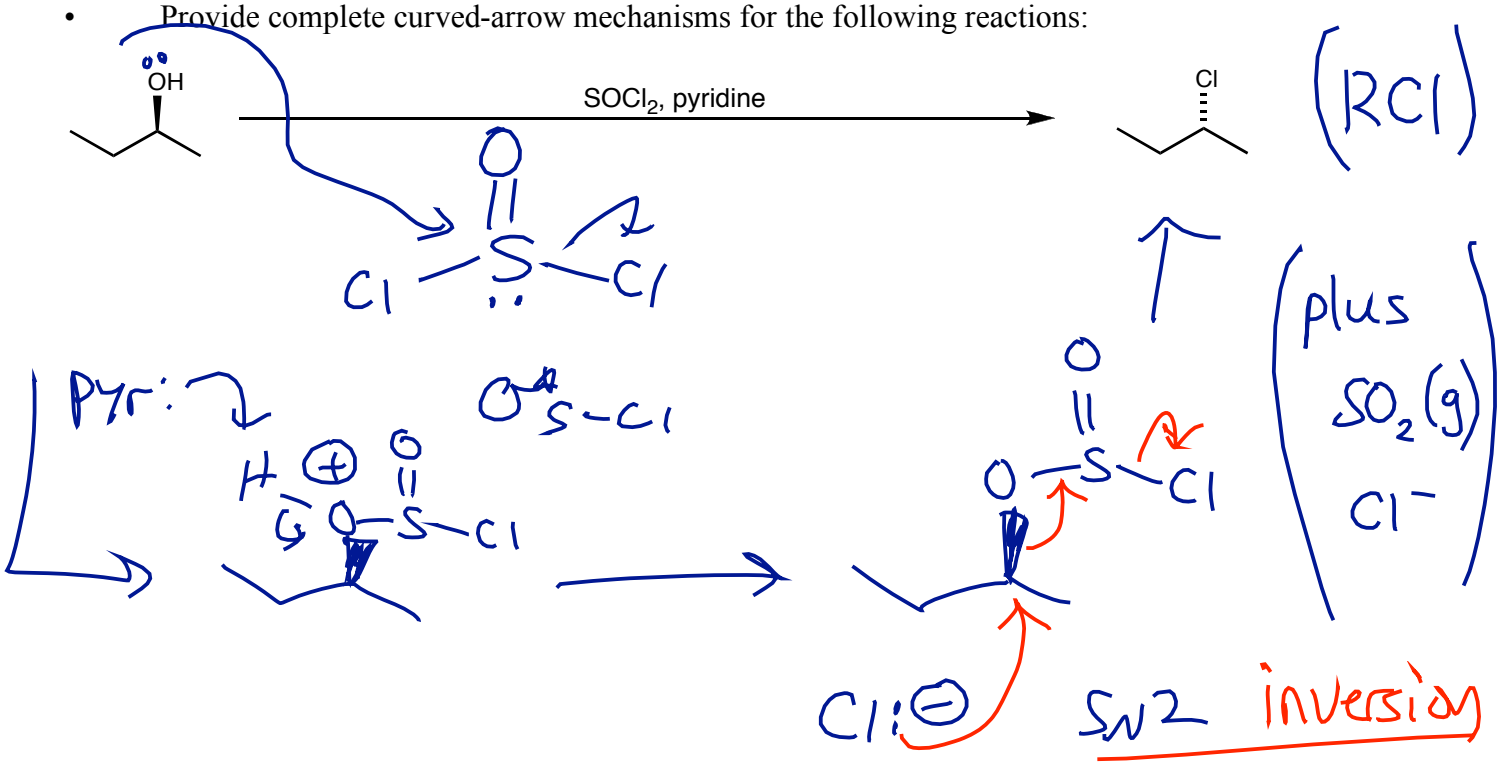


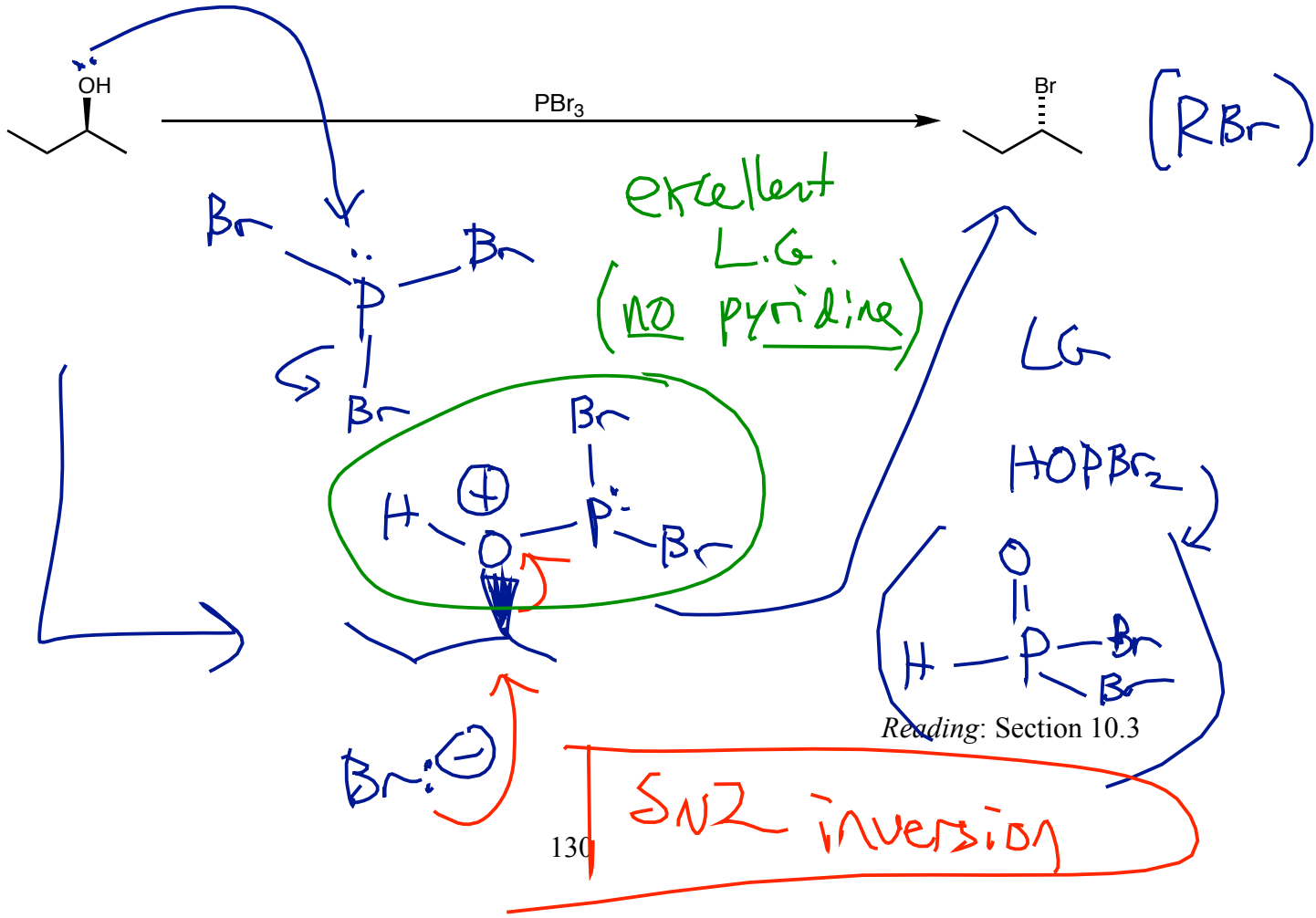
Reading: Section 10.3

Alcohol → RX directly

Making Alcohols Leave: Part 4–$SOCl_2$ and PBr_3

- Provide complete curved-arrow mechanisms for the following reactions:

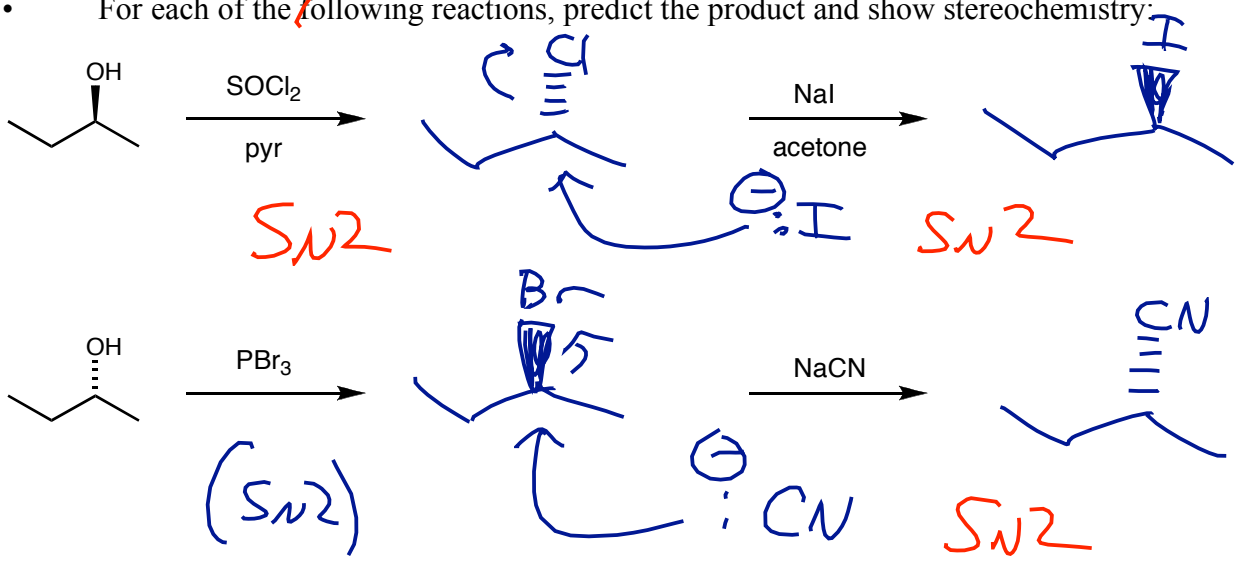




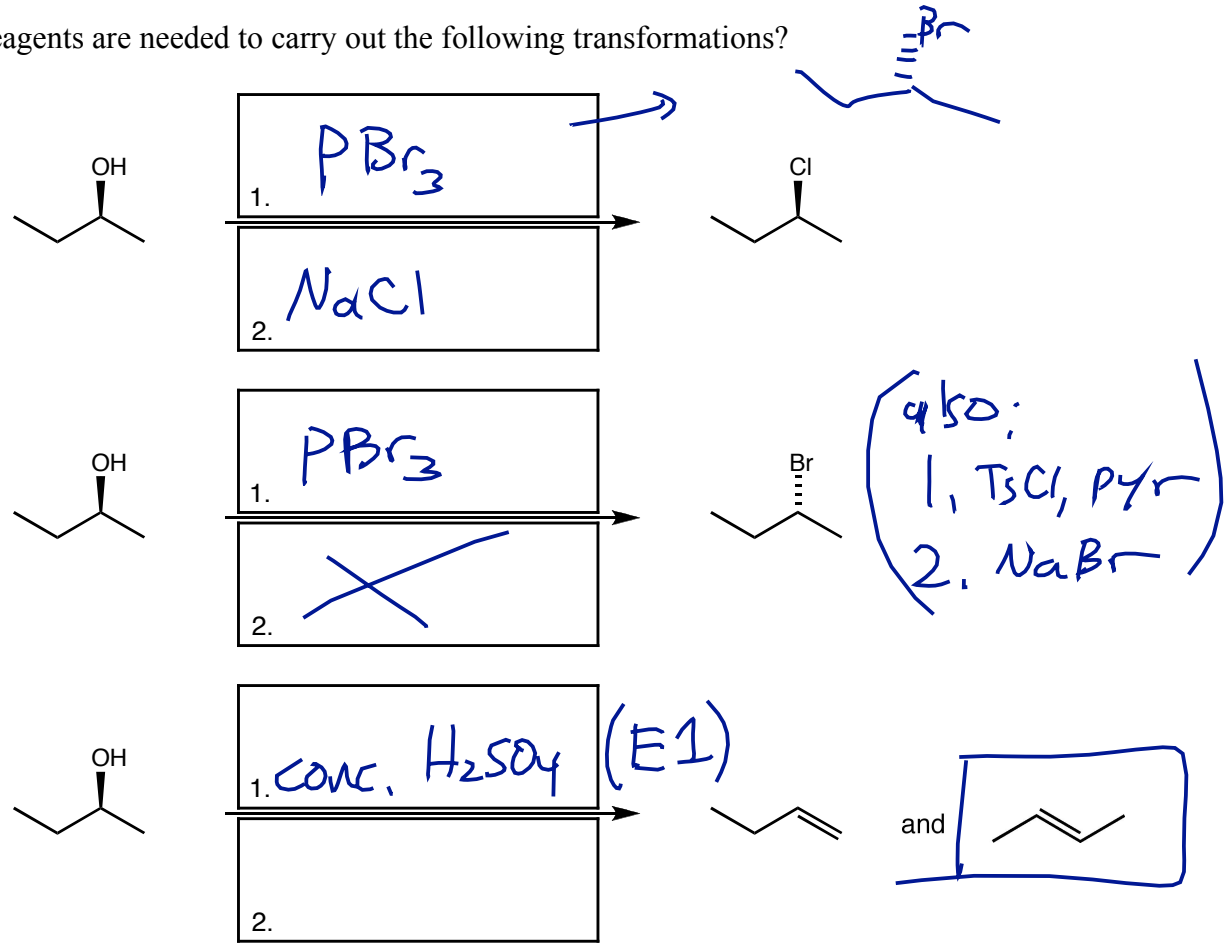
Reading: Section 10.3

Making Alcohols Leave: Part 4–Stereochemistry

- For each of the following reactions, predict the product and show stereochemistry:



- What reagents are needed to carry out the following transformations?



Reading: Section 10.3

Put it together:

- Reactions!
- Mechanisms!
- Synthesis

Excel

"=RAND()"

S.M.