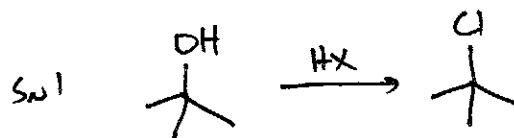


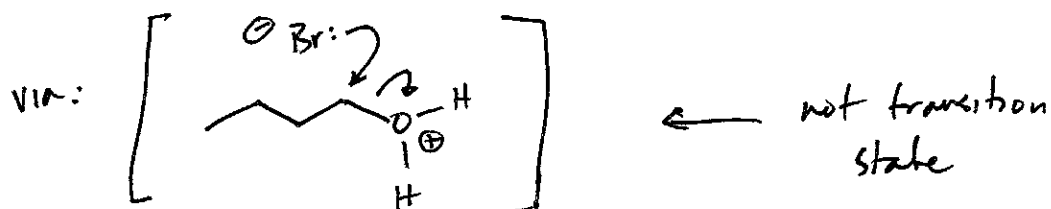
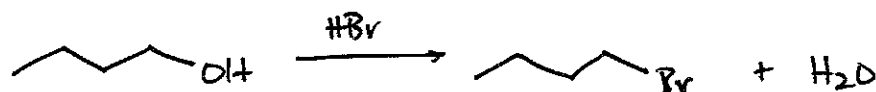
Submit notes to the Undergraduate Chemistry Office for posting.
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

· Last lecture - Carbenes

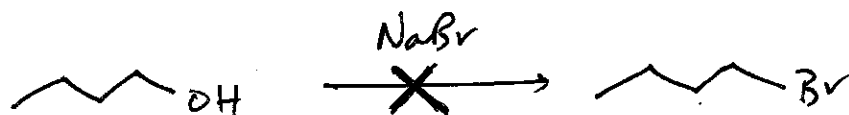
- addition to alkenes, concerted mechanism (Ch 9)
- dehydration of alcohols (acid cat.)
- S_N1 substitution of 2° and 3° alcohols w/ HX



· S_N2 w/ 1° alcohols



Could you do this rxn with NaBr?

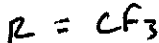
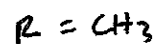
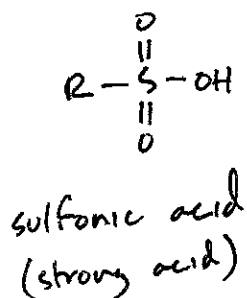
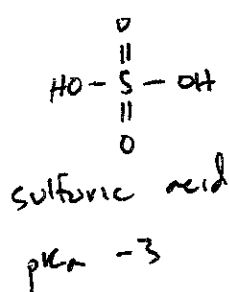


- doesn't work because leaving group in this case (OH) is a bad leaving group.
- strong acid needed to make good leaving group (H₂O)

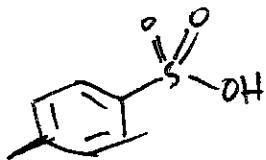
Submit notes to the Undergraduate Chemistry Office for posting.
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

- Disadvantage of this rxn: harsh reaction conditions (strong acid); could cause other sensitive functional groups to react.

• Alternative approach: convert $-OH$ to good leaving group

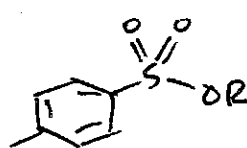


acidity of sulfonic acids due to resonance stabilization of anion:



para-toluenesulfonic acid

TsOH

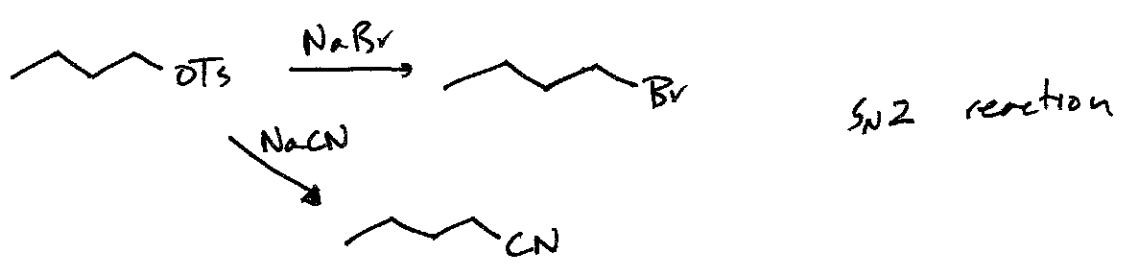
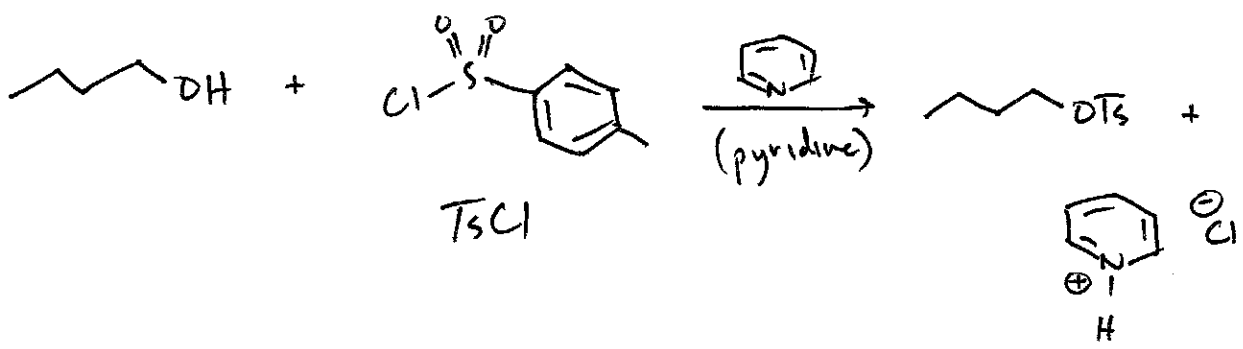


sulfonic ester

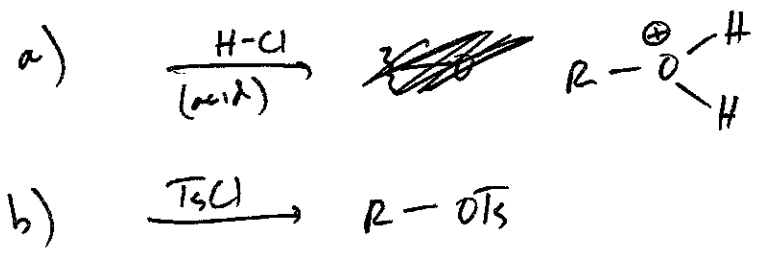
Good leaving group!

Submit notes to the Undergraduate Chemistry Office for posting.
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

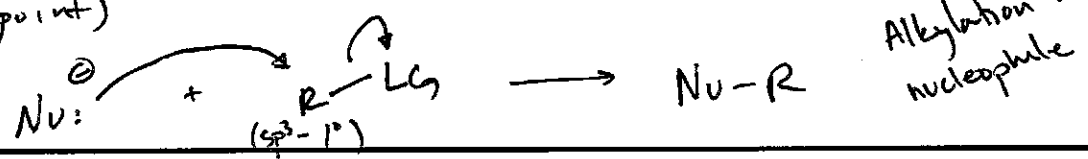
• Converting alcohols to good leaving groups:



• Ways to turn R-OH into good leaving group:

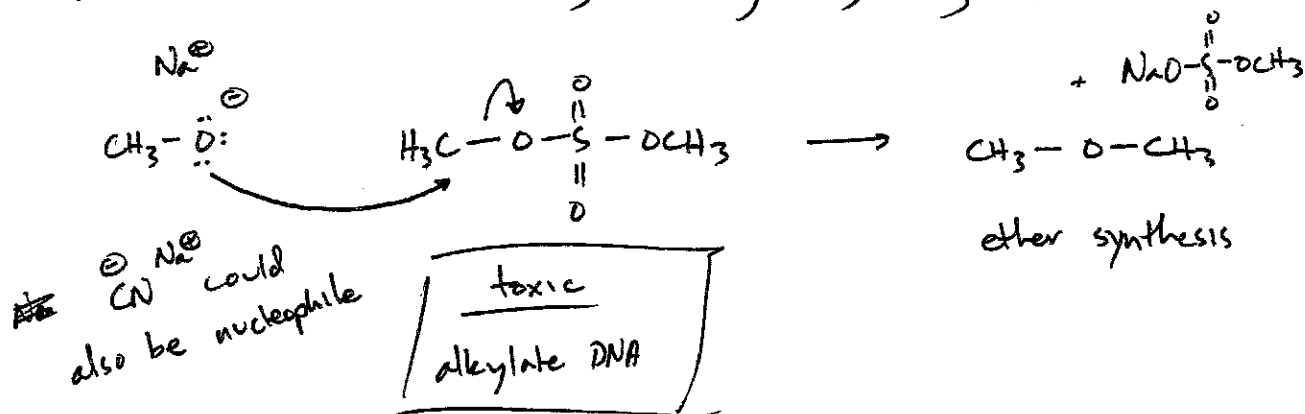


• Alkylating reagents (look at previous reaction from another starting point)

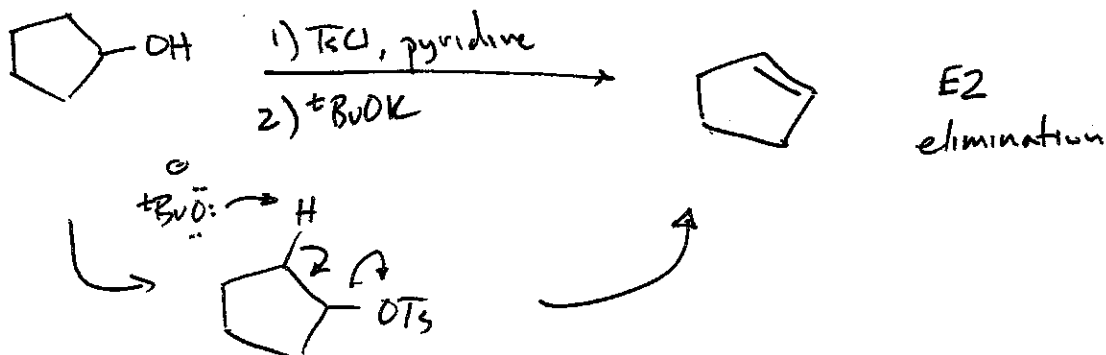


Submit notes to the Undergraduate Chemistry Office for posting.
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

• Sulfonate esters are good alkylating agents



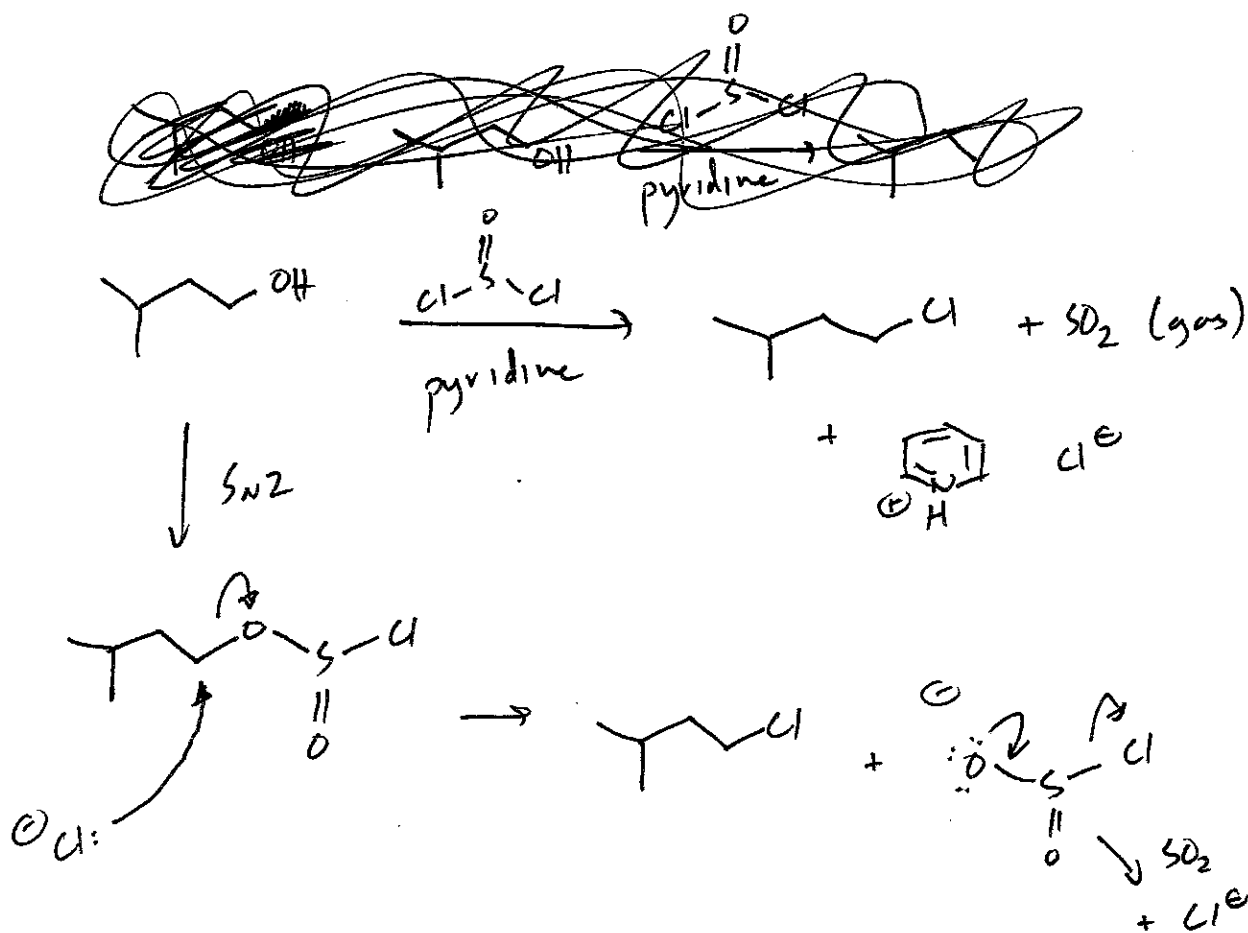
• Elimination also possible



• For these reasons, $-\text{OTs}$ is considered a "pseudo-halide" (does similar rxns)

Submit notes to the Undergraduate Chemistry Office for posting.
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

• special reagents: alcohol \rightarrow alkyl chloride



Other examples:



Mech: p 450

Submit notes to the Undergraduate Chemistry Office for posting.
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

Oxidation and Reduction

~~(2 types)~~ 3 categories:

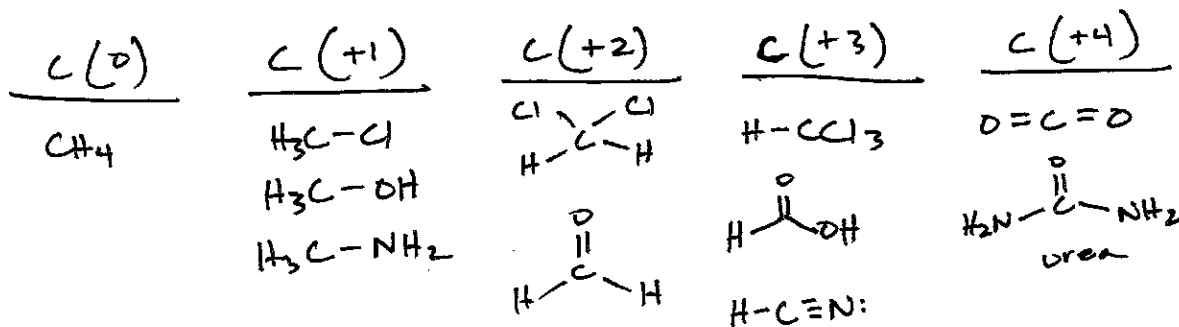
- 1) Rxn in which organic compound is oxidized
- 2) " " " " " " reduced
- 3) " " " " " " neither oxidized
~~nor~~ nor reduced

• Being able to assess the oxidation state of carbon is essential to assign each category

- two methods: p 452 - 455

• Looking at individual carbons:

- ox. state of carbon varies between 0 and +4
- ox. state goes up by +1 for every electronegative atom bonded to it (e.g., N, O, halogen)
- no ~~change~~ change for H or a single-bonded C



Course _____ Instructor _____
Day _____ Date _____
Notes Taken By _____ Total # of Pages _____

Submit notes to the Undergraduate Chemistry Office for posting.
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

~~Larger molecules~~

• Larger molecules

