

## Today

Section 6.1 and 6.2  
Electrophilic Addition and Carbocation Stability

Section 6.3  
Transition state

Section 6.4  
Regioselectivity

Sections 6.5 and 6.6  
Addition of water and alcohols

Section 6.7  
Carbocations will rearrange

Section 6.8  
Hydroboration-oxidation

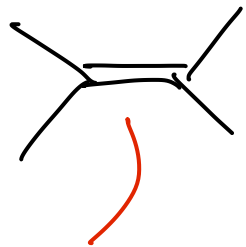
Section 6.9  
Addition of halogens

## Next Class

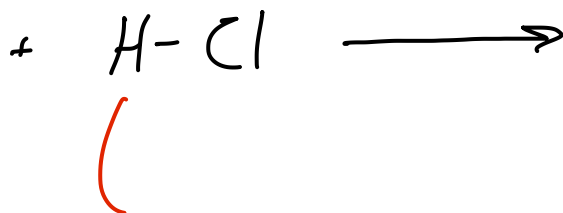
Sections 6.12 and 6.13  
Regio- and stereoselectivity

Section 6.16  
Reactions and synthesis

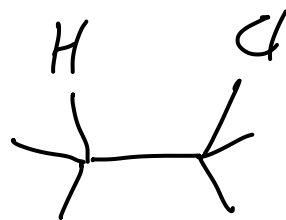
# Electrophilic addition



alkene is  
 $e^-$  rich

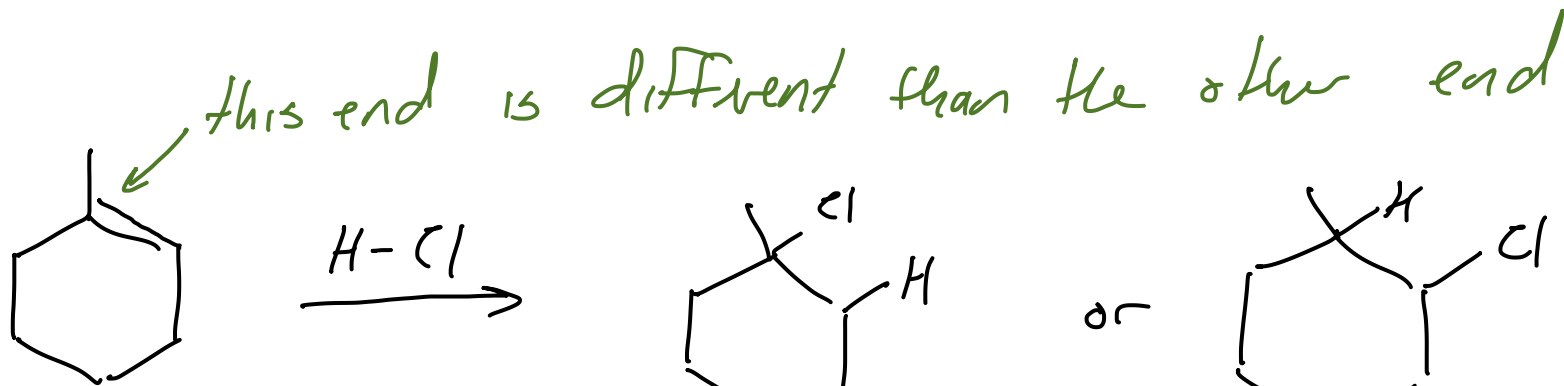


H atom is  
 $e^-$  deficient



added H + Cl  
across the  
db

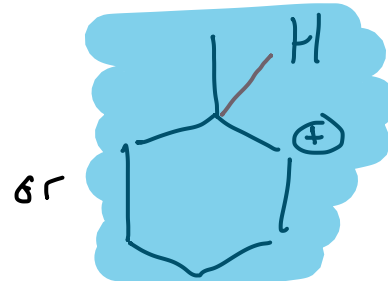
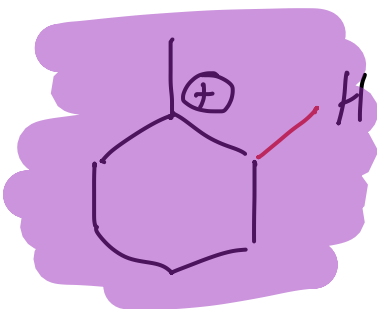
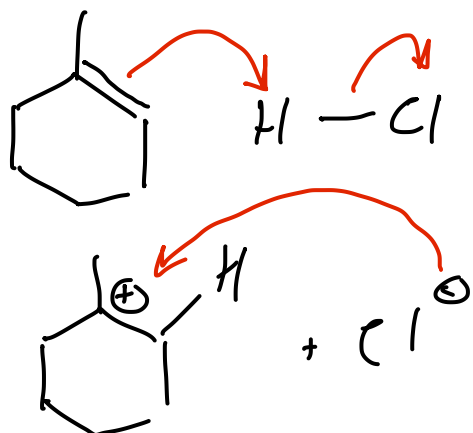
nucleophiles react with electrophiles



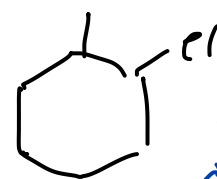
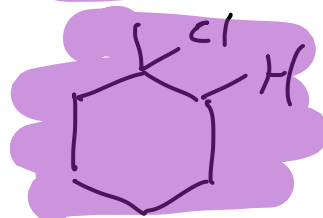
major product

what do I get?

Regioselectivity



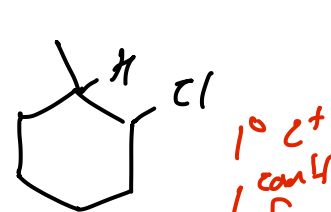
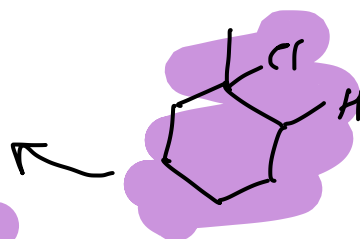
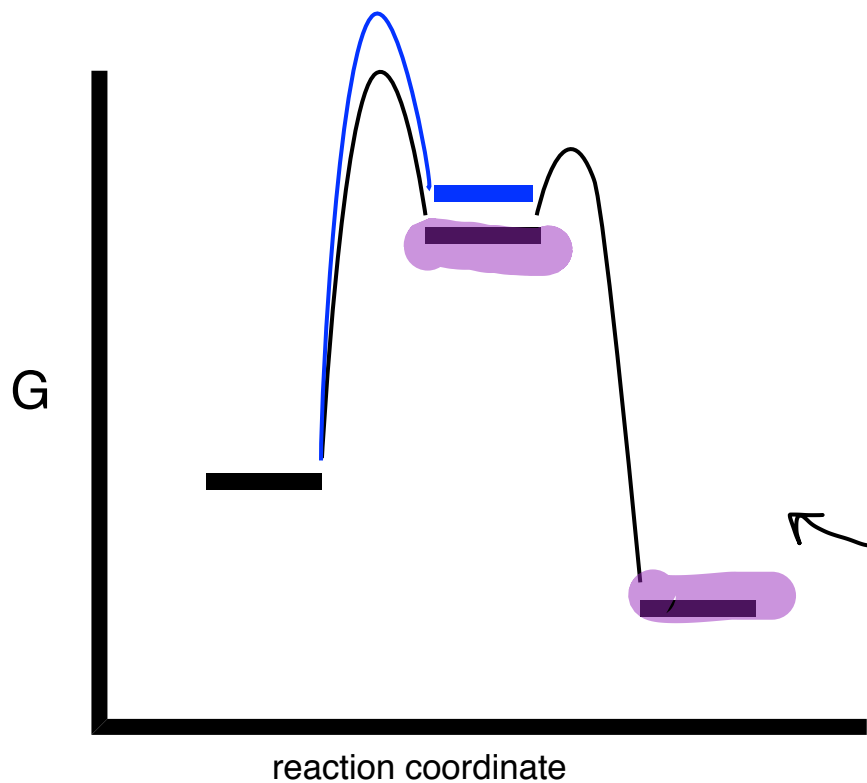
Section 6.4



some of this will form

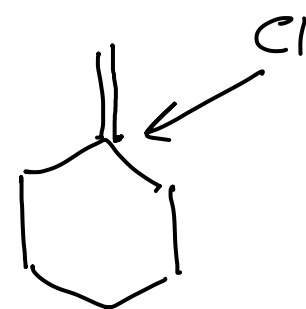
the <sup>major</sup> Cl is added preferentially to the 3° C

3° C<sup>+</sup> is more stable than the 2° C<sup>+</sup>



1° C<sup>+</sup> can't form

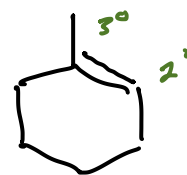
3° C<sup>+</sup>



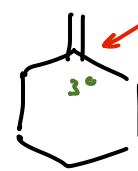
picked 'cu'z db needs to end where Cl<sub>3</sub> goes

A

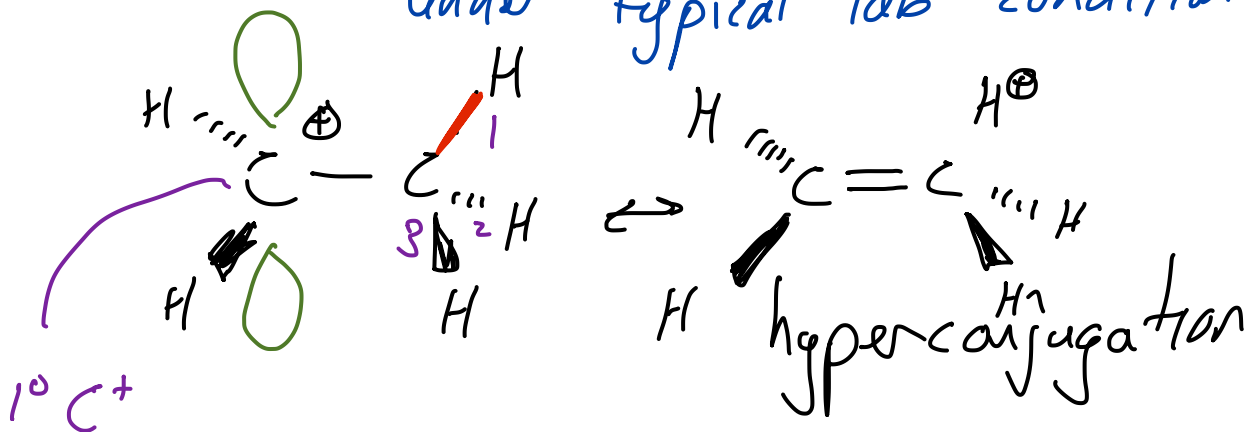
B



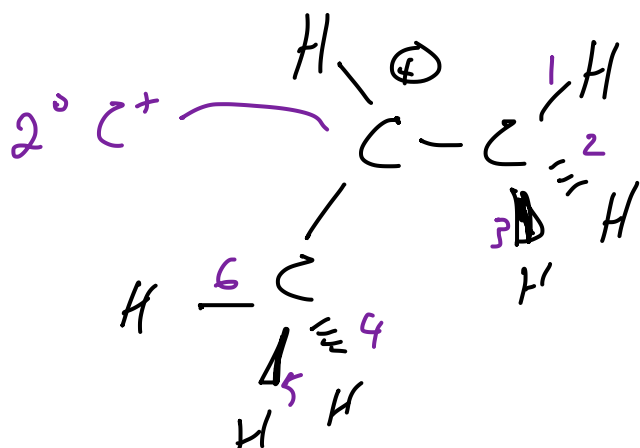
or



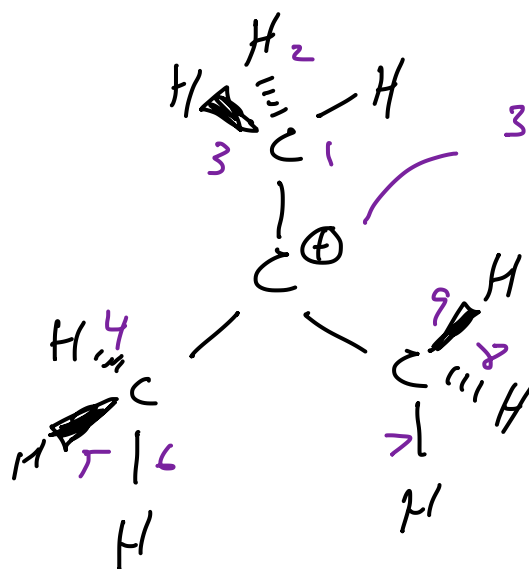
too unstable to form  
under typical lab condition



Empty p orbitals  
on a  $\text{C}^+$   
are stabilized by  
 $e^-$  donation  
from C-H bond  
on neighbor C atoms



can form under  
normal lab conditions



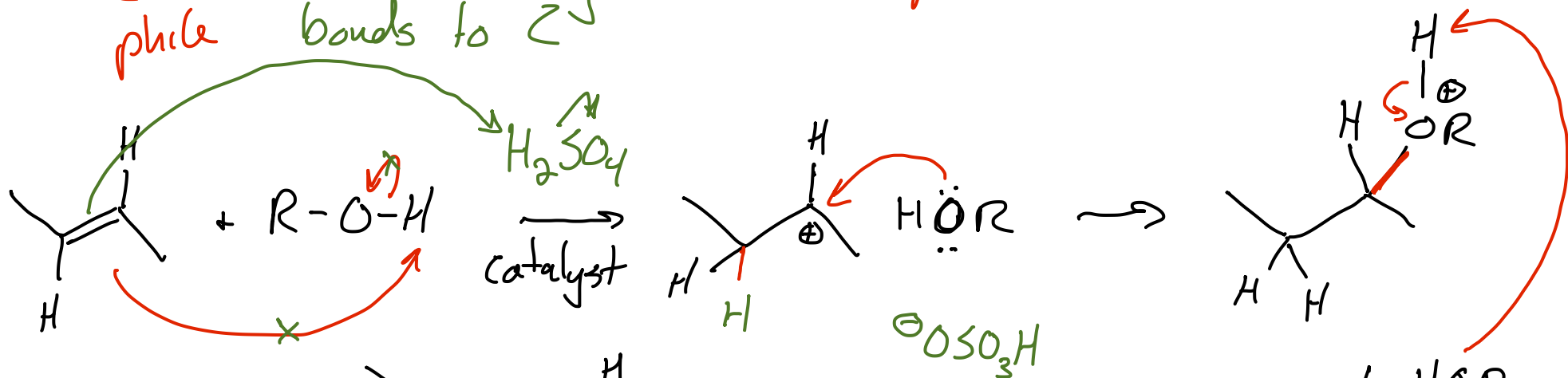
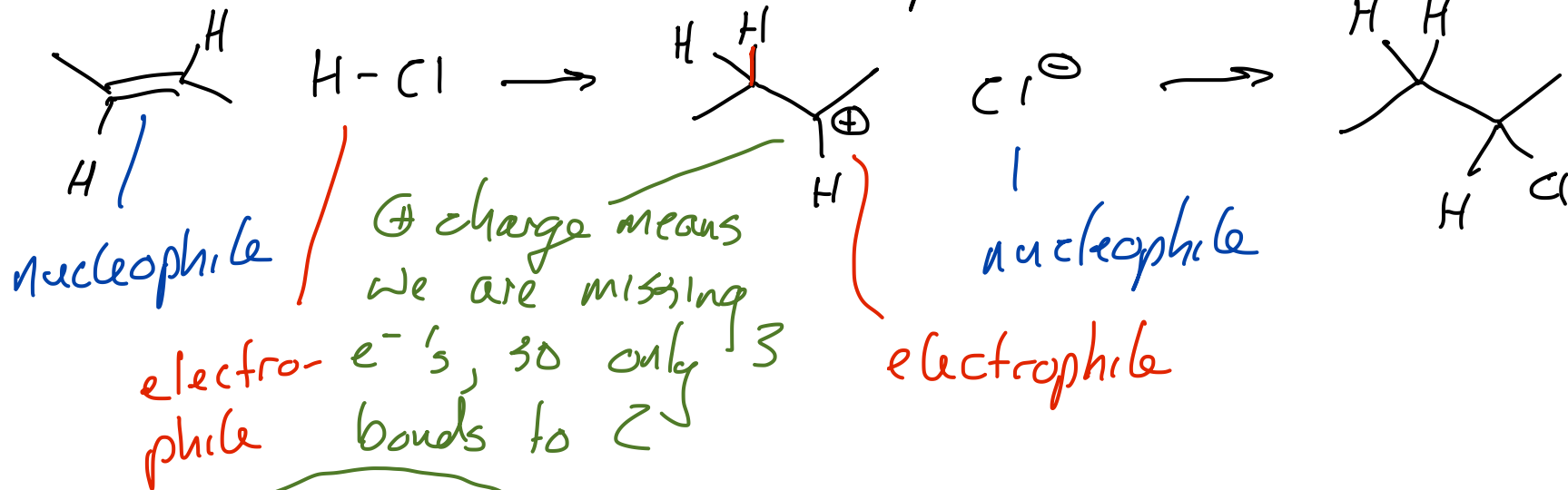
most stable  $\text{C}^+$

$3^\circ \text{C}^+$  has 9 C-H  
bonds on  
neighboring C  
atoms to stabilize  
the  $e^-$  deficient

The Addition of HOH and ROH

Section 6.5 and 6.6

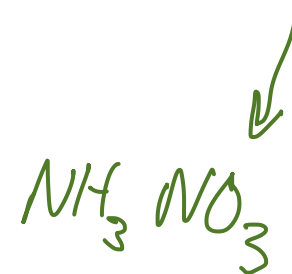
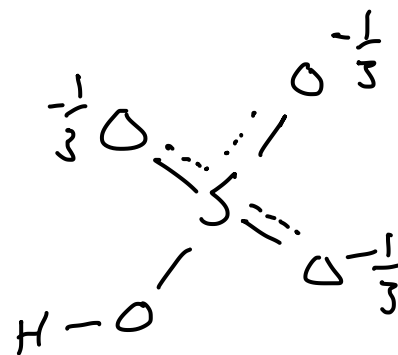
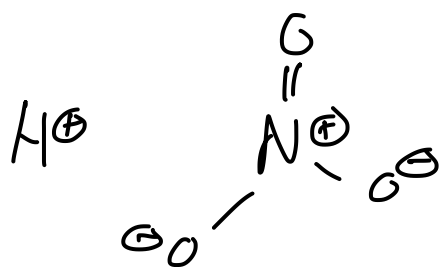
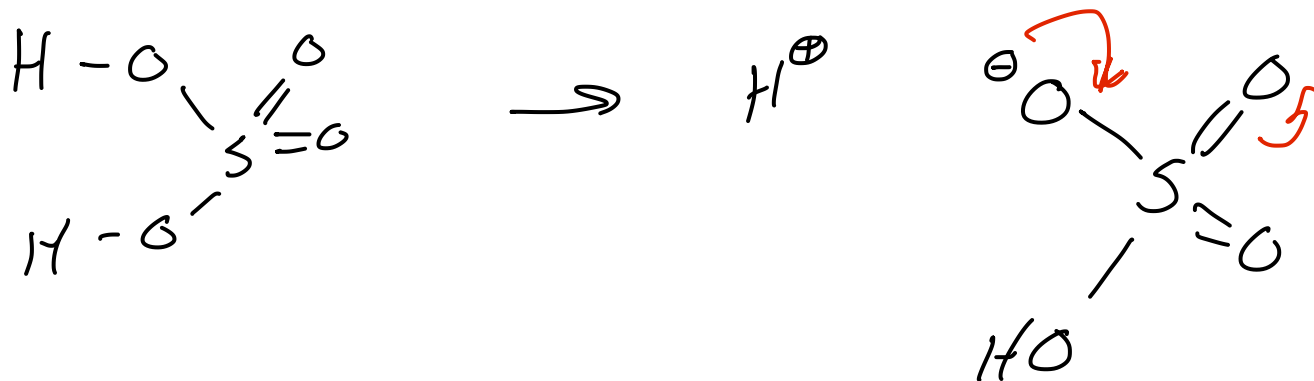
alkene reacts with electrophile to make  $C^+$  intermediate



$Cl^-$  can react  $\ddot{O}$   
 need a conj base that isn't nucleophilic  
 Strong Acid with delocalized charge  $H_2SO_4$

R-O-H both can react  
Cl-

$in^{\ominus}OR$   $R=H$  Hydroxide  $R=C$  alkoxide 4

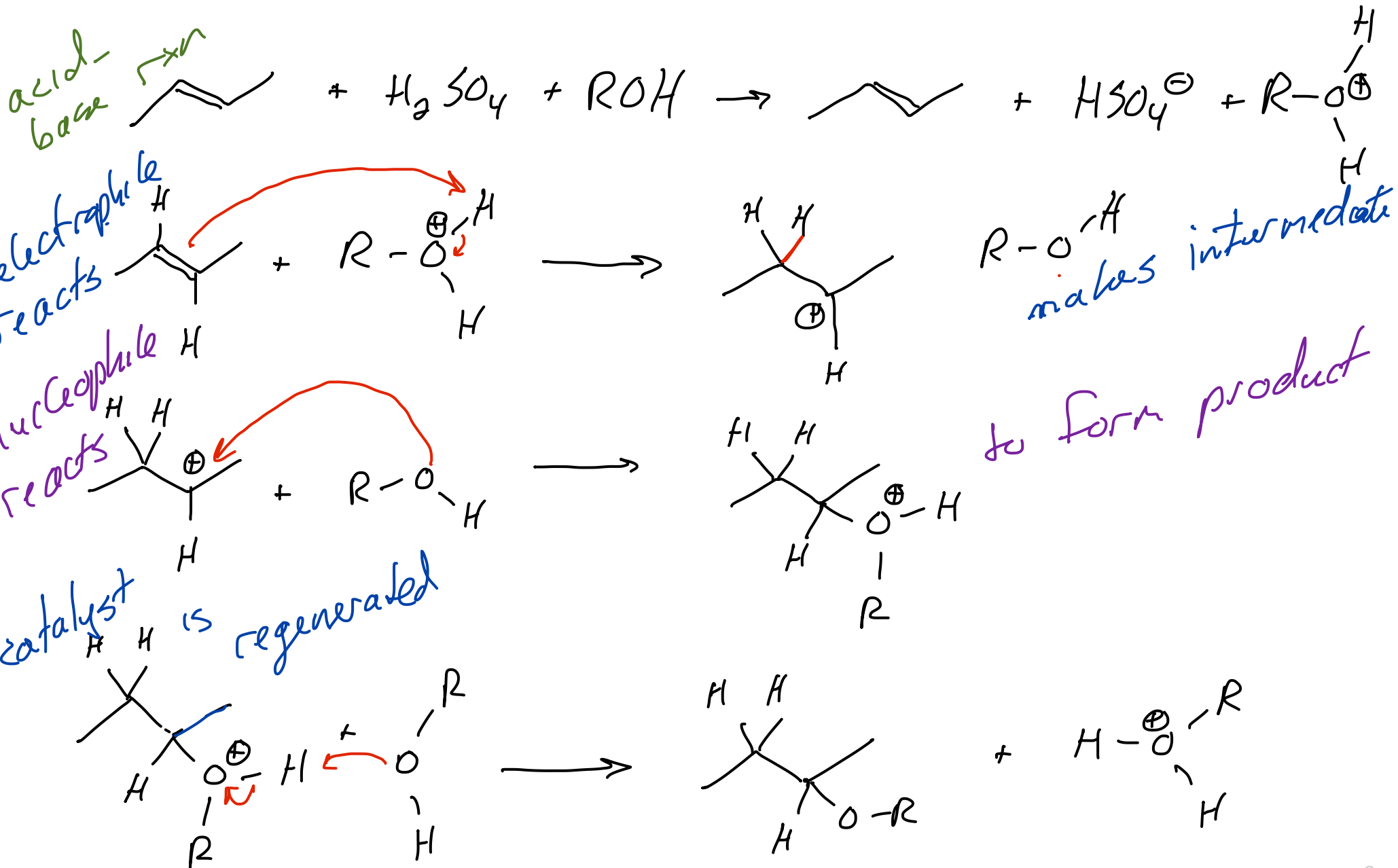


delocalized  $e^-$  so not nucleophilic ...

why not use nitric acid? very strong ANFO oxidizer + it will be very dangerous

Electrophilic Addition of Water (HOH) and Alcohols (ROH)

Section 6.6







E Add Rxns

