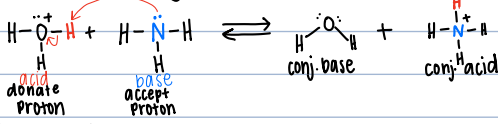
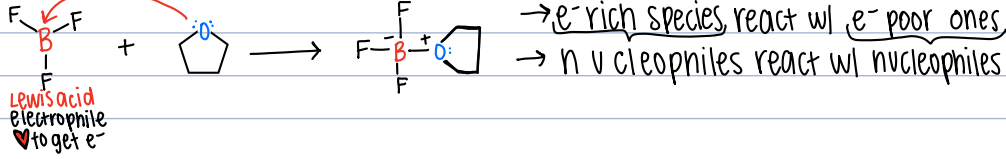


## Ch 2: Acids + Bases

Brønsted lowry acid **donates proton** to Brønsted-Lowry base



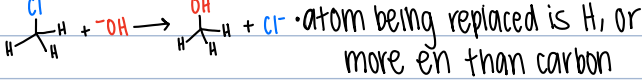
Lewis base **donates an electron pair** to a Lewis acid



## Ch 6: Organic Rxns

### > Substitution

one σ bond breaks + one σ is formed at same carbon

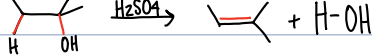


### > Elimination

two σ broken one π made, opposite of addition

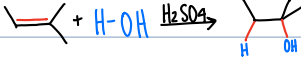
Some atoms removed to add π bond

→ one lost atom is H + one is atom more en than carbon



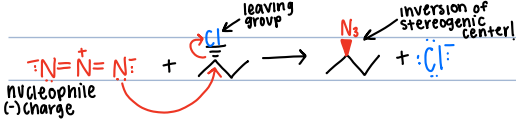
### > Addition

π bond broken and two σ bonds added, opposite of elimination



## Ch 7: Alkyl halides + NU<sup>-</sup> substitution

### > S<sub>N</sub>2



single product, **inversion of stereogenic center**

one step, 2nd order kinetics

rate = k[RX][NU<sup>-</sup>]

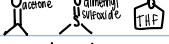
less R groups = faster rxn *\*steric hindrance\**

no carbocation intermediate

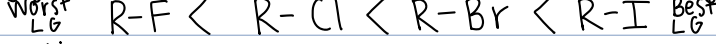
NU<sup>-</sup> attack from back

strong NU<sup>-</sup> *\*USU w/ (-) charge\**

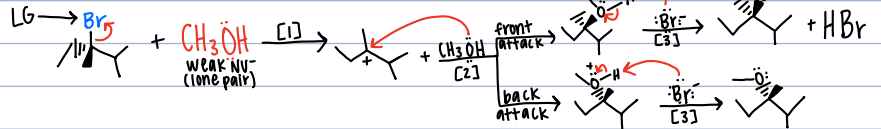
aprotic solvents



better leaving group = faster rxn



### > S<sub>N</sub>1



racemic mixture (2 enantiomers equal parts) produced

2 steps, first-order kinetics

rate = k[RX]

more R groups = faster rxn *\*stabilizes carbocation\**

trig. planar carbocation intermediate

NU<sup>-</sup> attack fm both sides

weak NU<sup>-</sup> w/ no charge (ROH, H<sub>2</sub>O)

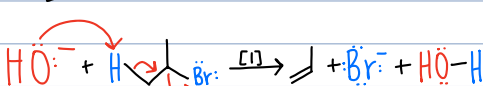
polar protic solvents



better leaving group = faster rxn

## Ch 8: Elimination reaction

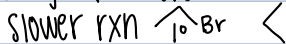
### > E2



one step, 2nd order

rate = k[RX][B]

more R groups = faster rxn



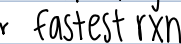
### > E2



two steps, first order

rate = k[RX]

more R groups = faster rxn



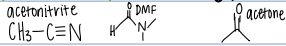
anti-periplanar trans H+Br

Strong bases NH<sub>2</sub><sup>-</sup>, OR<sup>-</sup>, OH<sup>-</sup>

better LG = faster rxn



Polar aprotic solvents



Zaitsev: more subst alkenes favored

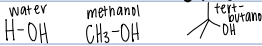


trigonal planar carbocation intermediates

Weak bases ROH, H<sub>2</sub>O

better LG = faster rxn

Polar protic solvents

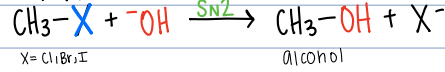


Zaitsev: more subst alkenes favored

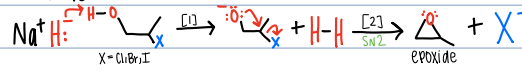
### Ch 9: Alcohols, Ethers + Related compounds

> Prep. of alcohols, alkoxides, ethers, epoxides, thiols + sulfides

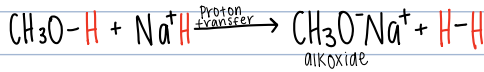
→ Alcohols



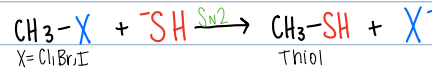
→ epoxide



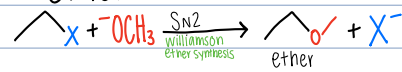
→ alkoxides



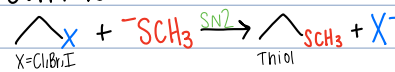
→ thiol



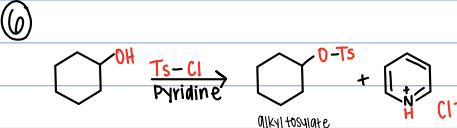
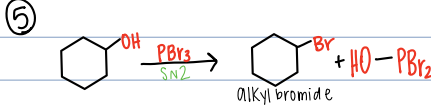
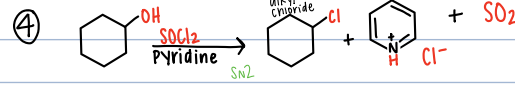
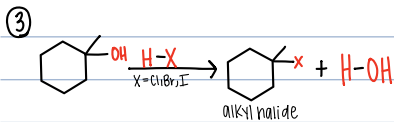
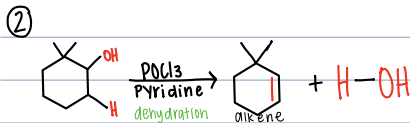
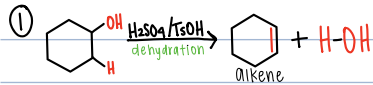
→ ether



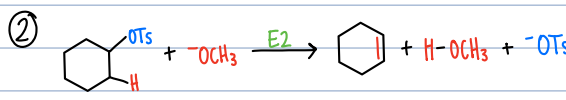
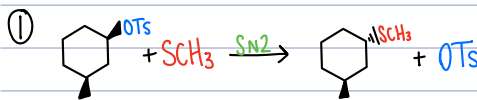
→ sulfide



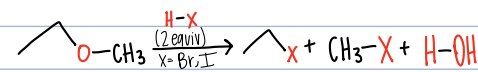
### > Reactions of alcohols (6)



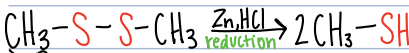
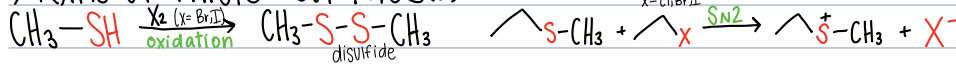
### > Rxns of alkyl tosylates (2)



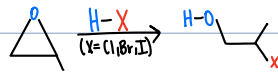
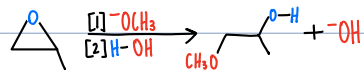
### > Rxns of ethers (1)



### > Rxns of thiols + sulfides (3)

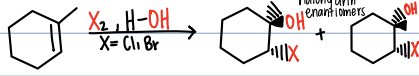
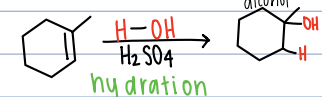
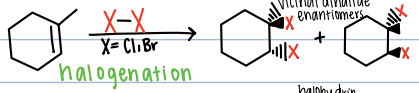
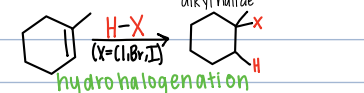


### > Rxns of epoxides



### Chapter 10: Alkenes + Addition Reactions

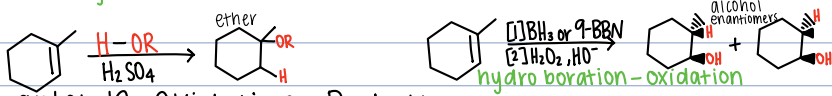
#### > Addition



add 2 notes: ↴

radical rearrangement  
carbocations → rearrange!  
radicals → DO NOT REARRANGE

rearrange! would need H• which is too unstable unless you're on the Sun

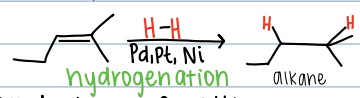


Via resonance

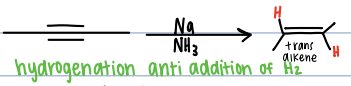
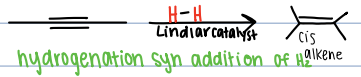
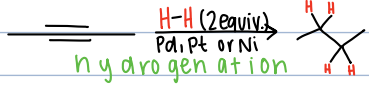
## Chapter 12: Oxidation + Reduction

### > Reduction Reactions

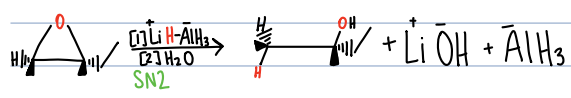
#### → reduction of alkenes



#### → reduction of alkynes



#### → reduction of alkyl halides + epoxides



ROOR / hv = radical

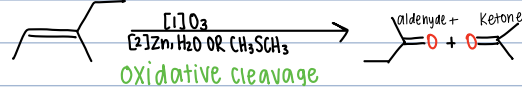
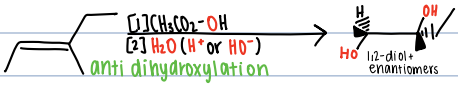
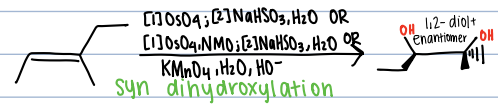
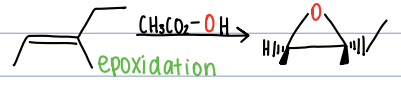
termination: 2 radicals coming together

Alkane + regioselectivity!

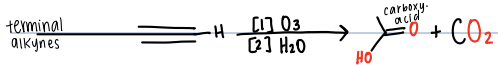
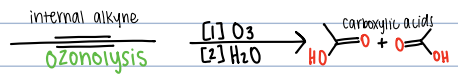
Br → on 2° mainly  
Cl → not selective

### > Oxidation Reactions

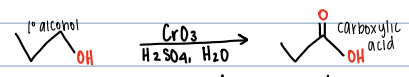
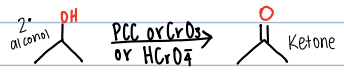
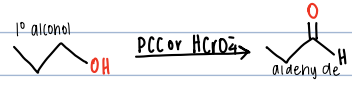
#### → Oxidation of alkenes



#### → Oxidative cleavage of alkynes



#### → Oxidation of alcohols



#### → asymmetric epoxidation of allylic alcohols

