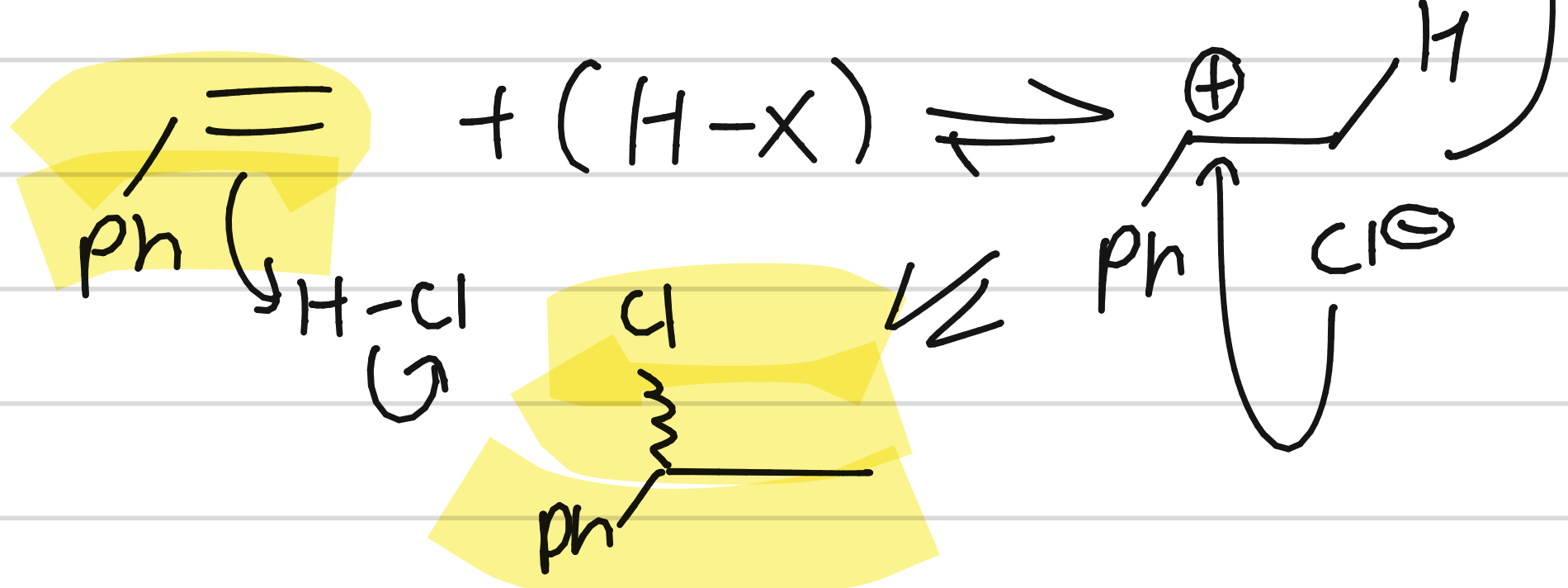


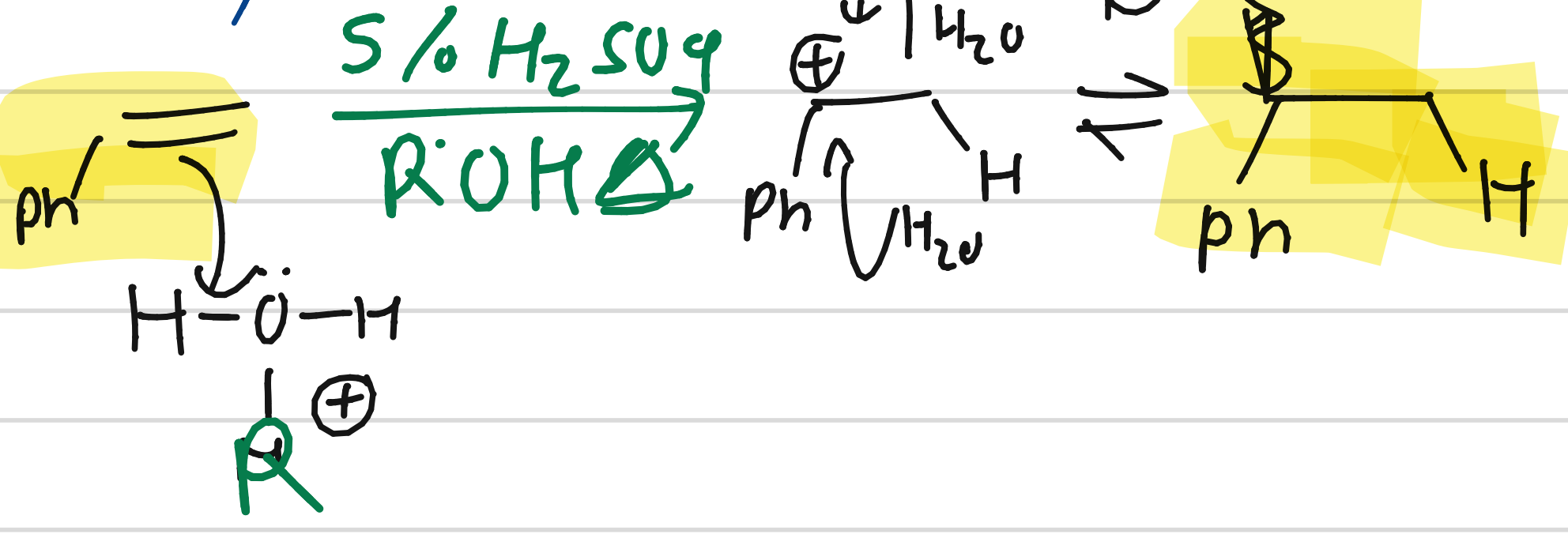
# Hydrohalogenation:

- M, ~~anti~~ Random



# Acid Catalyzed Hydration: OH, -OR, -R

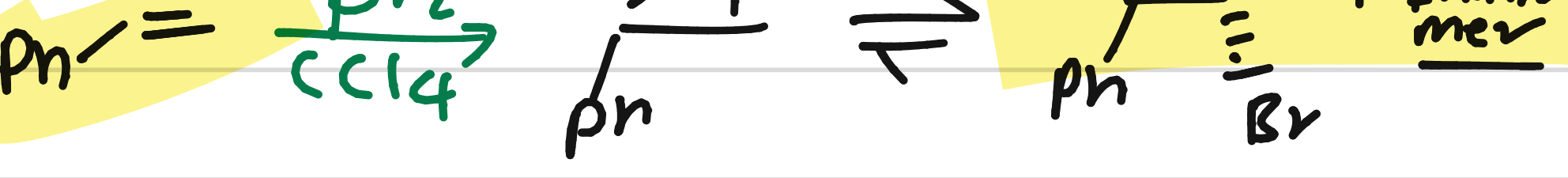
- M, Random



- Can make alcohol Nu: H2O
- Can make ether (-OR): MeOH
- cannot 2°, 3° OH 1° OH,
- can ester (RCOOH)

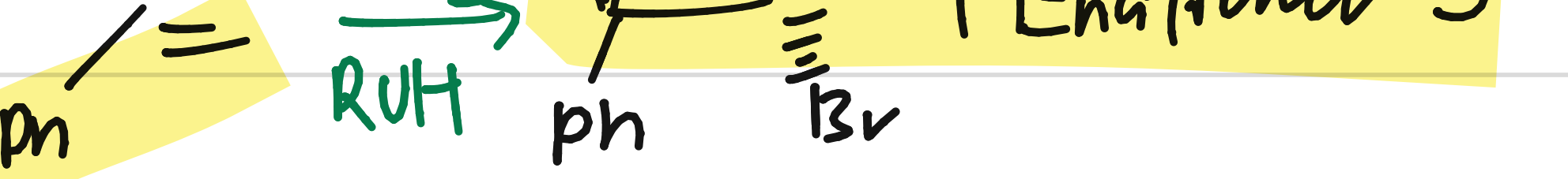
# Halogenation

- M, Anti



# Halohydrin formation: OH, -OR

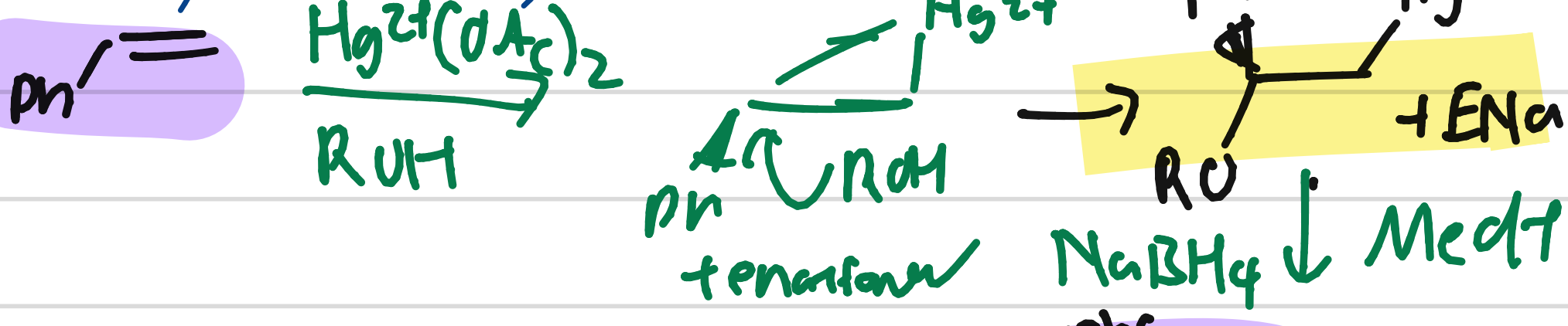
- M, anti



- NO REARR, no F2, no I2
- add to ring must be axial

# Oxymercuration: OH R-O-R

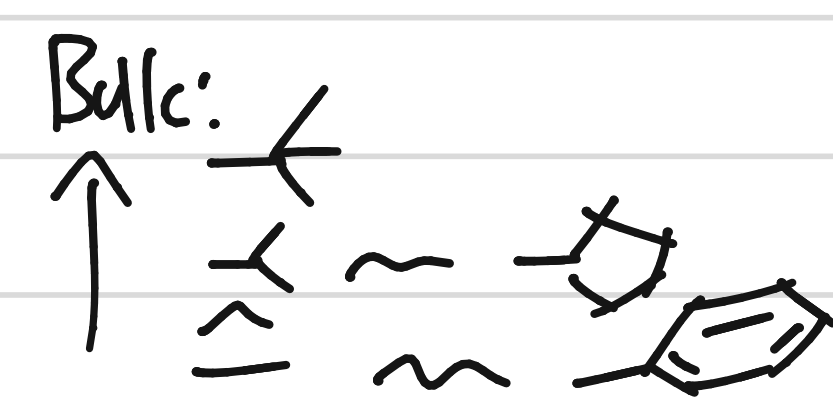
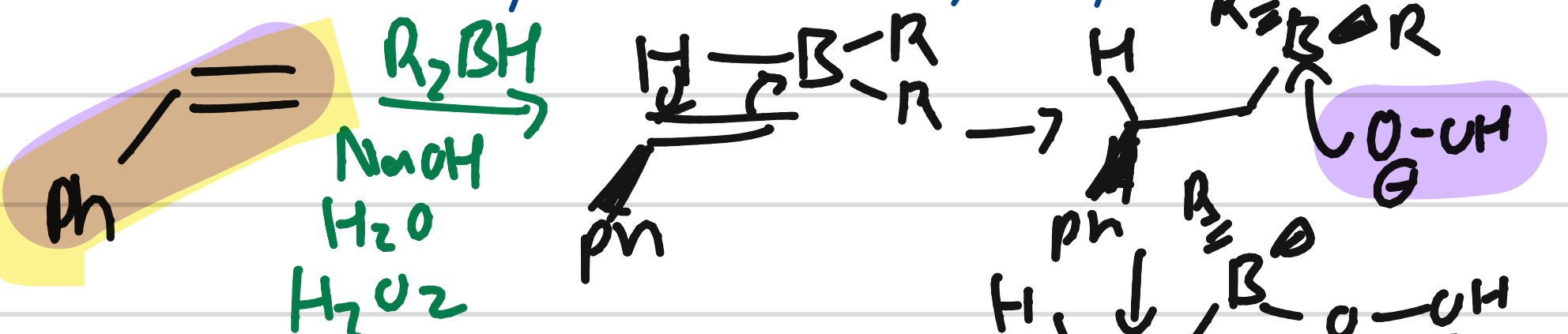
- M, no shift, anti -> Random



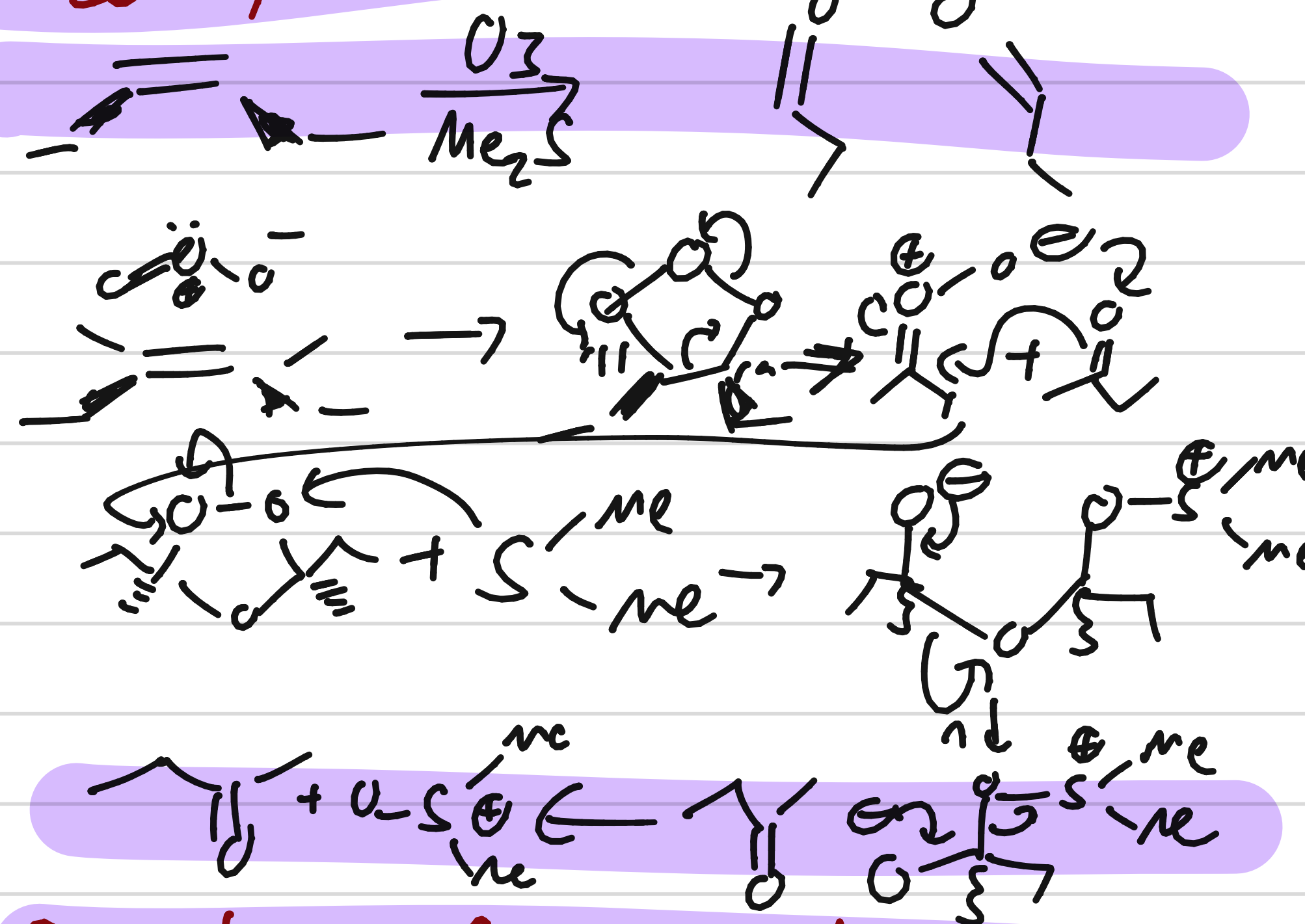
- note: NO Stereo: all Z -> Ph-CH2-CH2-OH
- NO carbocation, no rearrange:

# Hydroboration Oxidation: -OH ONLY

- Stark Driven, no shift, syn-addition:

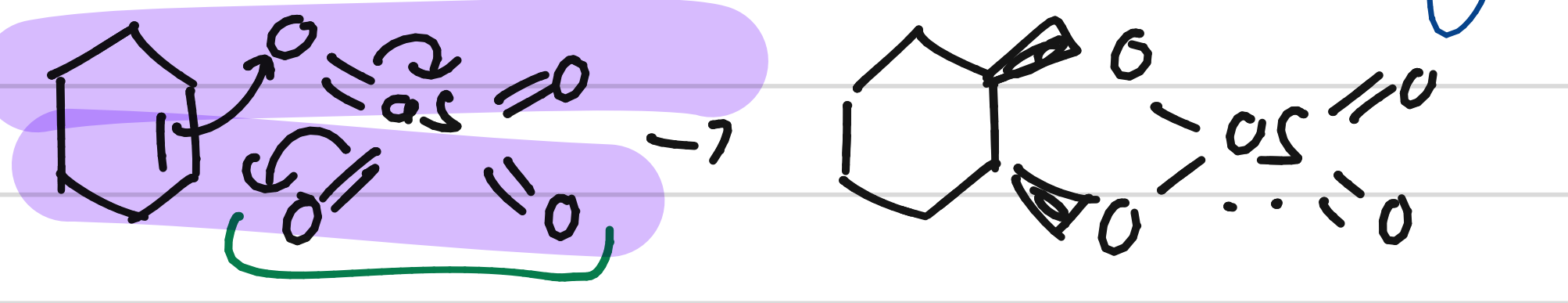


# Ozonolysis: =O



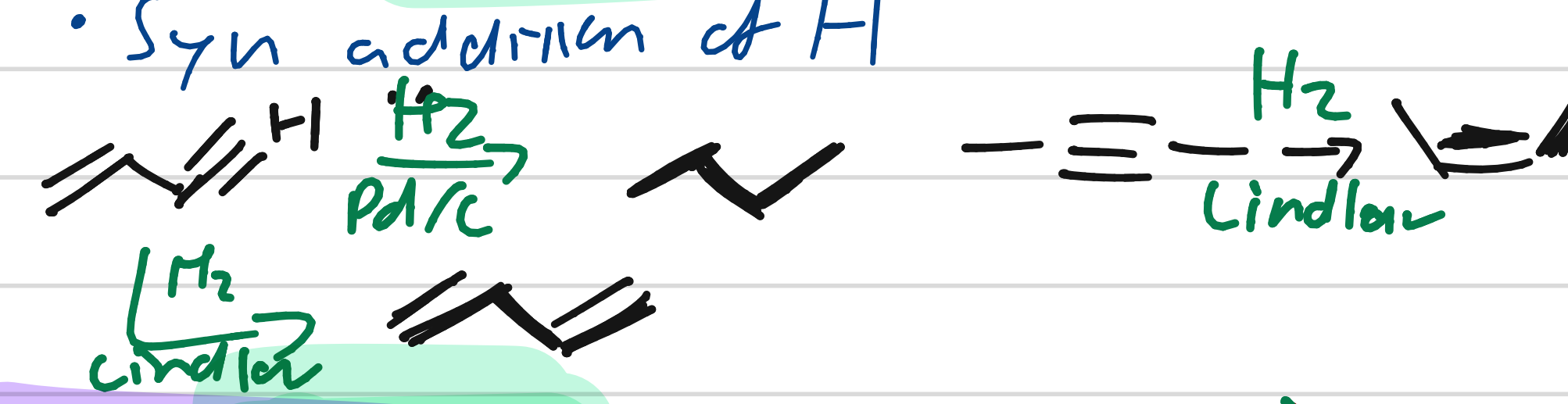
# Osmylation (Syn addition)

- Syn addition: no aromatic ring



# Hydrogenation: H2, Pd/C, Lindlar

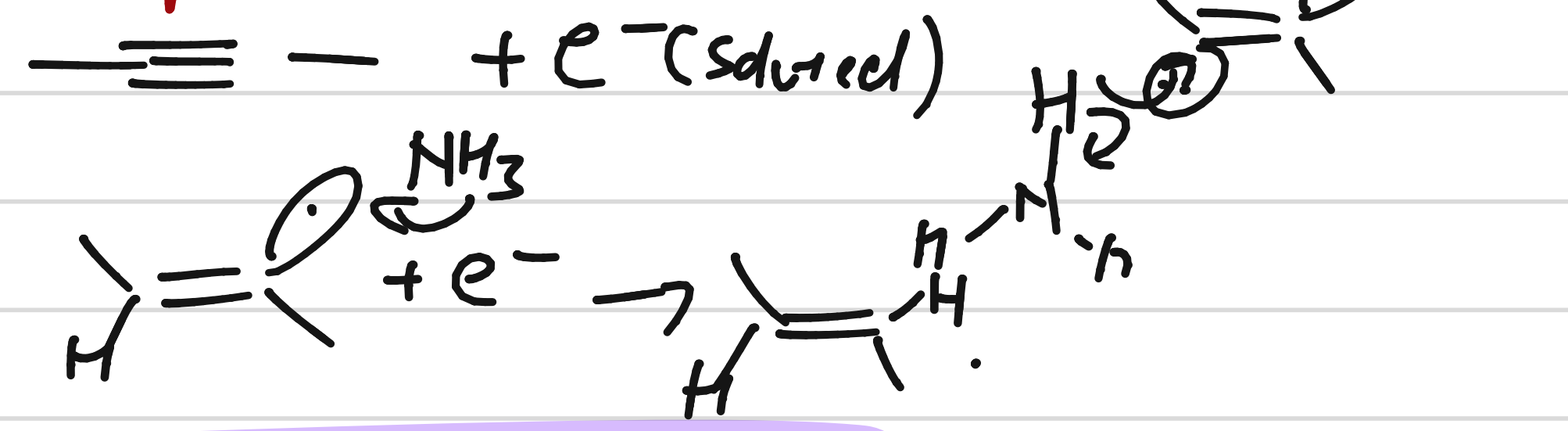
- Alkenes, Alkynes -> Syn (Z) cis



# Hydrogenation: 2Na+ NH3(l)

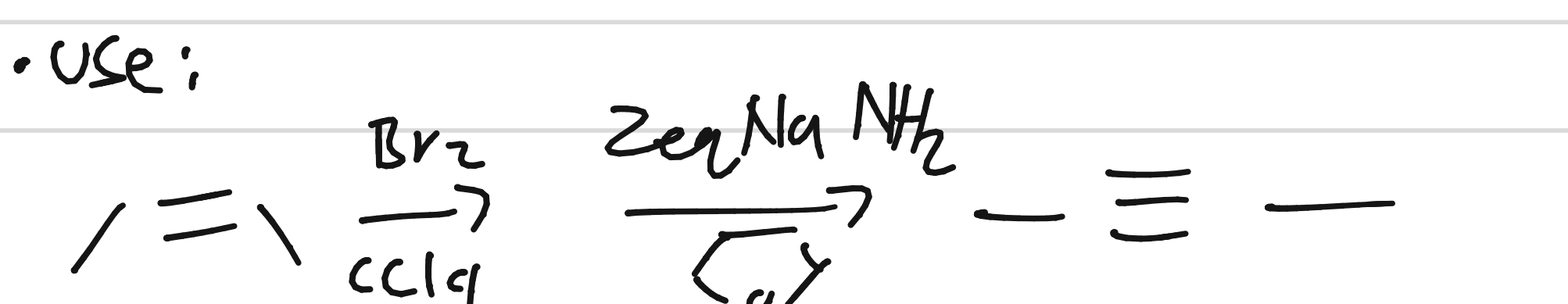
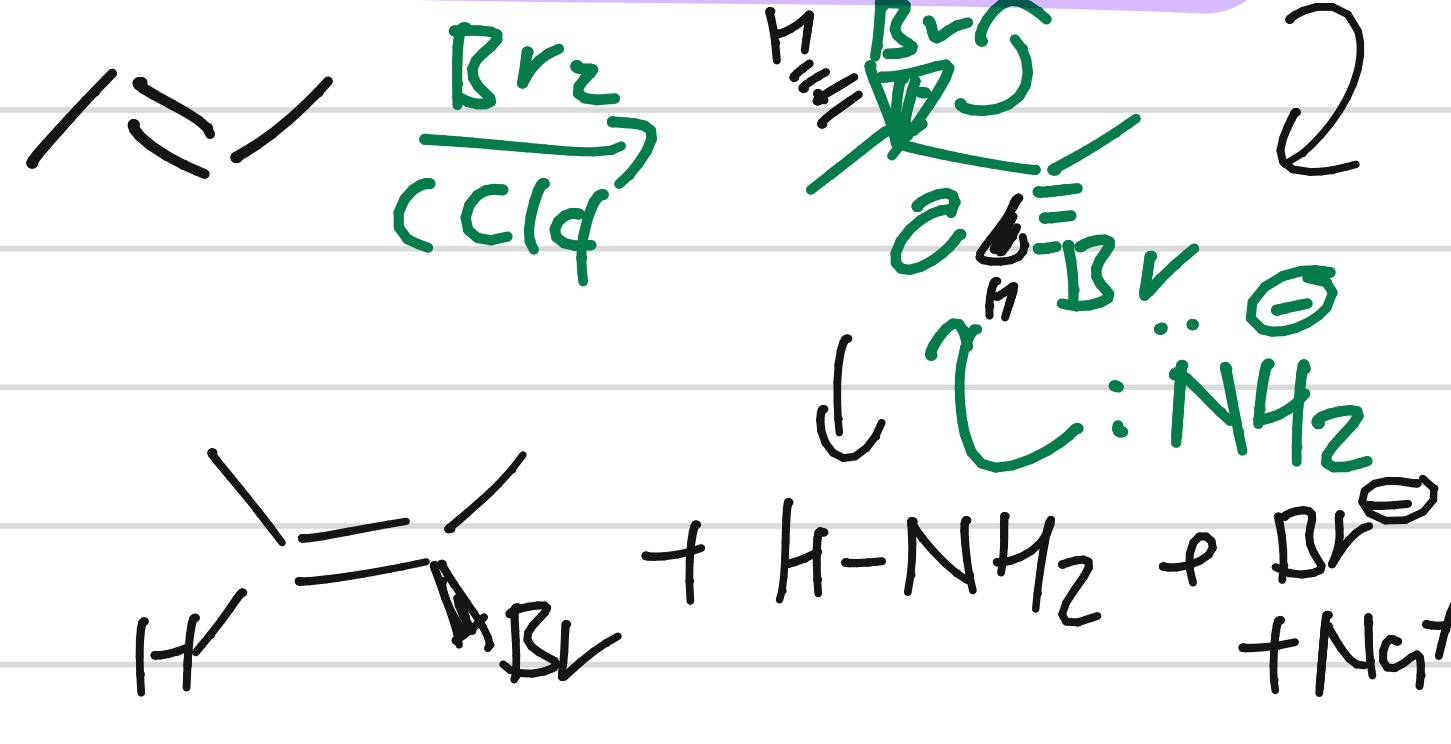
- Alkynes -> Anti (E) trans
- CANNOT WITH TERMINAL Alky

- start cannot have: RCH, ROH, ketone, Aldehyde, R-Br, R-Cl, pKa < 35



# Alkyne Rep 1: (internal):

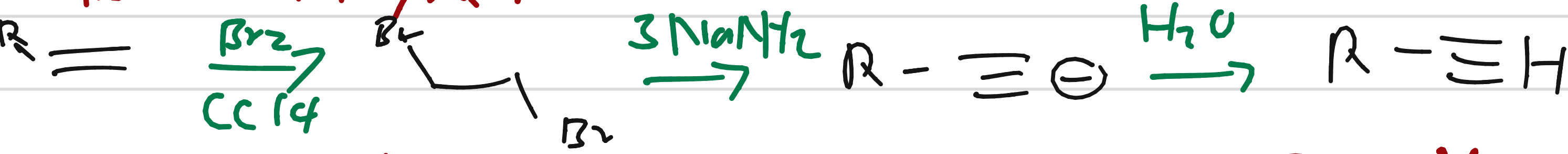
- Alkene -> Alkyne:





# Alkyne Prep 2: II (terminal)

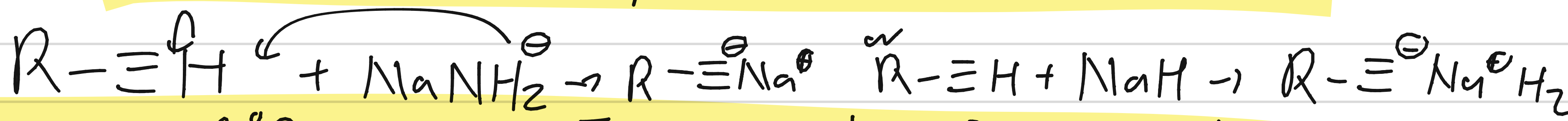
alkene → Alkyne:



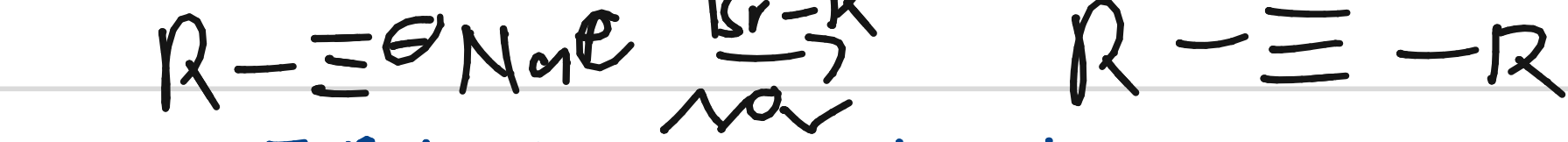
In case:  $\frac{d[P]}{dt} = Rate = k [Base^{\ominus}] [C\equiv C-H]$  2nd Rate Law.

## Anion (-C bond ("SN2")) - Rea: terminal carbons:

- backside addition: , C-C new alkyl group addition:
- Limitation: 1) solvent must be aprotic 2) R place < 2S



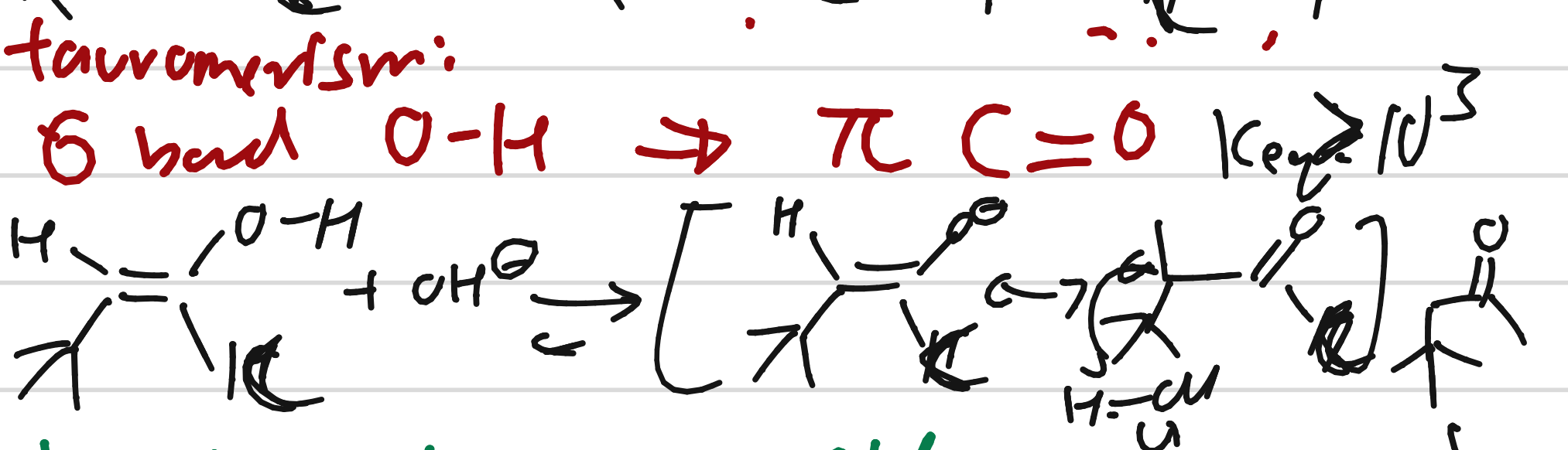
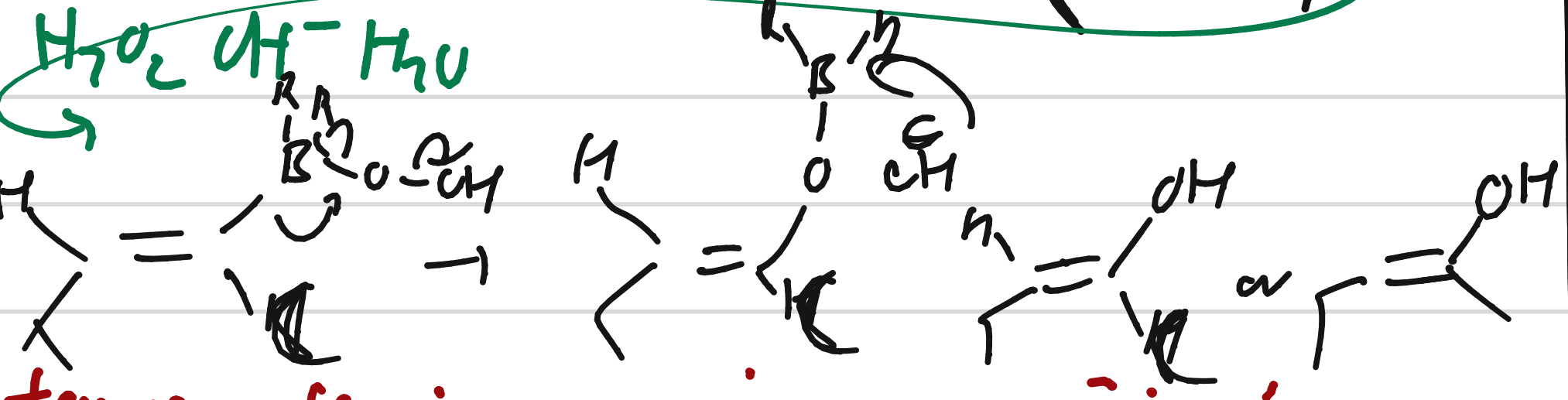
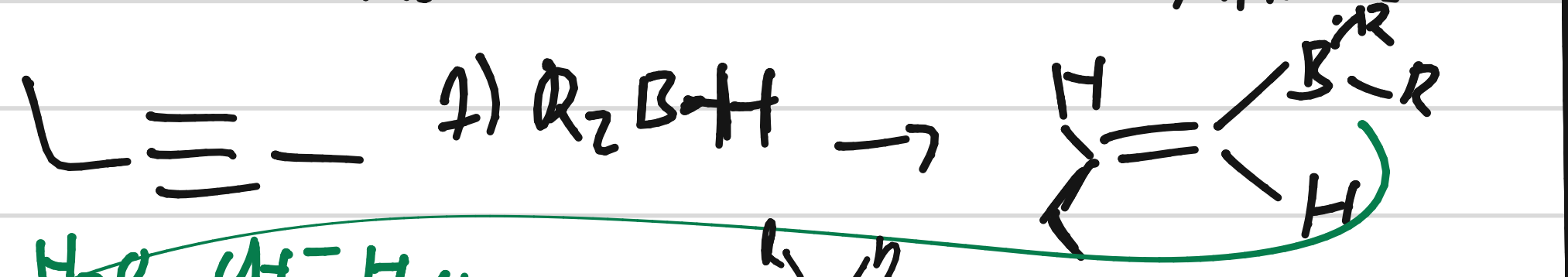
Step 2: must be: 1°R + Br or I, no place < 2S Functional groups.



### INTERNAL ALKYNE

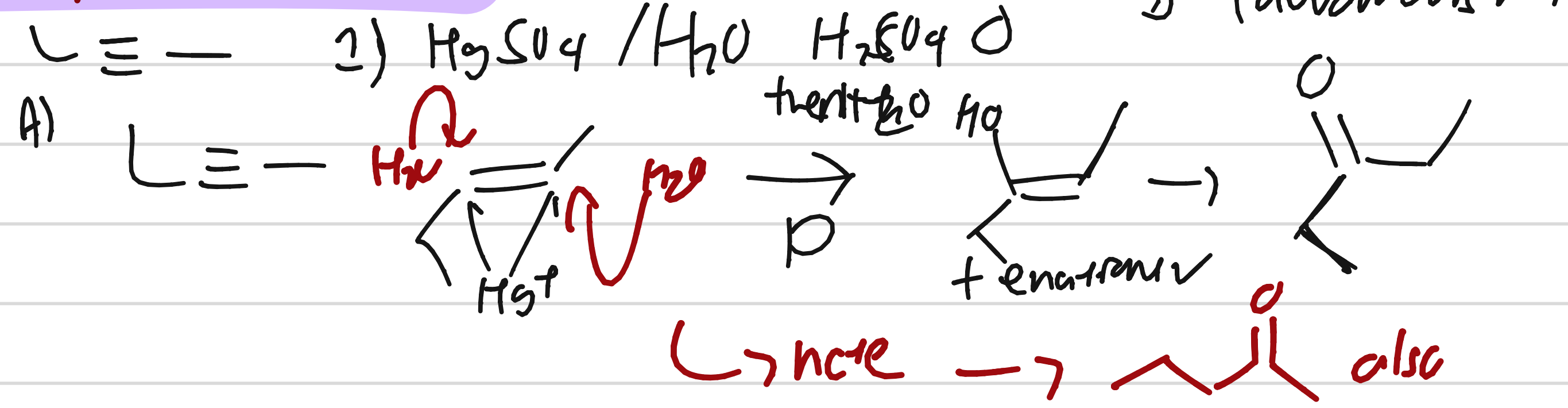
Hydroboration: anti mark - syn

- same restrictions as with Alkene:



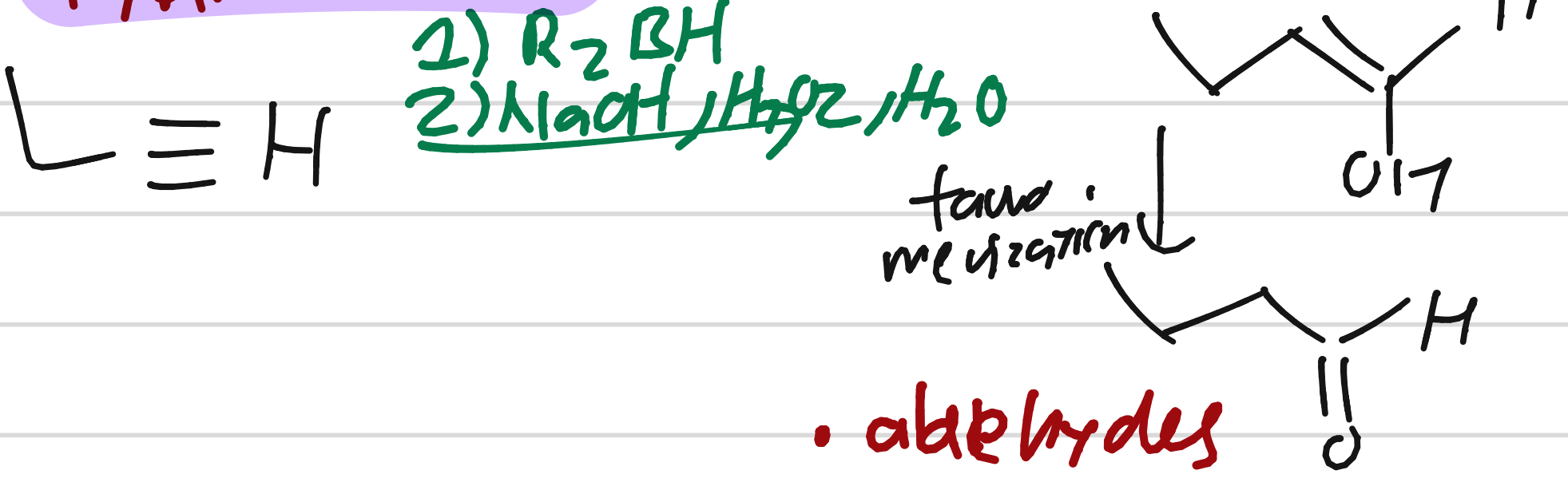
honestly, trust yourself:

Oxymercuration: mark - anti

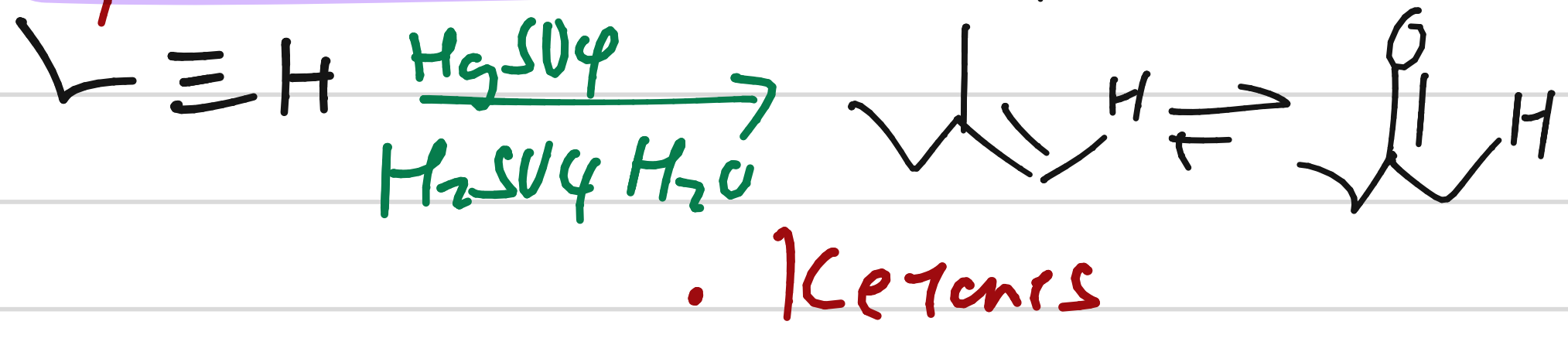


### TERMINAL ALKYNE

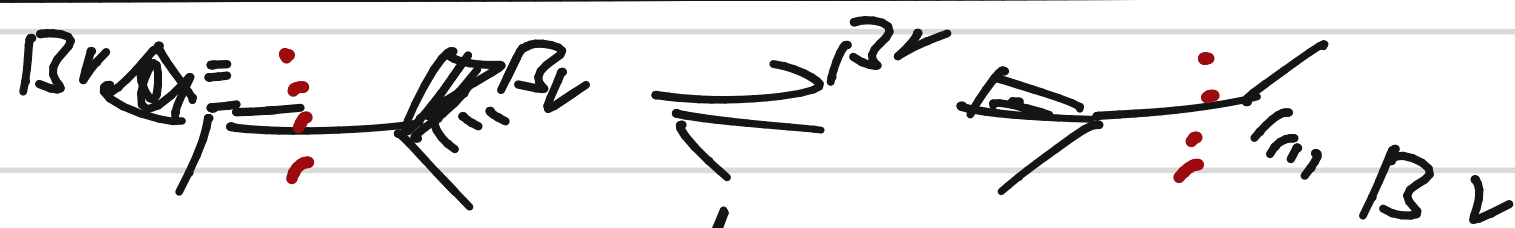
Hydroboration:



Oxymercuration:



meso compounds: have mirror planes:



Redox rxn =  $[C \cup \# \text{ carbons bonded to more electronegative atoms (O)}] - [C \cup \# \text{ carbons less electronegative (B, H)}]$

+1 → oxidized, -1 Reduced, 0 neutral.

In case: acids:

H-I -10	H-F 3	H-C≡CR 2S
H-Br -8	H-O <sub>2</sub> R 9-5	H-H 3S
H-Cl -7	H-SH 7	H-NH <sub>2</sub> 3S
H-OSO <sub>3</sub> H -5	H-C≡N 9	H <sub>2</sub> C=CR <sub>2</sub> 9-3
H <sub>2</sub> O <sup>+</sup> R -2	H-O <sup>+</sup> Ph 10	H-C(sp <sup>3</sup> )SO
H-O-NO <sub>2</sub> -2	H-N <sup>+</sup> R <sub>3</sub> 10-5	
H-O-SO <sub>2</sub> R -1	H <sup>+</sup> OR 17	

Remember that Hydride and Alkyl shifts exist

