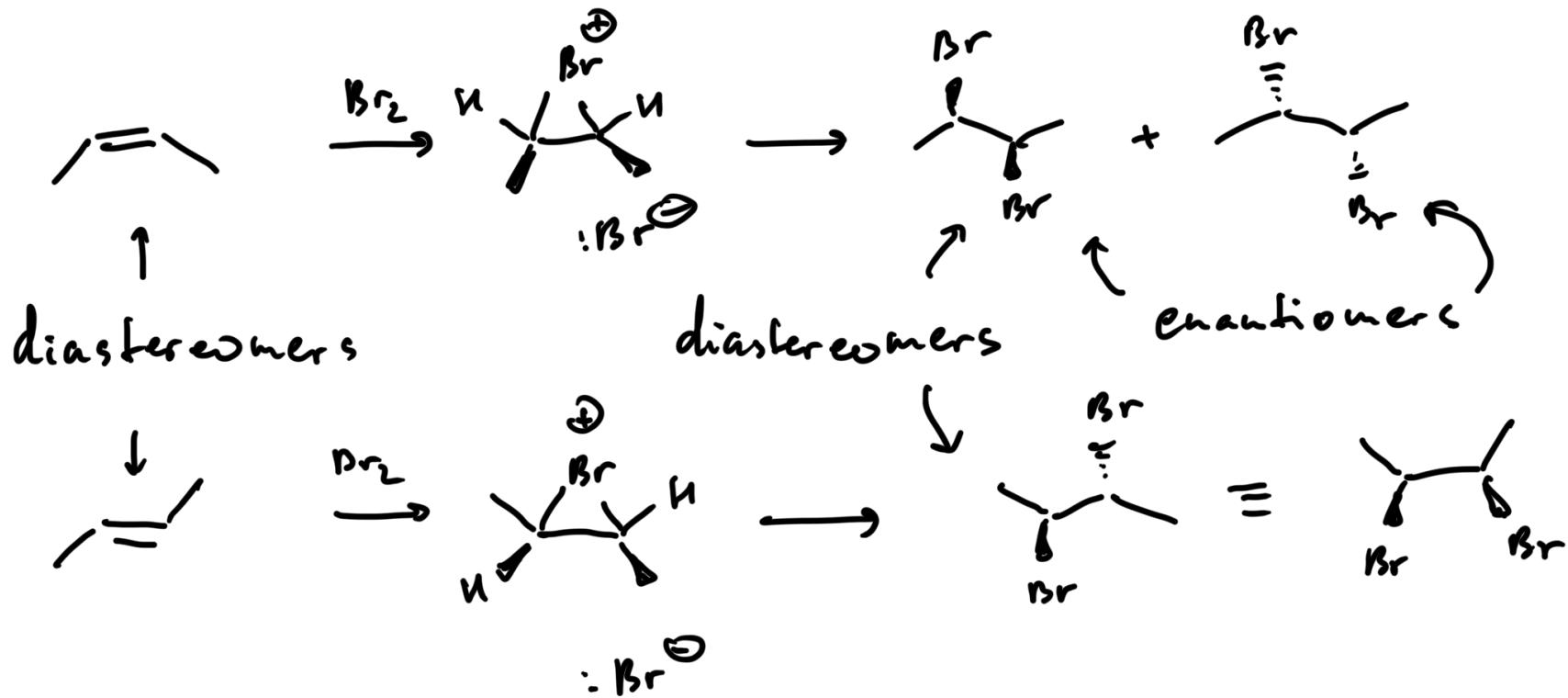


# Reactions of alkenes: halogenation

Stereochemistry. Stereospecific reactions

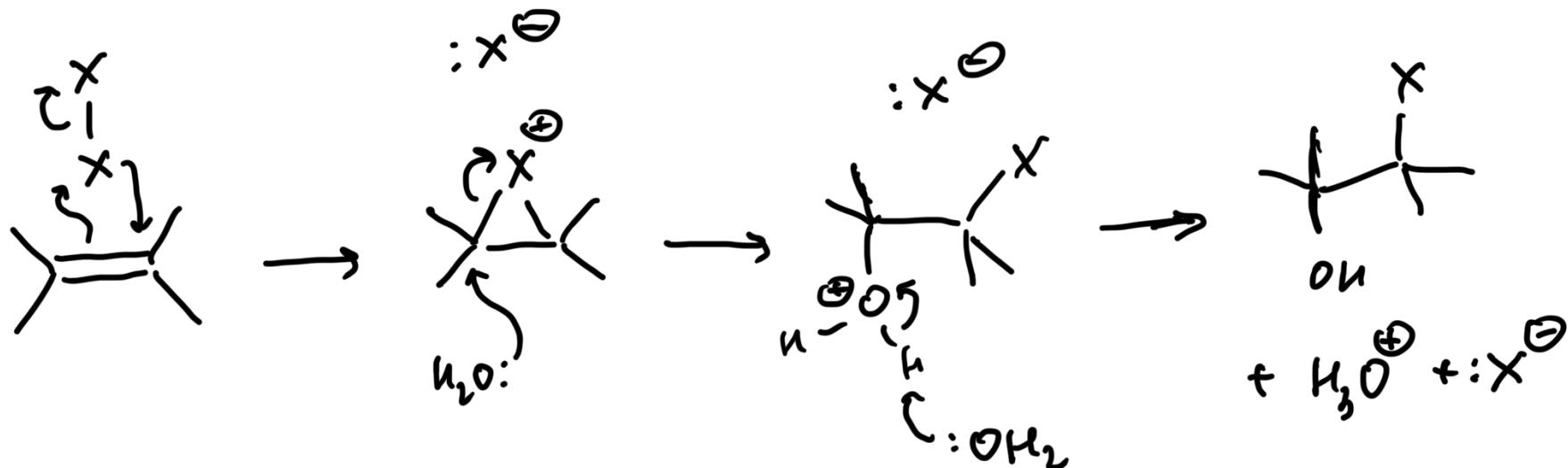
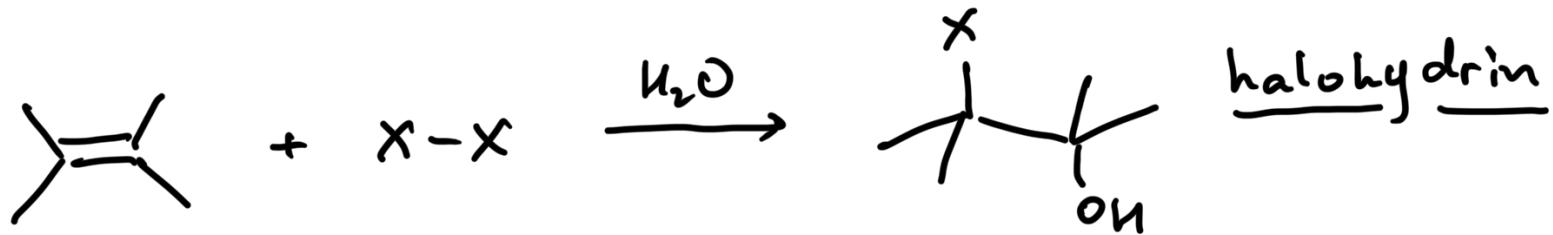
MeOH, MeONa



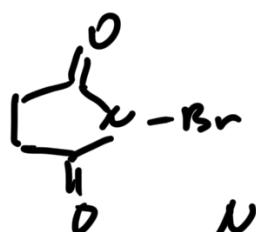
• Stereospecific

# Reactions of alkenes: halohydrin formation

General considerations. Mechanism

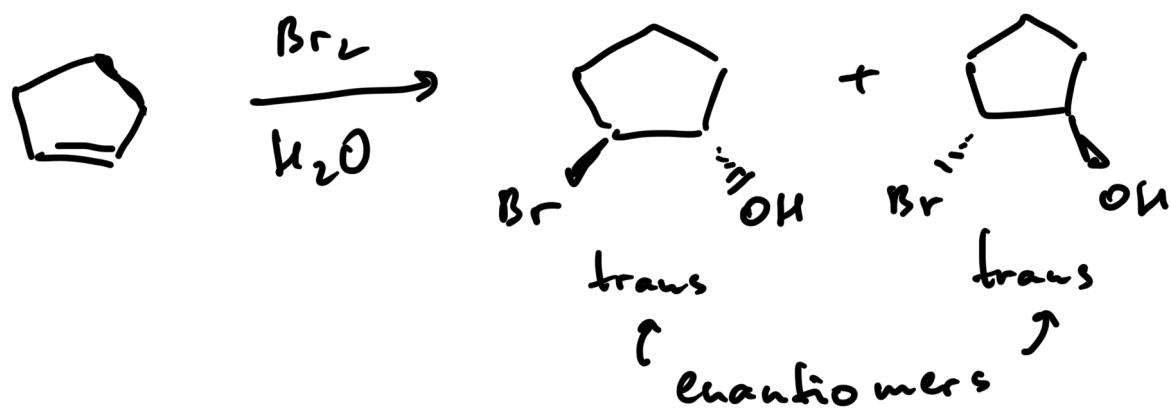


$Br_2, Cl_2$



# Reactions of alkenes: halohydrin formation

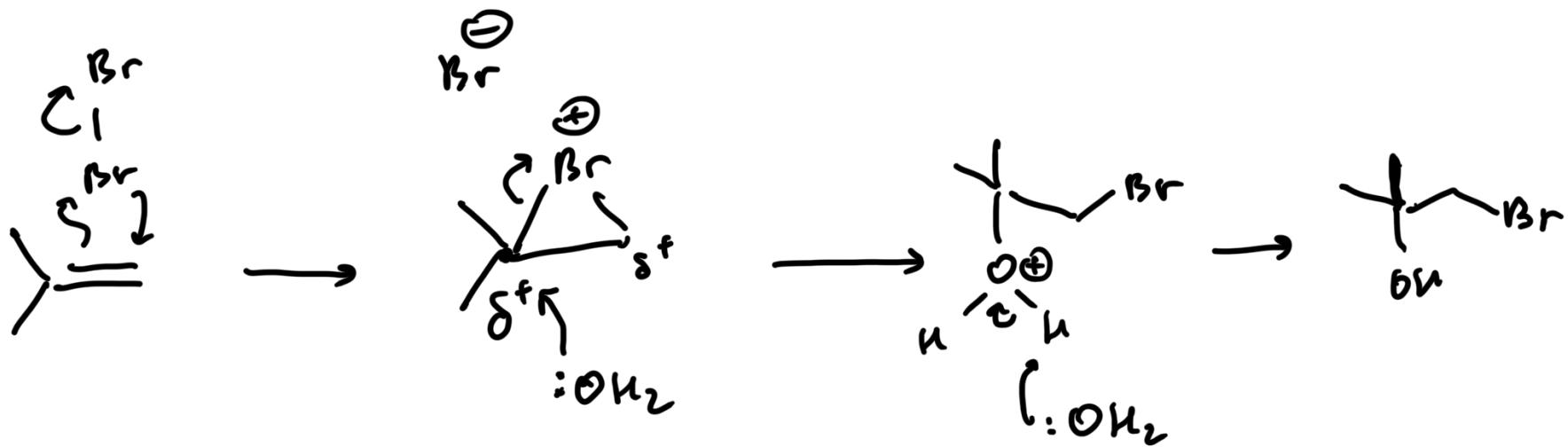
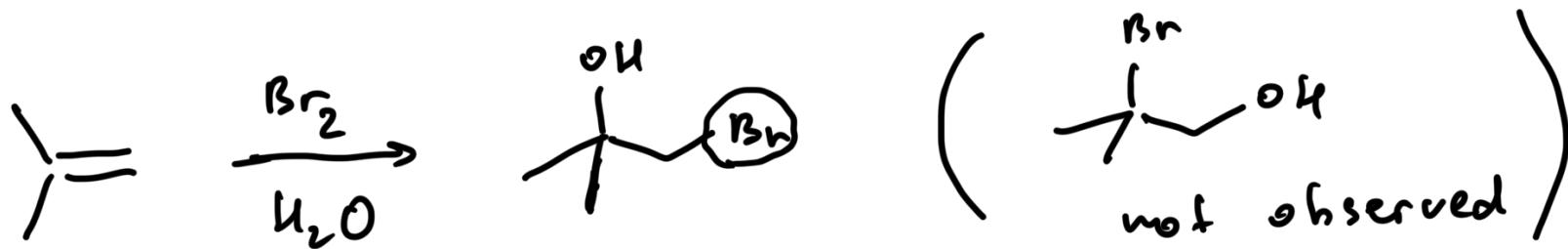
Stereochemistry and regioselectivity



- anti addition of  $X$  and  $\text{OH}$

# Reactions of alkenes: halohydrin formation

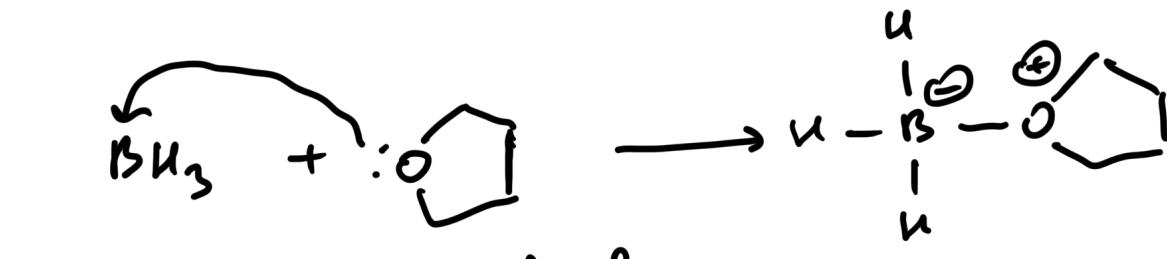
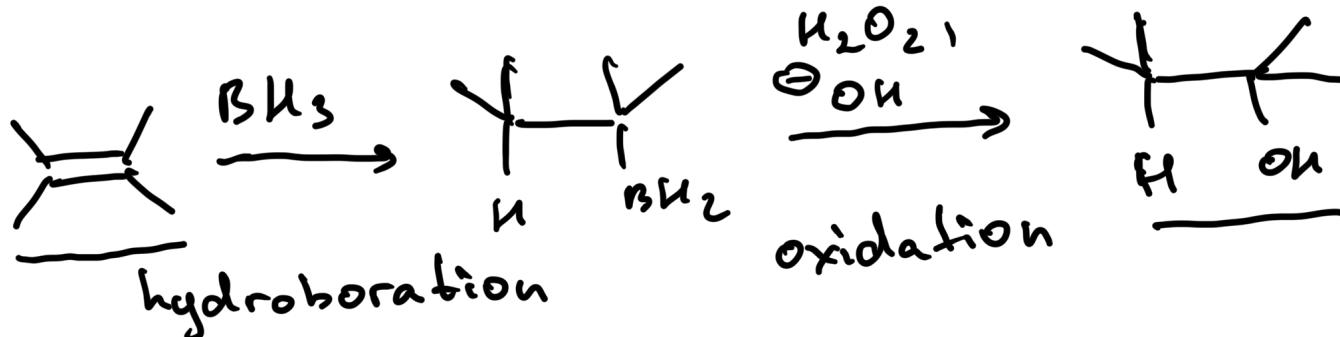
Stereochemistry and regioselectivity



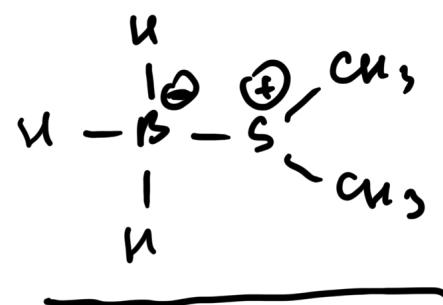
- regioselective – electrophile on less subst. C

# Reactions of alkenes: hydroboration–oxidation

General considerations

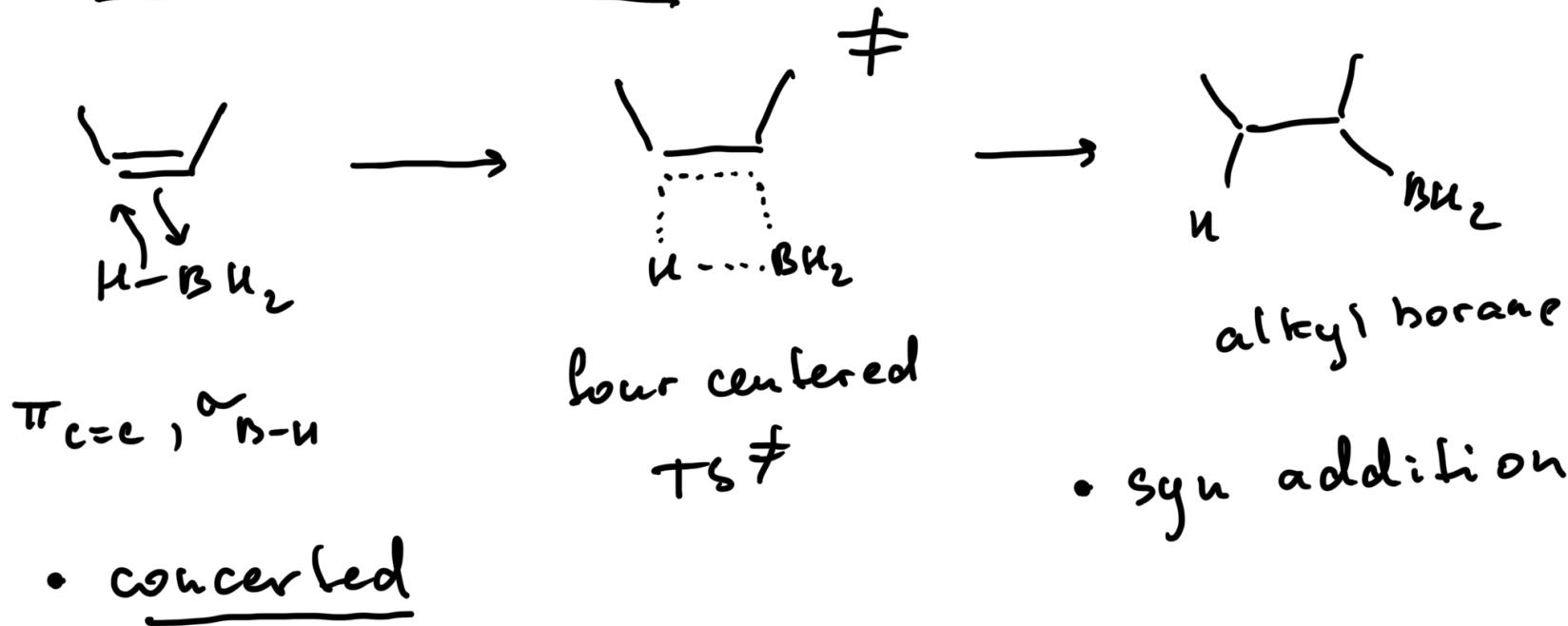


Lewis acid      tetrahydrofuran  
                        (Lewis base)



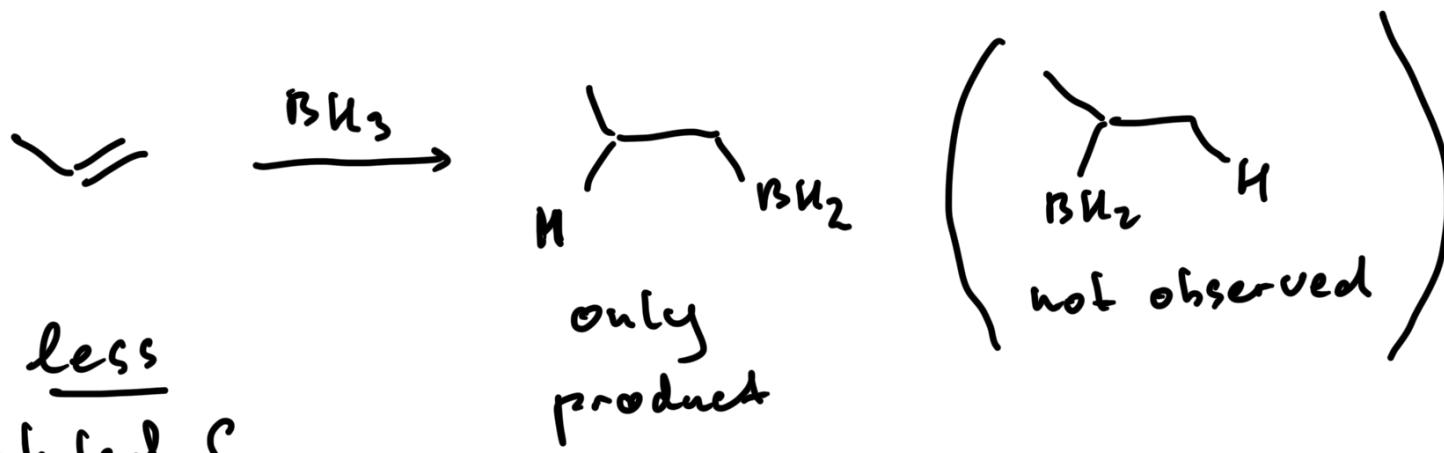
# Reactions of alkenes: hydroboration–oxidation

## Mechanism of hydroboration

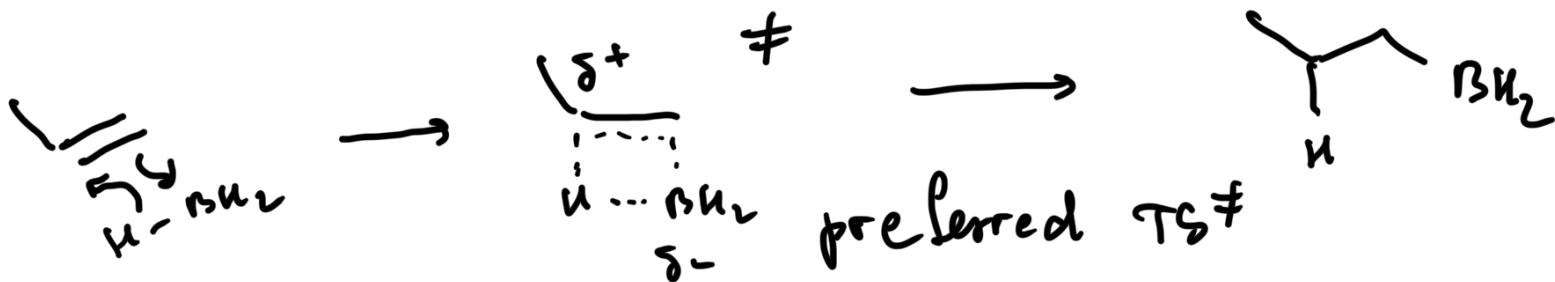


# Reactions of alkenes: hydroboration–oxidation

Regioselectivity of hydroboration

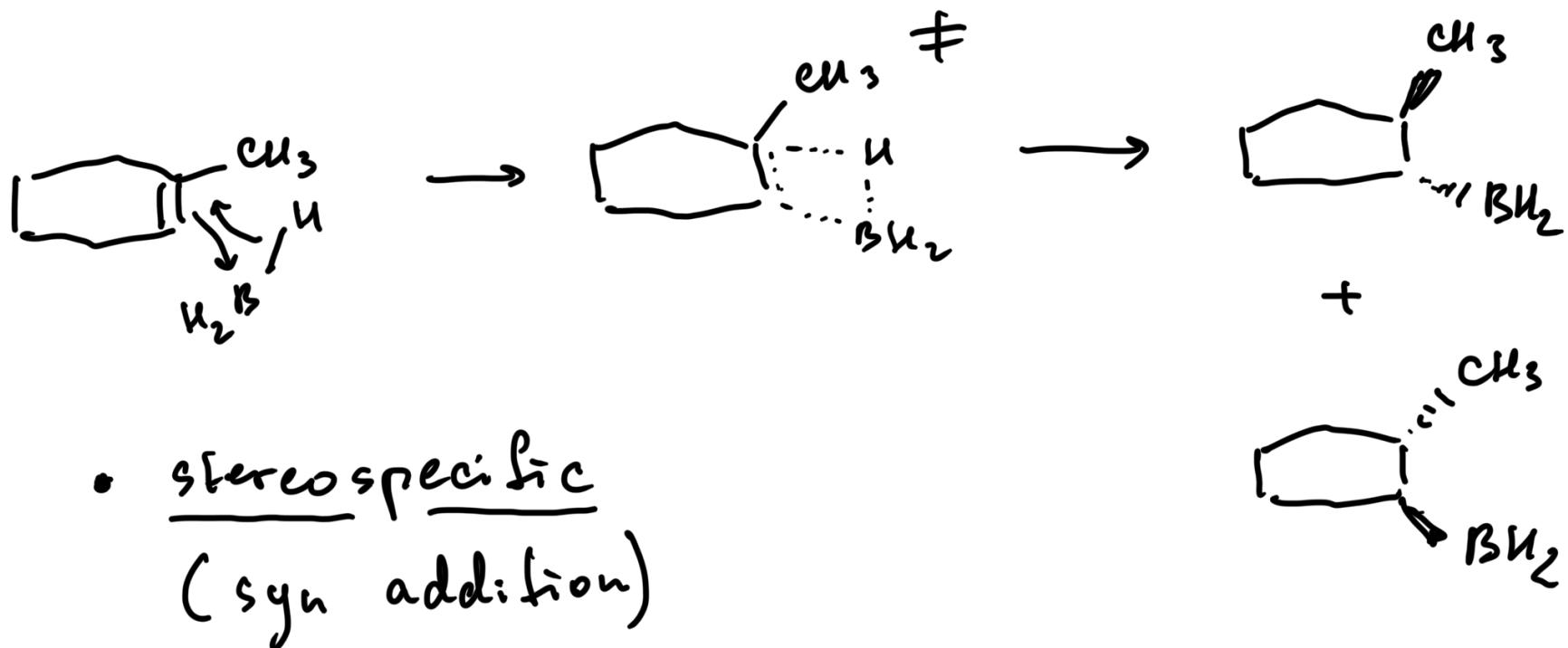


- Steric argument:  $\text{BH}_2$  is larger than H
- Electronic argument:
- regioselective



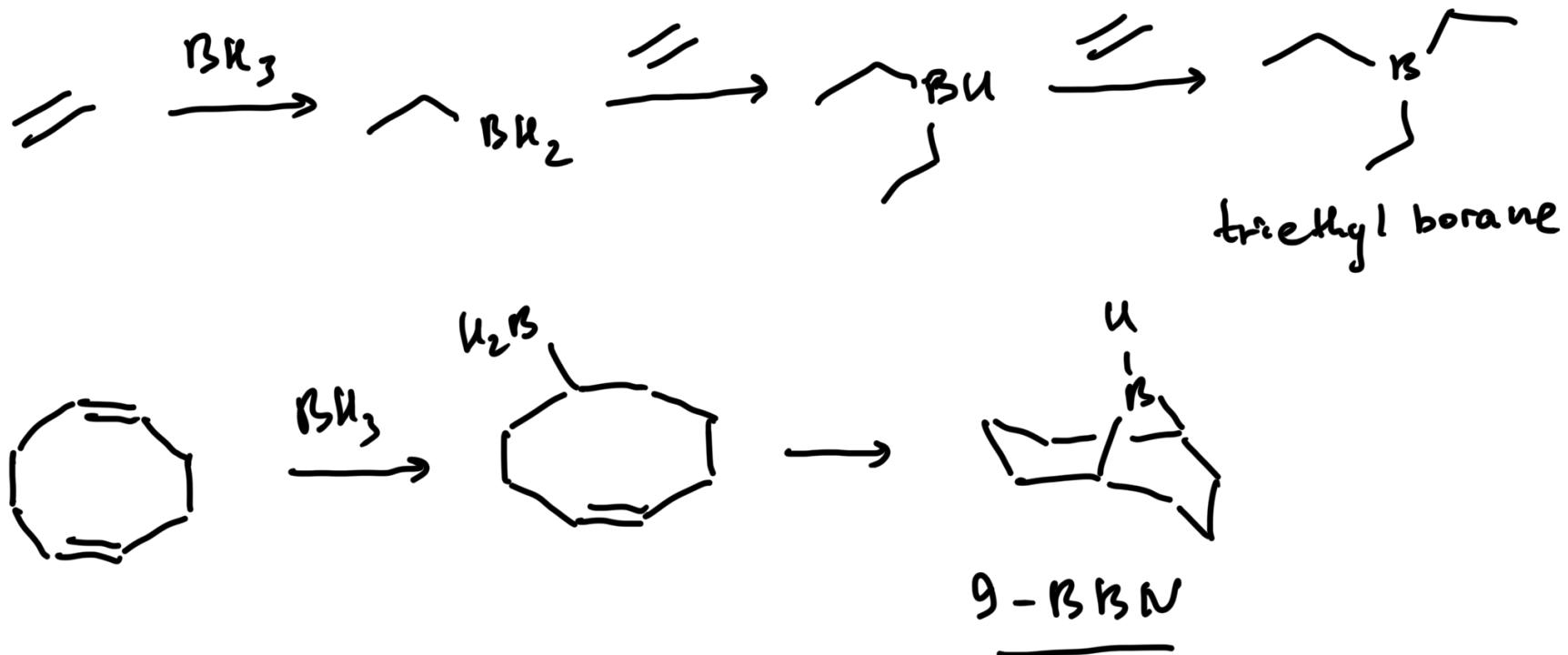
# Reactions of alkenes: hydroboration–oxidation

Stereoselectivity of hydroboration



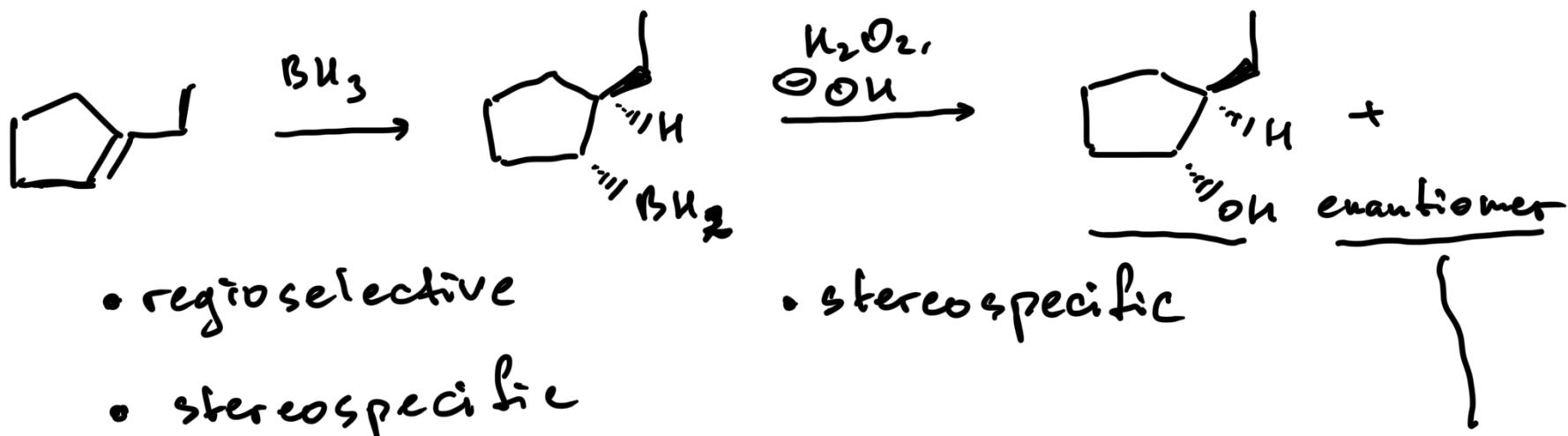
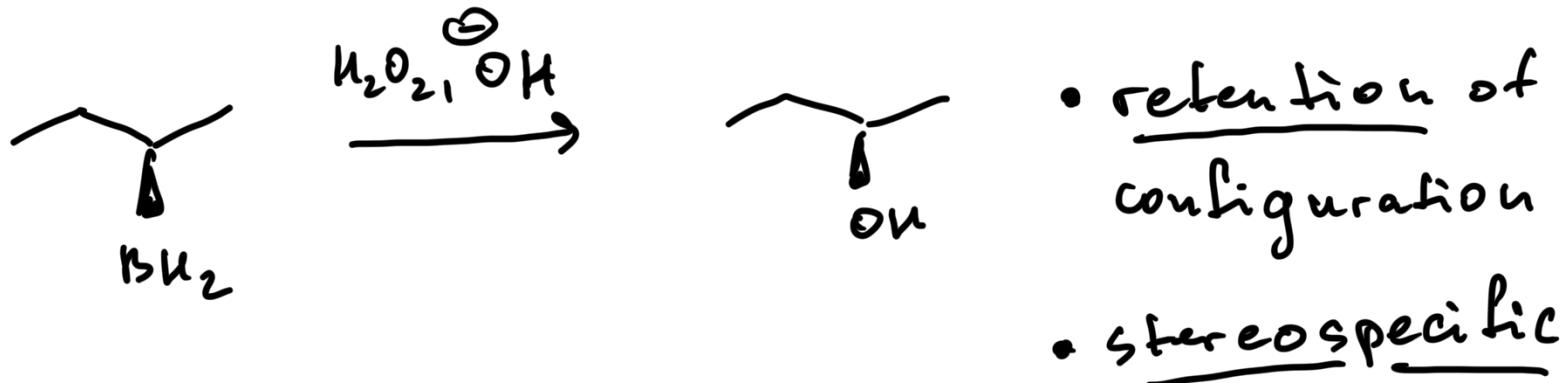
# Reactions of alkenes: hydroboration–oxidation

Synthesis of alkylboranes via hydroboration



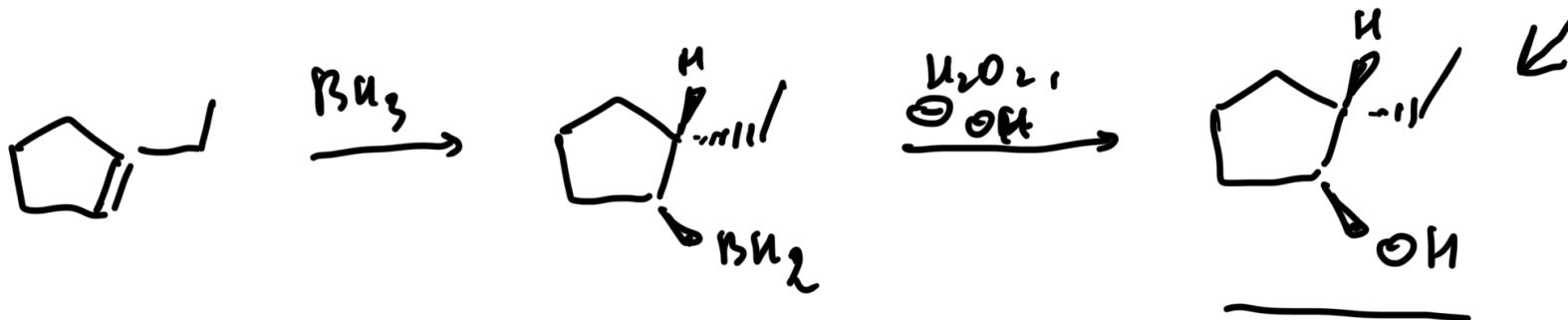
# Reactions of alkenes: hydroboration–oxidation

Oxidation of alkylboranes. Stereoselectivity of the oxidation



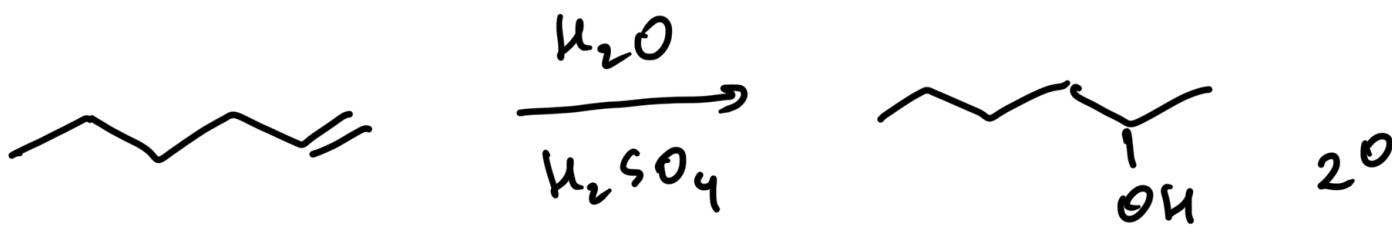
# Reactions of alkenes: hydroboration–oxidation

Hydroboration–oxidation as a formal syn hydration of alkenes

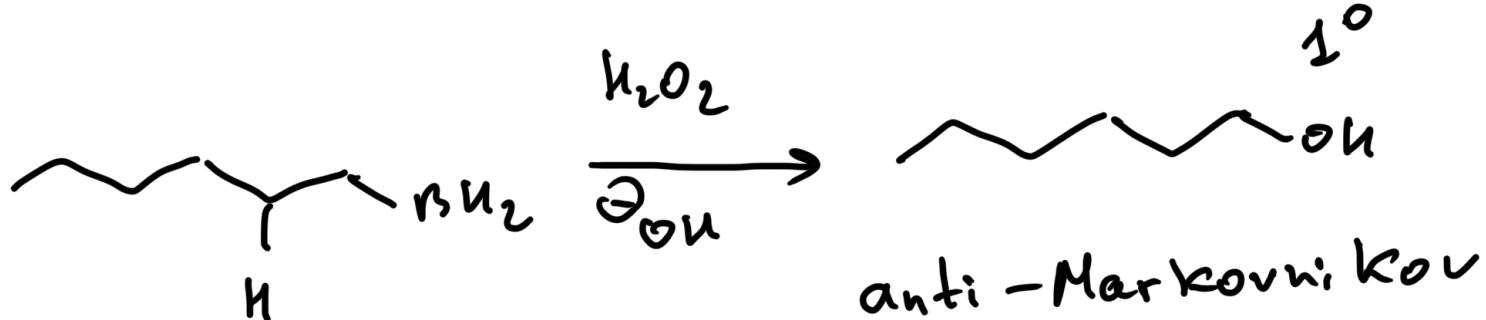


# Reactions of alkenes: hydroboration–oxidation

Complementary regioselectivities of the different hydration methods



Markovnikov



# **Alkenes in synthesis**

How to approach a synthesis problem that involves alkenes?

# **Alkenes in synthesis**

Case studies

# **Alkenes in synthesis**

Case studies