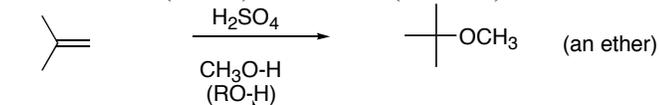
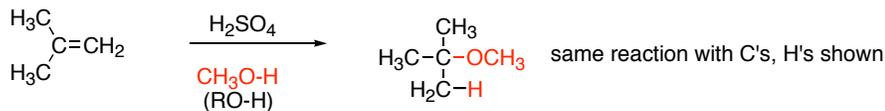
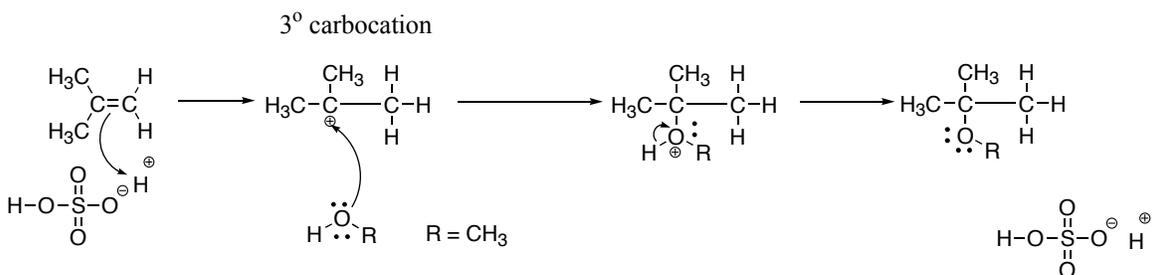


Review of HOH (water) and ROH (alcohol) addition to alkenes – need acid (H^+)

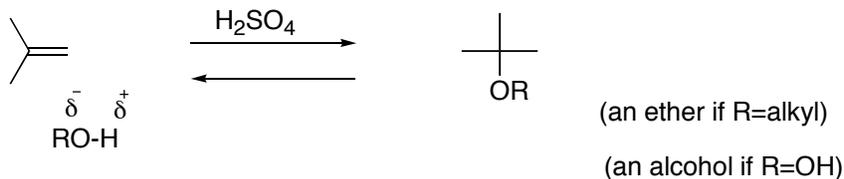
this bond (O-H) is polarized
so, easy to break



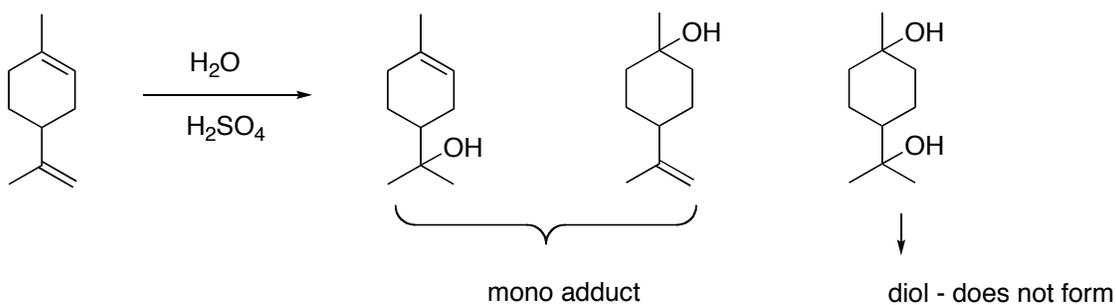
Mechanism:



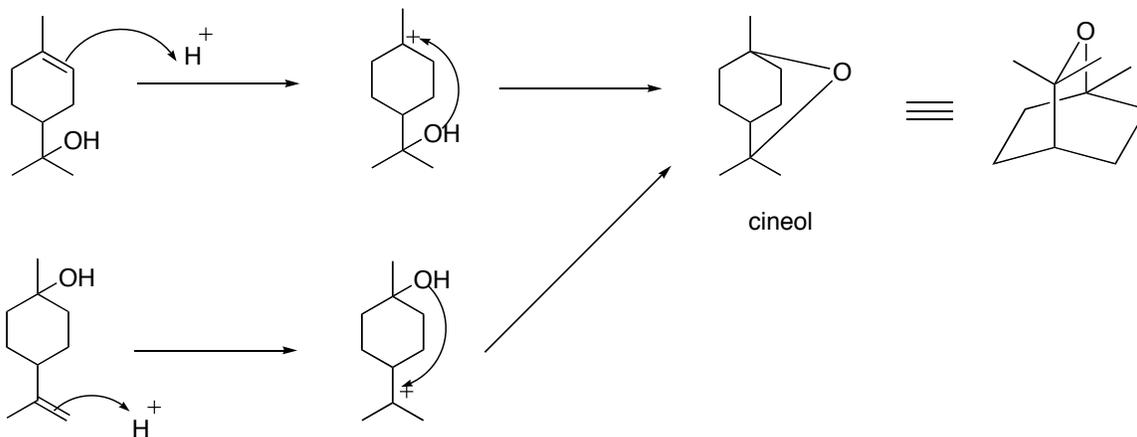
General reaction:



- reverse reaction is called "elimination"

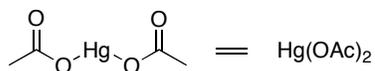
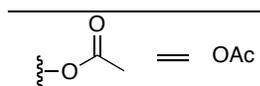
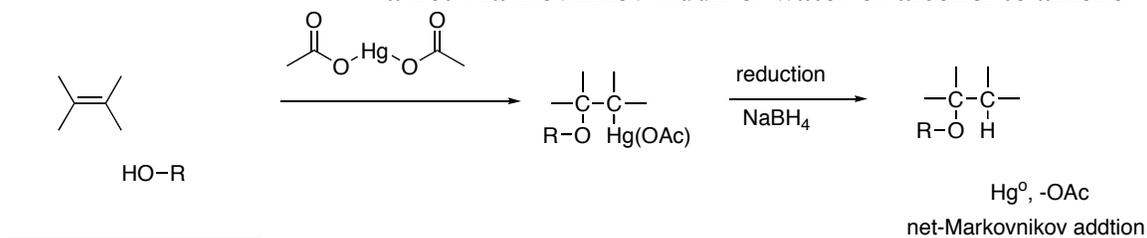


- Intramolecular reaction – within a molecule (fast if 3, 5, 6 member ring can form)
- Intermolecular reaction – between two molecules



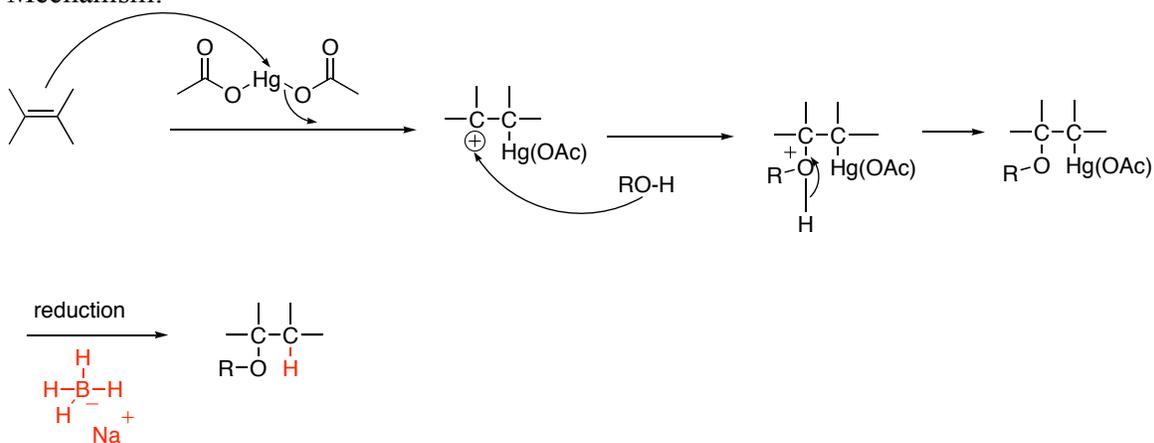
Oxymercuration & Reduction:

a net Markovnikov Addn of water or alcohol to alkene



$NaBH_4$ - sodium borohydride
- hydride donor

Mechanism:



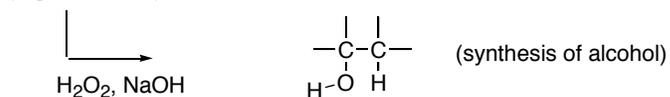
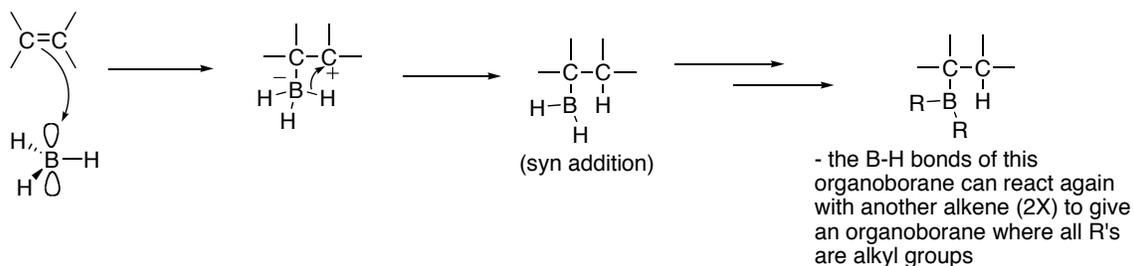
Hydroboration & Oxidation (Add a boron species):
a net anti-Markovnikov addn of H₂O

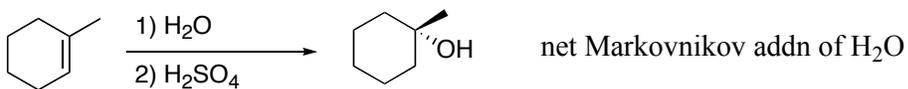
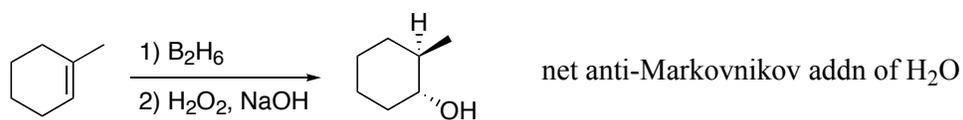
B₂H₆ – diborane (behaves like BH₃)



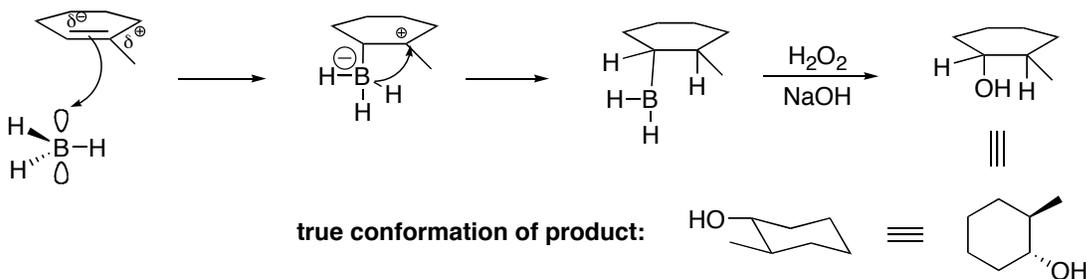
Borane:

- sp² hybridized
- planar molecule
- Lewis acid (has an empty p-orbital)





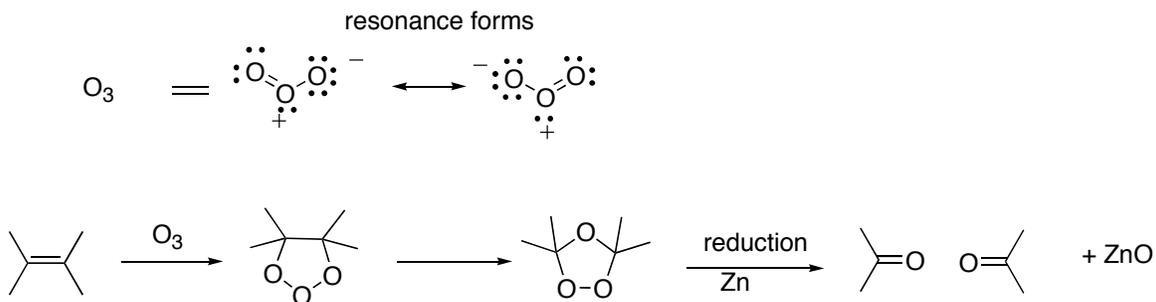
Not accurate depiction of conformation - just illustration of same side (syn) addition



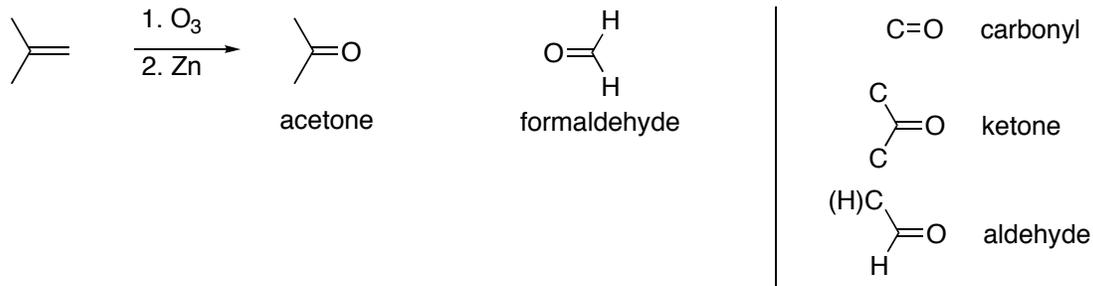
The hydroboration reactions are viewed as concerted syn additions – all bonds form and break at same time (or nearly so) from same face of double bond

Ozonolysis: cleavage of alkenes by ozone (O₃)

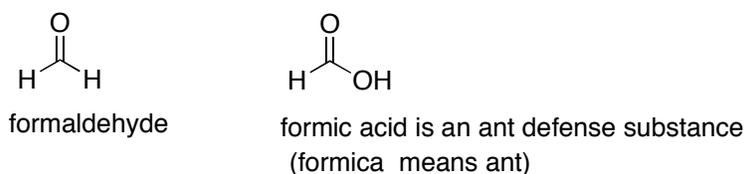
General reaction:



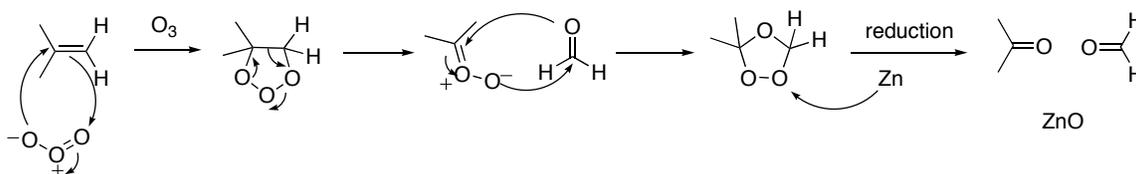
Eg.



formaldehyde name comes from formic acid, which comes from formica (ant):



Mechanism:



do not need to know mechanism of the reduction by Zn. It is a reaction in which Zn^0 is oxidized to Zn^{2+} (as ZnO)

Sample question for practice: What is a possible starting material below ($C_{10}H_{16}$) structure ?

Are there other isomers that will give the same products for ozonolysis followed by Zn treatment ?

