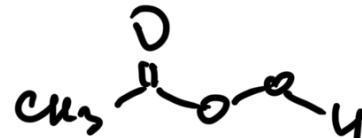


# Oxidation

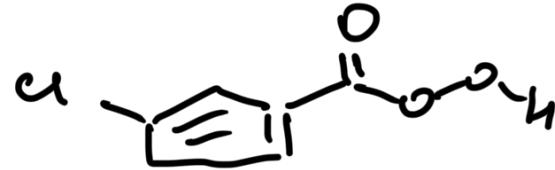
What makes a good oxidant? Peroxides and metal oxides



peroxy acid

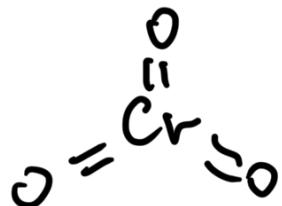


peroxyacetic



m-chloroperoxybenzoic  
acid  
(mCPBA)

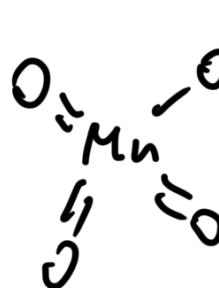
metal oxides



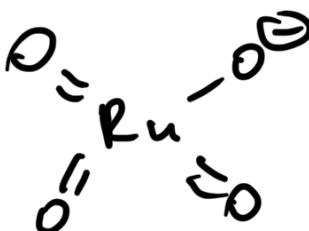
Cr(VI)



Os(VIII)



Mn(VII)

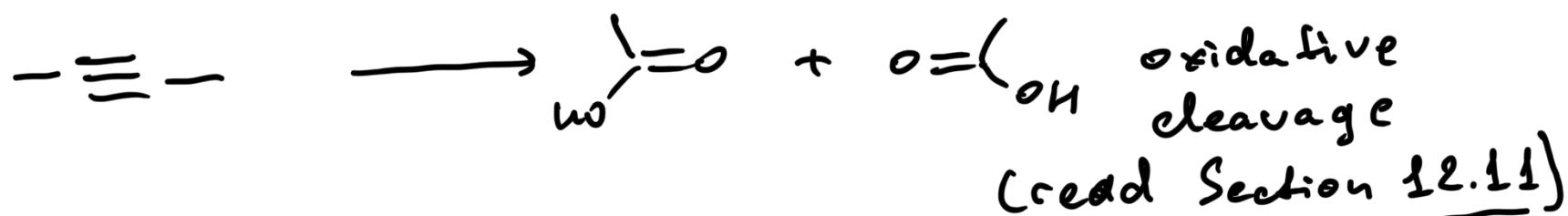
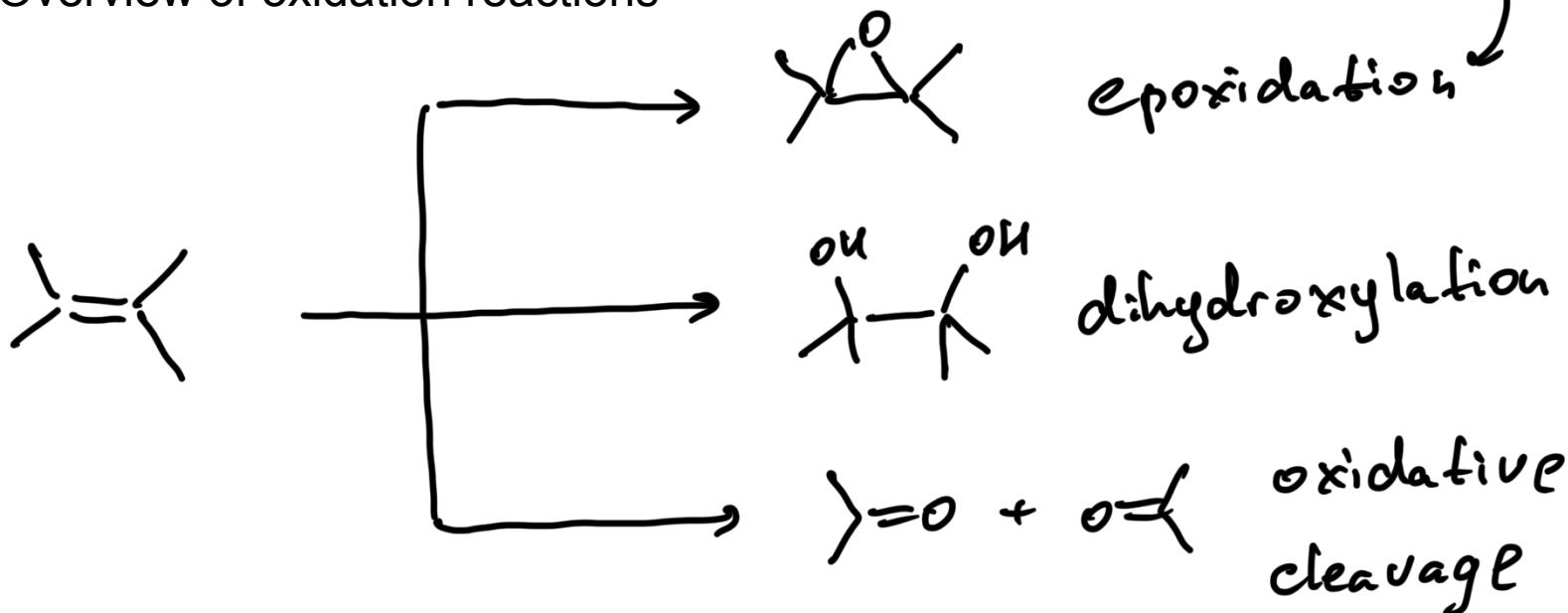


Ru(VII)

# Oxidation

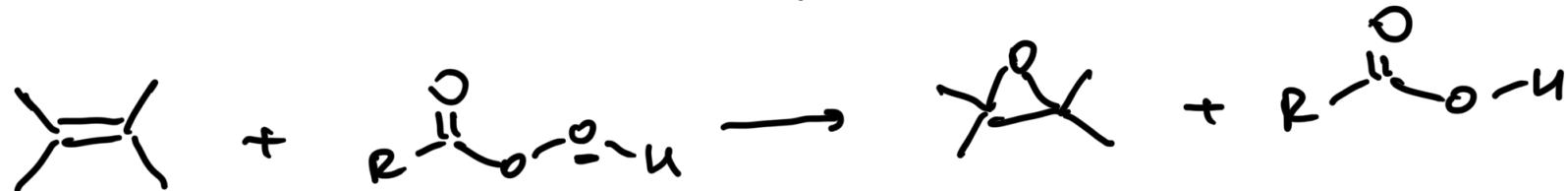
read 12.15

Overview of oxidation reactions

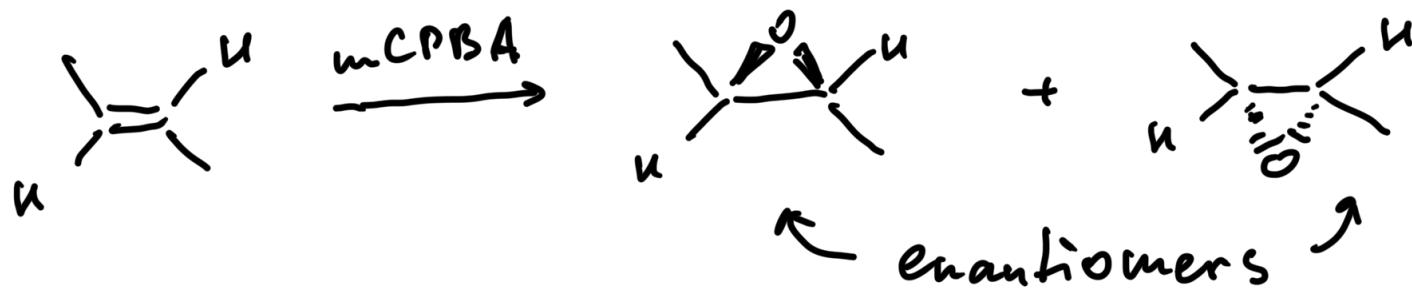
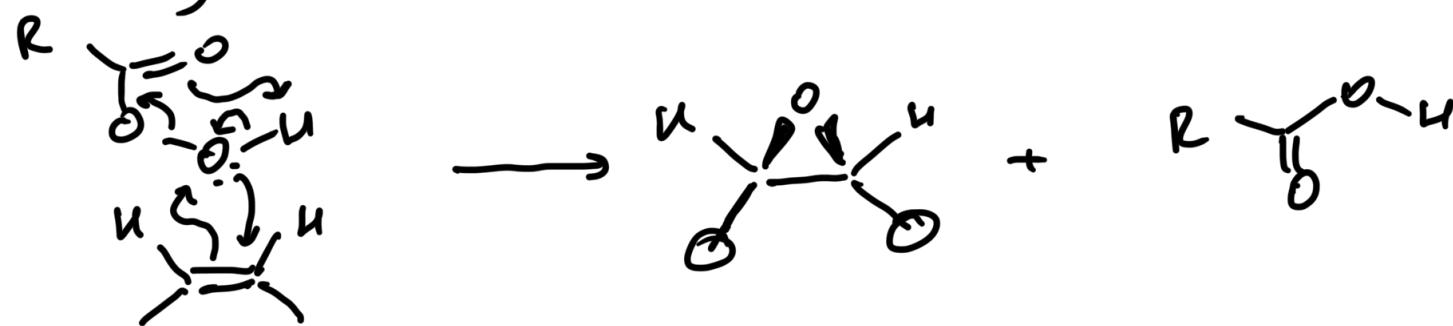


# Oxidation of alkenes: epoxidation

Oxidants, mechanism, stereochemistry

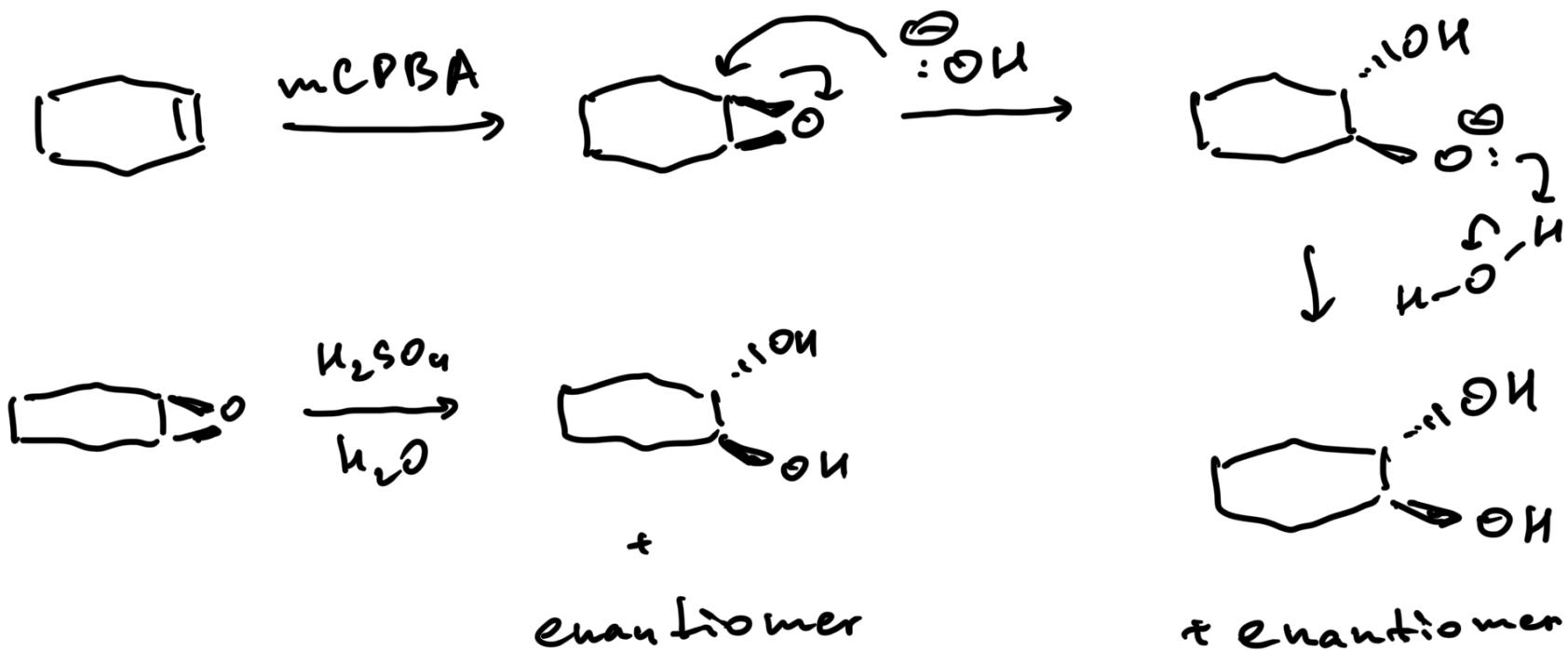
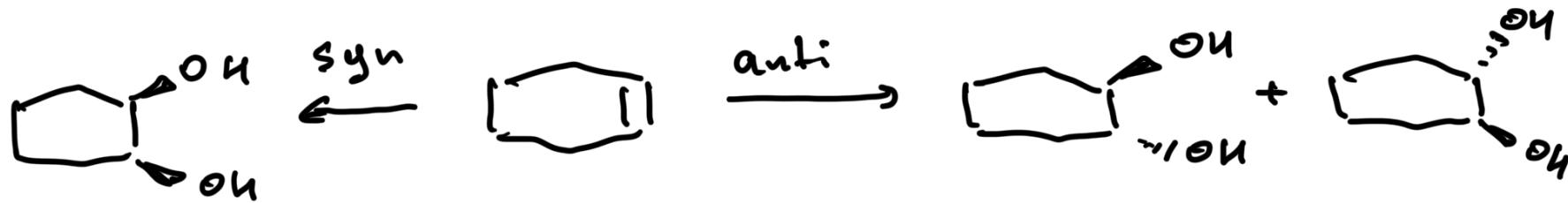


Butterfly mechanism: concerted process



# Oxidation of alkenes: dihydroxylation

Anti and syn dihydroxylation. Anti dihydroxylation via epoxides

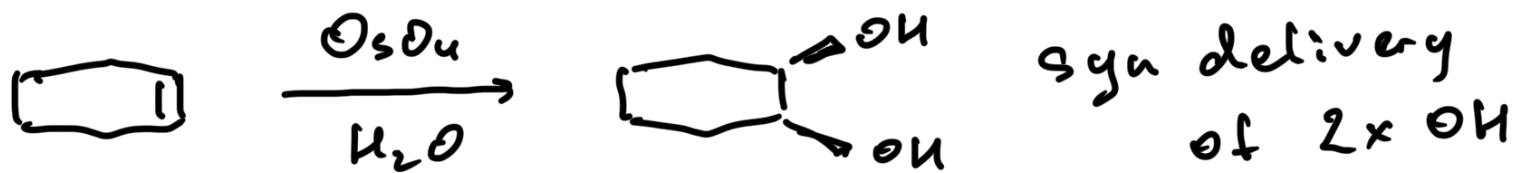


# **Oxidation of alkenes: dihydroxylation**

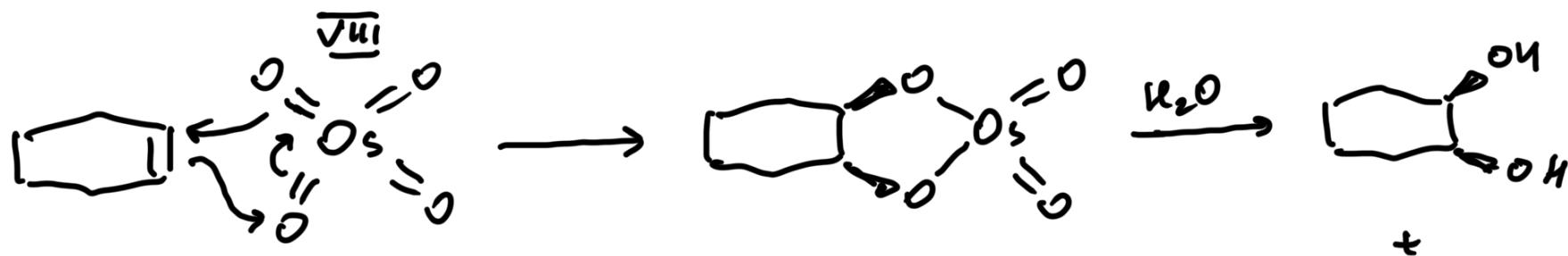
Anti dihydroxylation via epoxides

# Oxidation of alkenes: dihydroxylation

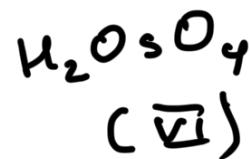
Syn dihydroxylation with Os(VIII) and Mn(VII). Mechanism



Same reactivity w/ KMnO<sub>4</sub> (must be kept basic)

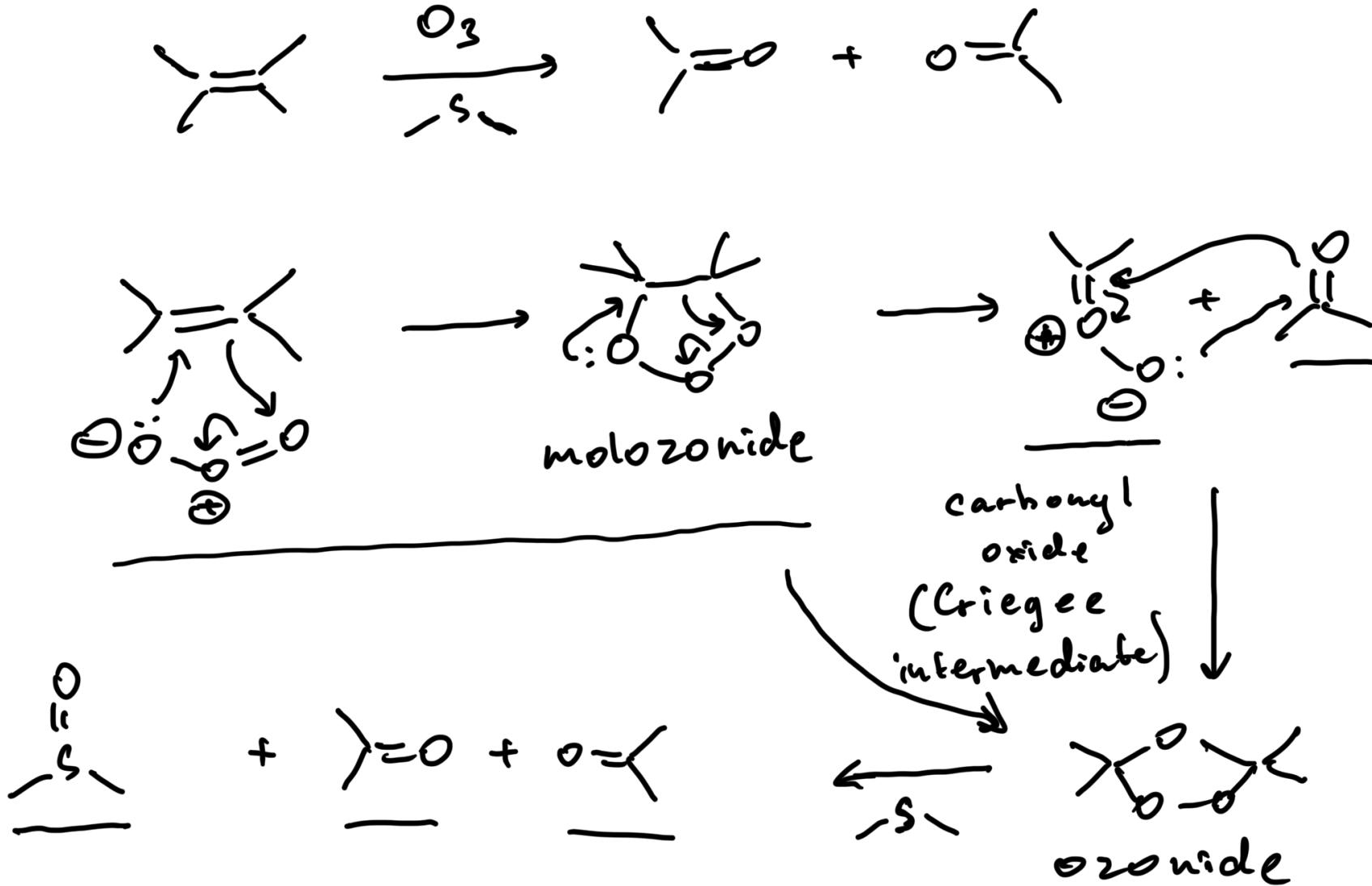


Upjohn process:



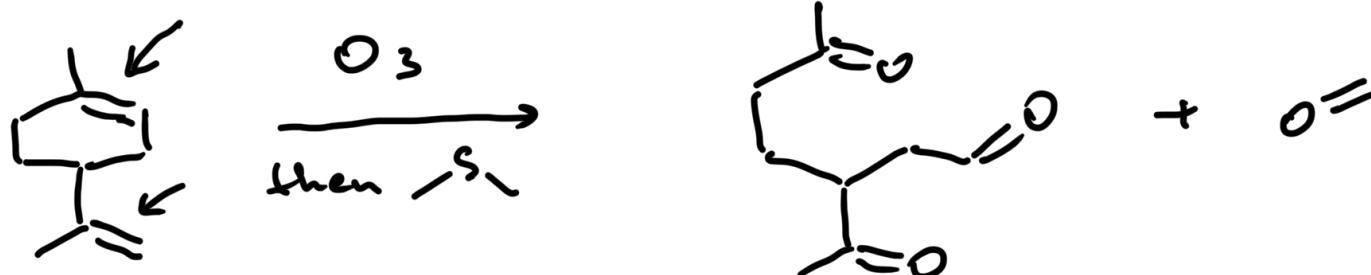
# Oxidation of alkenes: ozonolysis

Oxidative cleavage of alkenes. Mechanism and intermediates involved

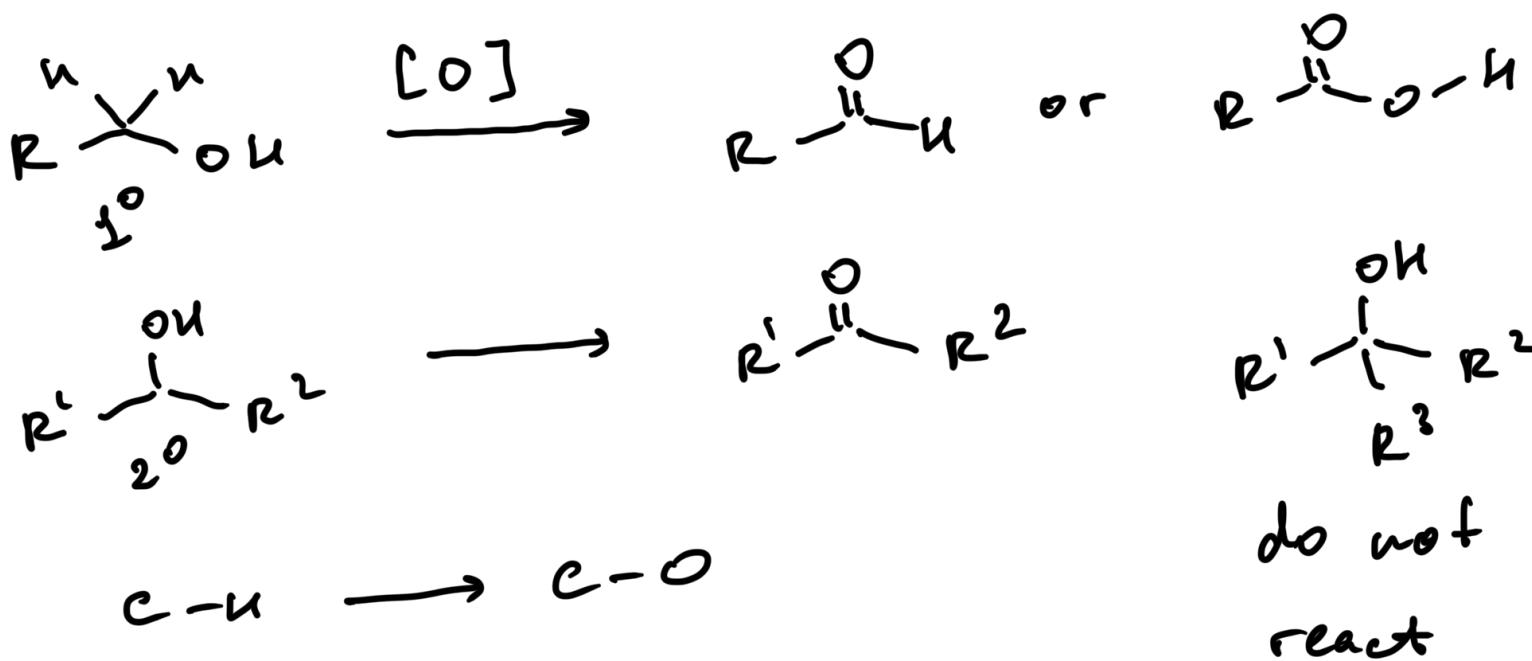


# Oxidation of alcohols

General considerations. 1°, 2°, and 3° alcohols



limonene



# **Oxidation of alcohols: secondary alcohols**

Mechanism of oxidation with CrO<sub>3</sub>

# **Oxidation of alcohols: primary alcohols**

Oxidation with PCC

# **Oxidation of alcohols: primary alcohols**

Oxidation to carboxylic acids

# **Reduction and oxidation in synthesis: disparlure**

Retrosynthesis of disparlure

# **Reduction and oxidation in synthesis: disparlure**

Synthesis of disparlure