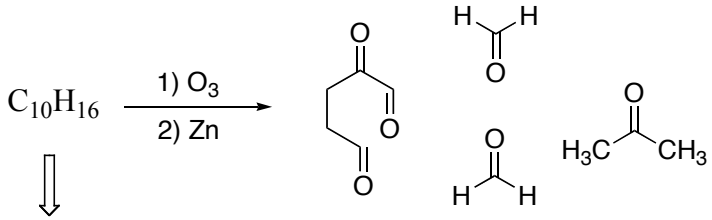
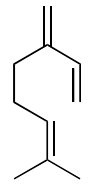
1) Ozonolysis – problem from last time

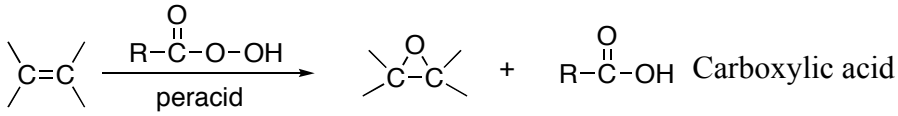




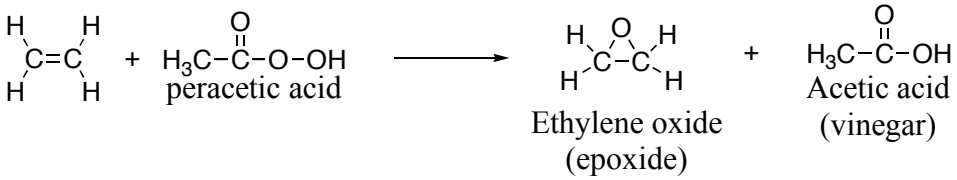
+ Other structural isomers

Myrcene

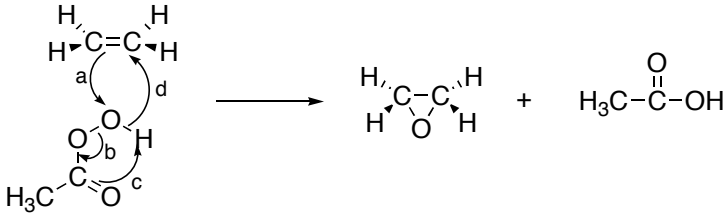
2) Epoxide formation (epoxidation) – Oxirane formation



ex)

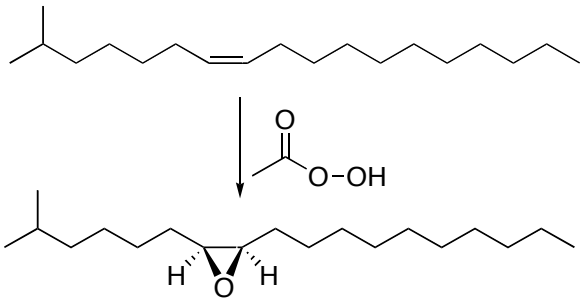


Mechanism:



- Concerted reaction: all bonds break and form at the same time.
- O-O bond is most reactive since two electronegative atoms attached to each other is unfavorable

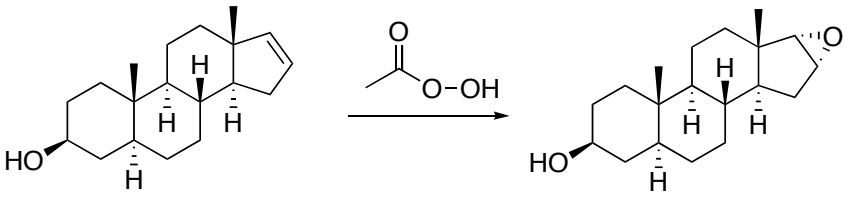
Ex)



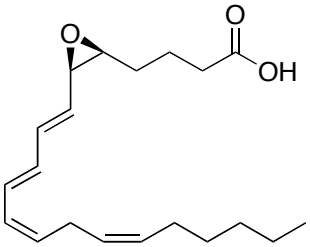
- Done by Adolf Butenandt

Gypsy moth sex pheromone

- Pheromones (pherein horman – to carry excitement)
- Chemical messengers

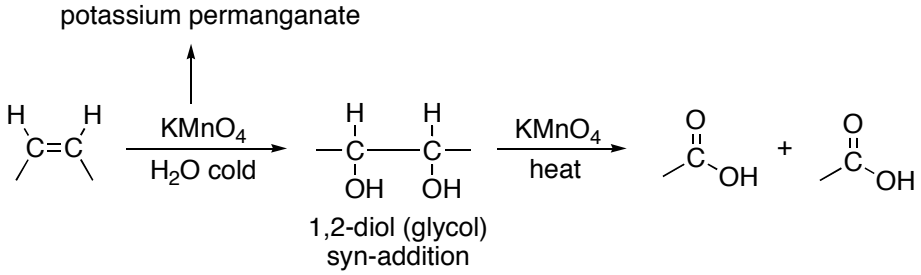


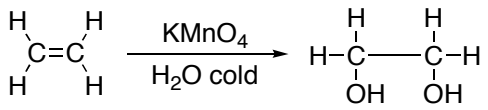
Androstenol - produced by males

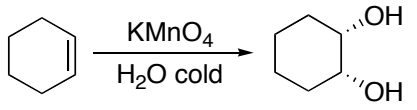


Leukotriene A4 -
- substance (chemical messenger) that mediates anaphylaxis (allergic reaction, asthma)

3) <u>Hydroxylation</u> – Diol (di-alcohol) formation – diols also known as glycols

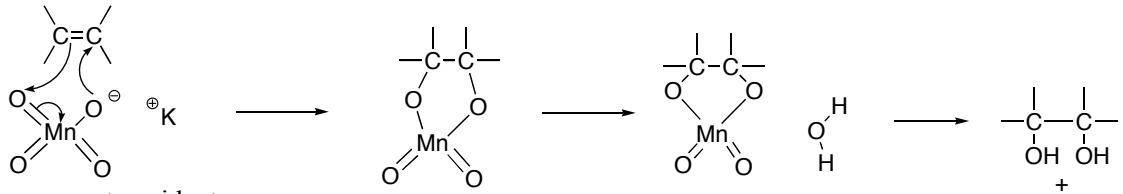






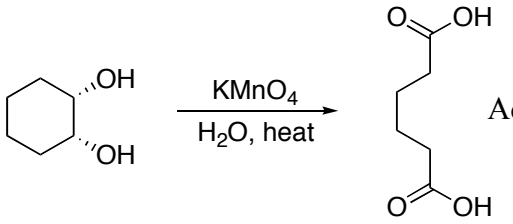
syn-addition

Mechanism:



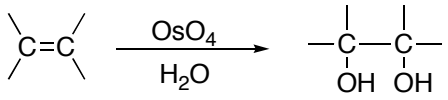
Permanganate oxidant desires electrons

ex)



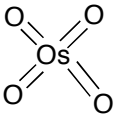
Adipic acid - precursor for nylon

Alternative use OsO_4, osmium tetroxide.



Syn - addition

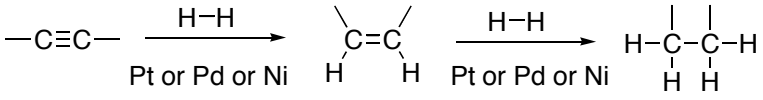
- stops with diol, does not form carboxylic acid when heated.



volatile and toxic

Addition Reactions of Alkynes

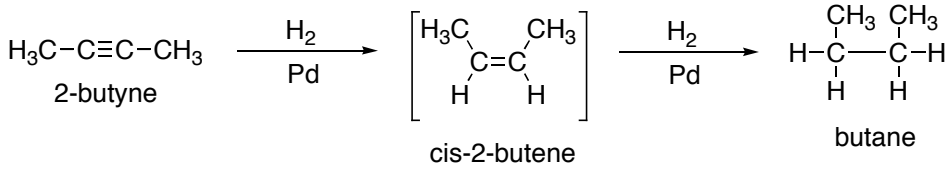
1) Hydrogen Addition

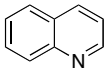


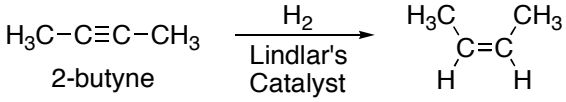
cis alkene

reaction can not be easily stopped at cis alkene

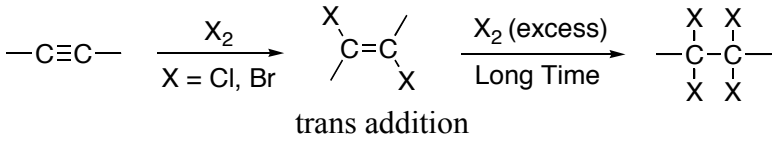
ex)



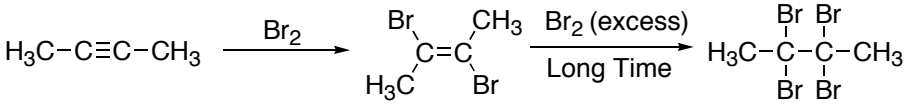
- to stop at alkene use Lindlar's catalyst: Pd, $BaSO_4$, quinoline 



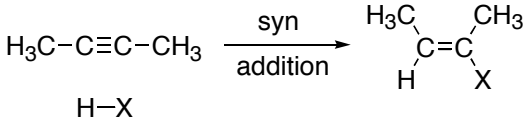
Halogenation:



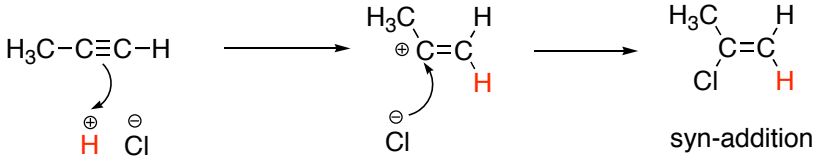
ex)



HX addition (syn)



ex) Propyne – (follows Markovnikov's rule)



Addition of H_2O