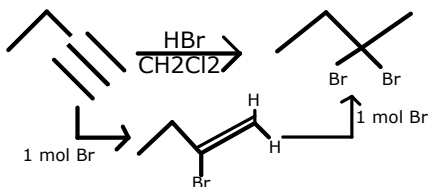


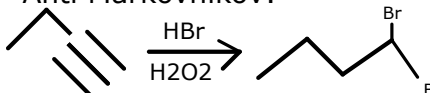
ALKYNE REACTIONS

HX Addition X=Halogen

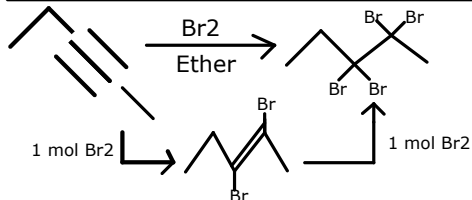
Markovnikov:



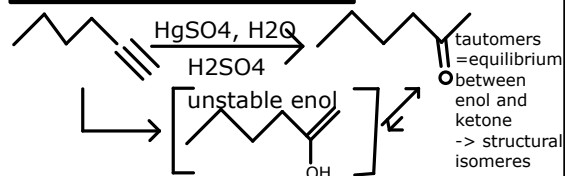
Anti Markovnikov:



Halogenation, Addition of X2

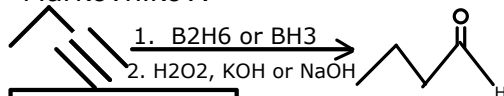


Oxymercuration (Hydration)



Hydroboration (Hydration)

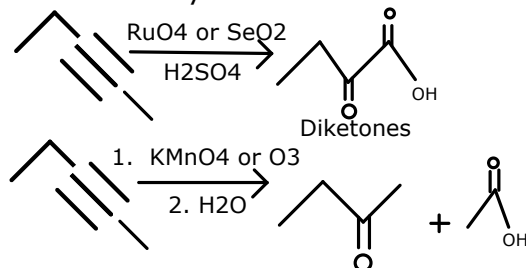
Markovnikov:



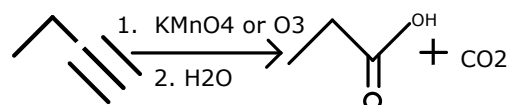
Oxidations

Antimarkovnikov:

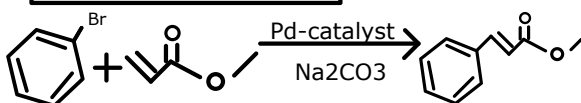
Internal Alkynes:



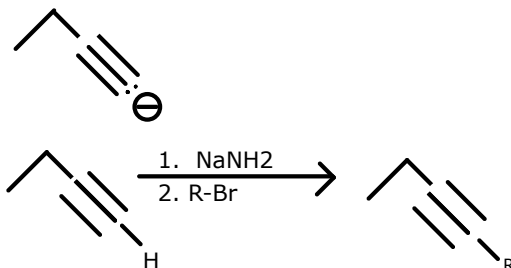
Terminal Alkynes:



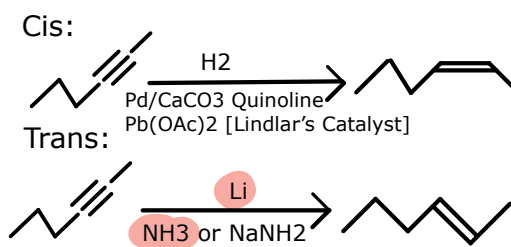
Heck Reaction



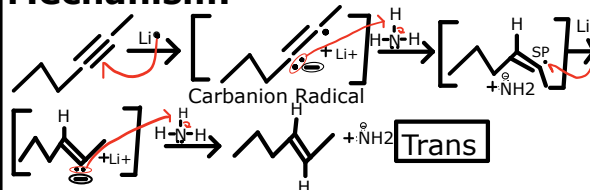
Acetylide Ion



Reductions



Mechanism:



Reagent Guide

Alkynes:

- **HBr/CH2Cl2** = Markovnikov addition of bromine (2 Br)
- **HBr/H2O2** = Antimarkovnikov addition of Br (2 Br)
- **Br2/Ether** = Addition of 4 Br (2 on each side of triple bond)
- **HgSO4, H2O/H2SO4** = ketone formation
- **1. B2H6 or BH3/2. H2O2, KOH or NaOH** = Aldehyde formation
- **RuO4 or SeO2/H2SO4** = diketone formation
- **Internal Alkynes**
1. KMnO4 or O3/2. H2O = 2 carboxylic acids (cleavage rxn)
- **Terminal Alkynes**
1. KMnO4 or O3/2. H2O = Carboxylic Acid & CO2 (cleavage rxn)
- **Heck RXN** = see example
- **Terminal Alkyne**
1. NaNH2/2. R-Br = Addition of "R." R could be CH3, CH2CH3, CH2CH2CH3, etc. New carbon-carbon bond formed
- **H2/Lindlar's Catalyst** = Cis reduction
- **Li/NH3 or NaNH2** = trans reduction

theredheadschemist

Organic
Chemistry 201
Handout

