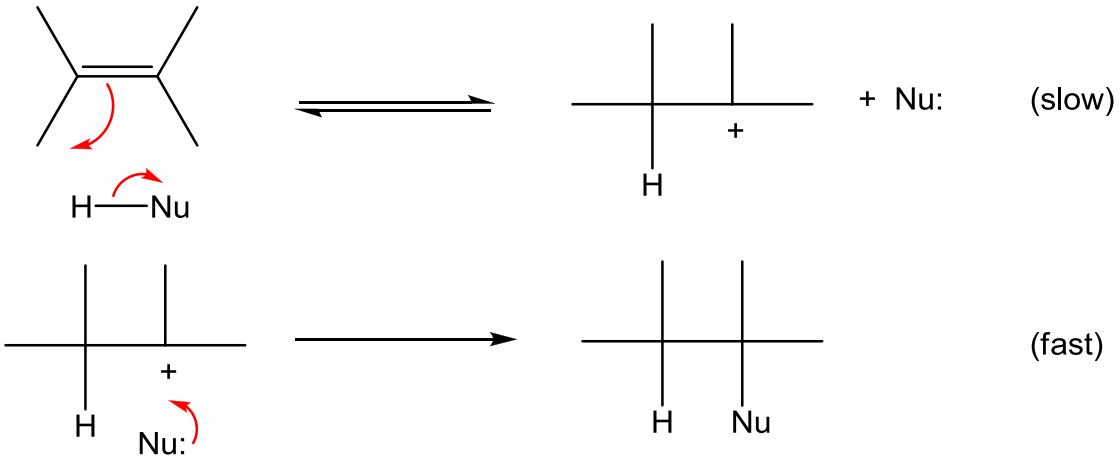
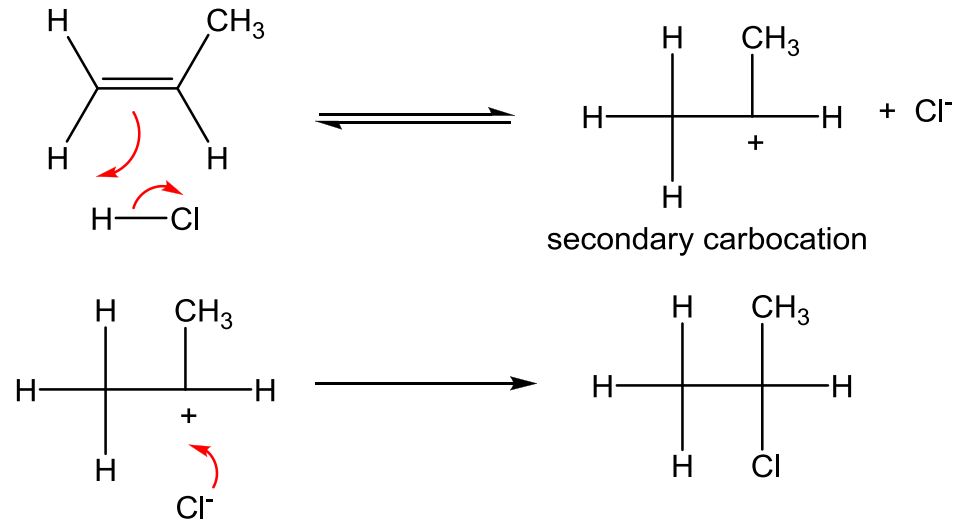
Mechanisms – Addition Reactions

1. Ionic electrophilic addition reactions

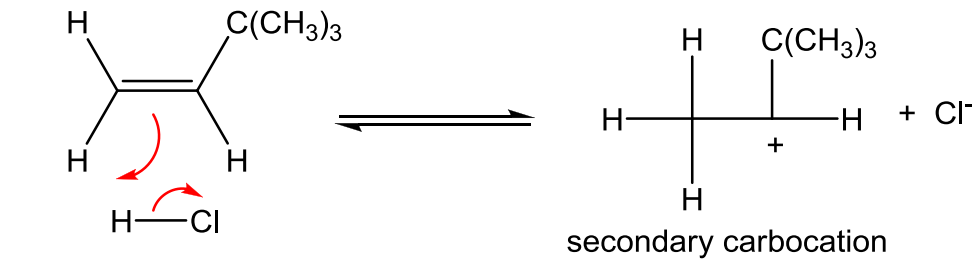
a) Electrophilic ionic addition to C=C via carbocations

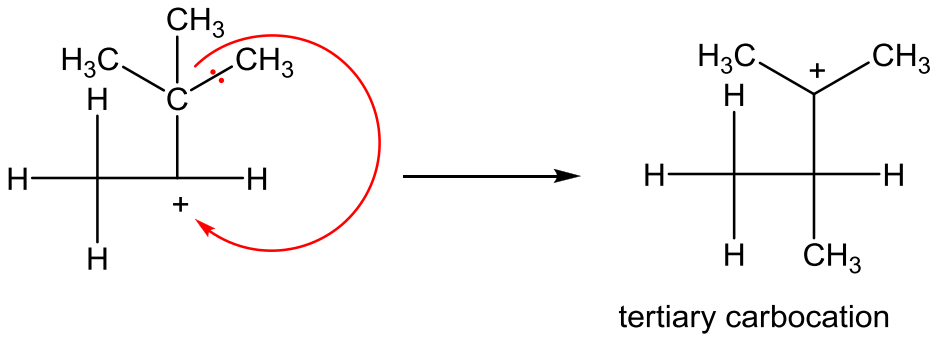


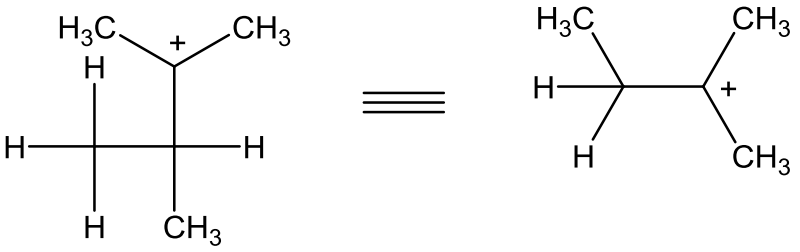
e.g.

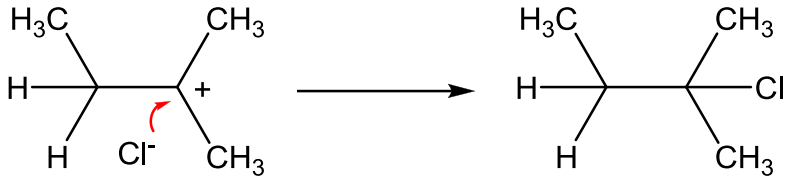


Do not forget re-arrangements …

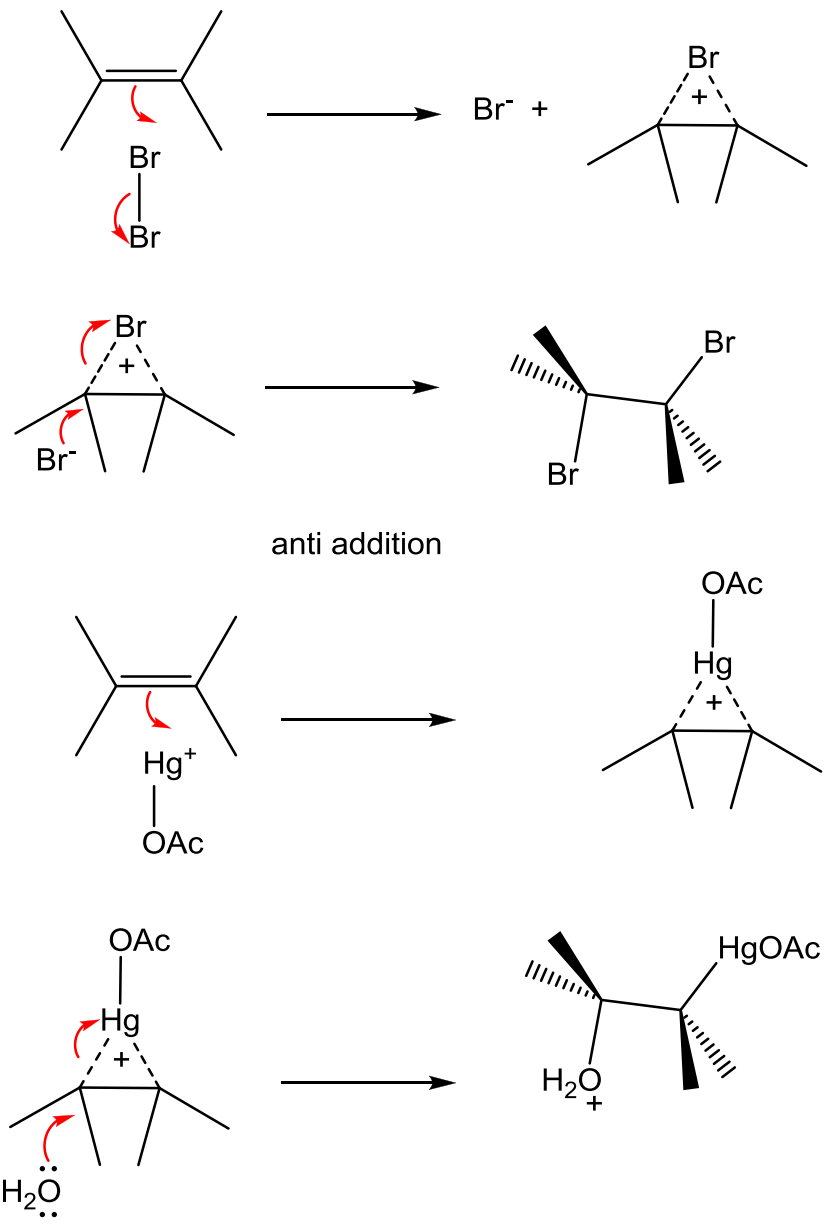




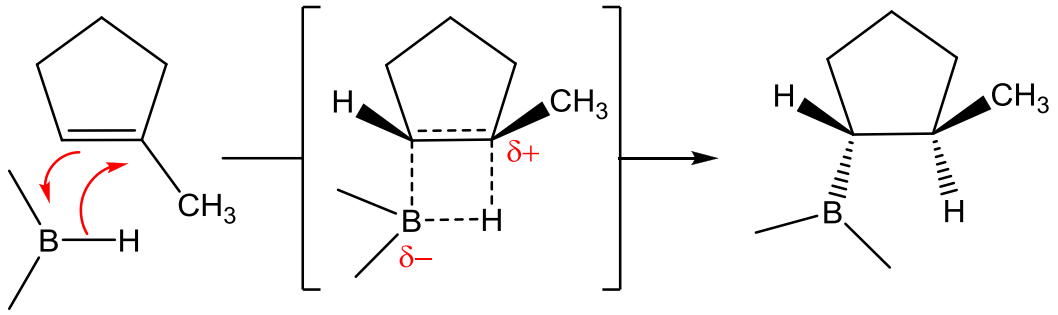




b) Electrophilic ionic addition to C=C via halonium/mercurinium ions:

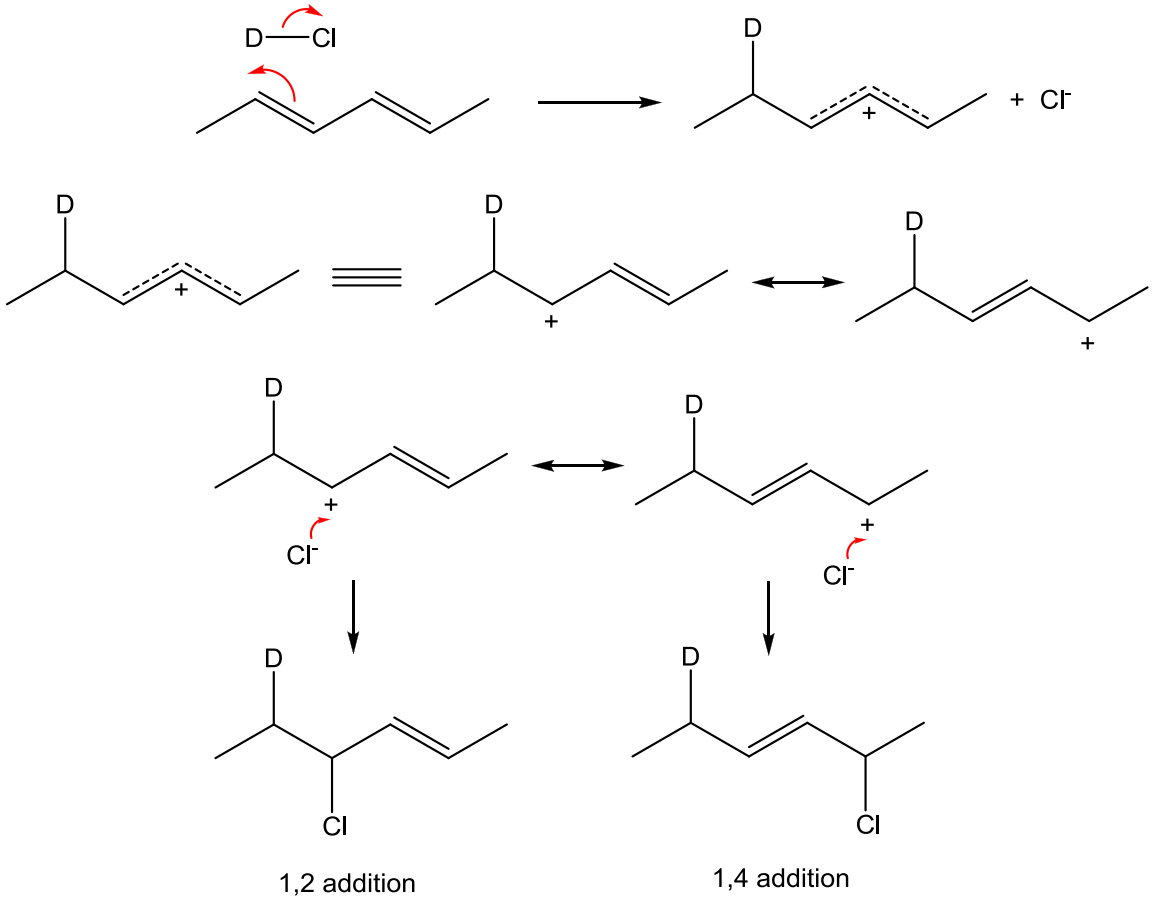


c) Electrophilic ionic addition to C=C via a four-membered transition state – hydroboration



syn addition

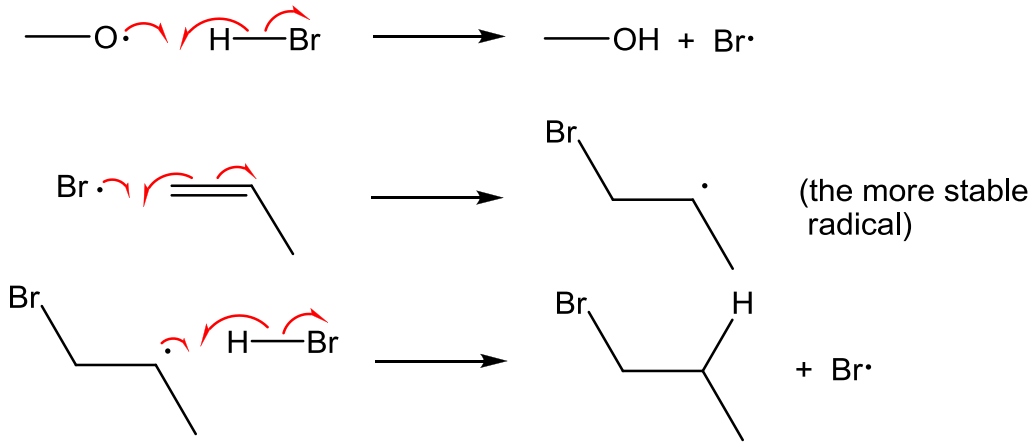
d) Electrophilic addition to conjugated dienes



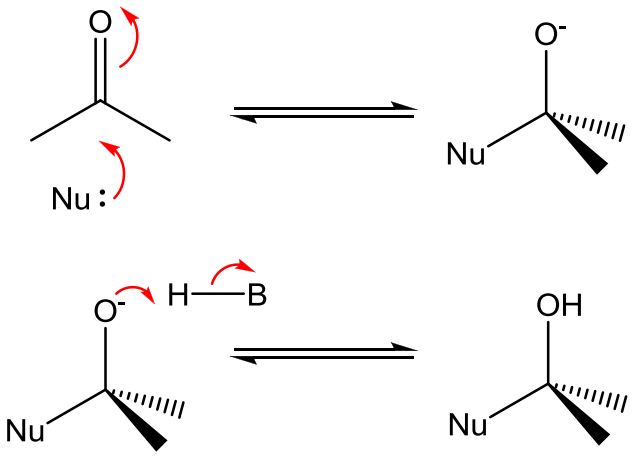
1,2 addition

1,4 addition

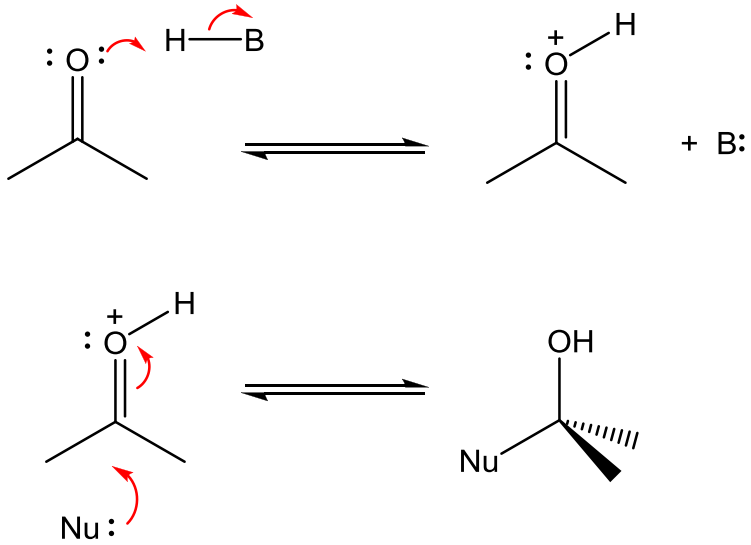
2. Free radical electrophilic addition reactions



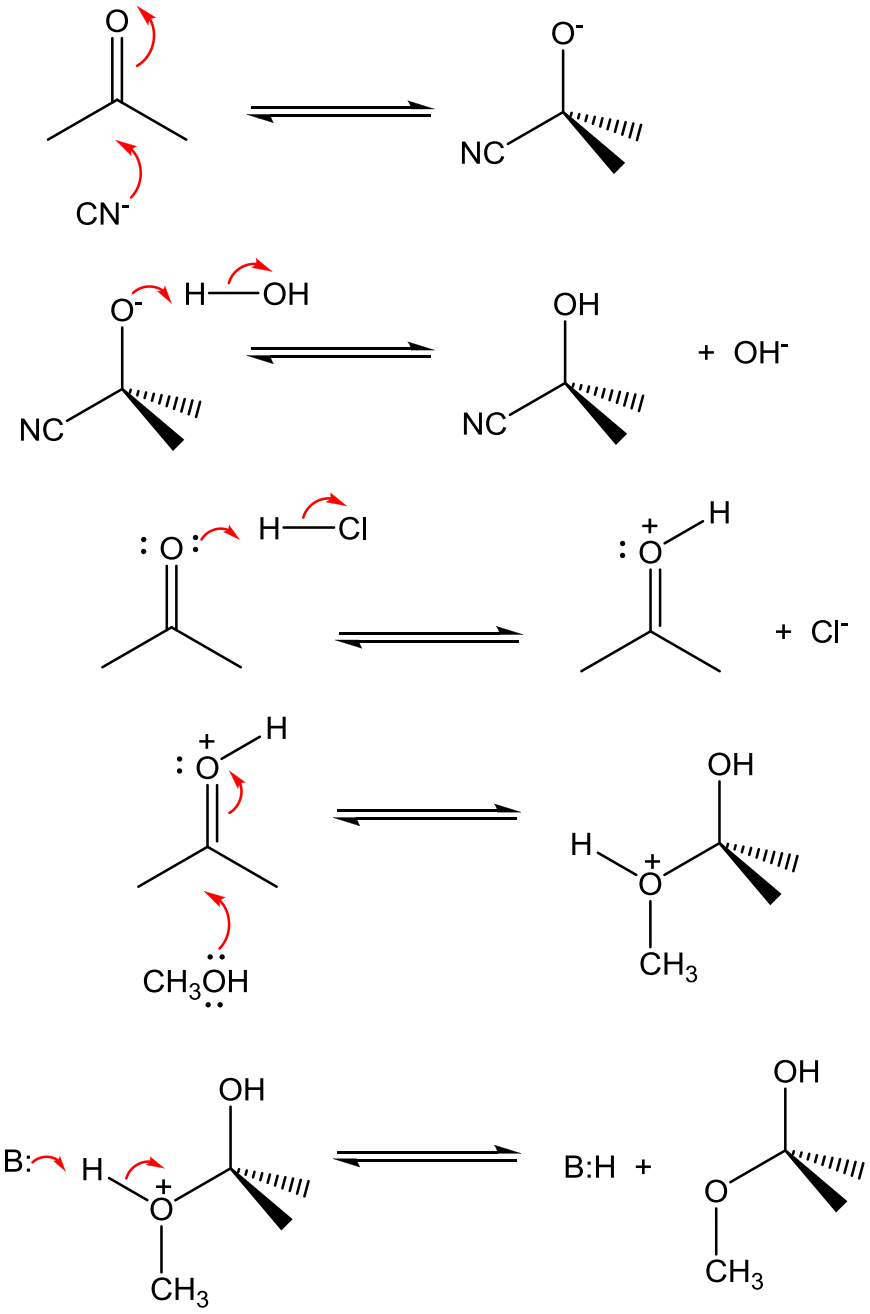
3. Nucleophilic addition to aldehydes and ketones



Via acid catalysis:



e.g.


O
CN-
O-
NC
O-
H—OH
NC
OH
NC
+ OH-
: O :
H—Cl
: O
H
+
+ Cl-
: O
H
+
CH3OH
OH
H
O
CH3
B:
H
OH
O
CH3
B:H +
OH
O
CH3