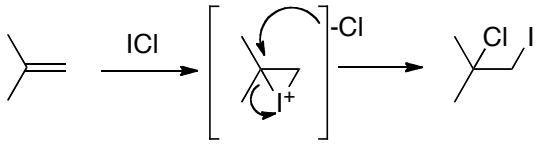
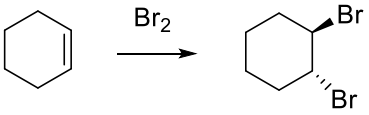
Addition of X_2 to alkenes (Halogenation)

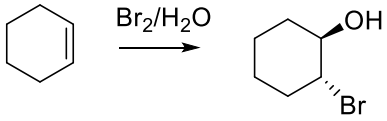
Iodine monochloride



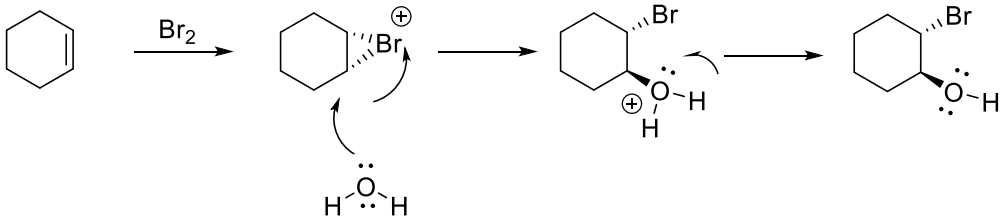
E.g 1)



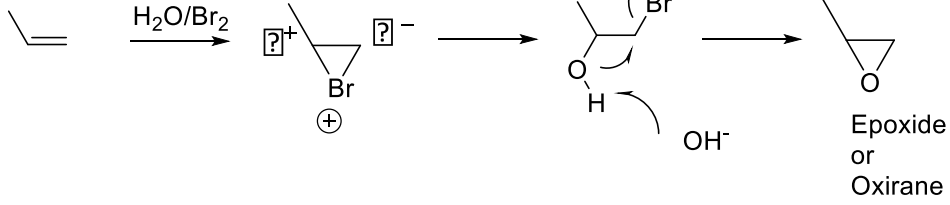
E.g 2



Mechanism:



E.g 3

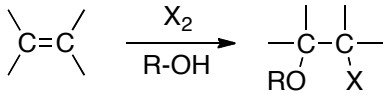


Alkyl groups donate electrons and stabilize positive charge.

- The more substituents, the more stable the carbocation.

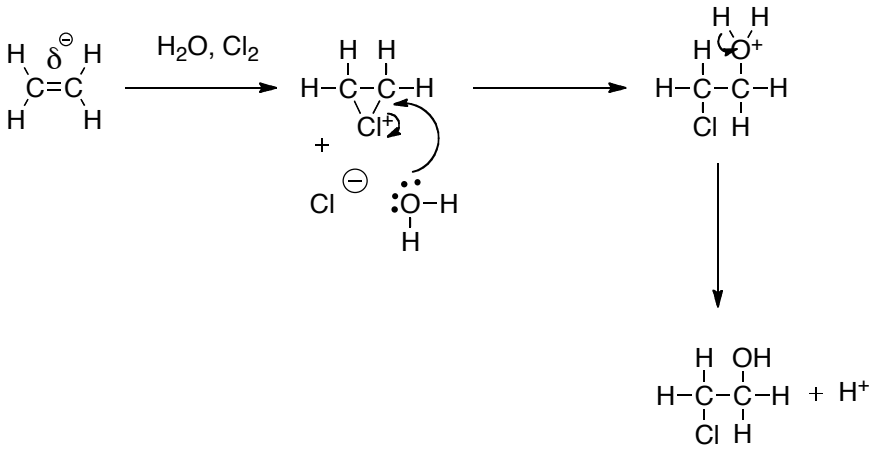
Reaction of alkenes with halogen and water/alcohol

General reaction

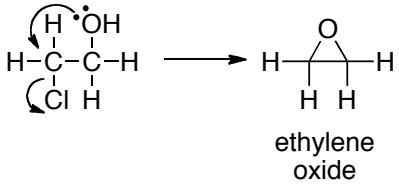


X = Cl, Br, F R = alkyl/H

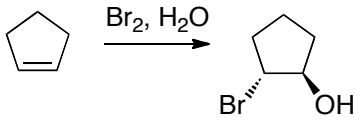
Eg 1.



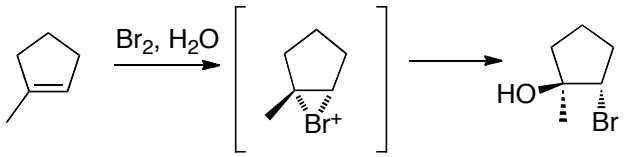
Eg. 2



Eg. 3

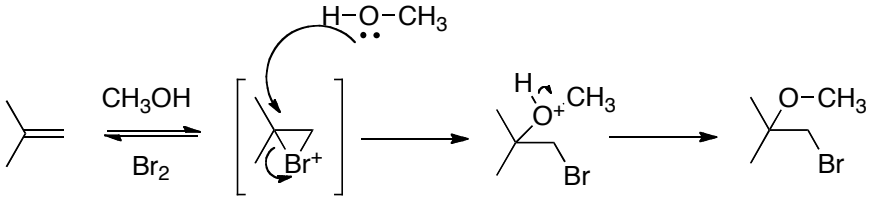


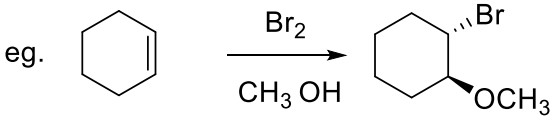
Eg. 4

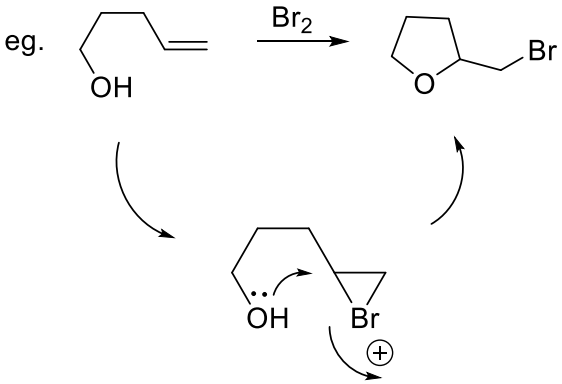


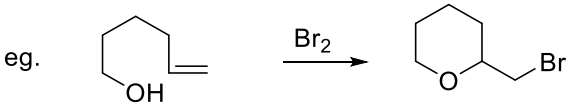
For A-B addition: most positive end adds to least substituted end of C=C (to give most stable carbocation).

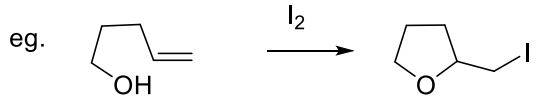
Eg. 1

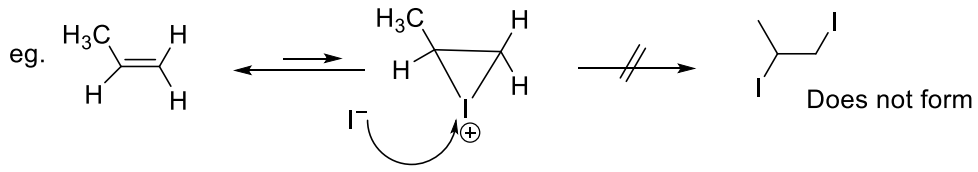


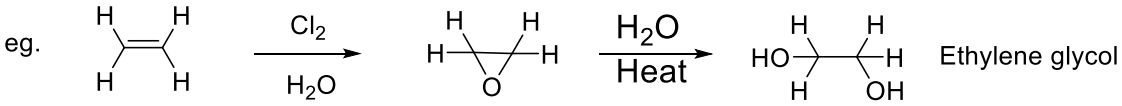






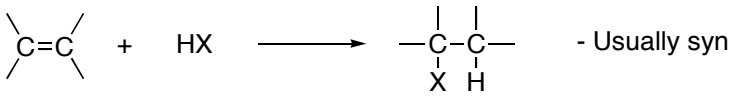


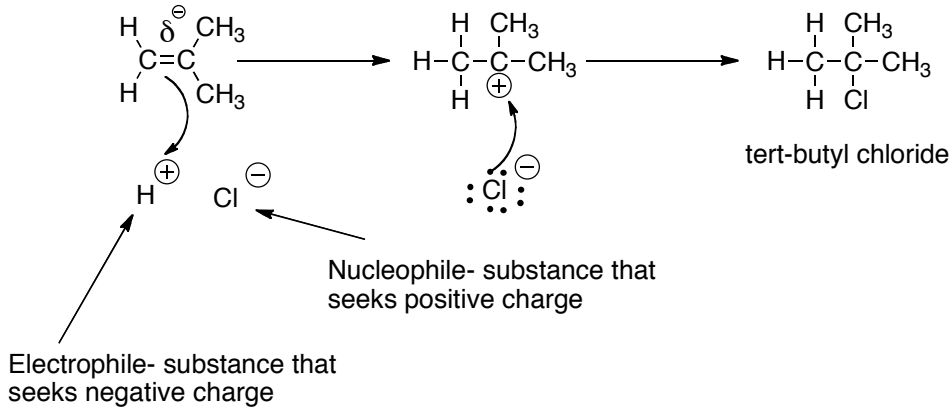




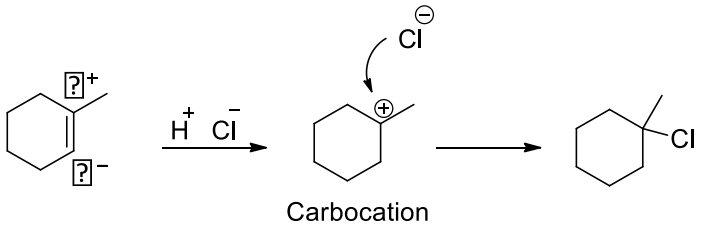
Hydrogen Halide Addition (HX)

General reaction





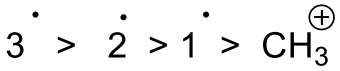
Eg.

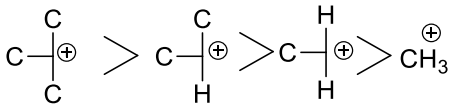


Markovnikov rule in Addition reactions

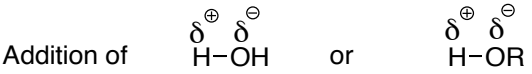
- positive species adds to the least substituted end of C=C
- negative species adds to the more substituted end of C=C (stabilized positive charge)

Carbocation Stability:





Hydration and Ether formation



General Reactions: