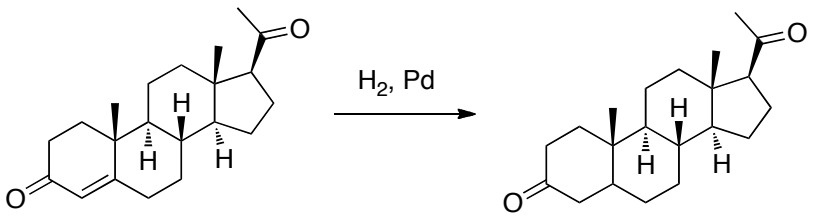
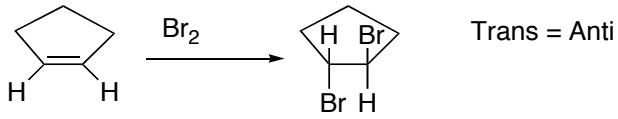


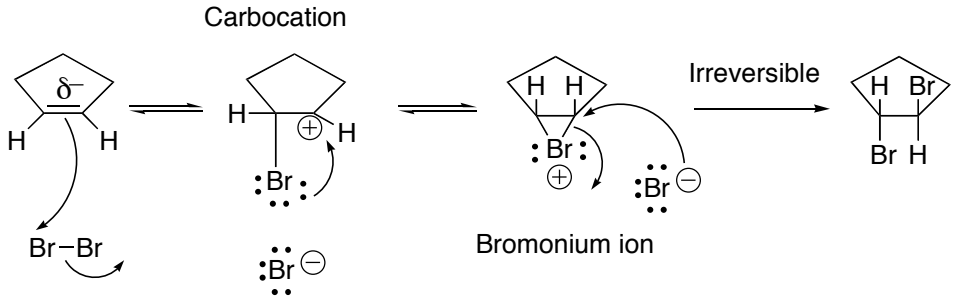
Progesterone

Addition of X_2 to alkenes (Halogenation)

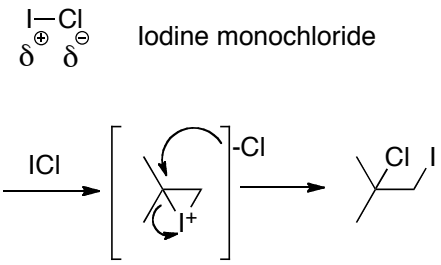
Eg. 1



Mechanism:



Eg. 2

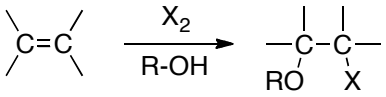


Alkyl groups donate electrons and stabilize positive charge.

- The more substituents, the more stable the carbocation.

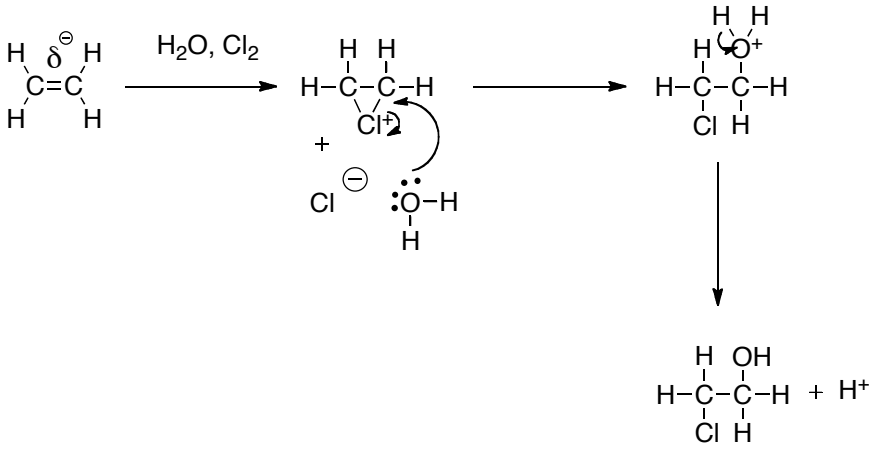
Reaction of alkenes with halogen and water/alcohol

General reaction

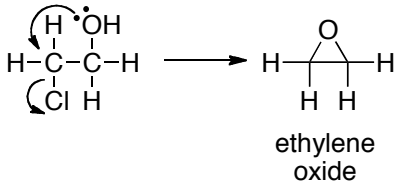


X = Cl, Br, F R = alkyl/H

Eg 1.

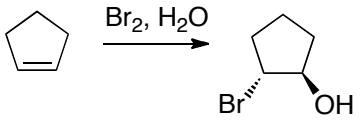


Eg. 2

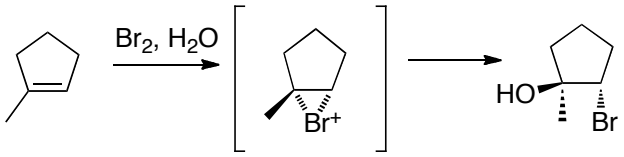


ethylene oxide

Eg. 3



Eg. 4

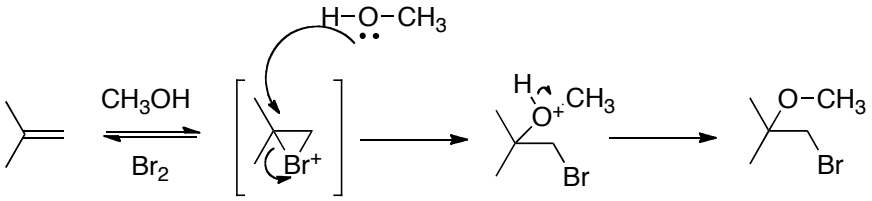


Markovnikov rule in Addition reactions

- 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)

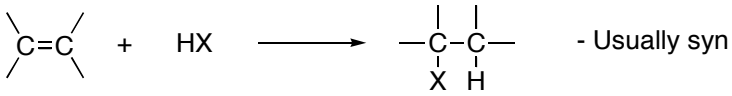
For A-B addition: most positive end adds to least substituted end of C=C (to give most stable carbocation).

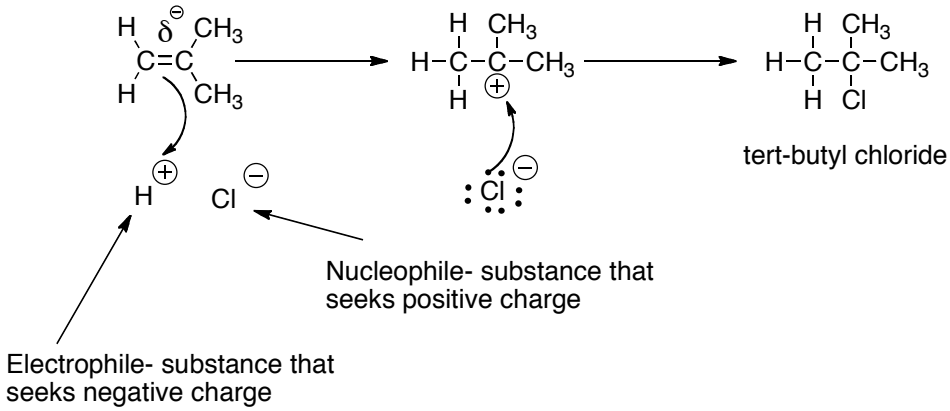
Eg. 1



Hydrogen Halide Addition (HX)

General reaction

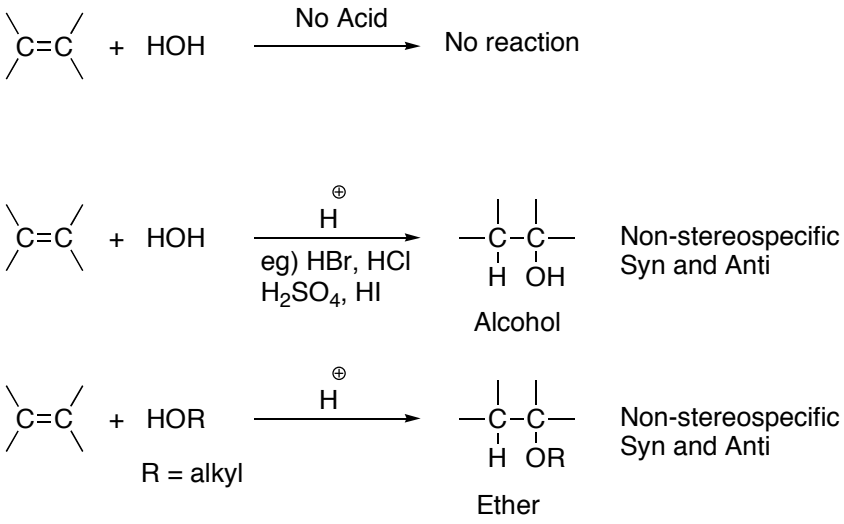




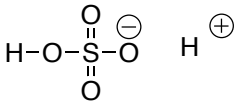
Hydration and Ether formation

Addition of $\overset{\delta\oplus}{H}-\overset{\delta\ominus}{OH}$ or $\overset{\delta\oplus}{H}-\overset{\delta\ominus}{OR}$

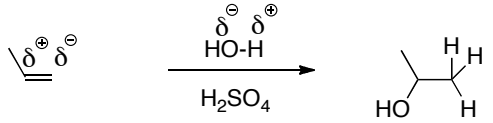
General Reactions



Sulfuric acid has a non-nucleophilic counter ion

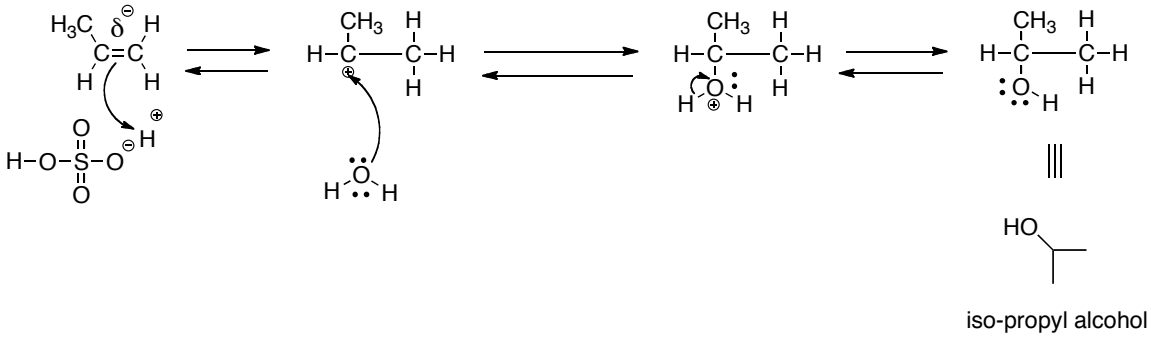


Eg. 1

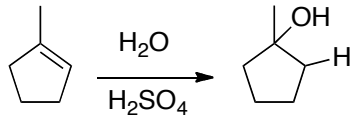


Mechanism:

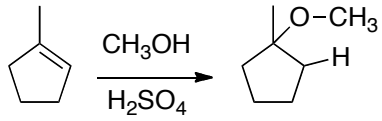
reverse elimination



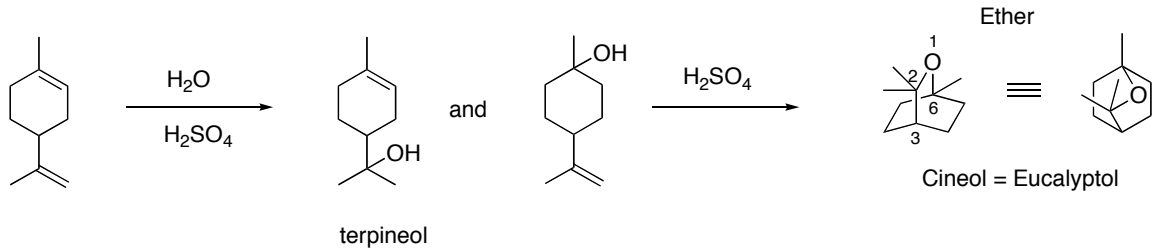
Eg 2

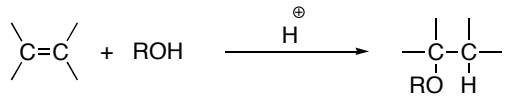


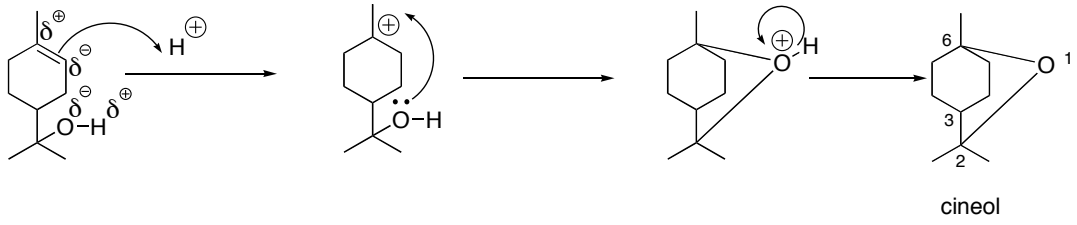
Eg. 3



Eg 4. Intramolecular







cineol