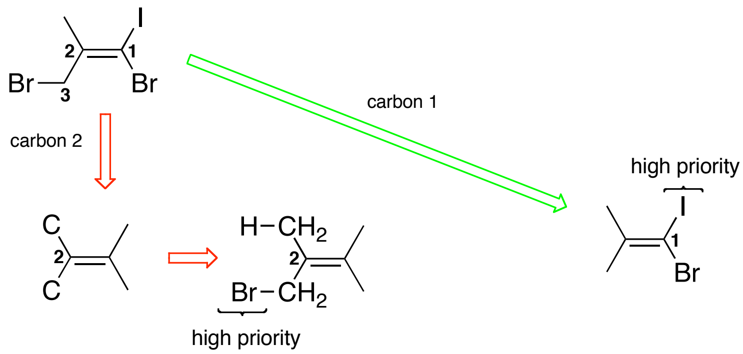
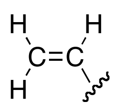
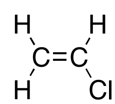


- high priority groups are on opposite sides
- so the molecule has *E* configuration
- name: (E)-1,3-dibromo-1-iodo-2-methylprop-1-ene.

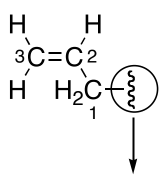
Groups:



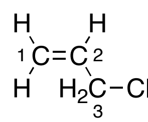
Vinyl group
(ethenyl group)



Vinyl chloride
(1-chloroethene)



Allyl group
(propenyl group)

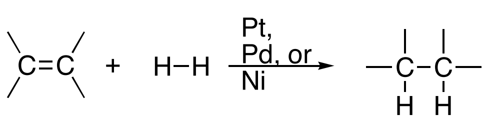


Allyl chloride
(3-chloroprop-1-ene)

When allyl group is attached to a high priority group, the above numbering system is used to label the allyl carbons.

Addition Reactions:

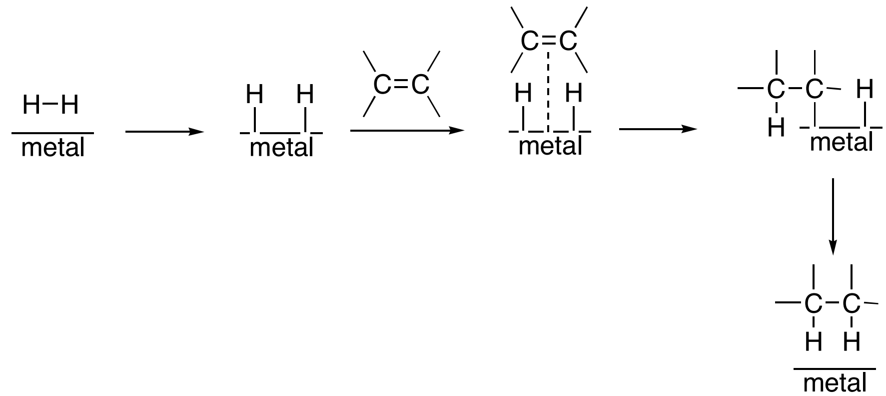
1) Hydrogenation (H-H addition)



(cis) syn-addition

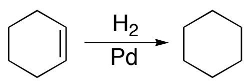
→ From the same side

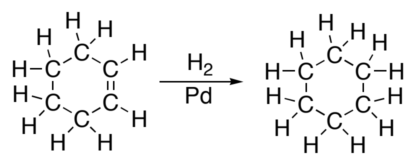
Mechanism:

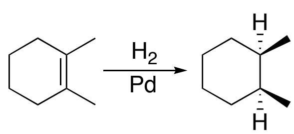


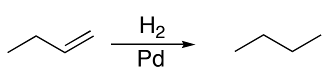
- Heterogeneous hydrogenation

Ex)

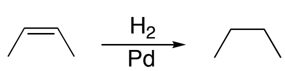




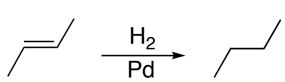




ΔH = -30.3 kcal/mol

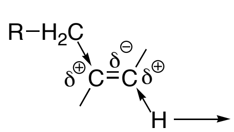


ΔH = -28.6 kcal/mol



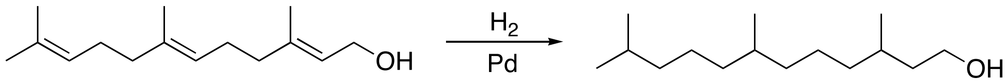
ΔH = -27.6 kcal/mol

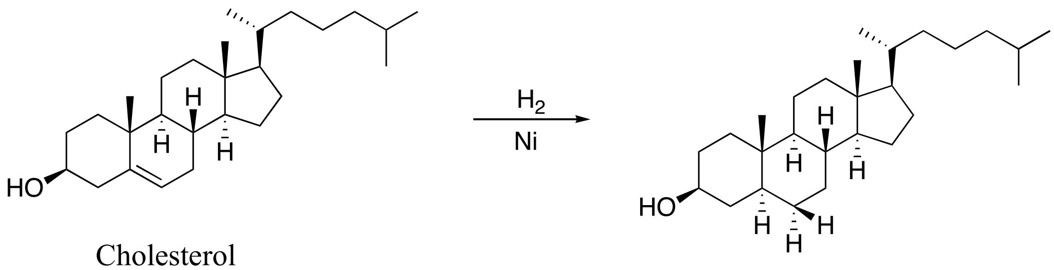
- From the above ΔH values, it can be understood that 1-butene is the least stable and trans-2-butene is the most stable isomers.



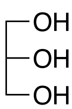
→ pKa of H ~36

- Electronegative C=C pulls electrons away from H.
- In alkenes, carbons have partial positive charge. Alkyl groups inductively donate electron density to stabilize these carbons.
- Therefore, the more substituted alkene is more stable. (alkyl groups are better electron donators than hydrogen)

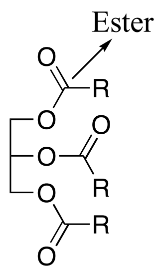




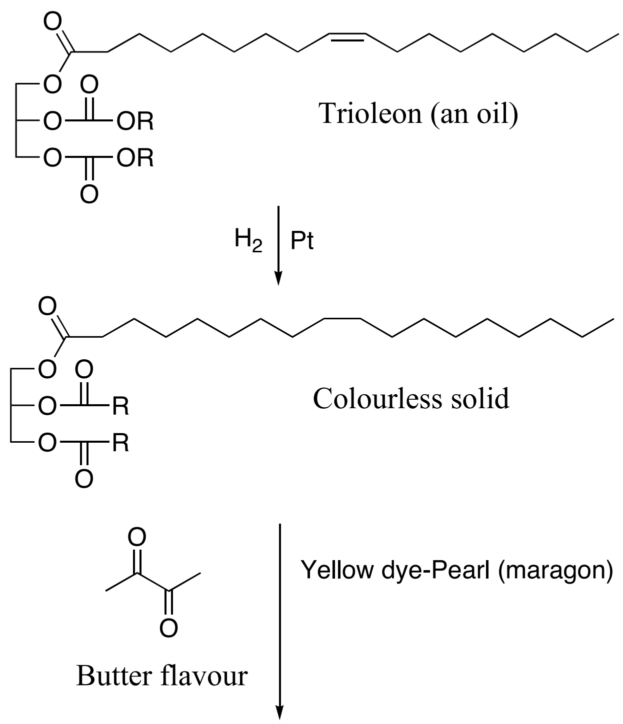
Cholesterol



Glycerol



Triglyceride



Margarine

- Saturated fats have long chains that interact with each other through London forces. These forces increase melting points and cause these saturated fats to become solid.

<u>Halogen Addition (Halogenation)</u>

Reactivity: ↗ Substitution

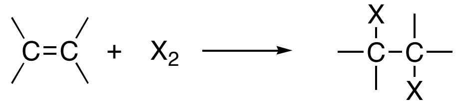
Alkanes << Alkenes << Alkynes

Least ... Most

Can use: F_2, Cl_2, and Br_2.

I_2 fails (reversible reaction)

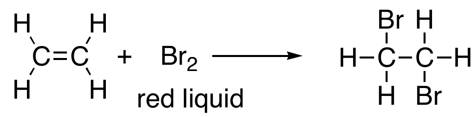
Addition



X = F, Cl, Br

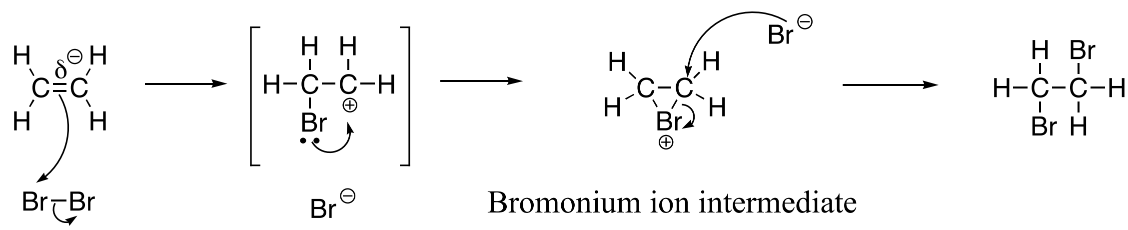
Anti/trans addition

Ex)



Mechanism:

Attack from back side



Bromonium ion intermediate

Ex)