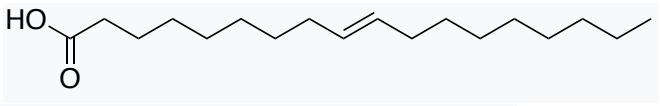
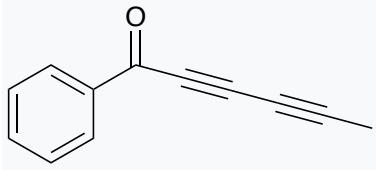
OCCURENCE OF ALKENES AND ALKYNES

- Growth factor: ethylene
- Hormone/Pheromones
- Fatty acids



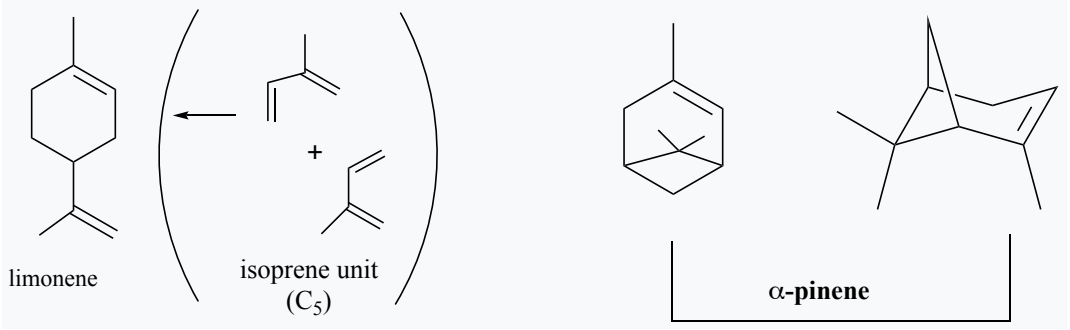
trans-oleic acid

- Antimicrobials



capillin

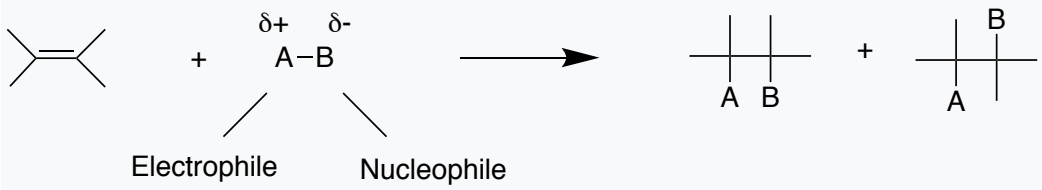
- Terpenes (polyisoprene)



Reactions of Multiple Bonds

a) Addition Reaction (reverse: Elimination)

General Reaction Scheme



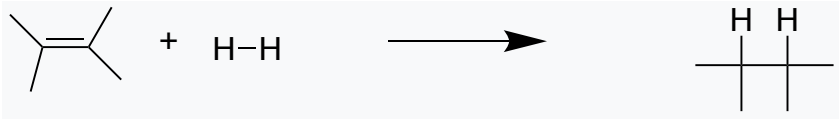
Step 1

Step 2

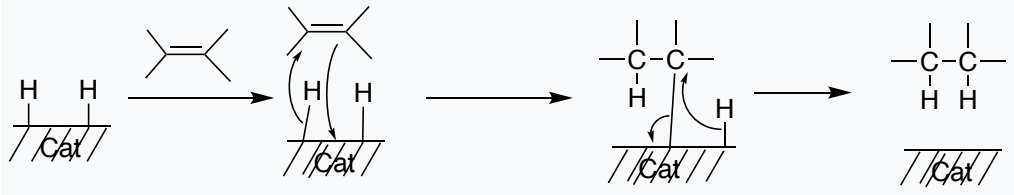
NOTE: Factors to Consider for each specific addition

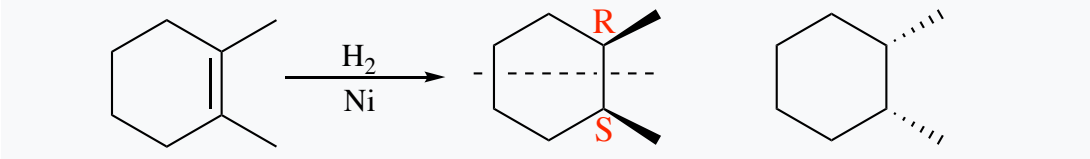
1) Regioselectivity (which side of multiple bond)
2) Stereoselectivity (relative orientation of each residue)

1) HYDROGENATION
- Addition of hydrogen
- Requires a catalyst (e.g. nickel, palladium, platinum)
- Stereospecific (*cis* addition, from same side)



MECHANISM

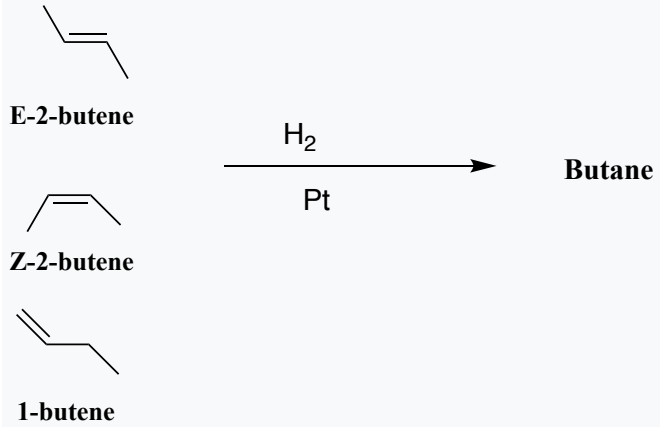


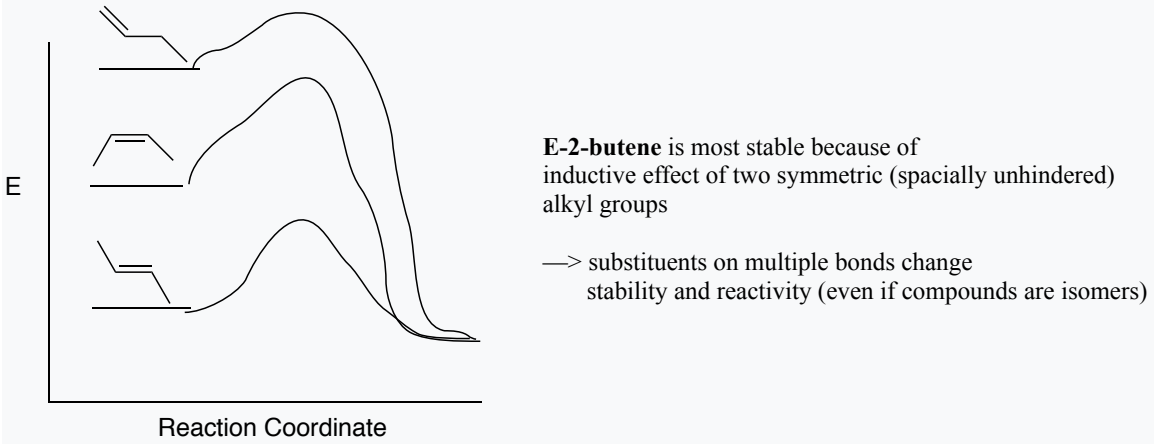


1,2-dimethylcyclohexene

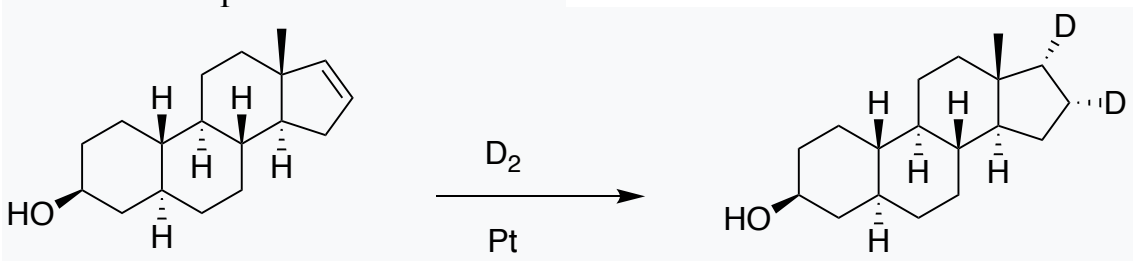
***cis*-1,2-dimethylcyclohexane**
(meso compounds - contain plane of symmetry)

Thermodynamic Stability vs Reactivity of Alkenes

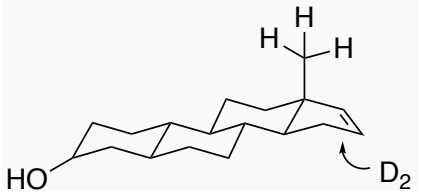




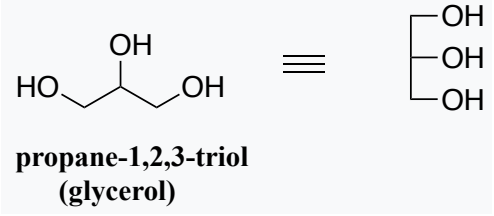
Another Example: for the Androstane



The hydrogen (in this case a deuterium, D) will be added opposite the bulky functional group $–CH_3$, see the chair conformation below:



SATURATION OF FATS (Margarine)



propane-1,2,3-triol
(glycerol)