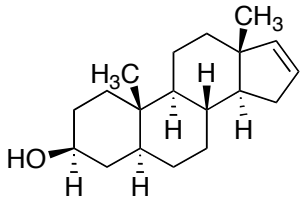
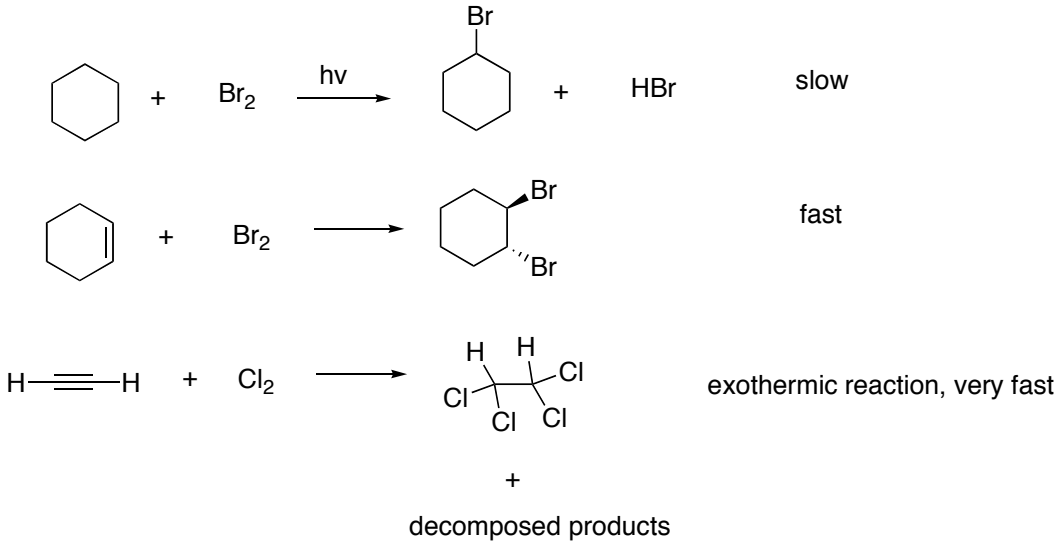
Reviews



a Steroid

A male pheromone

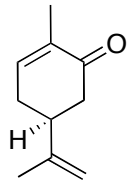


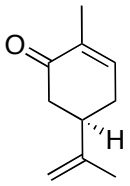
Hydrocarbons → C and H only
Physical properties

- alkanes – very non-polar
- alkenes – non-polar, but more polar than alkanes
- alkynes – non-polar, but more polar than alkenes

- overall, they all are very non-polar
- density less than water (1.0 g/cm^3) ρ = rho = density $\sim$ 0.8g/cm^3
- immiscible with water
- dissolve well in non-polar solvents (eg, haloalkanes)
- low mp, bp compared to other organic molecules due to hydrophobic interaction
- temporary dipole and London (dispersion) forces control self association

eg. Mirror image isomers (identify functional groups)



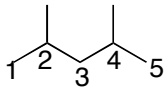


Monoterpene

different smell

(+) Carvone (-) Carvone

Alkane no ring C_NH_{2N+2} n = 1, 2, 3….



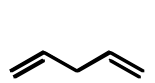
2,4-dimethylpentane

$C_7H_{14+2} = C_7H_{16}$

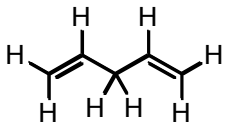
cycloheptane C_7H_{14}

Degrees of Unsaturation:

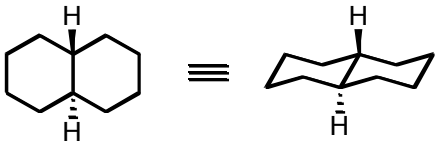
- all non-cyclic alkanes → have the general formula of C_nH_{2n+2}
- degree of unsaturation is a C=C or a ring.
- Each degree of unsaturation removes 2H from C_nH_{2n+2}



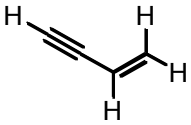
1,4 -pentadiene C_5H_8



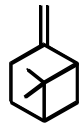
2 degrees of unsaturation



trans-decalin $C_{10}H_{18}$ 2 degrees of unsaturation



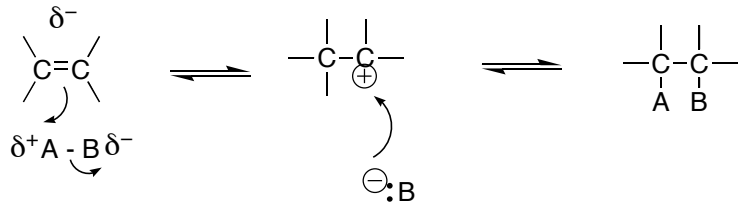
C_4H_4 3 degrees of unsaturation



β-Pinene

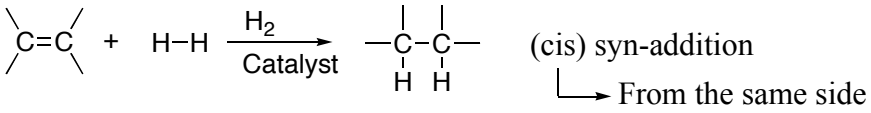
3 degrees of unsaturation
$C_{10}H_{16}$

Reaction of Alkenes: Addition Reactions

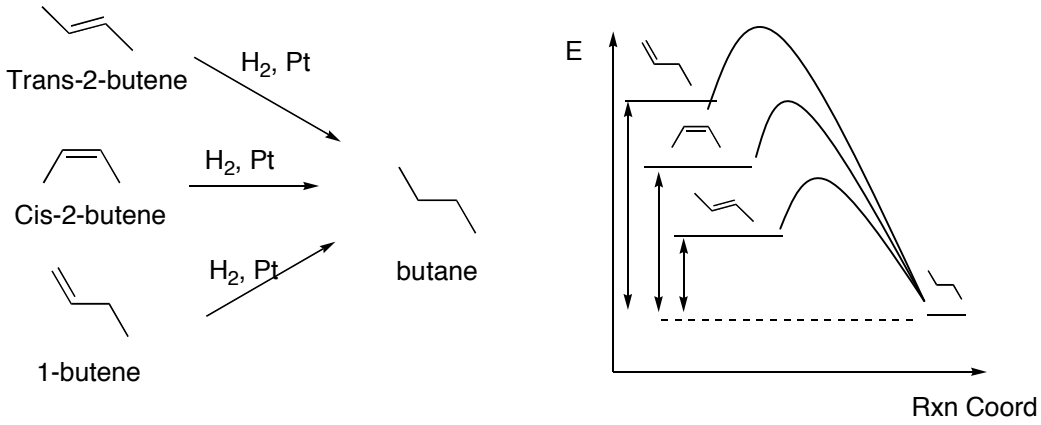


Reverse is called an elimination reaction

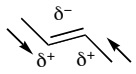
Hydrogenation (H-H addition) : Addition of H_2



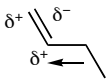
Catalyst is one of Ni (Nickel), Pd(Palladium), Pt(Platinum)



All of the above reactions are exothermic.

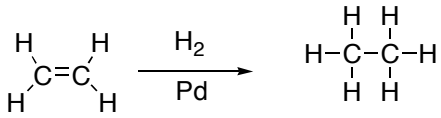


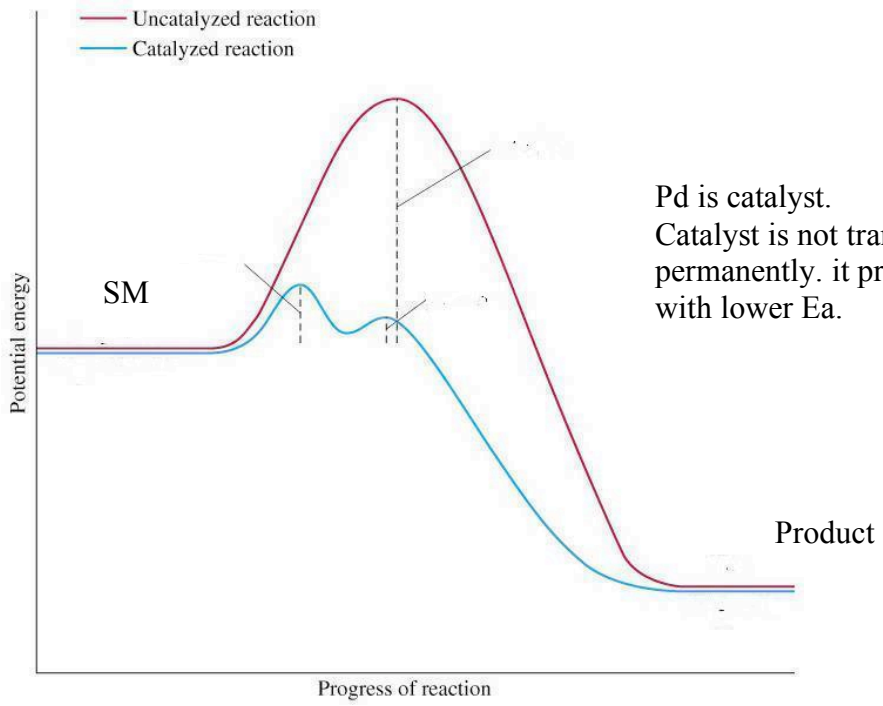
more alkyl substitution gives increased electron donation, making the alkene more stable and less reactive



trans more stable than cis due to sterics

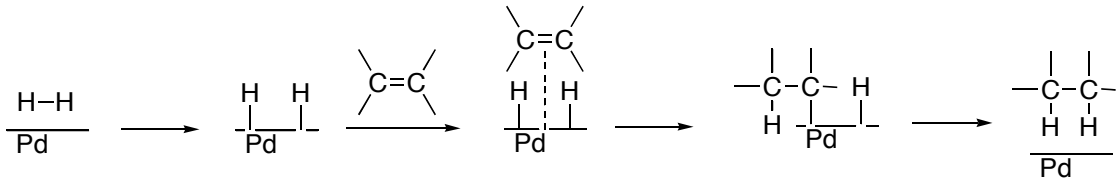
<u>Mechanism</u>

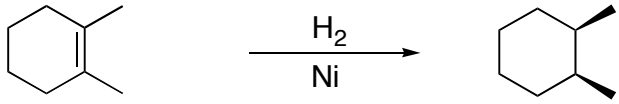




Pd is catalyst.
Catalyst is not transformed permanently. it provides a path with lower Ea.

SM : alkene and H_2
Product : alkane (after hydrogenation)

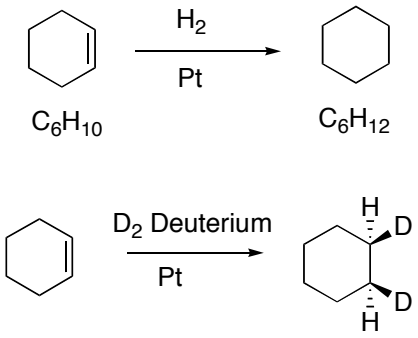




1,2-dimethylcyclohexene *cis*-1,2-dimethylcyclohexane

- hydrogenation gives syn (cis) addition, giving the cis-product as above

Stereospecific Reaction: Is one in which the stereochemistry of the starting material determines the stereochemistry of product.



FAT Hydrogenation

Eg.