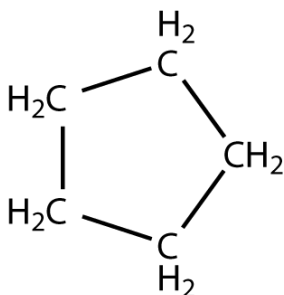




# Cycloalkanes

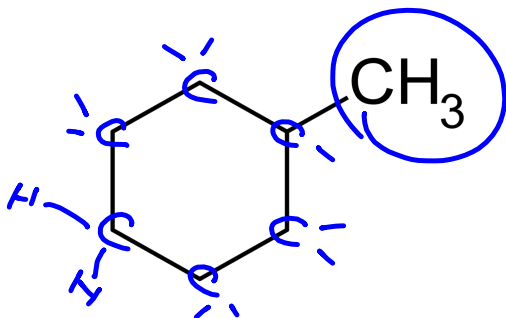
= saturated hydrocarbon in form of a ring

- rings of 3 or more C-atoms
- naming - put "cyclo" in front

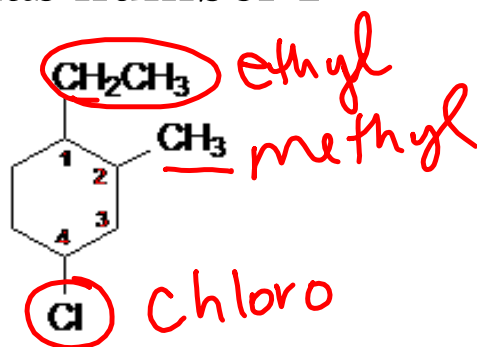


cyclopentane

- can also be substituted
  - > single substitution - no number
  - > more than 1 - 1st sub. has number 1



methylcyclohexane



4-chloro-1-ethyl-2-methylcyclohexane

## Alkenes & Alkynes

**alkene** = contains a C-C double bond

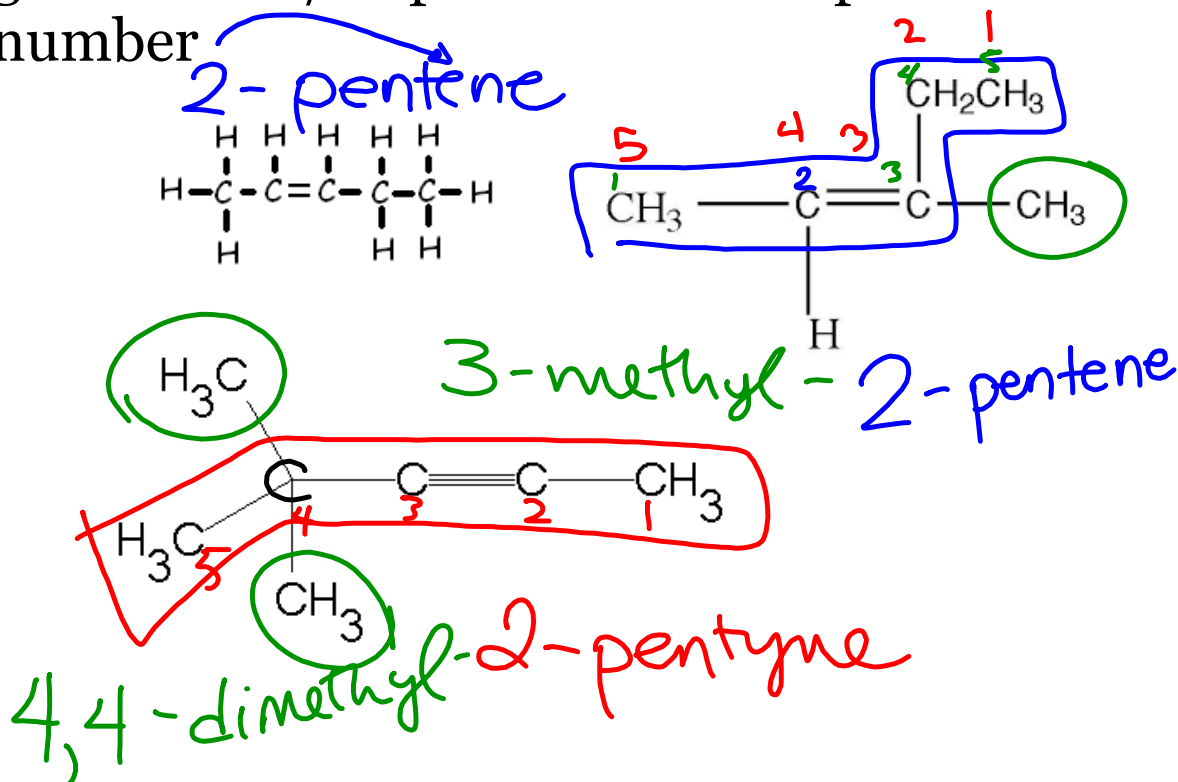
- general formula  $C_nH_{2n}$
- more reactive than alkanes (unsaturated)
- naming ends in "ene"

**alkyne** = contains a C-C triple bond

- general formula  $C_nH_{2n-2}$
- reactive (unsaturated)
- naming ends in "yne"

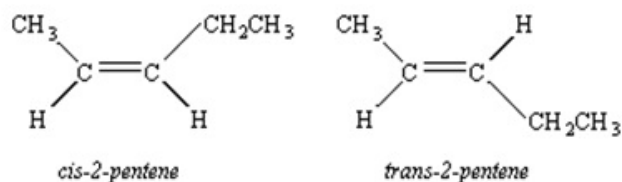
### Naming:

- give double / triple bond lowest possible number



## Cis-Trans Isomerization

- possible with double bond and groups (other than H) attached at double bond

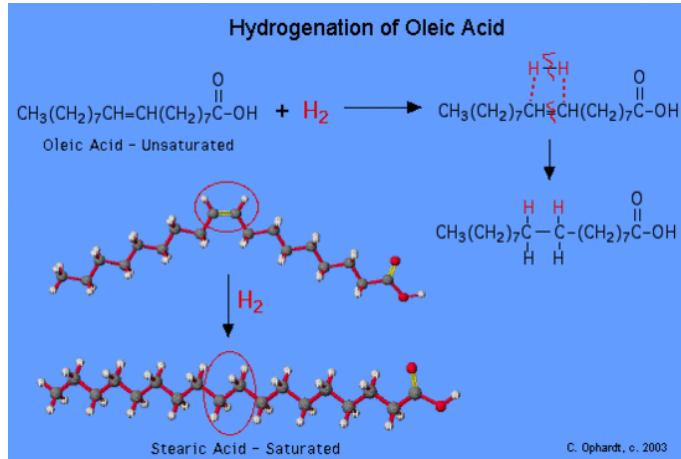


**Fig: Cis-trans isomers of 2-Pentene**

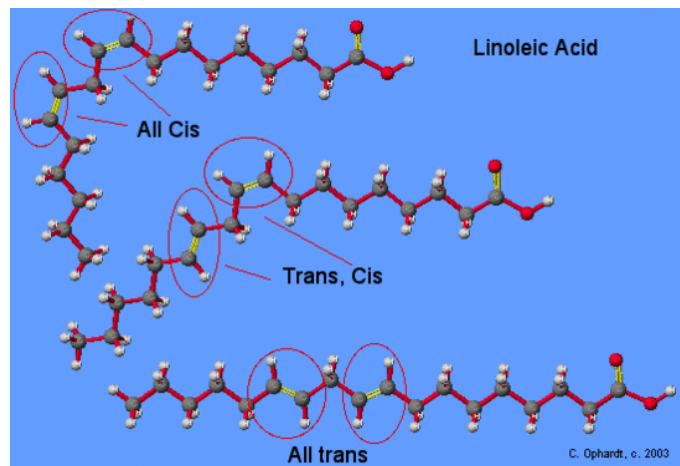
- **cis** = groups on same side of double bond
- **trans** = groups on opposite side of double bond (transverse)

## Hydrogenation & Trans Fatty Acids

- production of margarine involves hydrogenating unsaturated fats
- this adds H atoms across double bonds, turning unsaturated vegetable oils solid



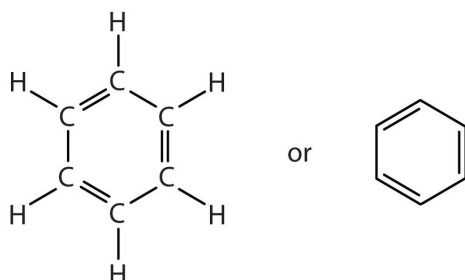
- a side rxn of hydrogenation results in some of the normally cis double bonds turning into trans bonds



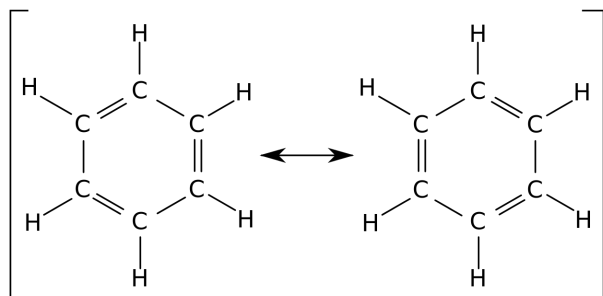
- trans fats behave very differently than cis fats, though they are still chemically unsaturated
  - > more like saturated fats
  - > raise "bad" cholesterol

## Aromatics

- organic molecules containing one or more benzene ring (C<sub>6</sub>H<sub>6</sub>)

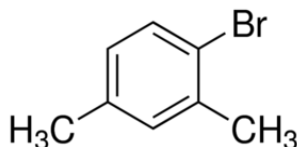


- unreactive
- distance between 2 C atoms
  - > less than single bond
  - > more than double bond
  - > somewhere between single & double bond
- electrons shared equally around ring
  - > **delocalized** = not associated with any one C atom
  - > written as **resonance structure**

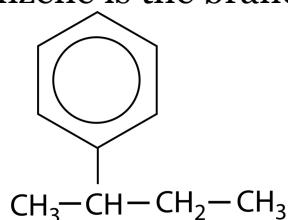


### Naming:

- number to give smallest numbers

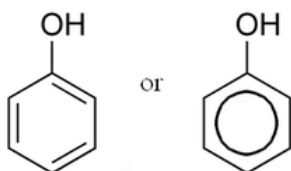


- if benzene is the branch = **phenyl** group



## Phenols

Phenols are chemical compounds consisting of a hydroxyl group ( $\text{—OH}$ ) bonded directly to an aromatic hydrocarbon group.



Phenols are named using the rules for aromatic compounds. With the  $\text{—OH}$  group given #1

Note: phenol is used rather than -benzene.

