

- \* Define alkyne
- \* Name alkynes using IUPAC naming rules
- \* Carbon atoms share 3 pairs of electrons, forming a triple bond
- \* Acetylene

- \* Alkynes have similar properties to those of alkanes and alkenes
- \* Naming is th



# Alkynes

# \*Sec. 1.12

## Benzene

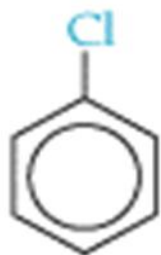
- \*Objectives
  - \*Recognize the versatile structure of a benzene ring
  - \*Recognized by Michael Faraday in 1825
  - \*Six sided structure with single and double mobile bonds
  - \*Resonance—a word used to describe the phenomenon in which no single Lewis structure can be used

# Structure and Nomenclature of Aromatic Compounds

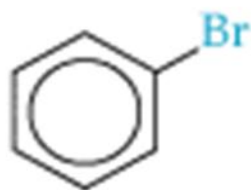
- \* Define and name aromatic hydrocarbons and aliphatic compounds
- \* Determine the difference between ortho, meta, and para distribution

- \* Benzene
- \* Named because thought to have strong aroma
- \* Now define as anything that has a benzene ring
- \* Aliphatic compounds—nonaromatic

\*One substituent...easy



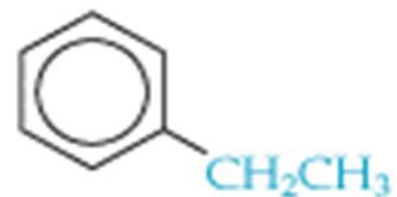
Chlorobenzene



Bromobenzene



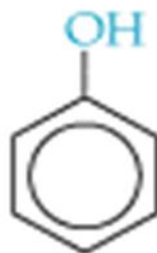
Nitrobenzene



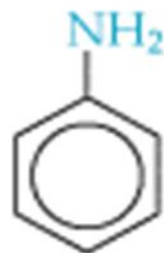
Ethylbenzene



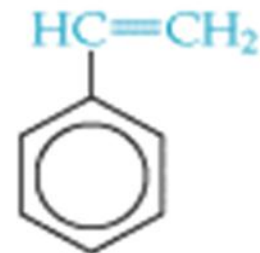
Toluene  
(Methylbenzene)



Phenol  
(Hydroxybenzene)



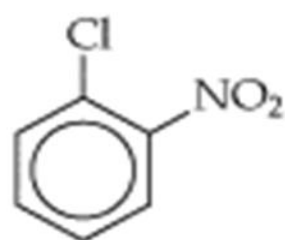
Aniline  
(Aminobenzene)



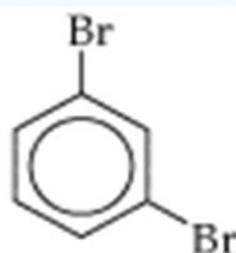
Styrene  
(Vinylbenzene)

- \* 2 substituents...2 different ways
- \* One way...same as before
- \* Other way...uses the terms ortho, meta, and para
- \* Ortho (1,2 distribution)
- \* Meta (1,3 distribution)
- \* Para (1,4 distribution)

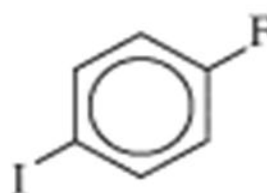
\* Naming



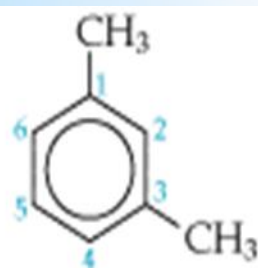
*o*-Chloronitrobenzene



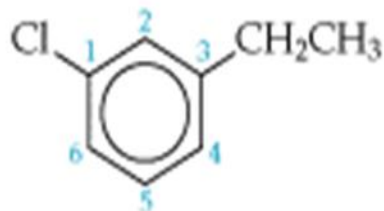
*m*-Dibromobenzene



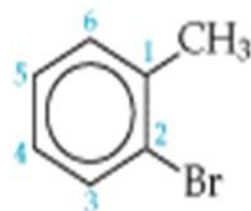
*p*-Fluoroiodobenzene



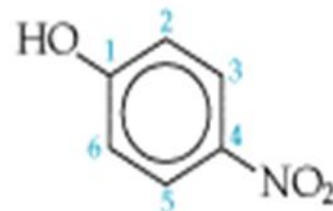
*m*-Xylene  
(1,3-Dimethylbenzene)



*m*-Chloroethylbenzene  
(1-Chloro-3-ethylbenzene)

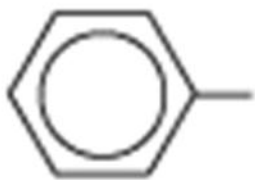


*o*-Bromotoluene  
(2-Bromotoluene)  
(1-Bromo-2-methylbenzene)

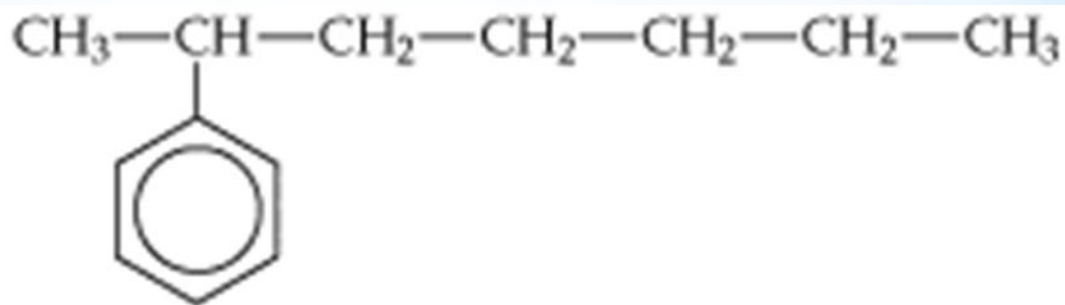


*p*-Nitrophenol  
(4-Nitrophenol)  
(1-Hydroxy-4-nitrobenzene)

- \* Sometimes Benzene rings attach to alkanes or alkenes
- \* Known as aryl groups
- \* Most common one is phenyl



Phenyl group



2-Phenylheptane

\*Sec. 13.14

\*Objectives

\*Discuss some of the uses of benzene

# Uses of Benzene and Benzene Derivatives



- \* Most comes from petroleum
- \* Used as a starting material
- \* Added to fuels to improve octane rating
- \* Cigarette smoke
- \* Very toxic
- \* In Nature..
- \* Tryptophan
- \* Vitamin K
- \* Folic acid

## \* Uses of Benzene