

# Aromaticity - Chapter 13

Note Title

2/11/2014

- Read Chapter 13.

Prototypical Aromatic Compound: Benzene  $C_6H_6$  (isolated from whale blubber)

Structure? 4 degrees of unsaturation (double bonds or rings), but less

Proposals:

reactive / more stable than an alkene.

1) Sir James Dewar



Wrong!

Dewar Benzene

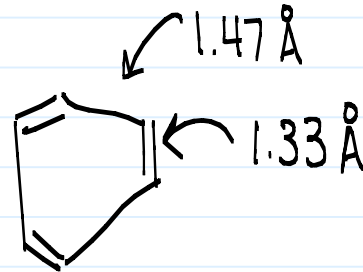
2) Albert Ladenberg



Wrong!

Ladenberg benzene

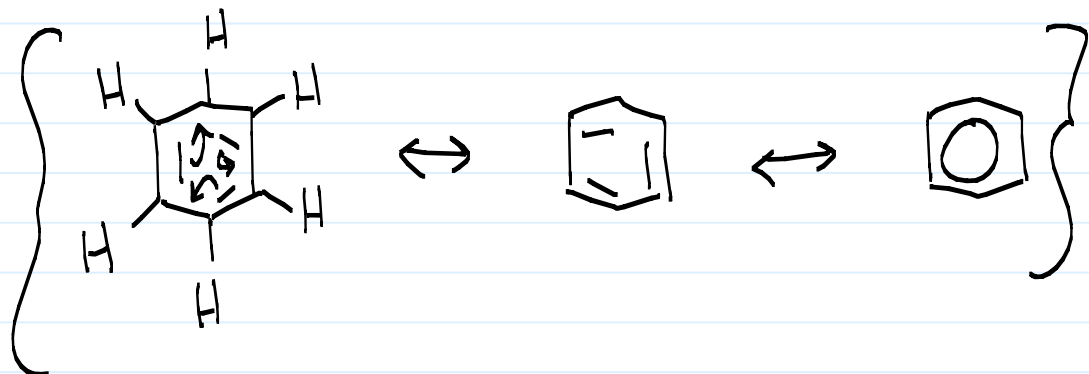
3) Friedrich Kekulé → Cyclohexatriene



Alternating single  
& double bonds

Almost right!

## Current Understanding of Benzene: (The Right Structure)



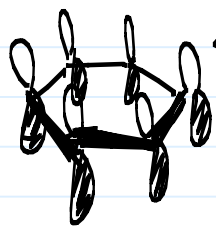
1) Regular hexagon

2) All C-C bond lengths = 1.39 Å

3) Each C →  $sp^2$  hybridized

Some double bond character  
between all C's!

## "Quick" Orbital Depiction:



← 2p orbitals (all parallel)

→ Orbital overlap among all neighboring C's.

↳ DELOCALIZATION OF ELECTRONS

↳ Circle of  $e^-$  density above & below ring

Delocalization = Stability

How much energy is delocalization worth?

