AROMATIC COMPOUNDS

Benzene and its structure was discovered in 1825 Loschmidt vs. Kekulé

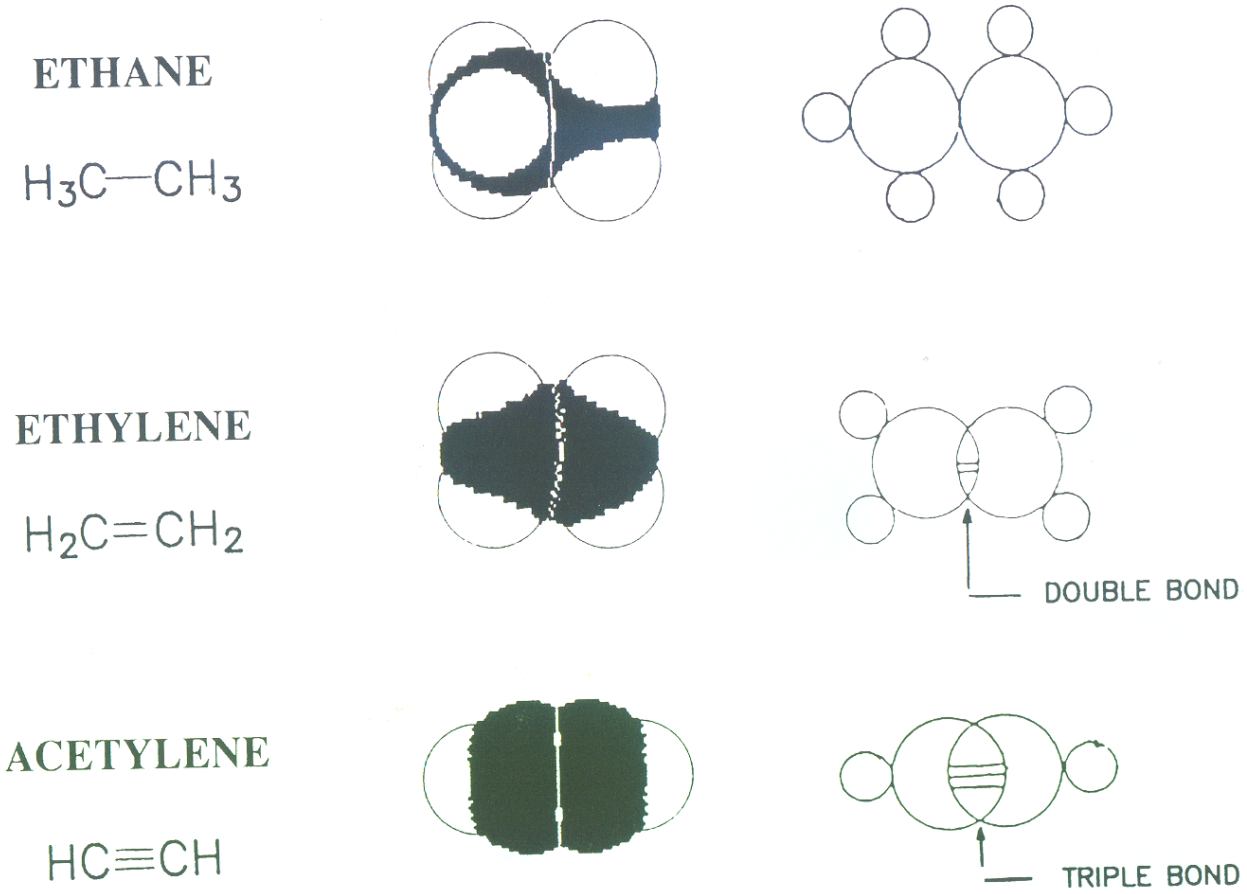


FIG. 2

AROMATIC COMPOUNDS

Benzene and its structure was discovered in 1825 Loschmidt vs. Kekulé

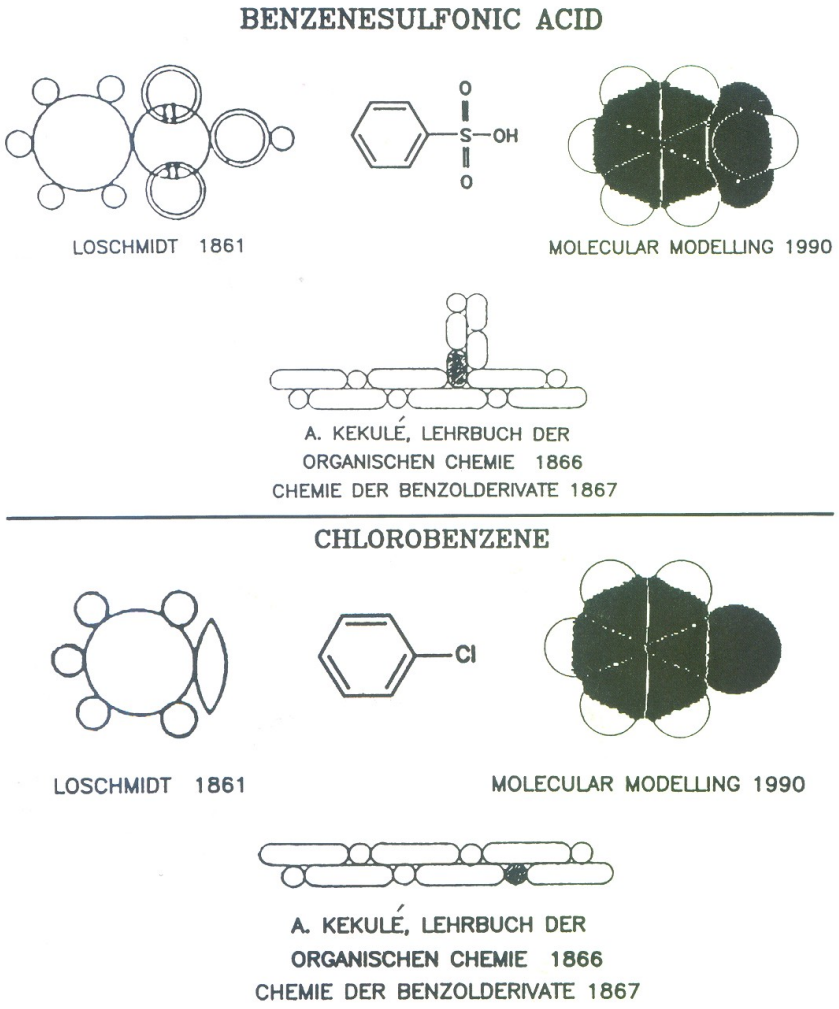


FIG. 4

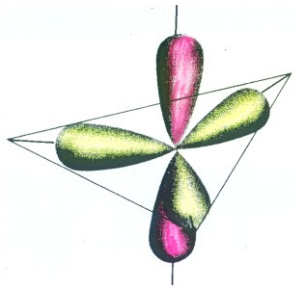
AROMATIC COMPOUNDS

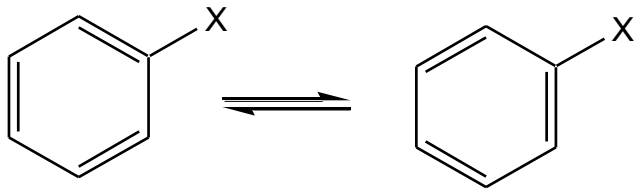
R E A C T I O N	Alkane	Alkene	Aromat
Burning	+	+	+ soot
Hydrogenation	-	+	+ difficult, high temperature, pressure catalyst
Oxidation by $KMnO_4$	-	+ addition	-
Br_2 (in CCl_4)	-	+ addition	-
Br_2 (hν or peroxide)	radikal substit.	+ addition	-
Br_2 (Fe or Al)	-	+ addition	+ substitution

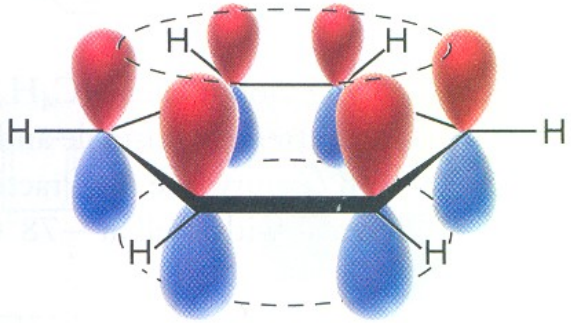
AROMATIC COMPOUNDS

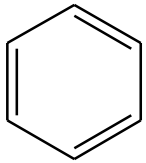
Aromaticity

Benzene and its structure was discovered in 1825 Kekulé vs. Loschmidt









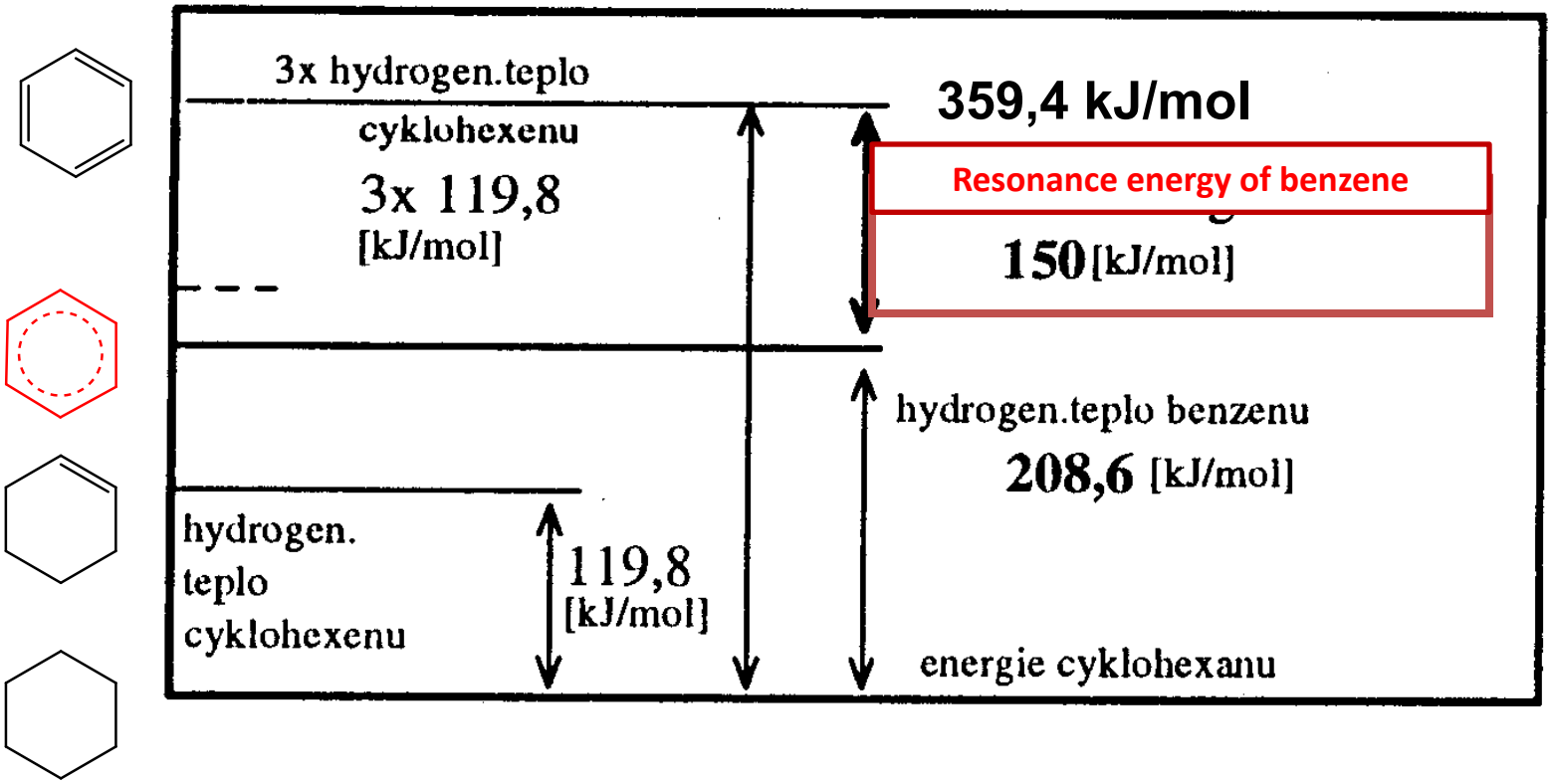
C — C 0,154 nm

C ═ C 0,134 nm

measured value of bond lenght
(all bonds have the same lenght)
0,139 nm

AROMATIC COMPOUNDS

Proof of the π-elektrones delocalization was given by hydrogenation heats measurement

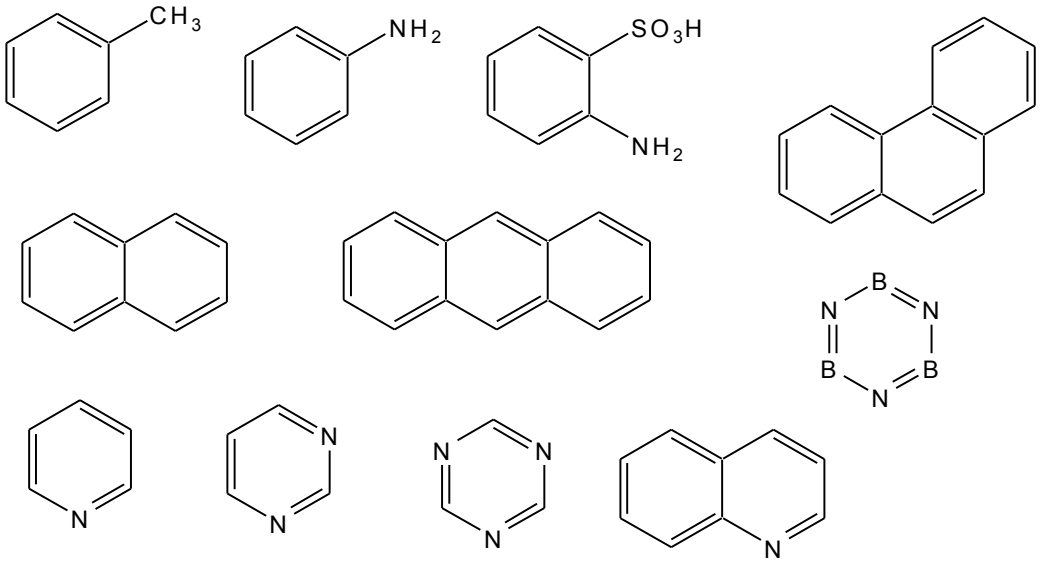


AROMATIC COMPOUNDS

AROMATIC STATE

Systeme of delocalized π- elektrones fulfiling the Huckel rule:

a) cyclic systemes
b) systemes with conjugated double bonds
c) having 4n+2π elektrones, where *n* can have value 0,1,2,3…)

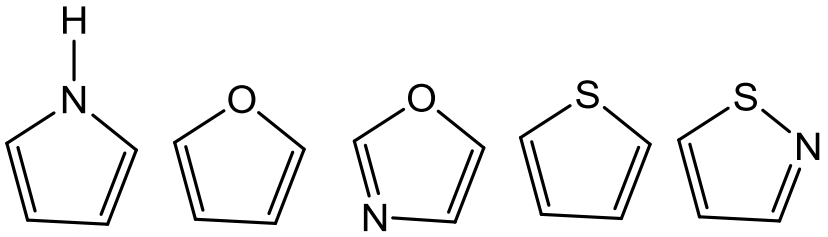


Benzoid aromates i.e.benzene, toluene and substituted benzene derivatives, fused aromatic hydrocarbons , as naphtalene, phenanthrene, anthracene, and also six-membered heterocycles, as pyridine, pyrimidine, 1,3,5-triazine etc.

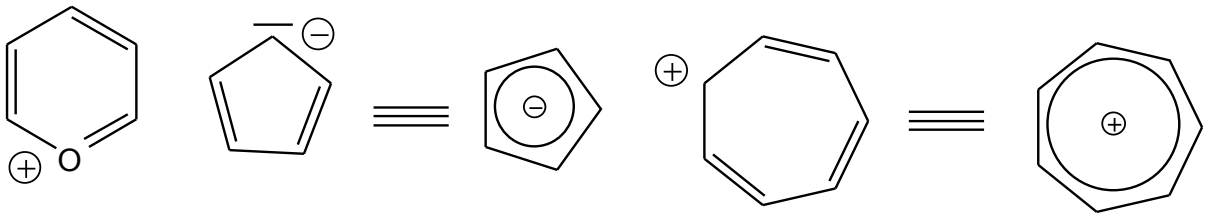
AROMATIC COMPOUNDS

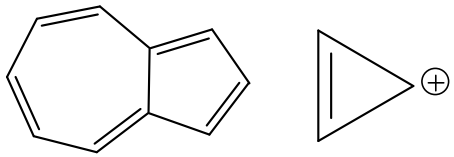
AROMATIC STATE

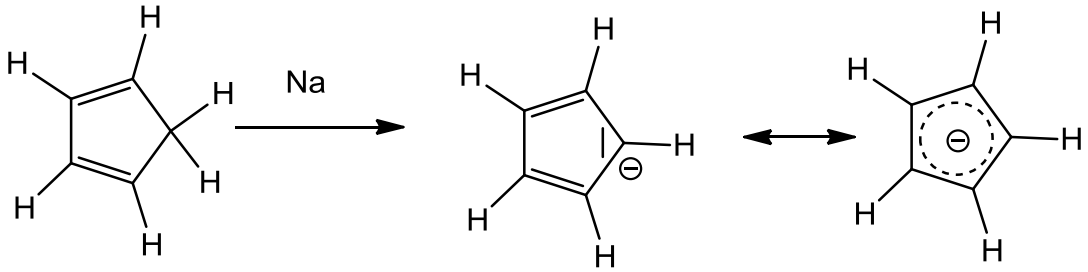
nonbenzoid aromates 1) five-membered heterocyclic compounds
2) anulenes
3) molecules having a charge (but fulfiling the rules of aromaticity aromaticity)



AROMATIC COMPOUNDS



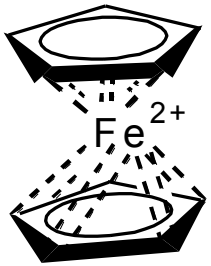


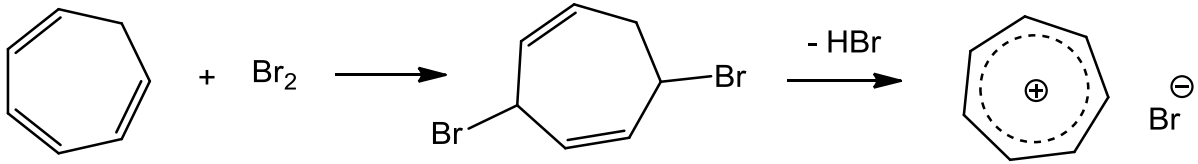


Unexpectedly acidic hydrogen at sp^3 carbon

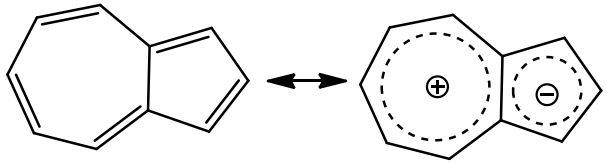
cyclopentadienide

ferrocene



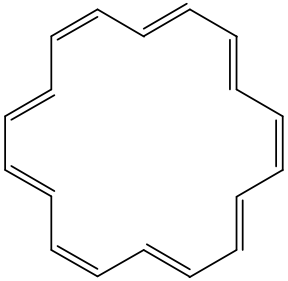


tropylium cataion



azulene

AROMATIC COMPOUNDS



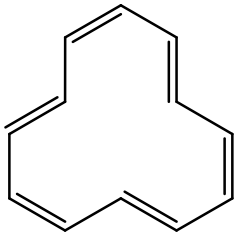
ANULENES (cyklic polyenes)

aromatic properties display only those fulfiling Huckel rule

[18]anulene

stabile are only those with

10, 14, 18, 30, ..π – electrones



[12]anulene

Is not aromatic