

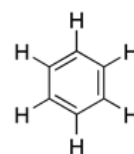
Aromatic Compounds

Historically aromatic compounds were organic compounds with an odour. Today aromatic compounds are defined as benzene (C_6H_6) and all carbon compounds that contain benzene-like structures.

Ex.

Although the molecular formula for benzene suggests 3 double bonds between three single bonds, empirical evidence shows:

(i) the ring is relatively unreactive ← we know multiple bonds are reactive

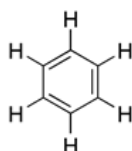


(ii) The C--C bonds are of equal length and strength
[EMPIRICAL EVIDENCE DOES NOT MATCH THEORY]

The evidence can only be explained if the **pi electrons** are delocalized (do not stay with any one carbon) and circle in a donut shaped cloud above and below the plane of the sp^2 C-C bonds.



or

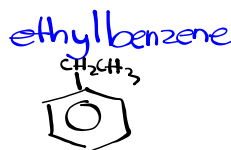
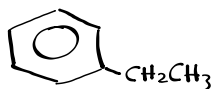


think multiple bonds

Substituted Benzenes

Mono- substituted benzene structures

Ex.



No number is needed for mono-substituted benzenes because all ring positions are identical.

Simple Di - substituted benzenes

Ex.

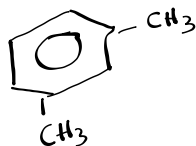


When two groups are attached to benzene, the ring is numbered to give the lower numbers to the branches.

1,2-dimethylbenzene or ortho-dimethylbenzene

The prefix meta is used for 1,3 di-substituted benzenes.

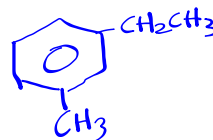
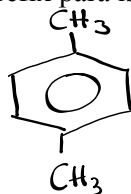
Ex.



1,3-dimethylbenzene or meta-dimethylbenzene

The prefix para is used for 1,4 di- substituted benzenes.

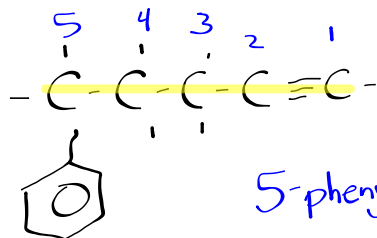
Ex.



1,4-dimethylbenzene or para-dimethylbenzene

When the benzene ring itself is considered as a branch, it is given the name *phenyl*

Ex.



5-phenyl-1-pentyne

