Brainbox learn easy

CHAPTER 13

HYDROCARBONS

The name aromatic is arised from Greek word aroma, which means pleasant smell, because most of these compounds possess pleasant odour.

- Aromatic compounds may be benzenoid or Non-benzenoid aromatic compounds.
- Aromatic compounds containing benzene ring are known as benzenoids and those not containing benzene ring are non-benzenoids.

Characteristics of aromatic compounds:

1. They must be cyclic and planar.

2. Complete delocalized π electrons must be present.

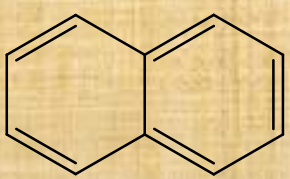
3. Must possess $(4n + 2)$ π electrons in the ring where n is integer.

Benzene

Cyclopentadienyl anion

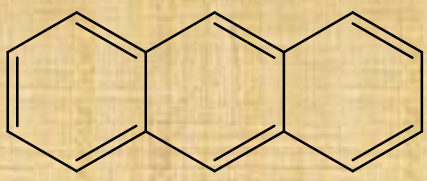
Cycloheptatrienyl cation

$(n = 1, 6\pi$ electrons$)$

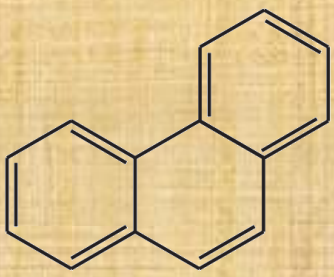


Naphthalene

$(n = 2, 10\pi$ electrons$)$



Anthracene

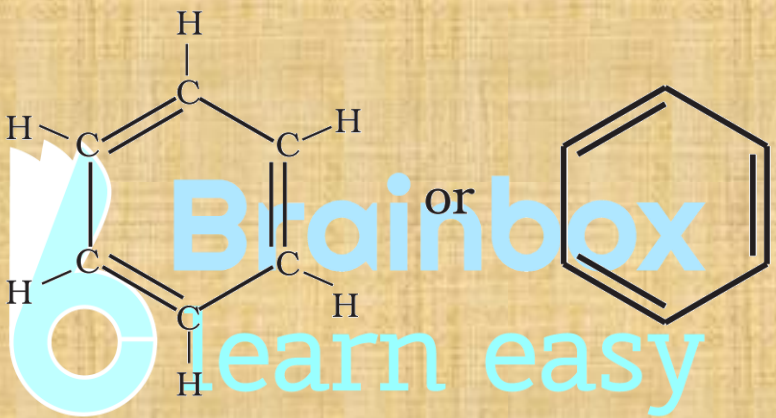


Phenanthrene

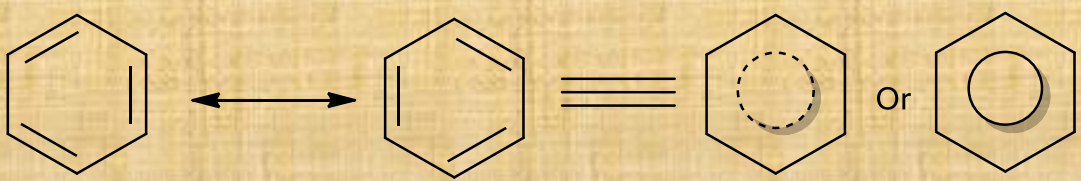
(n = 13, 14 π electrons)

Structure of Benzene:

Molecular formula of Benzene is C_6H_6. Kekule, proposed a cyclic structure, with alternate single and double bonds.



With above arrangement, two structures are possible for benzene. But experimental observation shows unique structure for benzene. This is explained by assuming benzene as resonance hybrid of both structures.



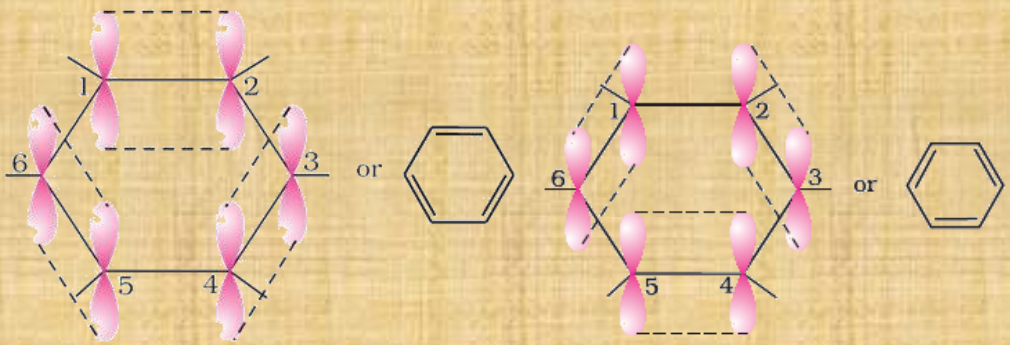


Fig. Structures shown as correspond to two Kekulé's structure with localised π bonds.

The delocalized π electron cloud makes it more stable.