

Aromaticity.

Aromatic compounds are thermodynamically stable homo or heterocyclic compounds.

The word aromaticity is derived from term aromatic which means ~~is~~ aroma (pleasant smell).

The study of aromaticity is important because it has importance in various ~~fit~~ fields such as pharmaceuticals, dyes, fertilizers agrochemicals fragrances.

* Characteristics properties of Aromatic Compounds:-

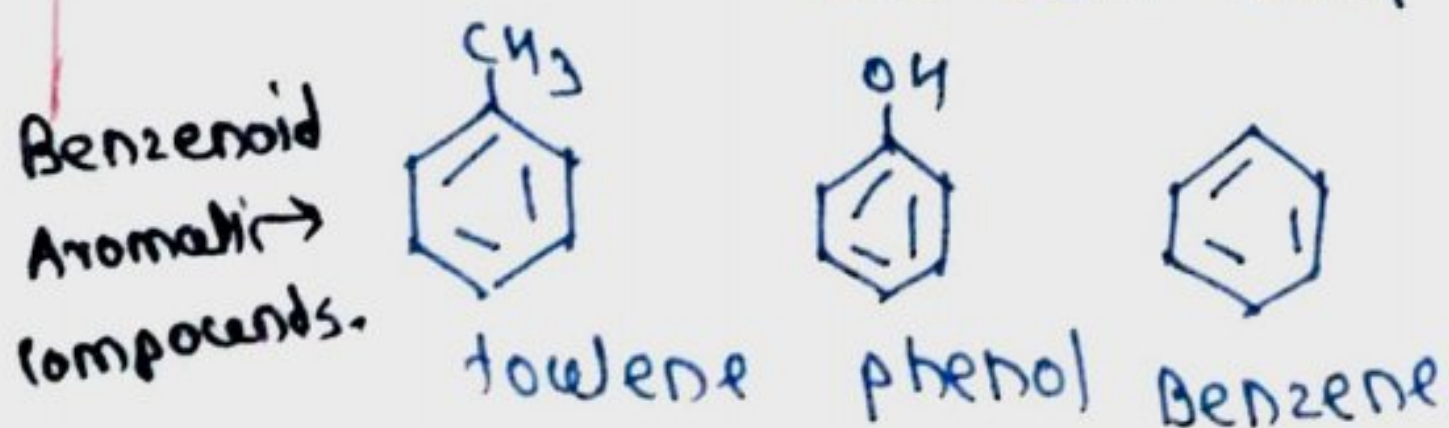
1. Aromatic compounds have high percentage of carbon
2. Aromatic compounds burns with sooty flame.
3. Aromatic compounds are cyclic in nature.
4. They contains double bond still they do not show test for unsaturation.
5. They undergoes substitution reaction.
6. Aromatic compounds are generally stable compounds.

* Classification of Aromatic Compounds (Important terms).

* Aromatic Compounds:- The compounds which are more stable than its acyclic analog are called as aromatic compounds. They are cyclic, Planer (sp^2 hybridized) compounds containing $(4n+2)\pi$ electrons. Aromatic compounds are divided into following groups:

1. Benzenoid aromatic compounds:- The aromatic compounds which contains benzene ring in their structure are called as Benzenoid aromatic compounds.

2. Non Benzenoid aromatic compounds:- The aromatic compound lacking benzene ring in their structure are called as non Benzenoid aromatic compounds.



3 Aromatic ions :- some cyclic cations and anions may act as aromatic compounds.



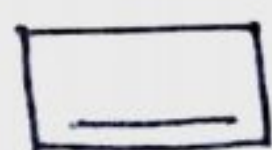
cyclopropyl cation



cyclopentadienyl anion

* Non Aromatic compounds :- The compounds which are equally stable with its acyclic analog are called as non aromatic compounds.

Non aromatic compounds are equally stable non planar in nature



cyclobutene.

* Antiaromatic compounds :-

The compounds which are less stable than its acyclic analog is called as antiaromatic compounds.

Antiaromatic compounds are cyclic, planar compounds containing $4n$ π -electrons.



cyclobutadiene



cyclopentadienyl cation.

* Pseudo Aromatic compounds :-

The compounds which do not possess aromatic properties but are equally stable with aromatic compounds are called as pseudo aromatic compounds.

The organic compound which exhibits some characteristics of organic compound but does not have all characteristics of aromatic compound.

eg.

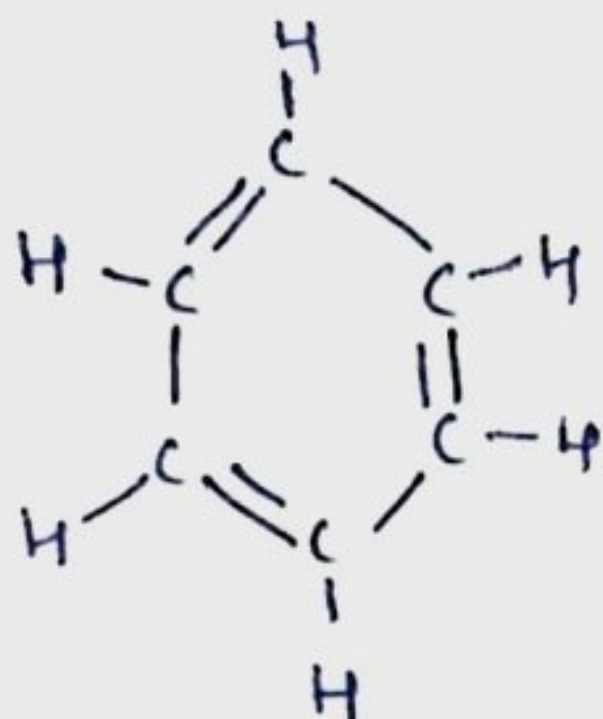


pentalene.

Modern views about structure of ~~compound~~ Benzene.

Benzene is the simplest aromatic compound isolated by scientist Kekule

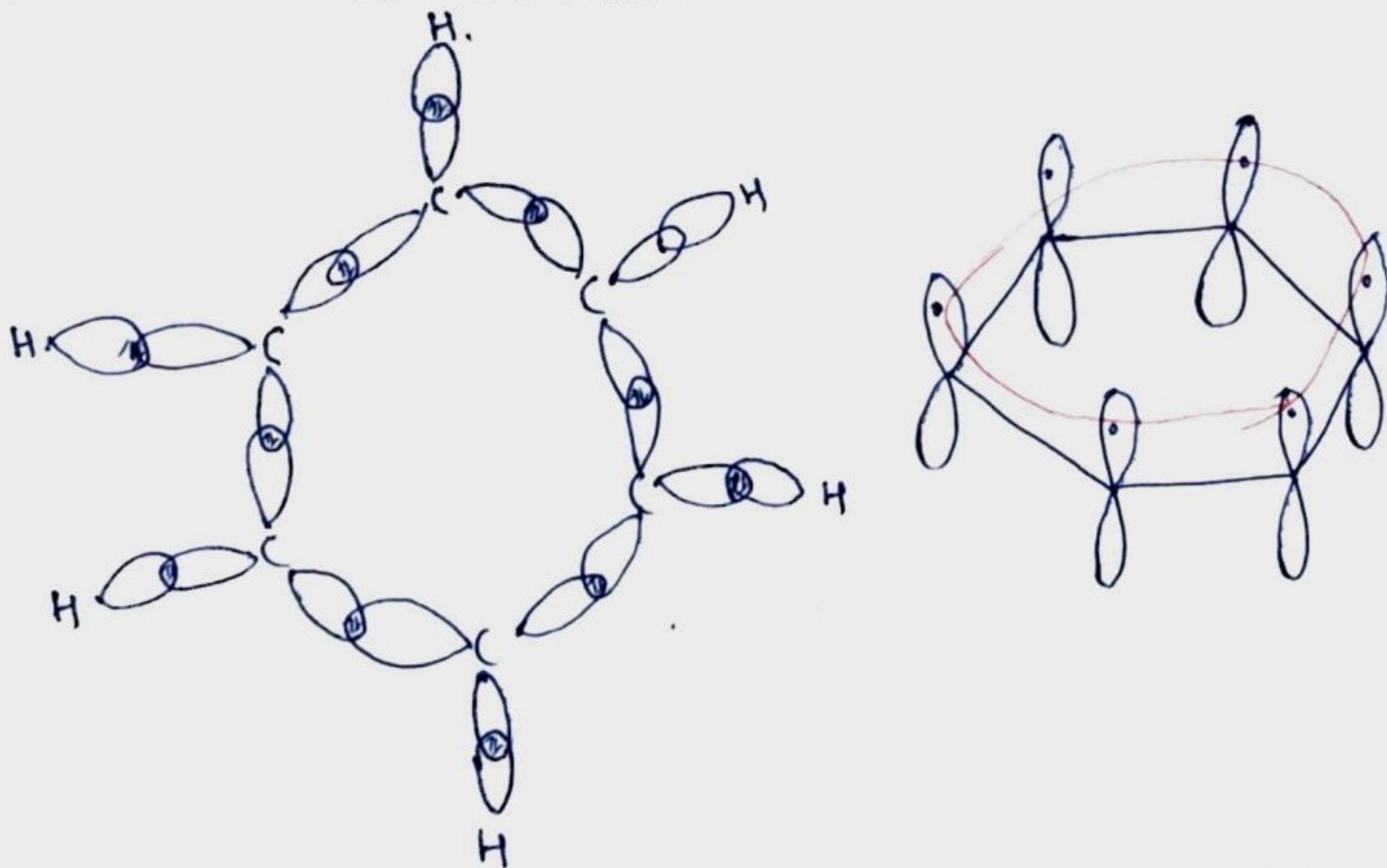
The structure of Benzene can be represented as,



In benzene the alternate single & double bonds are continuously changing the position.

Molecular orbital diagram for benzene:-

In benzene each carbon atom is linked with 2 carbon and 1 hydrogen atom. Therefore hybridization of each carbon atom is sp^2 therefore structure of Benzene is planar.



Resonance structures of benzene:- cyclic, planar structure of benzene shows phenomenon of resonance, where electrons in unhybridised p-orbital gets delocalised.

Resonance structures of benzene can be represented by

