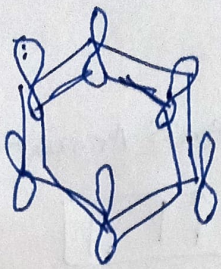
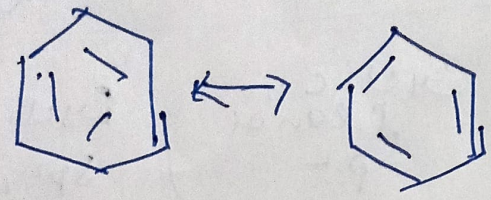
Aromaticity Benzene



The p-orbital are perpendicular to plane, all bonds lie in same plane



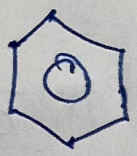
(ERS) Equivalent Resonating Structure.

No. of Resonating structure of Benzene: (2)

No of σ bond = 6 + 6 = 12 (6 from C-C, 6 from C-H)

No of π bond = 3

Due to resonace all bonds in C-C have Equivalent Bond length. ERS



Aromaticity: $(4n+2)$ e⁻ Huckle Rule

Conditions for Aromaticity:

↳ Follow Huckle Rule $(4n+2)$ π e⁻

↳ All bond should be in same plane for reso.

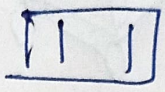
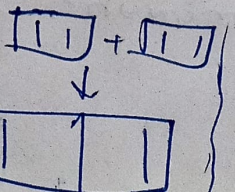
↳ (All Carbon Should be Sp^2)

↳ Compound Should be Cyclic.

↳ Quasi Aromatic are also aromatic.

Ex  $(4n+2)$ $n=1 \Rightarrow (6\pi^{\cdot})$

Non-Aromatic :

Characteristics	Aromatic 	Anti Aromatic 	Non-Aromatic 
Structure	Cyclic, planar sp^2	Cyclic, planar sp^2	Cyclic/acylic sp^2, sp, sp^3
No. of πe^-	$(4n+2)\pi e^-$	$4n\ \pi e^-$	Any πe^-
MOT	Upaired e^- in bonding MO.	Some π-e^- in non-bonding Mol. orbital.	πe^- in bonding & Non-bonding M.O.
Overlapping	Favourable Overlapping of p-orbital	Unfavourable Overlapping of p-orbital	Simple over lapping like alkenes
Resonance Energy	Very high	Zero.	4 ± 8 kcal/Mol
Stability	High Stability	Unstable	Normal Stability
Characteristic Redn	Electrophilic Aromatic Subst.	Dimerization to gain stability 	Electrophilic Add^n/ red^n like normal alkenes.