

AROMATIC

① is spiral copy ② 33

Aromatic

Antiaromatic

Non-aromatic

→ Aroma - Good smell

→ More stable

→ Least stable

→ In between

→ Cyclic

→ Cyclic

→ Cyclic

→ Planar

→ Planar

→ Non-planar

→ sp^2

→ sp^2

→ sp^3 (one or two position atleast) (Rest all sp^2)

→ Conjugation

→ Conjugation

→ Conjugation break.

Huckel's rule -

→ $(4n+2) \pi e^-$ ✓✓

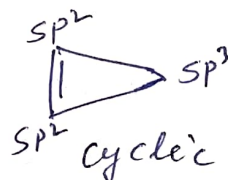
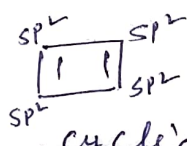
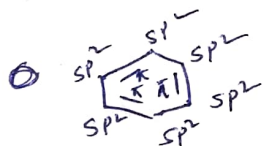
$(4n+2) \pi e^-$

→ $(4n) \pi e^-$ ✗✗

→ ✗✗

$n = 0, 1, 2, 3, 4, \dots$

eg



- Cyclic
- Planar
- $\pi - \sigma - \pi$

- cyclic
- Planar
- $\pi - \sigma - \pi$

- Non-planar
- break

odd no. of π -bond

$(4n+2) \pi e^- = 6 \pi e^-$

$(4n+2) \pi e^- = 4 \pi e^-$ → Non-aromatic

⇒ $4n+2 = 6$

⇒ $4n+2 = 4$

⇒ $4n = 6-2$

⇒ $4n = 4-2$

∴ $n = \frac{4}{4} = 1$

∴ $n = \frac{2}{4} = \frac{1}{2}$ (fractional)

→ do not follow $(4n+2) \pi e^-$ rule

(Huckel's rule)

→ Aromatic

→ $4n \pi e^- = 4 \pi e^-$

⇒ $4n = 4$

∴ $n = \frac{4}{4} = 1$ ✓

→ It follows $(4n) \pi e^-$ system

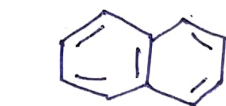
→ Anti Aromatic

Stability \rightarrow Aromatic > Non-aromatic > Anti-aromatic
 (Odd no. of π -bond) (even no. of π -bond)

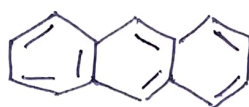
Reactivity \rightarrow Aromatic < Non-aromatic < Anti-aromatic
 (Diamagnetic) (Paramagnetic)

Aromatic # Anti aromatic # Non-Aromatic
 (unpaired e)

\rightarrow



\rightarrow Cyclic
 \rightarrow sp^2
 \rightarrow Planar
 \rightarrow π - σ - π
 \rightarrow Odd no (5 π -bond)

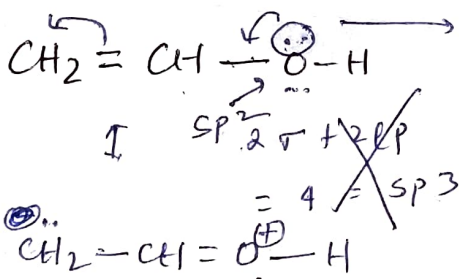


\rightarrow 7- π bond
 \rightarrow Aromatic

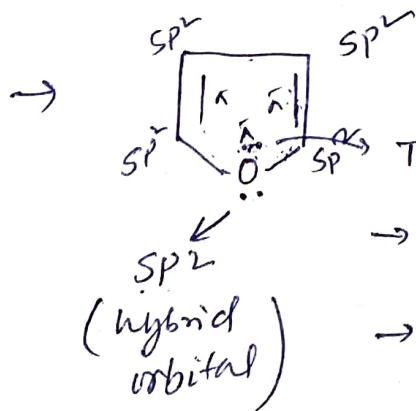


\uparrow sp^3
 \rightarrow Non-Aromatic

#



Unhybrid (pure p-orbital)
 \rightarrow Participate in conjugation



This sp^2 present in unhybrid p-orbital

\rightarrow If used in resonance

\rightarrow behaves like π -bond.

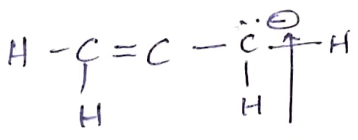
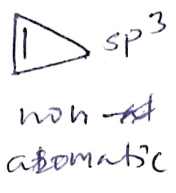
\rightarrow 3 π -bond (odd)

\rightarrow π - σ - π / π - σ - \ominus conjugation

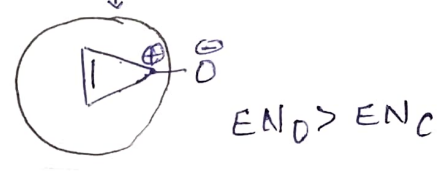
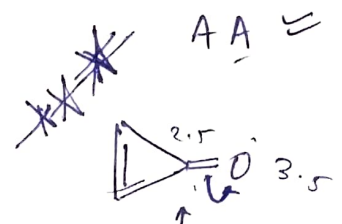
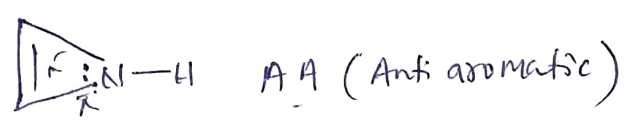
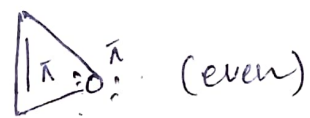
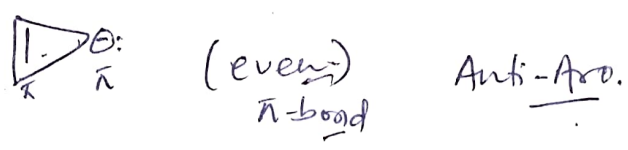
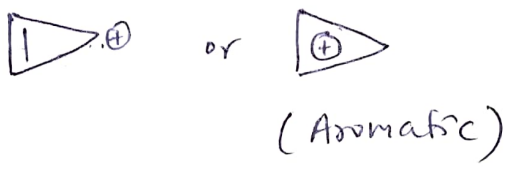
\rightarrow Planar

\rightarrow Aromatic

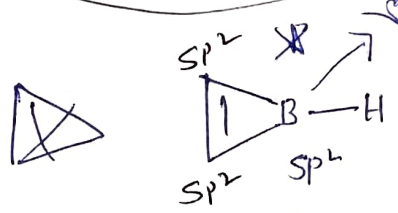
\checkmark



behaves like \bar{n} -bond.



Aromatic (more stable)



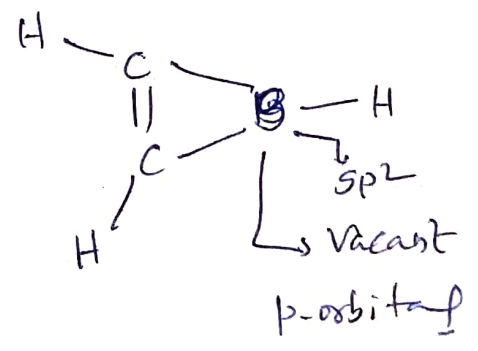
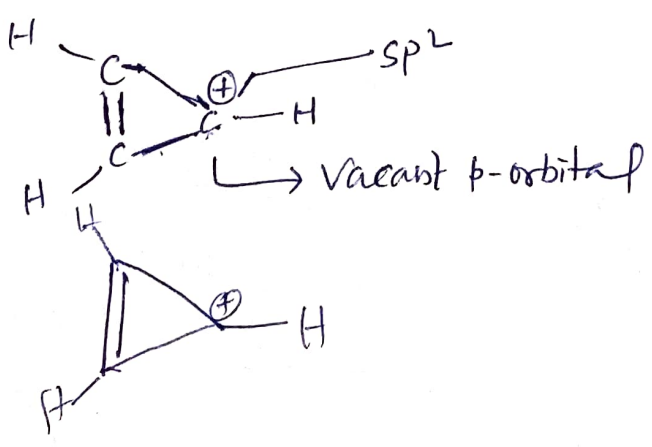
↳ It contains
vacant p-orbital

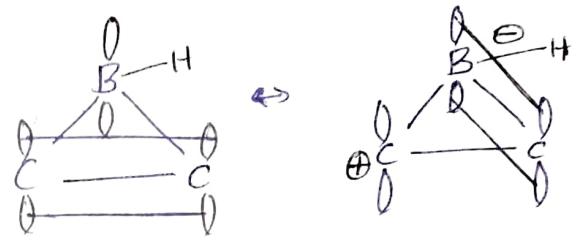
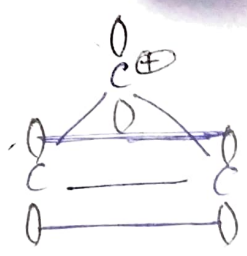
→ Aromatic

$C^+ = B$
 $z = 6$ $z = 5$
 $e = 5$ $e = 5$
 sp^2 sp^2

Vacant p Vacant p

More explanation

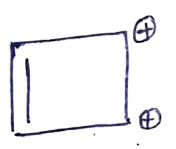
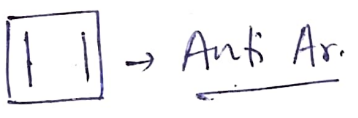




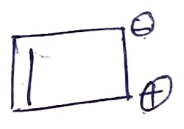
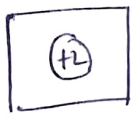
Conjugation system

$\pi - \sigma - \oplus$
or
 $\pi - \sigma - \text{vacant orbital}$

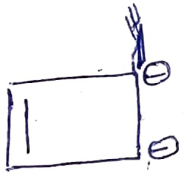
$\pi - \sigma - \text{vacant orbital}$



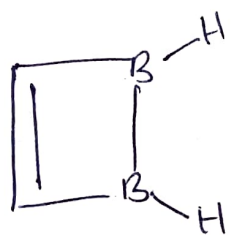
Aromatic or



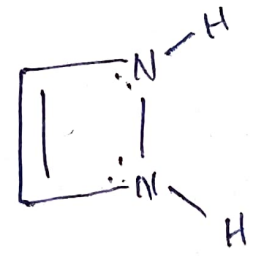
Anti aromatic



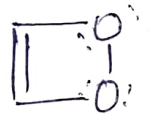
Aromatic



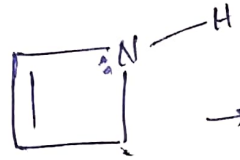
→ Aromatic



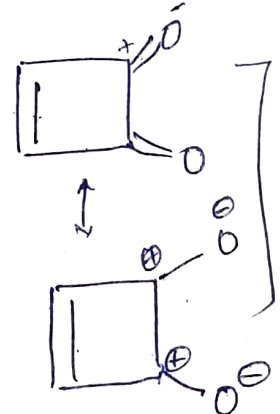
→ Aromatic



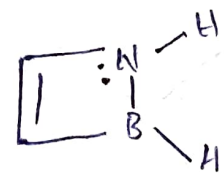
→ Aromatic



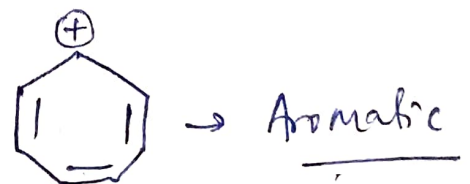
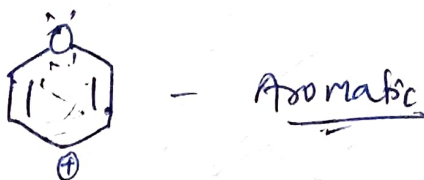
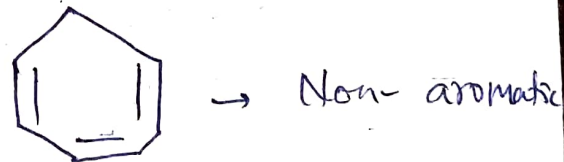
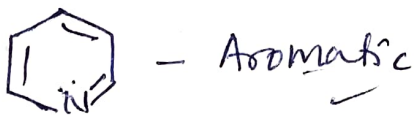
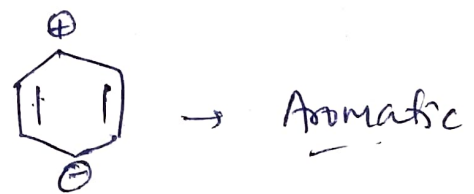
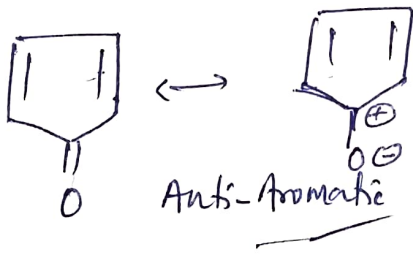
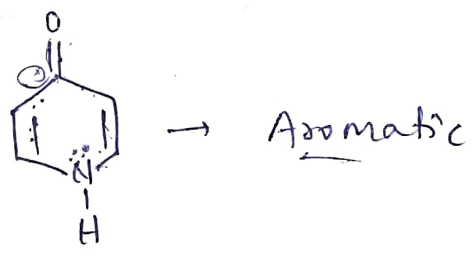
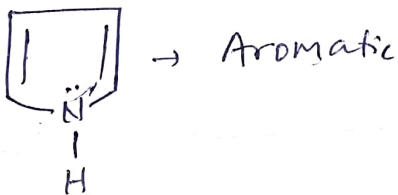
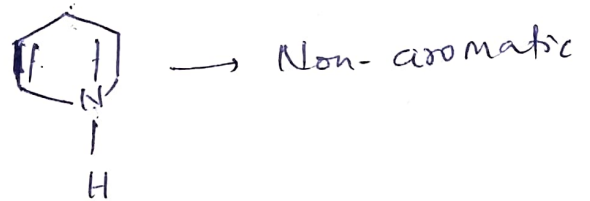
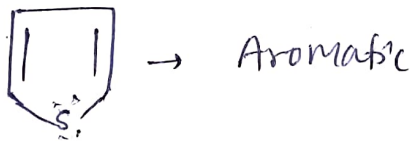
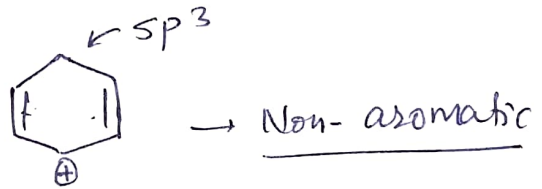
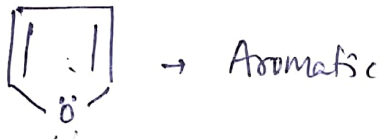
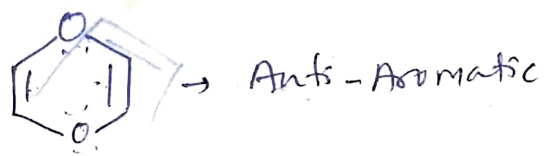
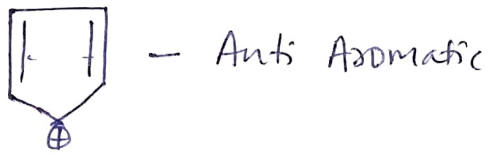
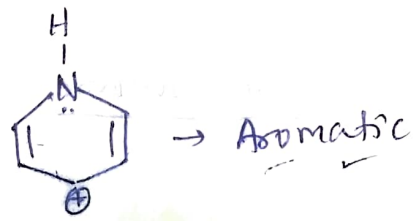
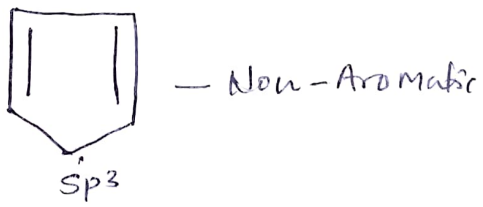
→ Non-aromatic

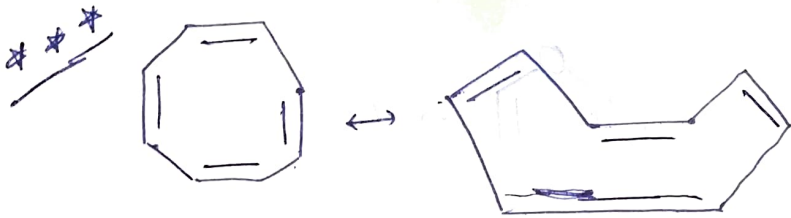
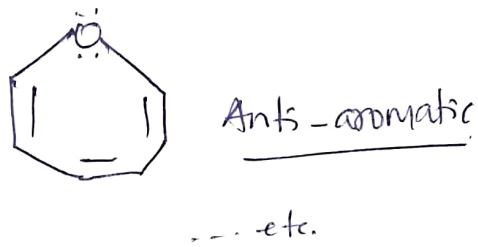
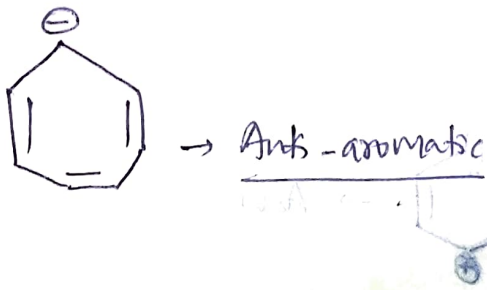


Aromatic



Anti aromatic





non-planar
non-Aromatic

* All sigma bonds are not equal.
/ It has different C-C bond.

