

3

M.H. Khan D2(S) 14-5-20 (THQ)

Page No.

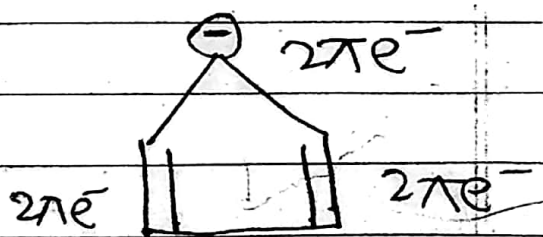
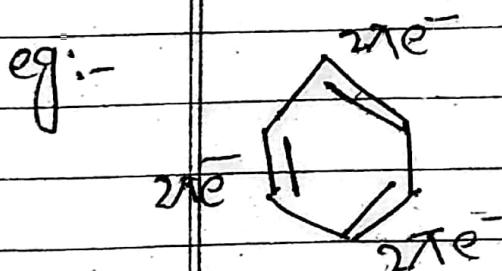
Aromatic Compound

time = 11:40 - 12:30, Marwan college,

Aromaticity :- or Hückel's rule

Condition for aromatic comp.

- i) Compound must be cyclic.
- ii) Compd. must be co-planar.
- iii) It obey Hückel's rule of aromaticity $(4n + 2\pi e^-)$ where $n = +ve$ integer not -ve fraction
- iv) No. of $\pi e^- = 2 \times \text{no. of } \pi \text{ bond}$.
- v) When -ve charge or lone pair separated from double bond by single bond then -ve ~~charge~~ ~~charge~~ charge and lone pair acts as $2\pi e^-$
- vi) If +ve charge present at π -bond then $\pi e^- \downarrow = \text{No. of } +ve \text{ charge}$



- Cyclic
→ Co-planar (sp^2)
→ No. of $\pi e^- = 6\pi e^-$
 ~~$= 4\pi + 2\pi e^-$~~
 $4n + 2\pi e^- = 6\pi e^-$
 $n = 1$

→ Cyclic
→ Co-planar
→ No. of $e^- = 6\pi e^-$
 $4n + 2\pi e^- = 6\pi e^-$
 $n = 1$

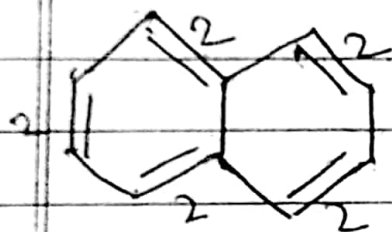
then decrease selection then to
no. of +ve charge.

$$\text{Or, } 4n = 6\pi e^- - 2\pi e^-$$

$$= 4\pi e^-$$

$$n = \frac{4\pi e^-}{4\pi e^-} = 1$$

i.e., $n = +ve$



→ Cyclic

→ Co-planar

$$\rightarrow 10\pi e^- = 4n + 2\pi e^-$$

$$4n = 8\pi e^-$$

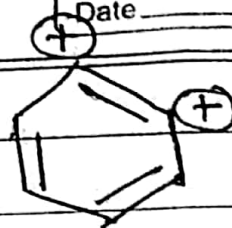
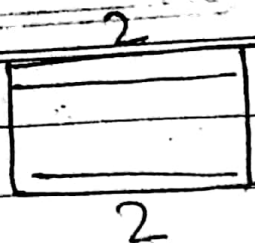
$$n = 2$$

* Anti aromatic compound

Condition for anti aromatic compound.

- i) Compd. must be cyclic
- ii) Compd. must be co-planar (sp^2 hybrid)
- iii) Obey Hückel's rule
- $4n\pi e^-$ rule
- $n = +ve$ integer not $-ve$ fraction

eg:-

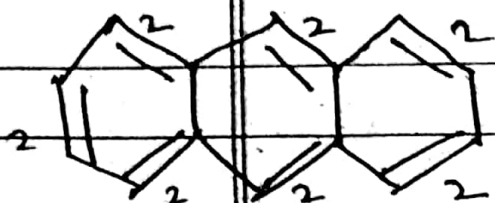


- Cyclic
- sp^2 (coplanar)
- $4n\pi e^- = 4\pi e^-$
- $n = \frac{4\pi e^-}{4\pi e^-} = 1$

- Cyclic
- sp^2
- no. of πe^-
- $= 6 - 2 = 4\pi$
- $n = \frac{4\pi e^-}{4\pi e^-} = 1$

i.e., +ve Integer
hence anti aromatic

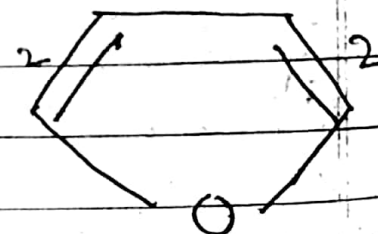
Q:- Write 7 example of aromatic and anti aromatic compound



$$14\pi e^- = 4n + 2\pi e^-$$

$$4n = 12\pi e^-$$

$$n = 3$$



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

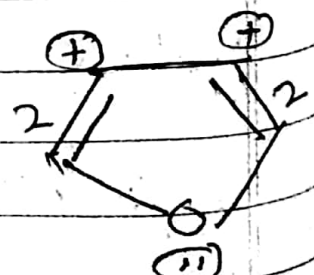
$$= 4n$$

Aromatic



$$8\pi e^- = 4\pi e^-$$

$$n = \frac{8\pi e^-}{4\pi e^-} = 2$$



$$6 - 2 = 4$$

$$4n\pi e^- = 4\pi e^-$$

$$n = 1$$

Antiaromatic