Rules for Drawing Resonating Structures - II

Course on General Organic Chemistry for Class XI

SURENDRA K MISHRA • Lesson 18 • Sept 6, 2021

HW (Theory Copy)

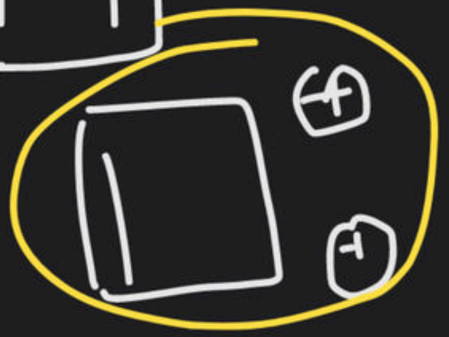
(4) Non

(No Conjugation)

(5) Anti

(4π e⁻β)

(6) Aromatic

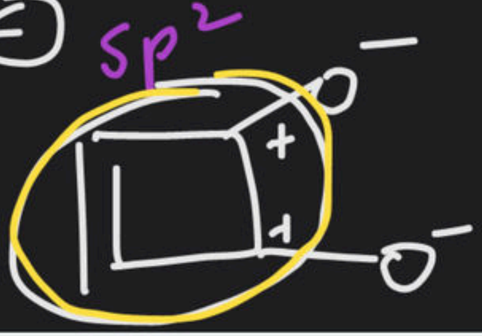


(2π e⁻λ)

(7) Aromatic

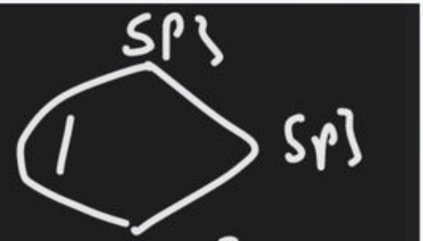
(6π e⁻β)

(8)

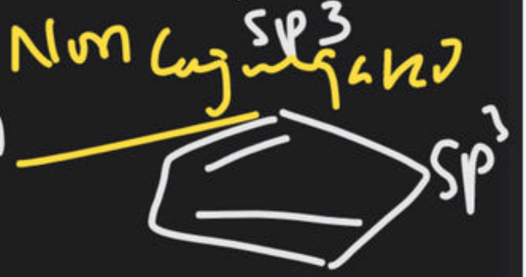


Aromatic

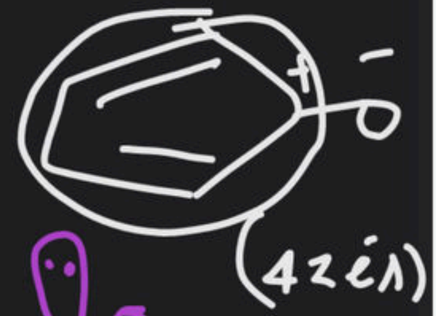
(9) Non



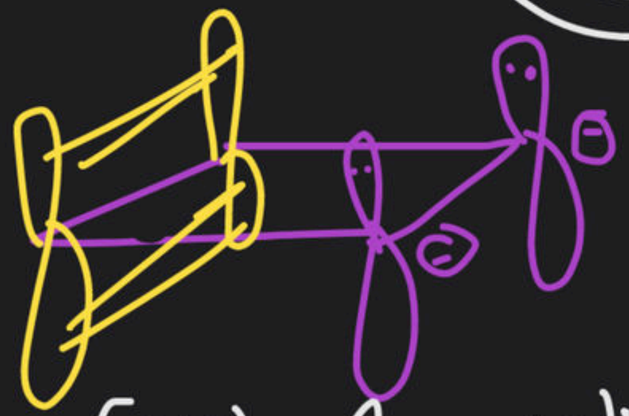
(10)



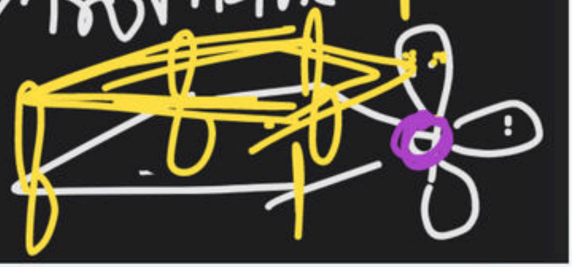
(11) Anti



(4π e⁻λ)



(12) Aromatic



(13) Aromatic

(14) ″

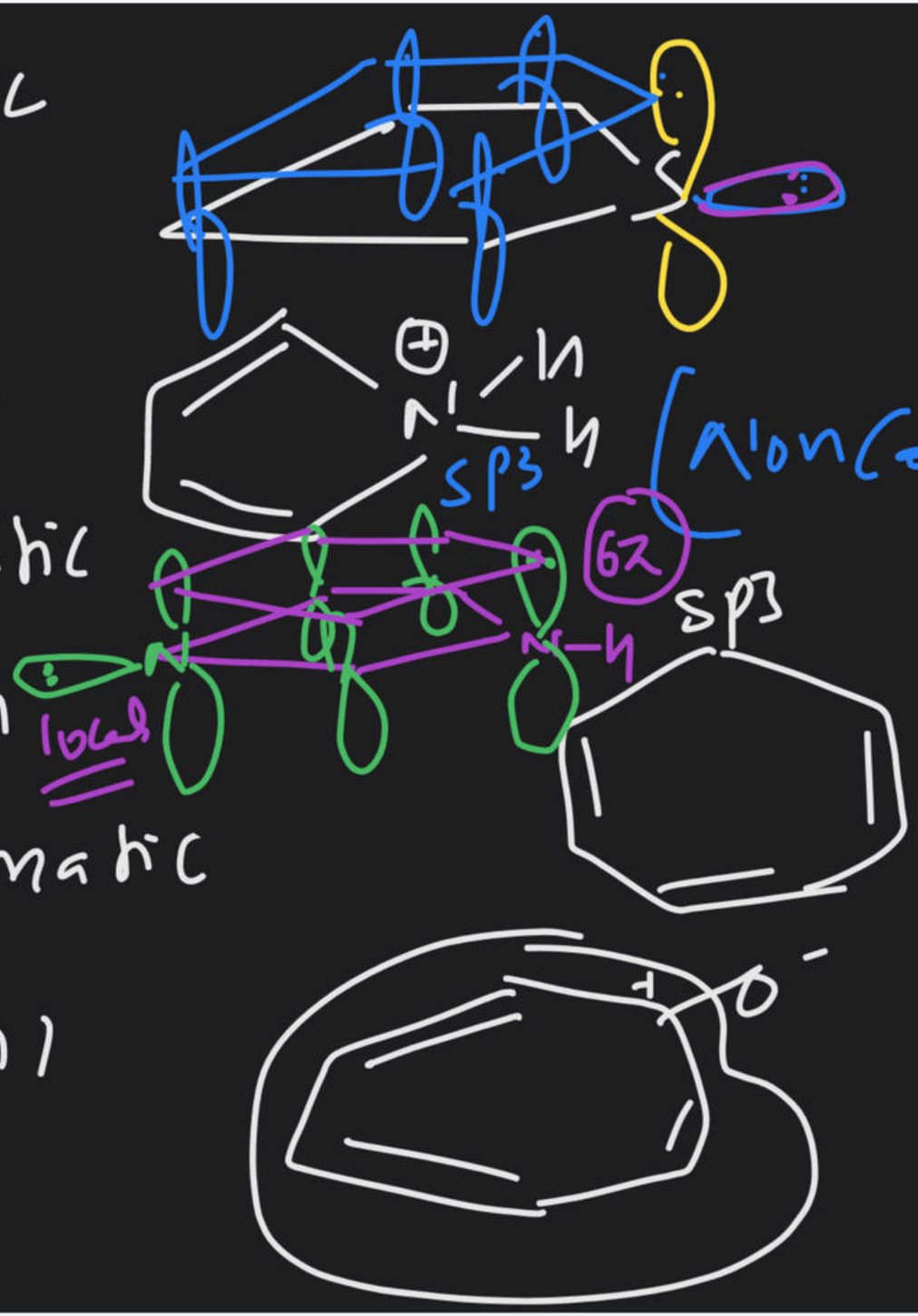
(15) Non Aro

(16) Aromatic

(17) Non

(18) Aromatic

(19) ″



(A) Aromatic

(B) Anti Aro

(C) Non Aro

(Non Conjugated)

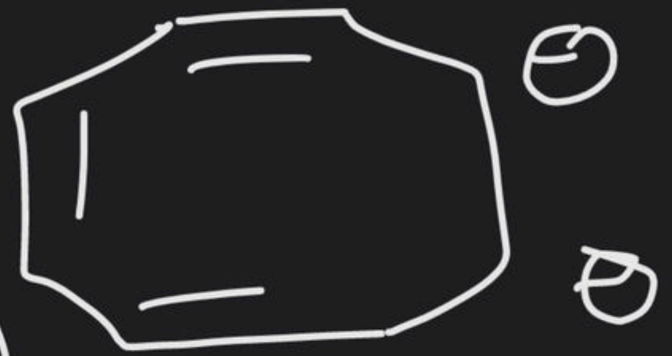
(20) Aromatic

(21) Non Aromatic

(a) (Tub shaped)
(b) Non planer
(c) COT (Cyclo Octa Tetraene.

(22) Aromatic (Hückel)

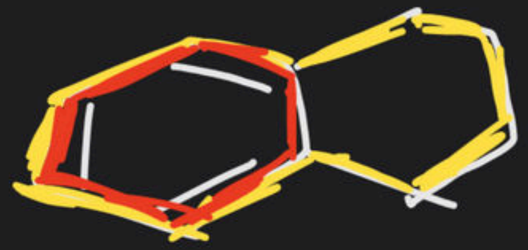
(23) Aromatic (Hückel)



(24) Aromatic (Hückel)

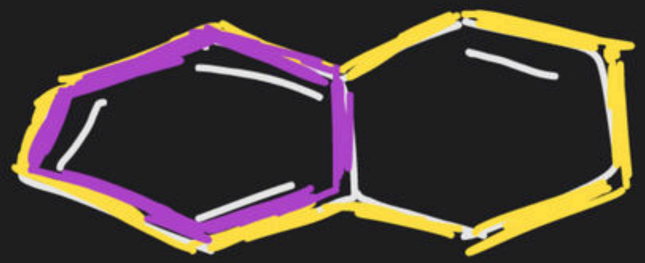
(25) Aromatic

(26) Aromatic



(27) Aromatic

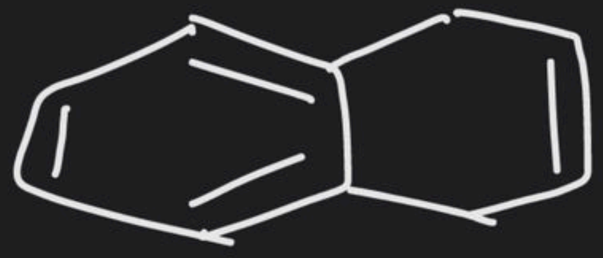
2015 IIT Advance



(A) Aromatic
(B) Non Aromatic
(C) Anti Aromatic

(28) Aromatic

MCQ



(29)

(Octet) (Anti Aromatic)

(30) Aromatic (10 π e⁻s)

(31) Aromatic (14 π e⁻s)

(32) " (14 π e⁻s)

(33) " (10 π e⁻s)

MFM

(34) Non Aromatic

(35) Aromatic

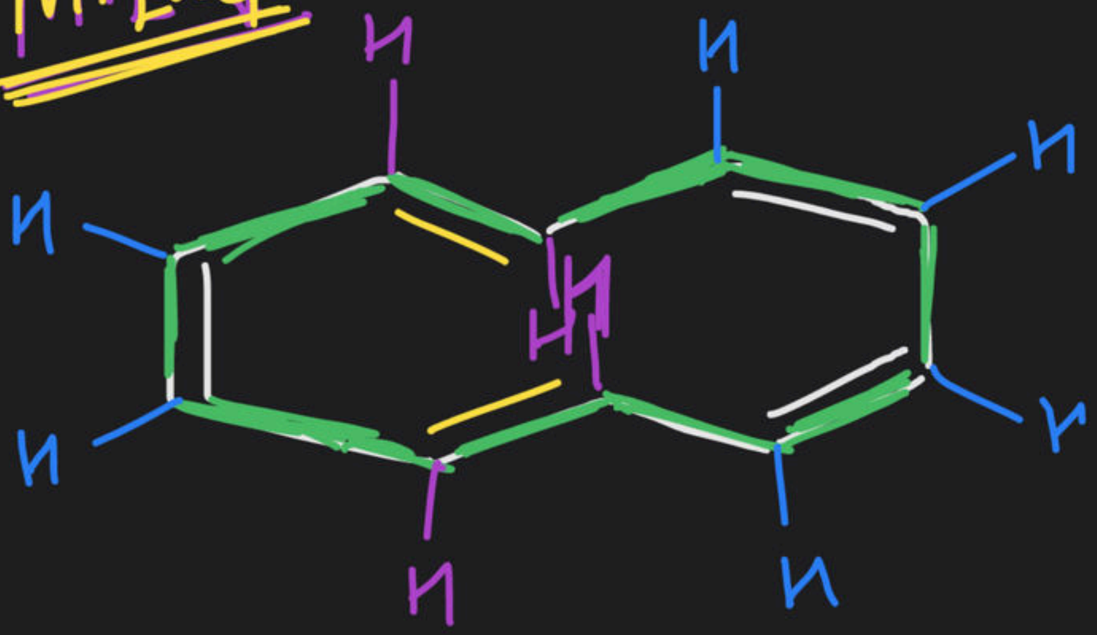
(36) Non Aromatic

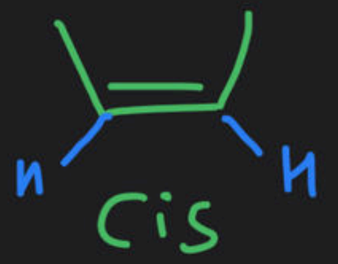
16 π e⁻s

(37) Aromatic

(38) Aromatic

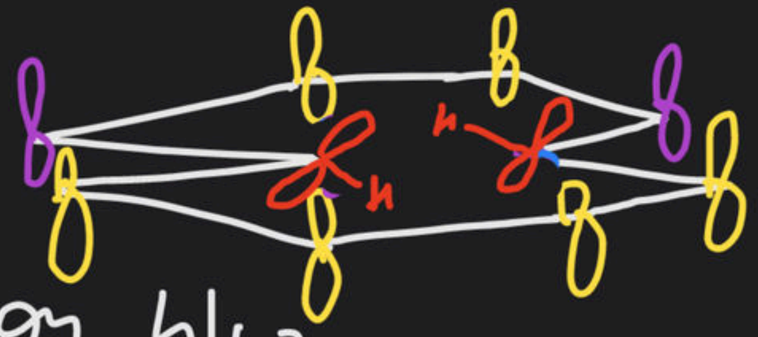
M.Imp





(*) Non Aromatic

(*) Non planer due to repulsion b/w Two trans intervening H atoms.



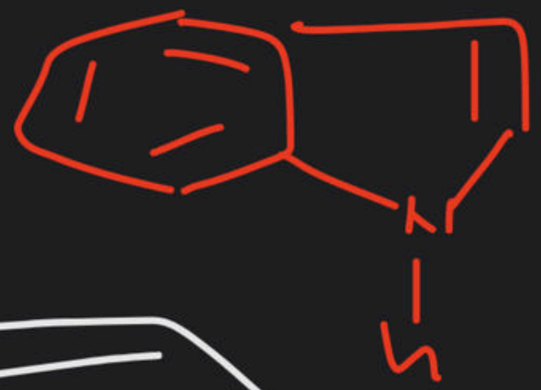
(37) 10 H. No.

(IAS):

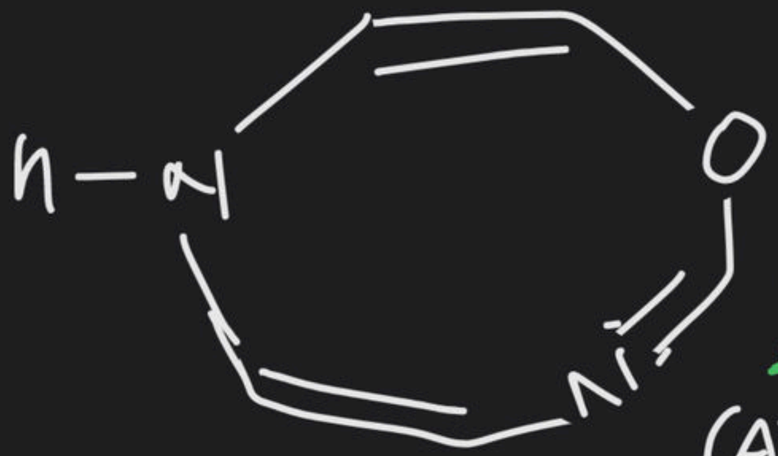
(20) Prove that A_n (n ≥ 4) is not abelian

(39) Pyridine

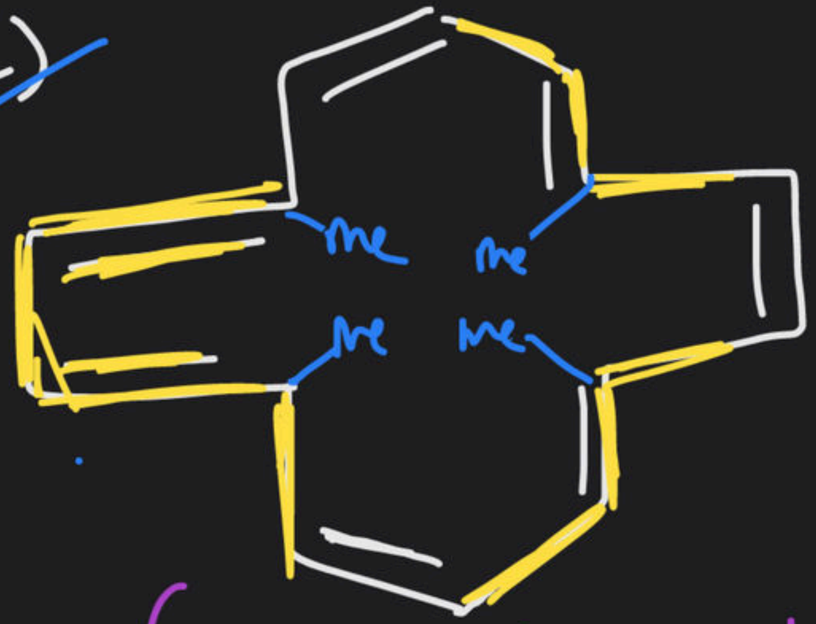
(40) Indole



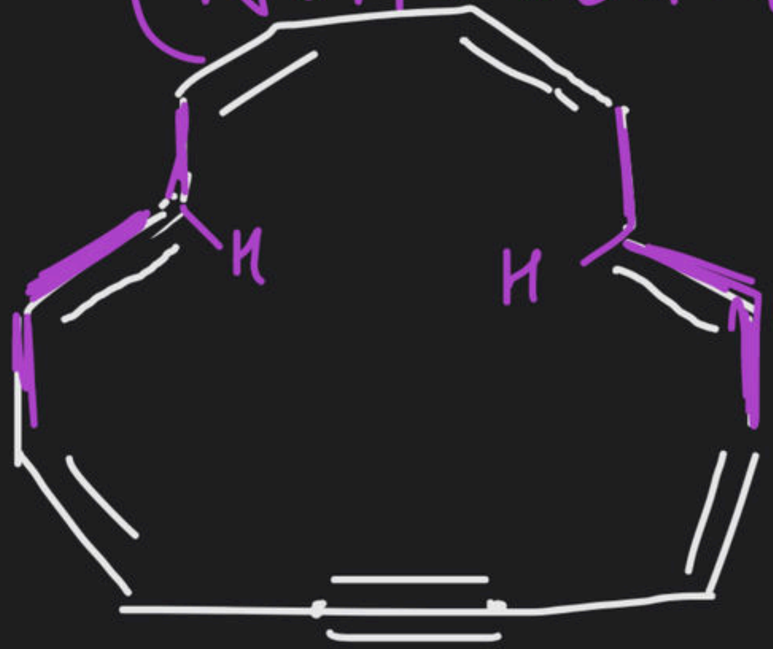
(41)



(42)



(Non Aromatic)



(43)

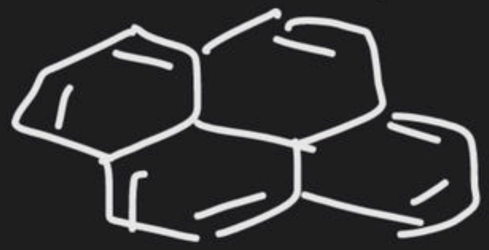
(A) Aromatic
(B) Non Aro
(C) Anti Aro

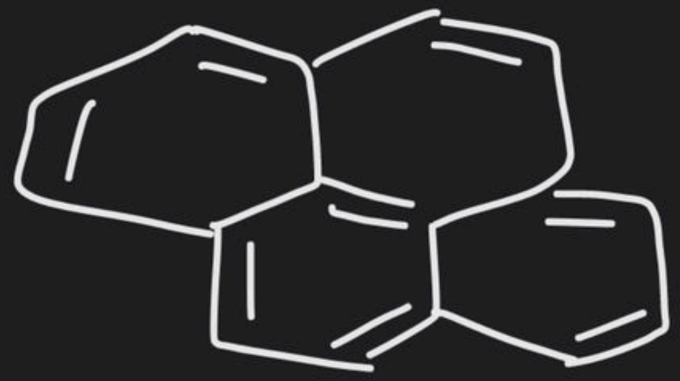
(44) 

(45) 

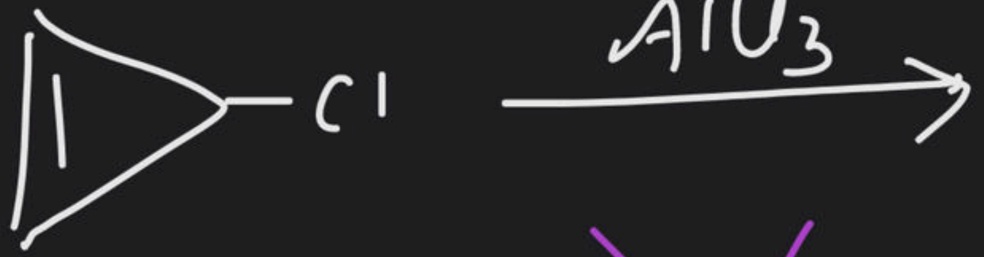
(46) 

(47)  (Benzyne)

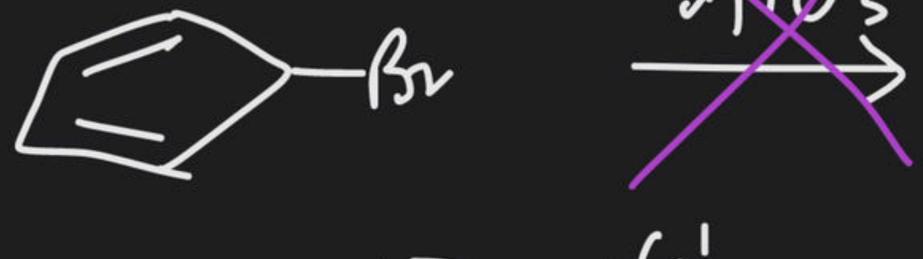
(48) 

(49) 

(#) Find Reaction in which Aromatic product is obtained / spontaneous reaction / feasible reaction.

(50) 

Aromatic / feasible / spon

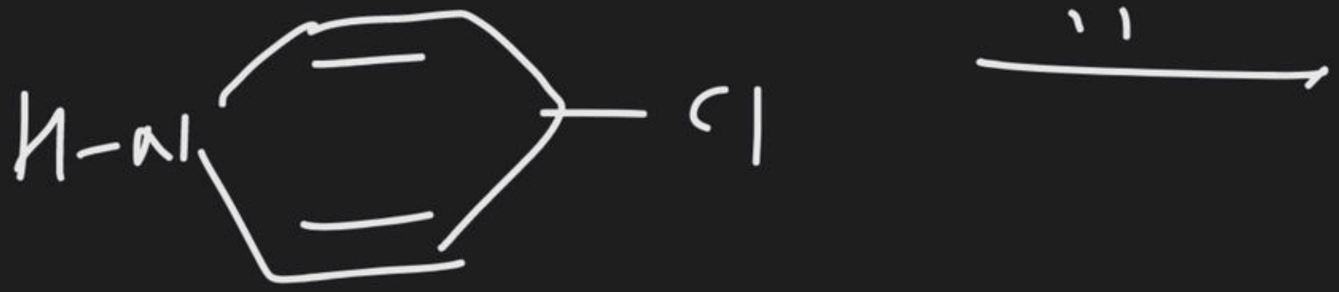
(51) 

Anti Aromatic
non feasible
non spontaneous.

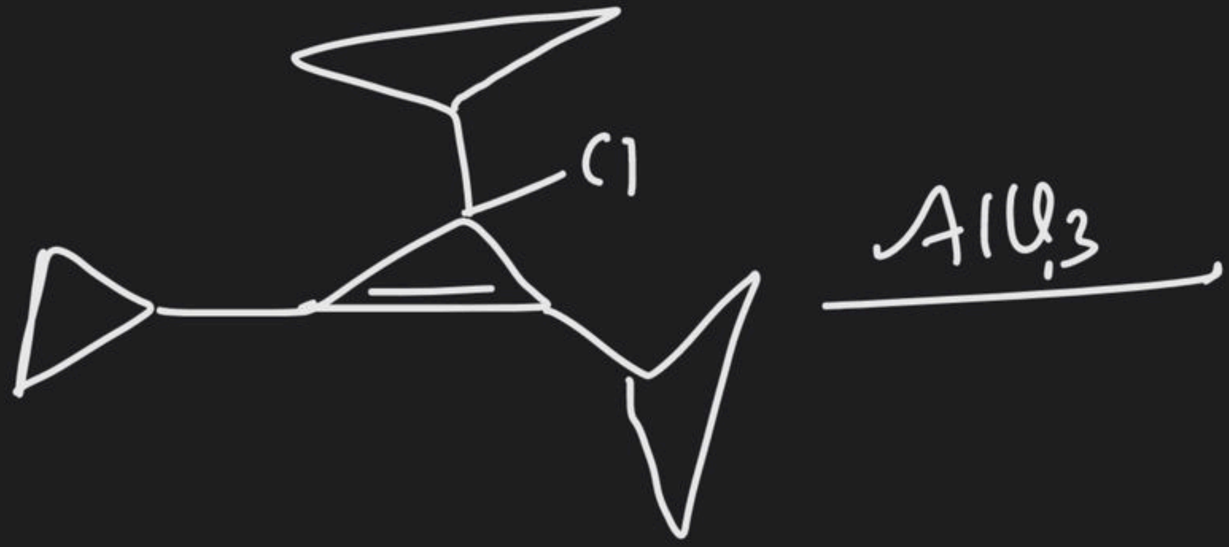
(52) 

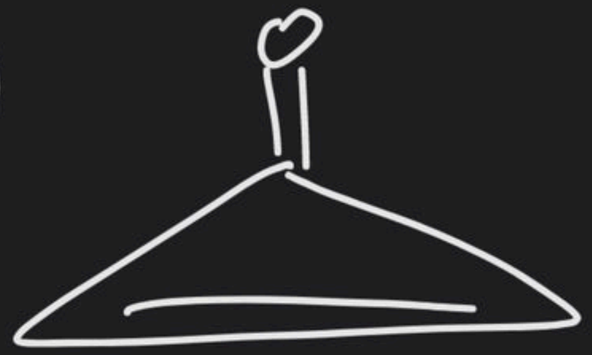
(53)

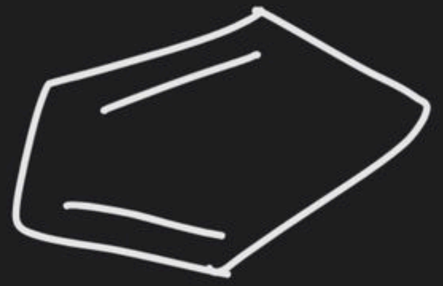
(54)

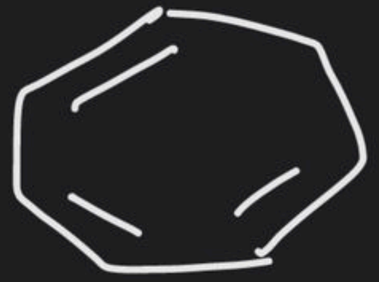


(55)



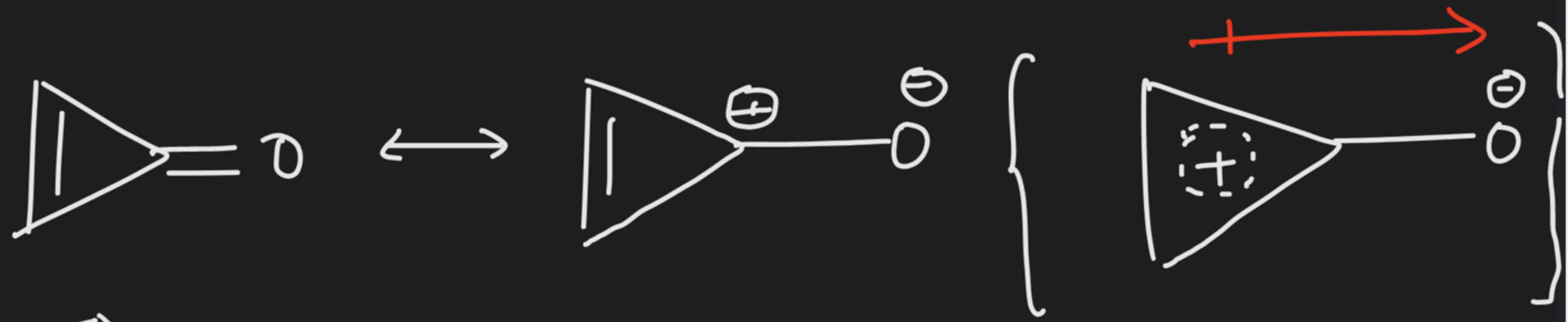
(56)  $\xrightarrow{NaH}$

(57)  $\xrightarrow{NaH}$

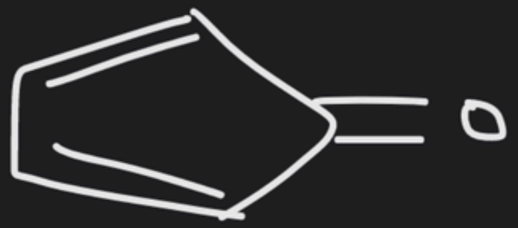
(58)  $+ Ph_3C^{\oplus} \longrightarrow$

(#) **Predict direction of dipole moment**

(59)



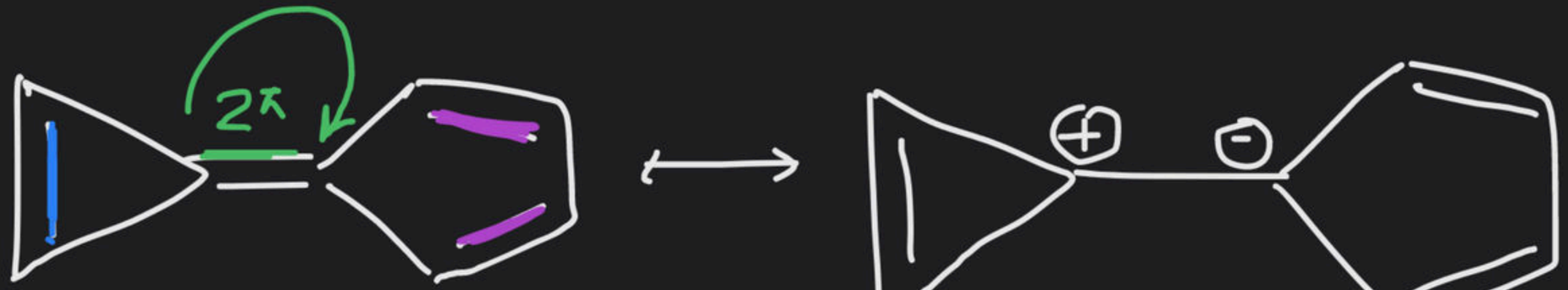
(60)



(61)

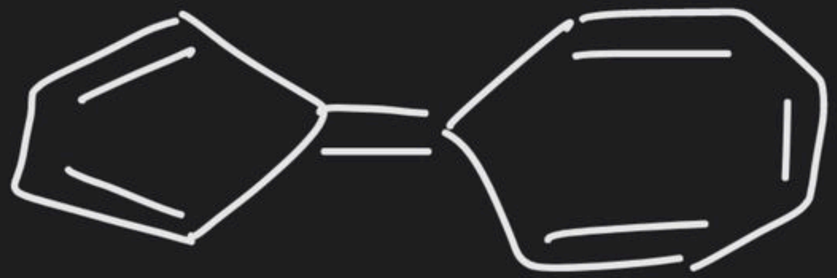
(62)

(63)



(2π es
H·MO·)

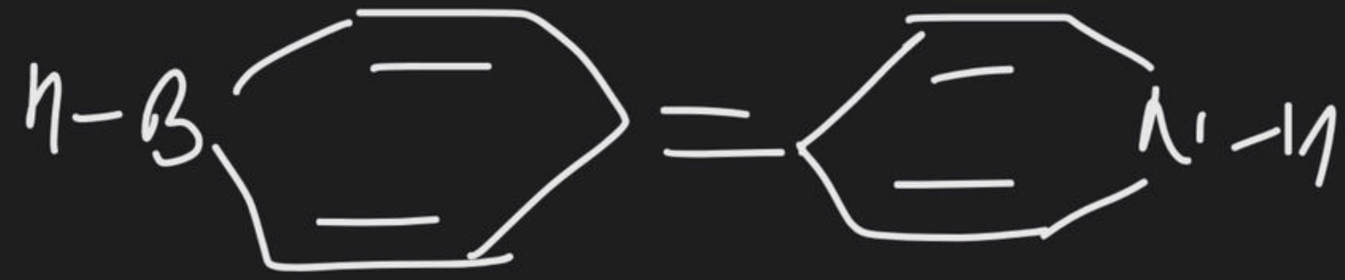
(64)



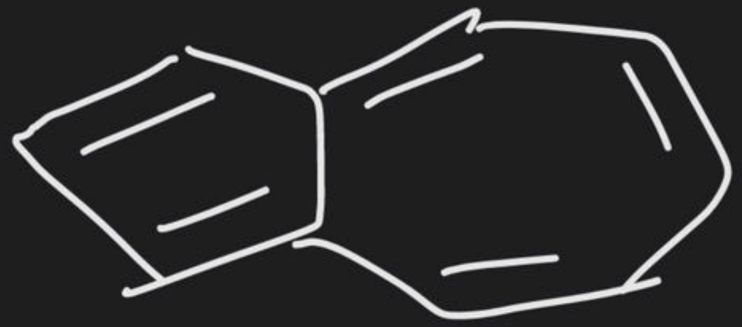
(65)

(66)

(67)

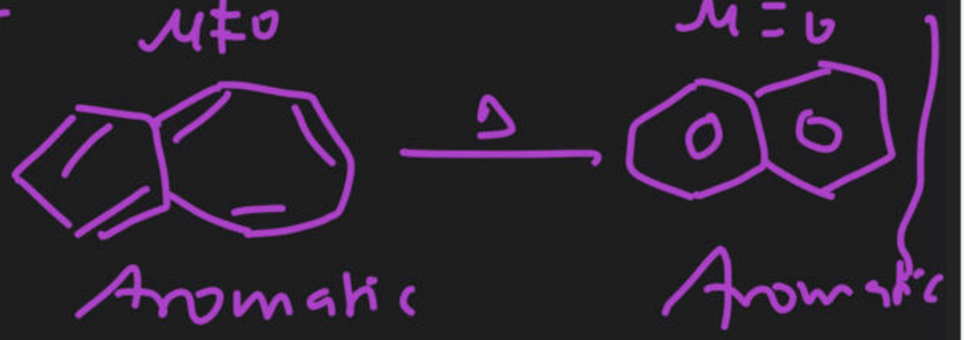


(68) Azulene



Note

Azulene on heating gives Naphthalene



(#) Acid & Base theory

Arhenius Theory

Acid is a substence which gives H^+ ion in solution & Base is a substence which gives $^{\ominus}OH$ ion in solution

Acid $\longrightarrow$ $H^{\oplus}$

Base $\longrightarrow$ $^{\ominus}OH$

Ex:-

$$H-Cl_{(aq)} \longrightarrow H^{\oplus}_{(aq)} + Cl^{\ominus}_{(aq)}$$

$$NaOH_{(aq)} \longrightarrow Na^{\oplus}_{(aq)} + OH^{\ominus}_{(aq)}$$

Bronsted & Lowery :-

According to this theory Acids are proton (H^+) donar & Bases are proton acceptors.

Acid $\longrightarrow$ $H^{\oplus}$ donar

Base $\longleftarrow$ $H^{\oplus}$ acceptor

Ex:

$$HCl_{(aq)} \longrightarrow H^{\oplus}_{(aq)} + Cl^{\ominus}_{(aq)}$$

(Acid)

$$NH_3 + H^{+}_{(aq)} \longrightarrow NH_4^{\oplus}{}_{(aq)}$$

(Base)

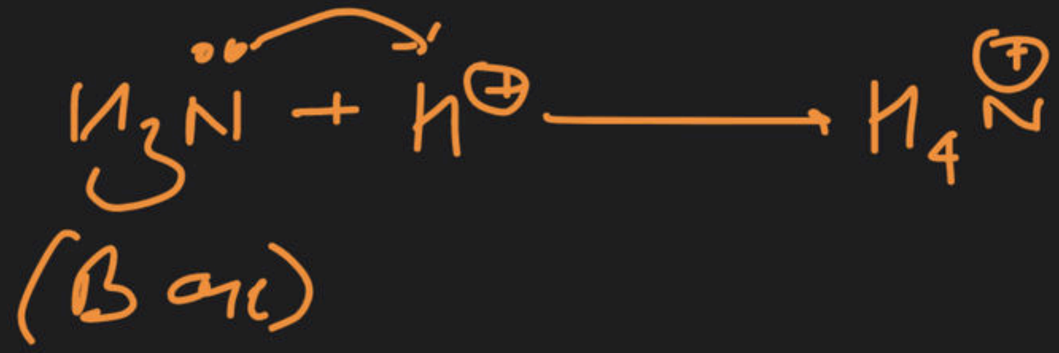
(#) **Lewis theory**

Acc. to this theory Acids are electron pair acceptors & Bases are electron pair donors.

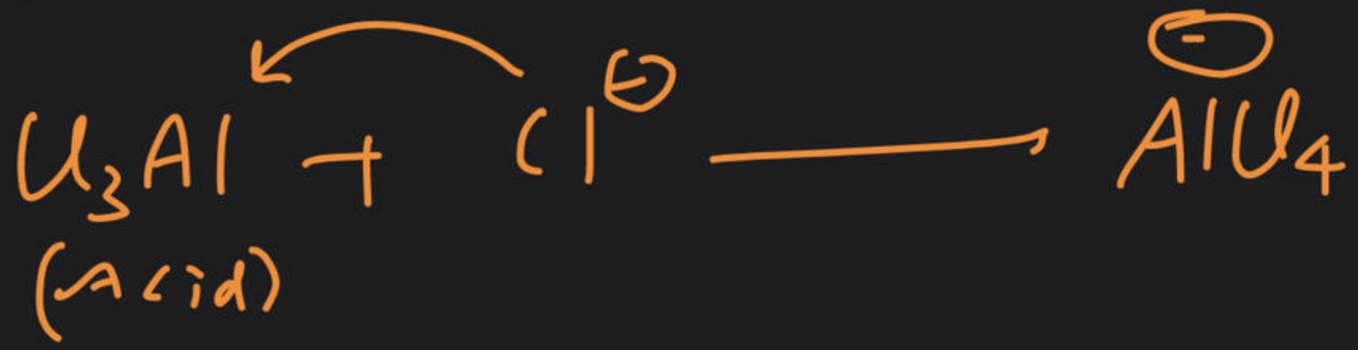
Acid $\longleftarrow$ e^{-} pair

Base $\longrightarrow$ $e^{\ominus}$ pair

Ex:



(Base)



(Acid)

(#). Let us Consider a Acid

(unstable) ⟶ Stable

$$HA \rightleftharpoons H^{\oplus} + A^{\ominus}$$

(C. Base)

Strong Acid

$$\text{Constant} = K_a = \frac{[H^+][A^-]}{[HA]}$$

(Equilibrium Constant)

$$pH = -\log[H^+]$$

$$pKa = -\log Ka$$

For a Strong Acid $\Rightarrow$ Rxn must move towards formed much..

Acidic Strength $\propto$ Stability of $A^{\ominus}$ (Conj. Base) (EWG) (-R, -H, -E)

$\propto$ Ka

$\propto \frac{1}{pKa}$

Let us Consider a Base

(Base) Conjugate Acid

Basic Strength $\propto$ Stability of C. Acid

$\propto$ EDG $(+R_I + H_I + I)$

$\propto$ K_b

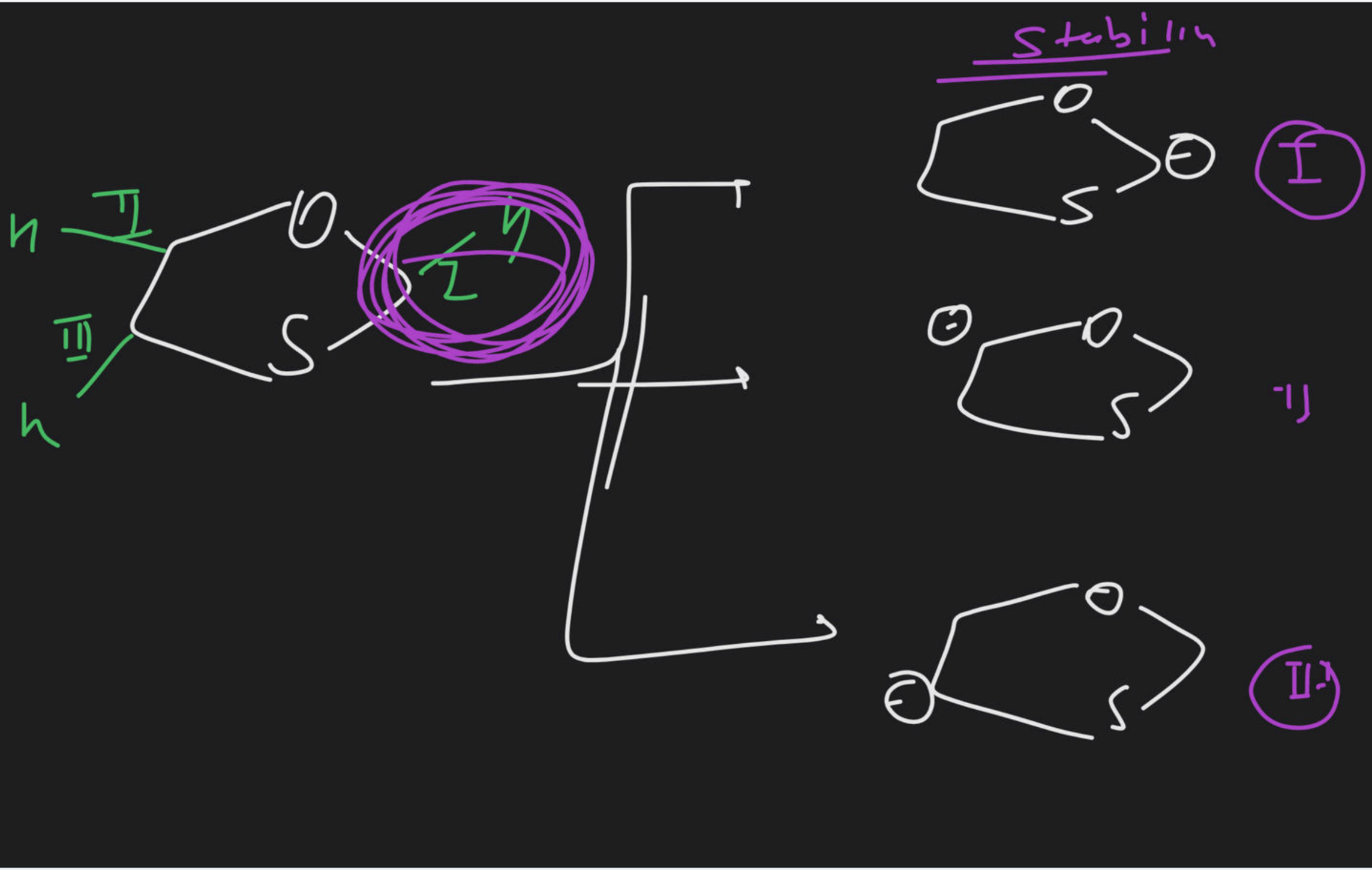
$\propto \frac{1}{pK_b}$

Note (i) On deprotonation from any compound Conjugate Base of that Compound appears.

(ii) Strg Acid / strg Base both are highly unstable than respective analogus w. Acid & w. Base.

(iii) Each Acid-Base reaction moves towards weaker Acid & weaker Base side.

(iv) On Protonation Conjugate Acid is obtained


Stability
I
II
III