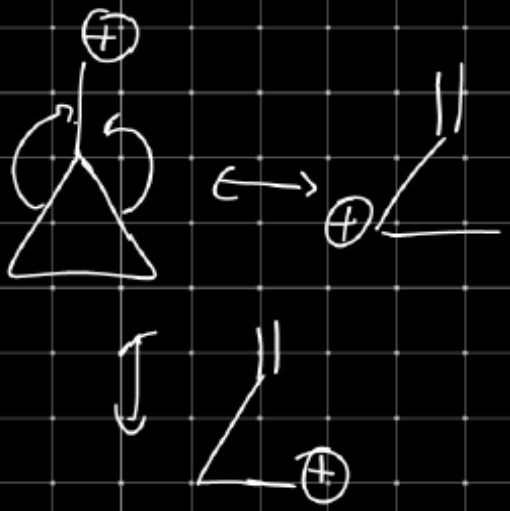
Compare Stability

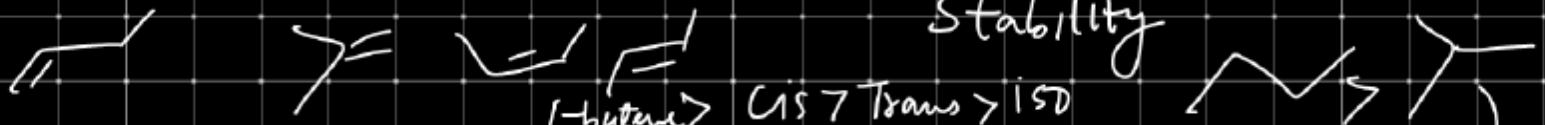


Heat of Combustion

$C_xH_y + O_2 \rightarrow CO_2 + H_2O$ $\quad \Delta H = -ve$ $\quad H_{OC}$

Case I → If no. of C same

$H_{OC} \propto \frac{1}{\text{Stability}}$

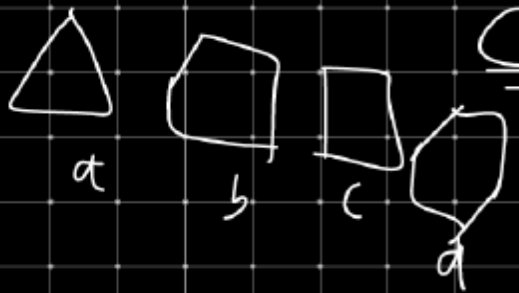


1-butene > cis > Trans > iso

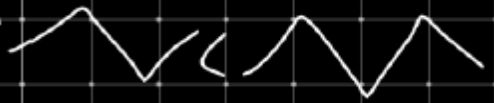
branched alkane are more stable

Case II

More no. of C more H_{OC}

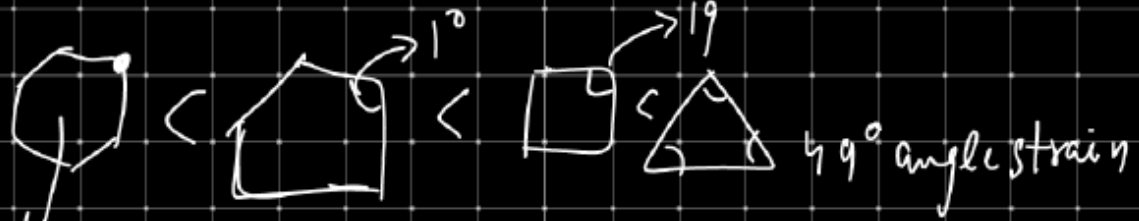


d > b > c > a

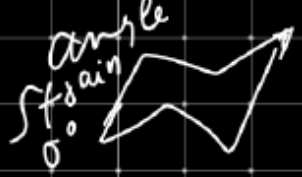


Case III Per mole of $-CH_2$

$\frac{(n-2)\times 180}{n}$



$\frac{4\times 180}{6} = 120$ 9t exist Chair form



Acid & Base

Arrhenius Theory

Acid → H^+ donor

Base → OH^- donor

Bronsted-Lowry Theory

Acid → H^+ donor

Base → H^+ acceptor

Lewis Acid-Base Theory

Acid → e^- pair acceptor

Base → L.P donor

$HA \rightleftharpoons H^+ + A^-$

Acid — Conjugate Base

K_{eq} / K_d / $K_a = \frac{[H^+][A^-]}{[HA]}$

$K_a \propto A \cdot S$

A·S ∝ Stability of Conjugate Base

$K_a = 10^{-3}$ 10^{-4}

$pK_a = -\log K_a$

$pK_a = 3$ 4

$pK_a \propto \frac{1}{A \cdot S}$

$-M, -I \propto A \cdot S$

Draw C·B

① $H_2O \xrightarrow{-H^+} OH^-$

② $OH^- \xrightarrow{-H^+} O^{2-}$

③ 

Phenoxide

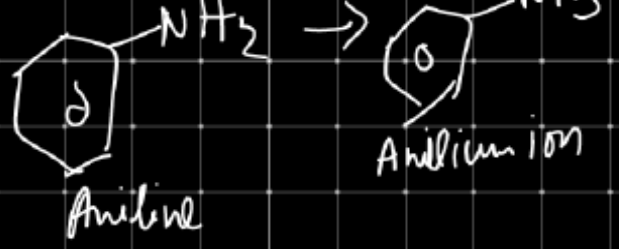
④ $RH_3-OH \rightarrow CH_3-O^-$

⑤ $CH_3-C\equiv CH \rightarrow CH_3-C\equiv C^-$

Terminal Alkyne

$H_3C-C\equiv C-CH_3$ ↳ Not acidic

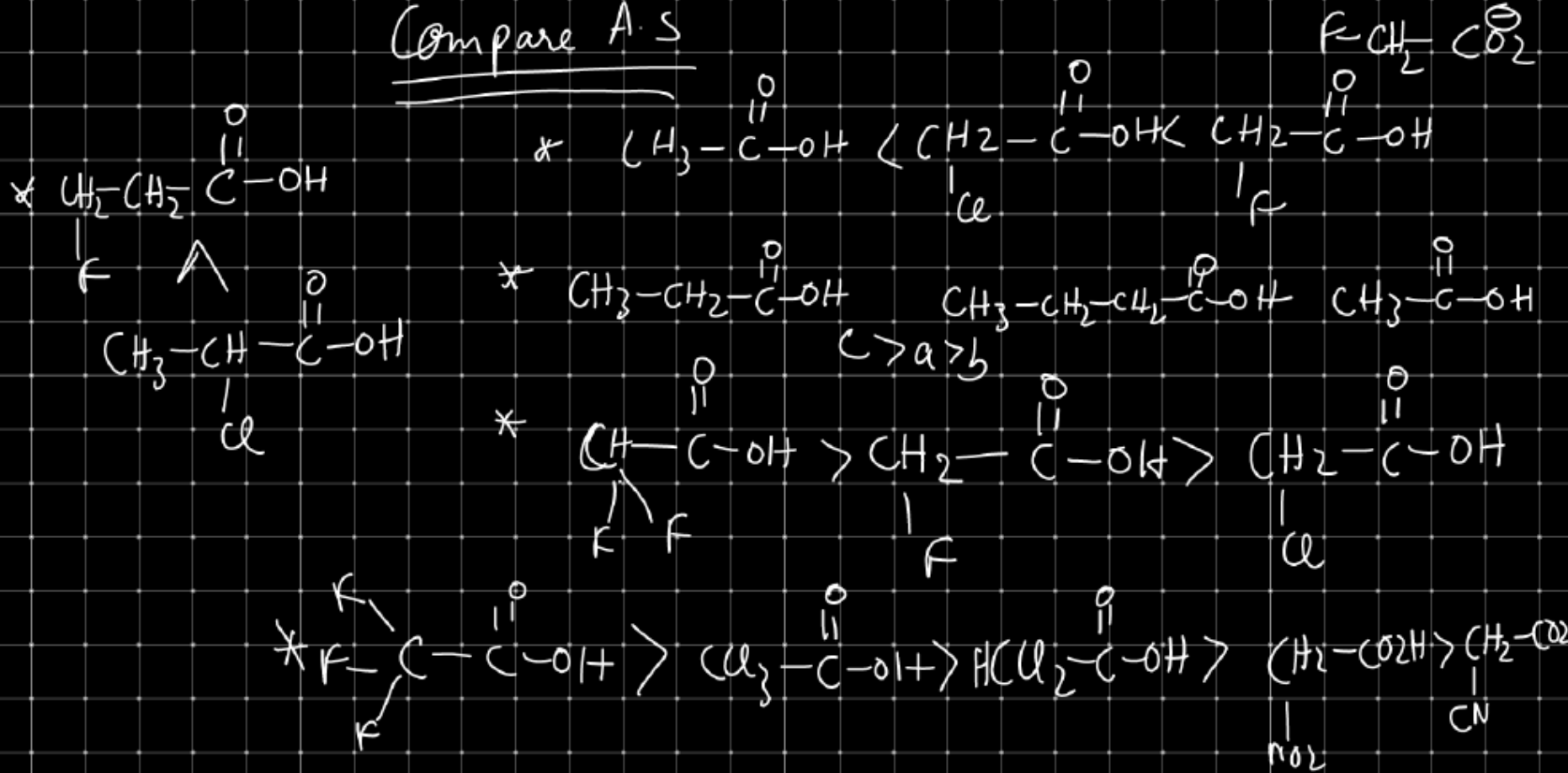
Draw C·A

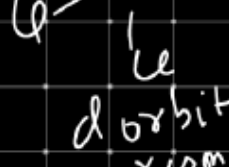
* $H_2O \xrightarrow{+H^+} H_3O^+$
* $HO^- \rightarrow H_2O$
* $NH_3 \rightarrow NH_4^+$
* 

Aniline

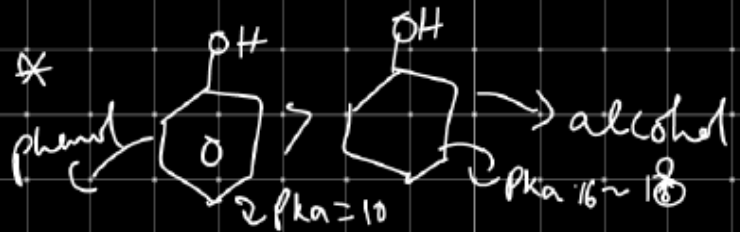
Anilinium ion

Compare A.S





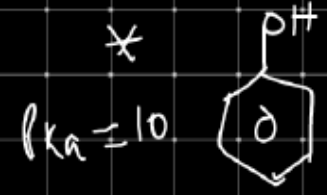
* $CHCl_3 > CHF_3$



** $CH_3-\overset{O}{\overset{\|}{C}}-CH_3$ Acetone

$CH_3-\overset{O}{\overset{\|}{C}}-OEt$ ester

Aromatic Hydrocarbon



$< CH_3-\overset{O}{\overset{\|}{C}}-OH$ → pKa ≃ 4·2

Acetic Acid

$\rightarrow (H_3-\overset{O}{\overset{\|}{C}}-O^{\ominus}$

eq & stable R·S

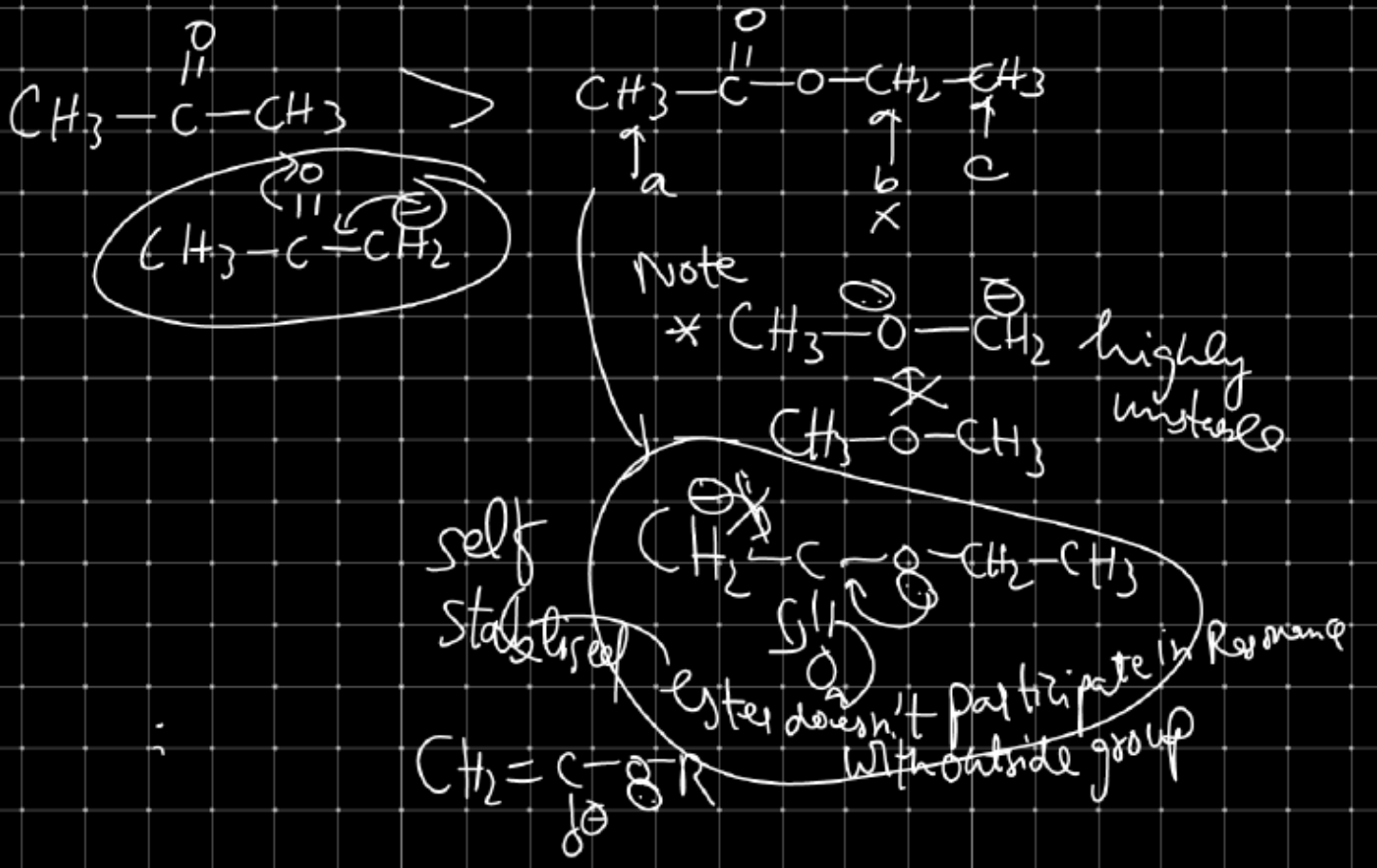
* $CH_3CO_2H < CH_3-\overset{O}{\overset{\|}{S}}-OH$ (O)

eq R·S

pKa = -ve

$(CH_3-\overset{O}{\overset{\|}{C}}-O^{\ominus}$ (O)

→ eq R·S


Note
highly unstable
self stabilised
Ester doesn't participate in Resonance
Without outside group