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OC Mega Revision

- **Live** at 8:00 PM

5th April - 24th April

I Love Chemistry

Complete Chemistry Mega Revision Timetable

5 April	7 April	9 April	12 April
IUPAC + GOC	Structural + Stereo Isomerism	Hydrocarbon	Haloalkane & Haloarenes

14 April	16 April	19 April	21 April
Alcohol, Phenol & Ether	Carbonyl Compounds	Oxidation, Reduction, Carboxylic Acid & amines	**Polymer & Environmental Chem**

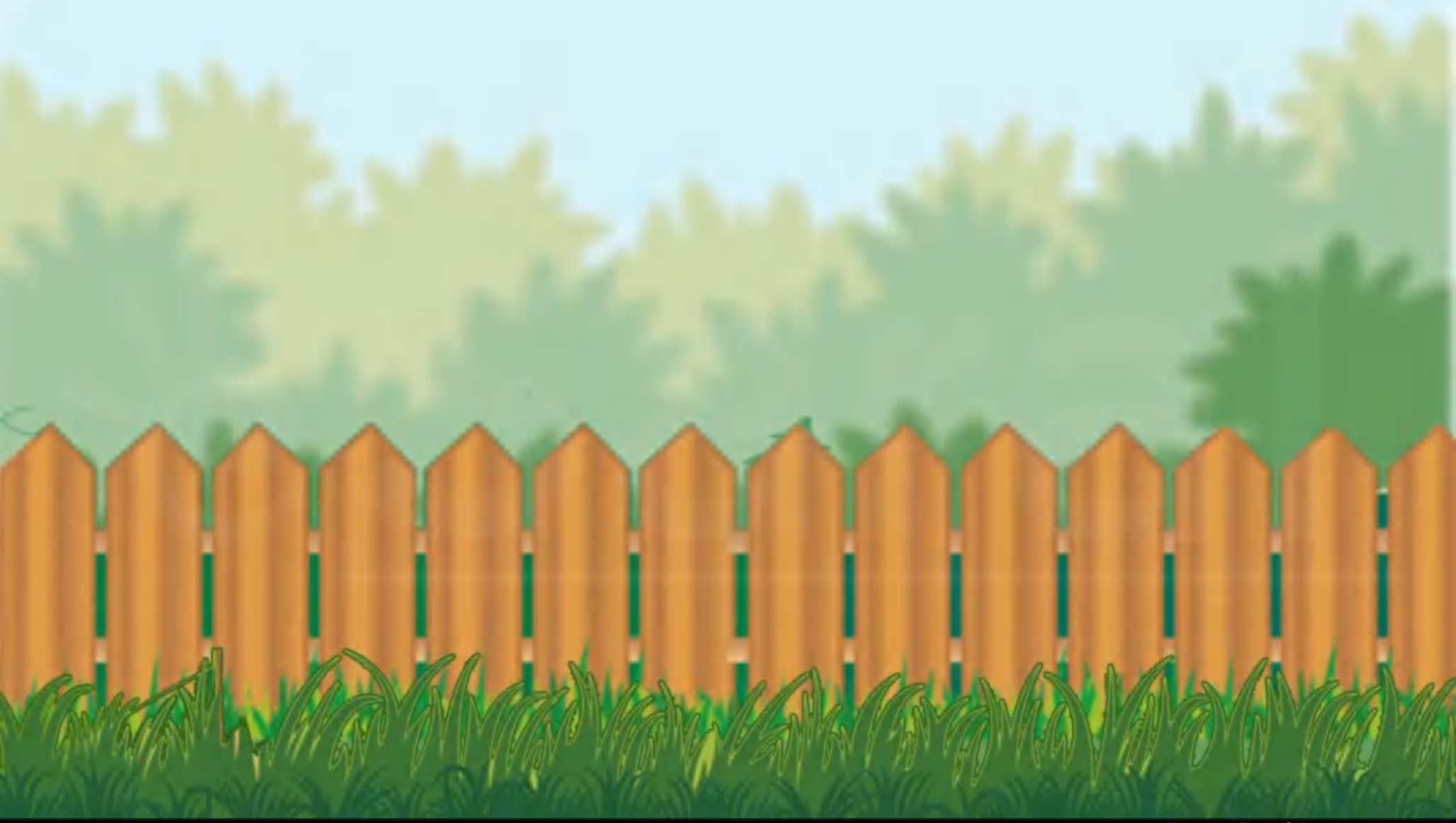
23 April
Biomolecule and CIEL

Organic Chemistry Mega Revision Imp Qs Timetable

6 April	8 April	10 April	13 April
IUPAC + GOC	Structural + Stereo Isomerism	Hydrocarbon	Haloalkane & Haloarenes

15 April	17 April	20 April	22 April
Alcohol, Phenol & Ether	Carbonyl Compounds	Oxidation, Reduction, Carboxylic Acid & amines	**Polymer & Environmental Chem**

24 April
Biomolecule and CIEL



Hydrocarbon

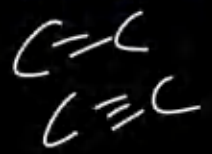
CH_4 , $CH_3 - CH_3$,

$CH_2 = CH_2$

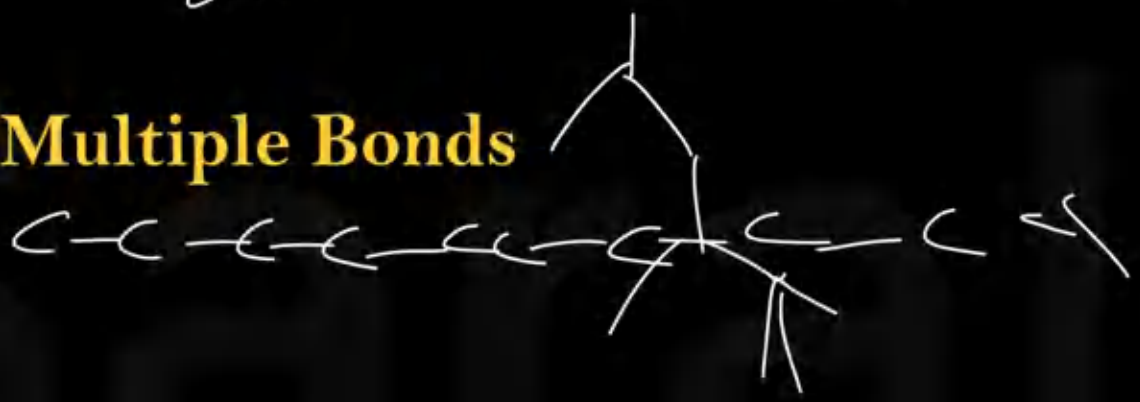
Hydrocarbon Derivatives

$$\underset{\text{Hydrocarbon}}{CH_4} \xrightarrow[+OH]{-H} \underset{\text{Hydrocarbon derivatives}}{CH_3 - OH}$$

Characteristics of C-Atoms



3 Million

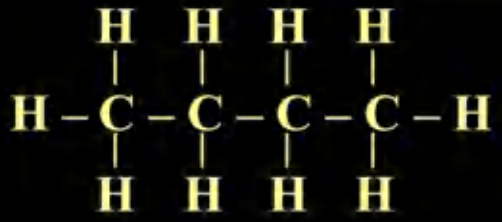


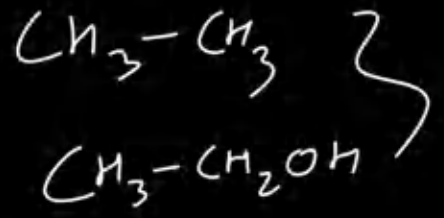
Tetra Valency

Tendency To Form Multiple Bonds

Tetrahedral Shape

Catenation





Functional groups are specific groups of atoms or bonds within molecules that are responsible for the characteristic chemical reactions of those molecules.

Example -OH, $-NH_2$, Double Bond etc.

Homologous Series

A group or class of organic compounds each containing one particular characteristic functional group constitutes a homologous series.

14

CH_4

C_2H_6

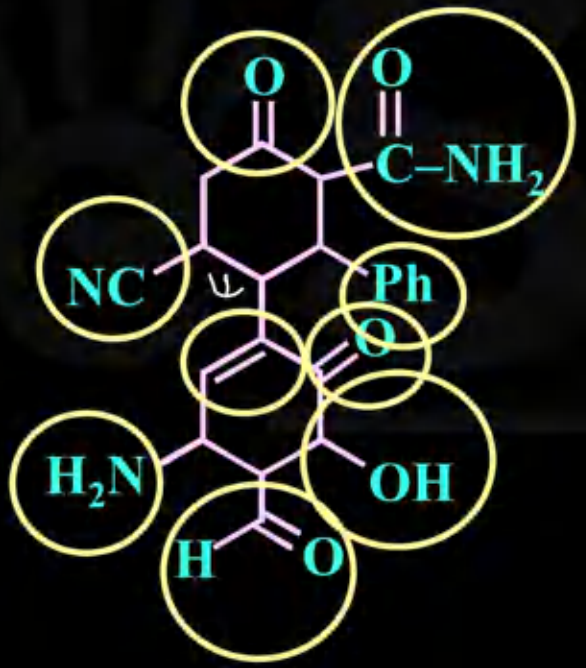
C_3H_8

Two successive homologues differ by $>CH_2$ group or 14 molecular weight.

Q) Find the number of functional groups present in the compound

9

1.



Degree of Unsaturation

$C_2H_4 \xrightarrow{H_2} C_2H_6$

$C_n H_a N_b O_c X_d$

$$DU = (n+1) - \frac{(a-b+d)}{2}$$

5

DU = no of π + no of rings

Word Root

Number of Carbons	
1	Meth
2	Eth
3	Prop
4	But
5	Pent

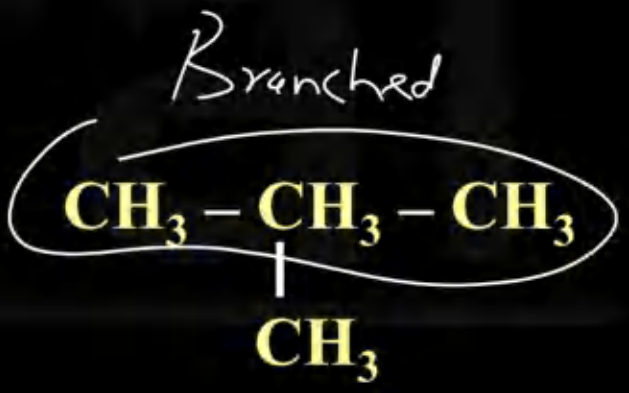
(ii) Denoted by 'n' ($n \geq 4$).

$CH_4 \longrightarrow$ Methane

$CH_3 - CH_3 \longrightarrow$ Ethane

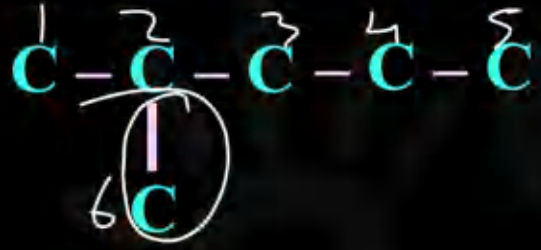
$CH_3 - CH_2 - CH_3 \longrightarrow$ Propane

$CH_3 - CH_2 - CH_2 - CH_3 \longrightarrow$ n-butane

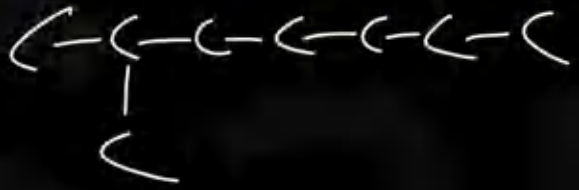


• Iso Prefix

When single methyl group is present on second or second last carbon of straight carbon chain, then we use iso prefix.

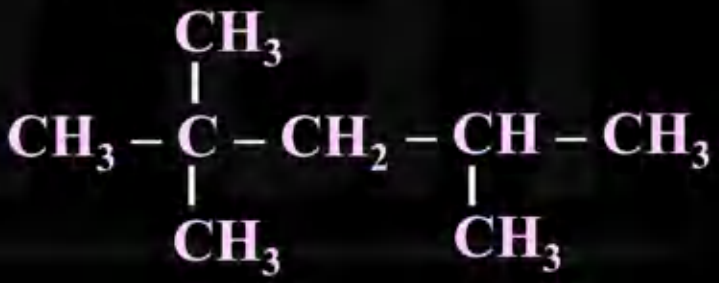


Isohexane



Exception

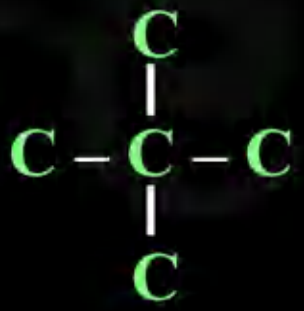
Petrakem



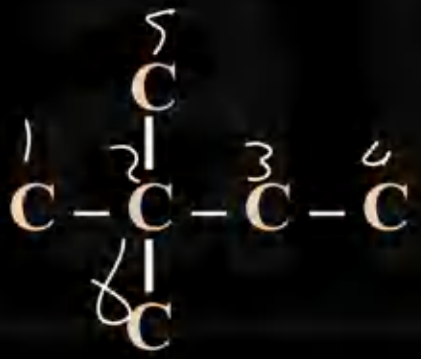
Isooctane ✓

• Neo Prefix

When 2 methyl groups are present on 2nd or 2nd last carbon of straight carbon chain, then we use neo prefix.

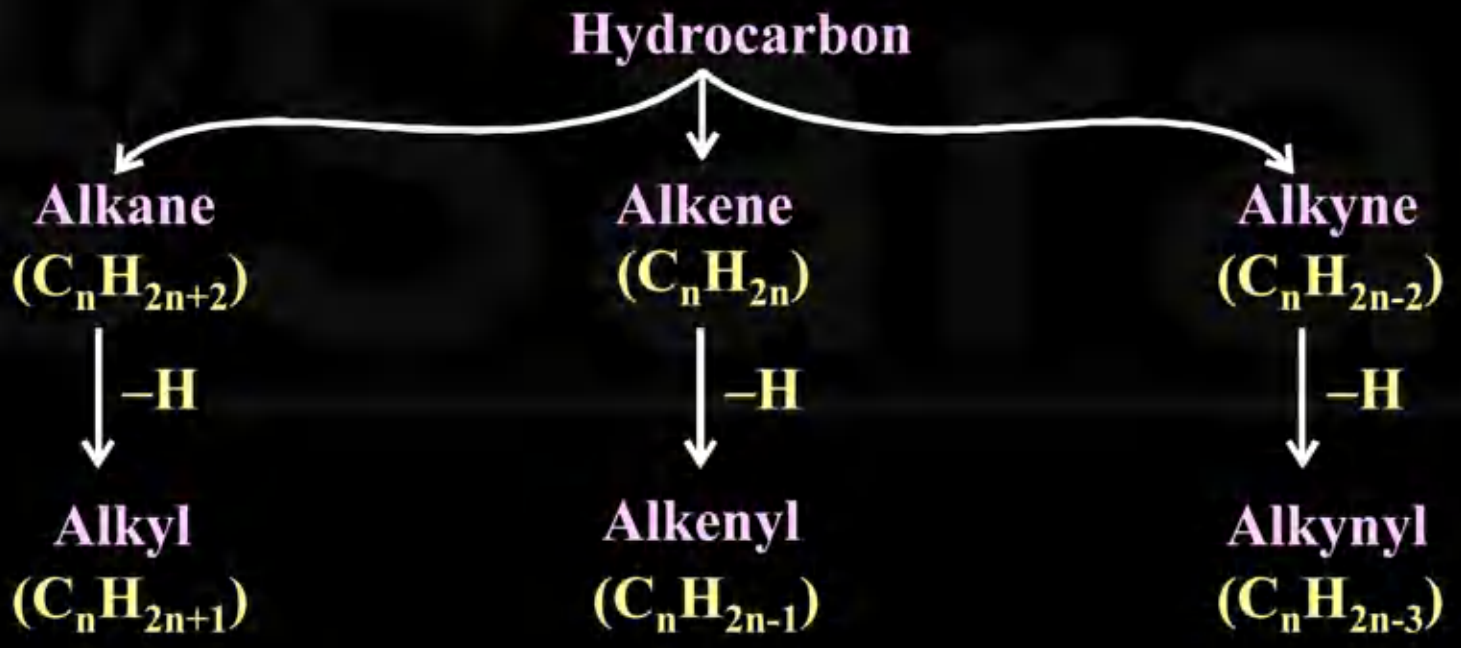


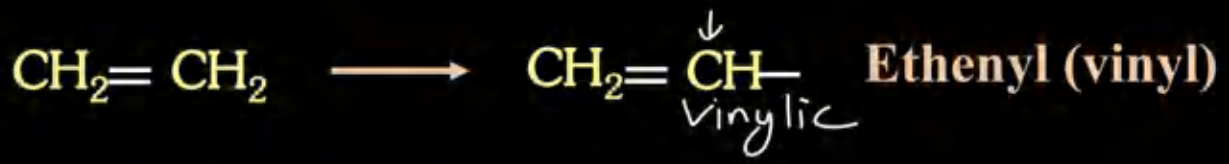
Neopentane

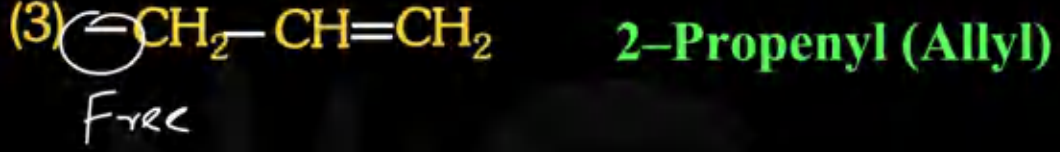


Neohexane

Hydrocarbon Radicals







IUPAC System of Nomenclature

Secondary prefix + Primary prefix + Word root + Primary suffix + Secondary suffix

Word Root - According to number of carbons in parent C–chain.

Number of carbons	Word root
1	Meth
2	Eth
3	Prop
4	But
5	Pent

Number of carbons	Word root
6	Hex
7	Hept
8	Oct
9	Non
10	Dec

Number of carbons	Word root
11	Undec
12	Dodec
13	Tridec

2) Primary Suffix

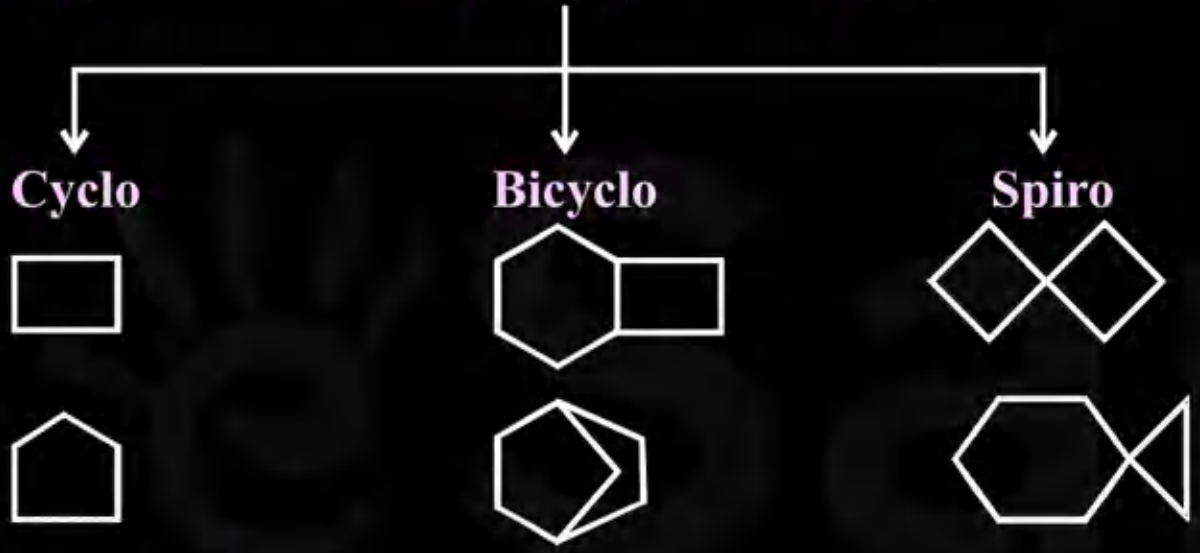
CH_4 → Methane $CH_2=CH_2$ Ethene

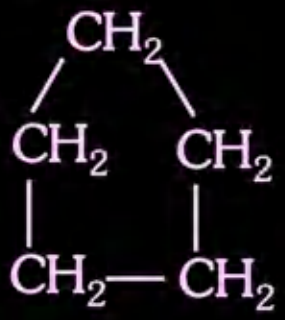
S.No.	Type of Carbon Chain	Primary Suffix	General Name
1	(a) Saturated	-ane	Alkane
2	b) Unsaturated with one double bond	-ene	Alkene
3	(c) Unsaturated with one triple bond	-yne	Alkyne

S.No.	Type of Carbon Chain	Primary Suffix	General Name
1	(a) Unsaturated with two double bonds	-adiene	Alkadiene
2	(b) Unsaturated with two triple bonds	-adiyne	Alkadiyne

3) 1° (Primary) Prefix

1° prefix is used only for cyclic compounds.





Cyclo + Pent + ane = Cyclopentane

4) Secondary Suffix

Functional Groups

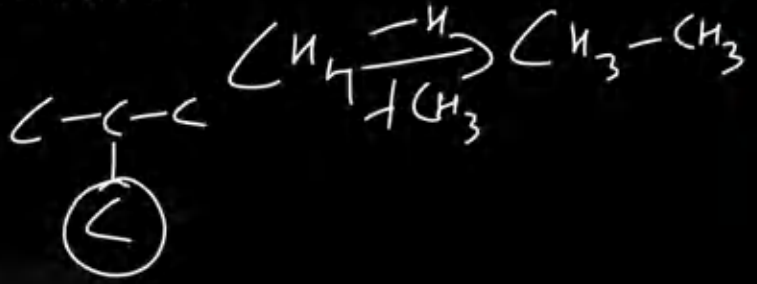
Vowel

Ethanol

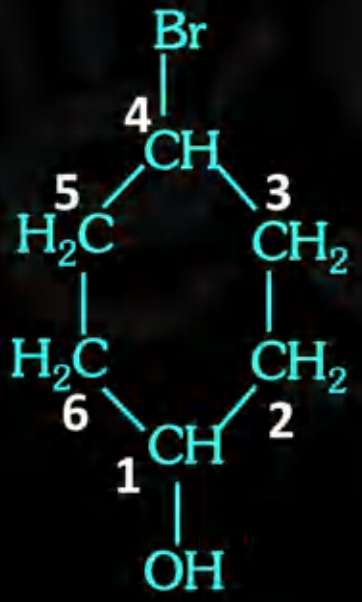
S.No.	Organic Compounds	Word Root	Primary Suffix	Secondary Suffix	IUPAC Name
1	CH_3CH_2OH	Eth	an (e)	ol	Ethanol
2	$CH_3CH_2CH_2COOH$	But	an (e)	oic acid	Butanoic acid

5) 2i (Secondary) Prefix

Substituents		2° Prefix
1.	–R	Alkyl
2.	$–CH_3$	Methyl
3.	$–CH_2–CH_3$	Ethyl
4.	–X	Halo
5.	–Br	Bromo
6.	–F	Flouro



7.	$-O-R$	Alkoxy
8.	$-O-CH_3$	Methoxy
9.	$-O-CH_2-CH_3$	Ethoxy
10.	$-NO_2$	Nitro
11.	$-O-N=O$	Nitride
12.	$-\ddot{N}=O$	Nitroso



4-Bromo-cyclohexan-1-ol

4-Bromo + Cyclo + hex + an(e) + 1-ol

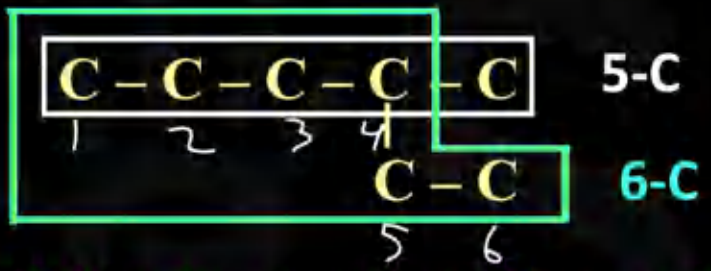
Secondary prefix	Primary prefix	Word root	Primary suffix	Secondary suffix

Naming of Saturated Hydrocarbons

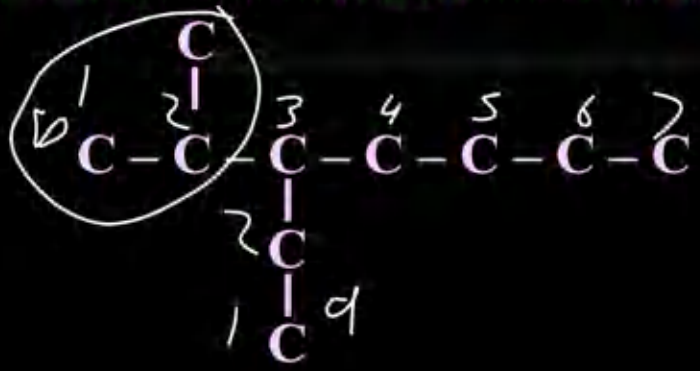
Rules

(1) Selection of Parent Chain

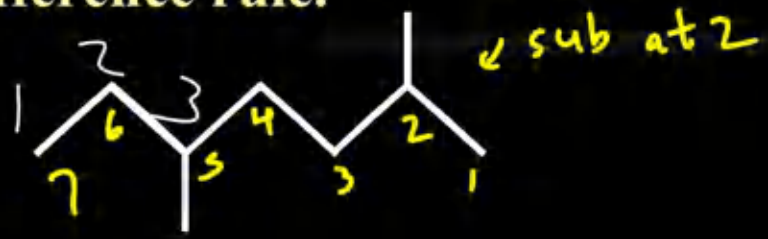
Chain with maximum number of C atoms (longest chain).



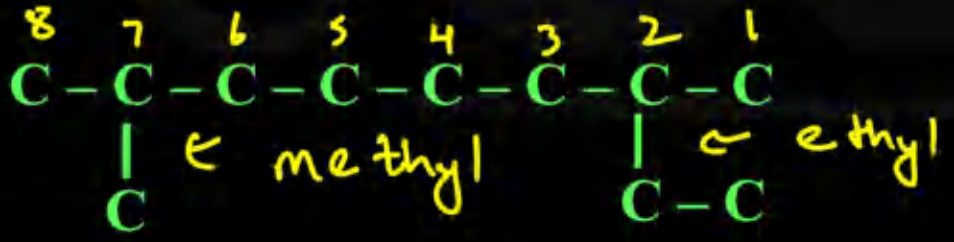
(2) When in a compound more than one PCC is present than we select that PCC which has more number of substituents.

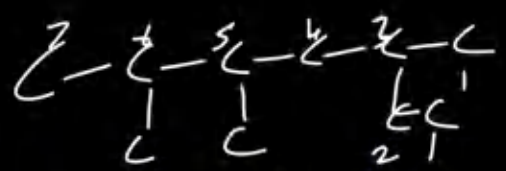


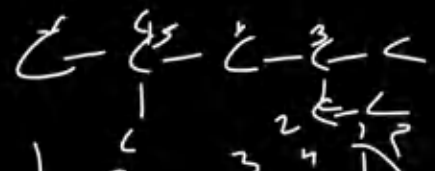
4) When in a compound more than one substituent are present then we use lowest locant rule or first point difference rule.



(5) If position of substituent are same from both end of the parent chain, then numbering is done according to alphabetical order.







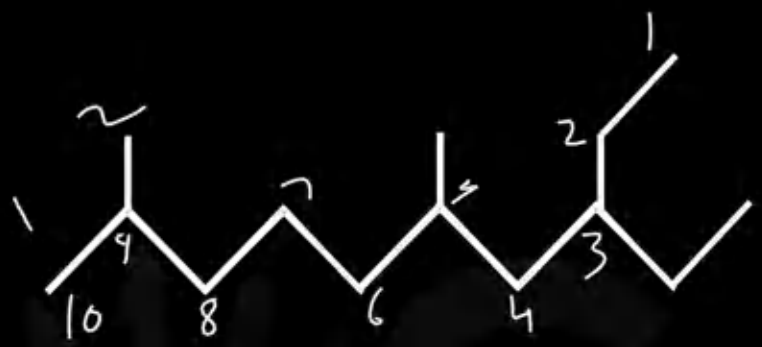
Dimethyl

Ethyl

(6) When in a compound one substituent is repeated more than one time then we use

2-Ethyl, 4, 5 dimethyl

2-Di
3-Tri
4-Tetra
5-Penta
Di, Tri and Tetra are not included in alphabetical order.



3-Ethyl-5,9-dimethyl undecane

Naming of Cyclic Hydrocarbon

(1) Main Chain Selection

(a) Multiple Bond > Number of carbon atoms >Maximum number of substituents > Nearest locant >Alphabetization.

(2) Naming

Prefix 'cyclo' just before the word root if it constitutes the main chain.

Methylcyclopropane

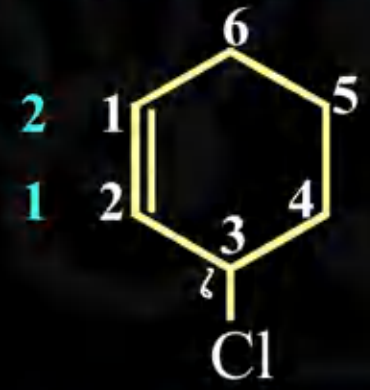
If cyclic part is the main chain then the prefix 'cyclo' is not considered for alphabetical order.

If cyclic part constitutes the side-chain (substituent) then prefix cyclo is considered for alphabetization.

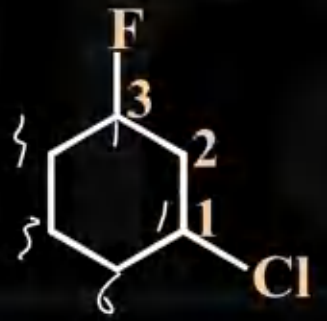
(3) Numbering

a) Lowest Locant

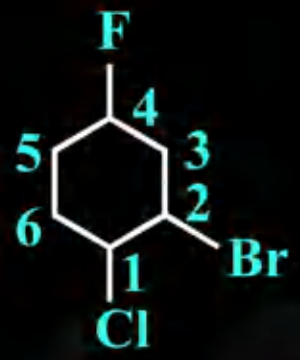
b) Alphabetization



3-chlorocyclohex-1-ene



1-chloro-3-fluoro cyclohexane



1, 3, 4

1, 2, 4

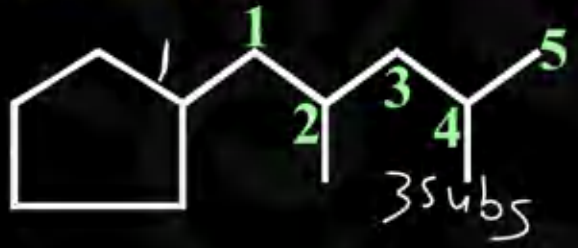
2-Bromo-1-chloro-4-fluoro cyclohexane

3. **When number of carbon in parent carbon chain of cyclic ring is more than or equal to side chain then cyclic ring is selected as parent carbon chain.**

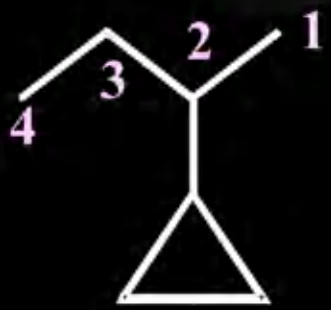
4. **If number of substituents in side chain is more than in cyclic, when number of carbon in cyclic and side chain are same, then we select side chain as parent carbon chain.**

5. If number of carbons in parent carbon chain of side chain is more than in cyclic then we select side chain as parent carbon chain.

Propylcyclopropane



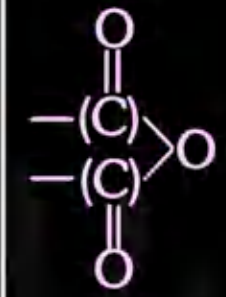
1-cyclopentyl-2,4-dimethyl pentane



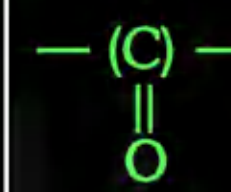
2-cyclopropyl butane

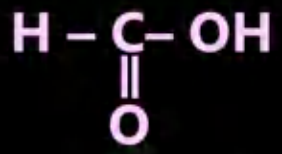
Functional Group Table

S. No.	Functional Group	Suffix
1.	— (C) OOH (carboxylic acid)	oic acid
2.	— SO_3H (sulphonic acid)	sulphonic acid

3.	 (anhydride)	oic anhydride
4.	— (C)OOR (ester)	alkyl ------ oate
5.	— (C)OX (acid halide)	oyl halide

6.	— (C)ONH$_2$ (amide)	amide
7.	— (C)N (cyanide)	Nitrile
8.	— NC (isocyanide)	carbylamine
9.	— (C)HO (aldehyde)	al

10.	 (Ketone)	one
11.	$-OH$ (alcohol)	ol
12.	$-SH$ (thio alcohol)	thiol
13.	$-NH_2$ (amine)	amine



Methanoic Acid

Methan(e) + oic acid

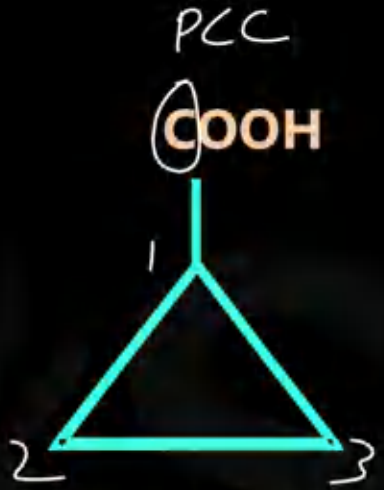
When secondary suffix starts with vowel (a,e,i,o,u) then we skip last letter "e" of primary suffix.

Use of Special Suffix

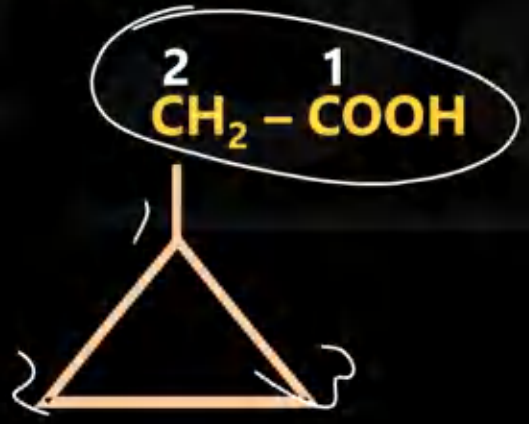
Case 1

When carbon containing functional group is directly attached with cyclic ring then carbon of that functional group is not included in parent carbon chain and we use special suffix for them.

F.G.	Suffix	IUPAC Name
-COOH	Oic acid 'C' of COOH considered in the parent chain	Alkanoic acid
	Carboxylic acid 'C' of COOH is not considered in parent chain	Alkane carboxylic acid



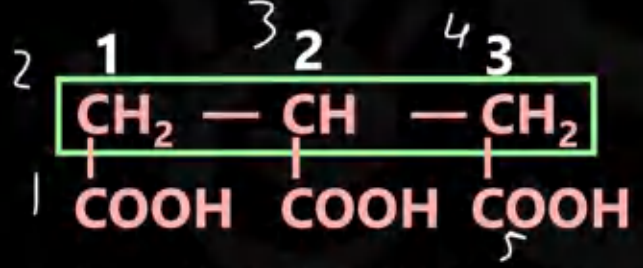
Cyclopropanecarboxylic acid



2-Cyclopropylethanoic acid

Case-2

When more than two same carbon containing functional group are directly attached to parent carbon chain,then functional group is not included in PCC and we use special suffix for them.



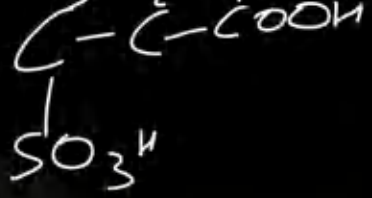
Propane-1,2,3-tri-carboxylic acid

Mixed Anhydride (According To Alphabet)

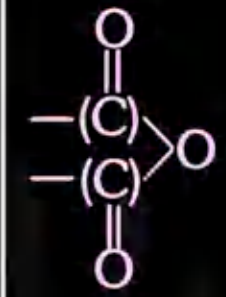
Ethanoic propanoic anhydride

Functional Group Table (Seniority Order)

3-Sulphopropanoic acid



S. No.	Functional Group	Prefix	Suffix
1.	— (C) OOH (carboxylic acid)	×	oic acid
	— COOH	carboxy	carboxylic acid
2.	— SO_3H (sulphonic acid)	sulpho	sulphonic acid

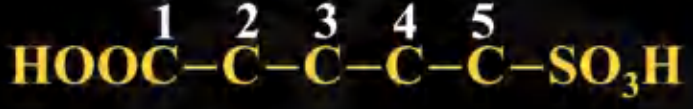
3.	 (anhydride)	×	oic anhydride
4.	— (C)OOR (ester) — COOR	× alkoxy carbonyl or carbalkoxy	alkyl ------ oate alkyl-----carboxylate
5.	— (C)OX (acid halide) — COX	× Halo carbonyl	oyl halide carbonyl halide

6.	— (C)ONH$_2$ (amide)	×	amide
	— CONH$_2$	carbamoyl	carboxamide
7.	— (C)N (cyanide)	×	Nitrile
	— CN	cyano	carbonitrile
8.	— NC	isocyano/carbyl amino	carbylamine
9.	— (C)HO (aldehyde)	Formyl/oxo	al
	— CHO		carbaldehyde

10.	 (Ketone)	keto/oxo	one
11.	–OH (alcohol)	hydroxy	ol
12.	–SH (thio alcohol)	mercapto	thiol
13.	$-NH_2$(amine)	amino	amine
14.	–OR(ether)	alkoxy	×

The senior most functional group constitutes secondary suffix.
Other junior F.G's are written in prefix in alphabetical order.

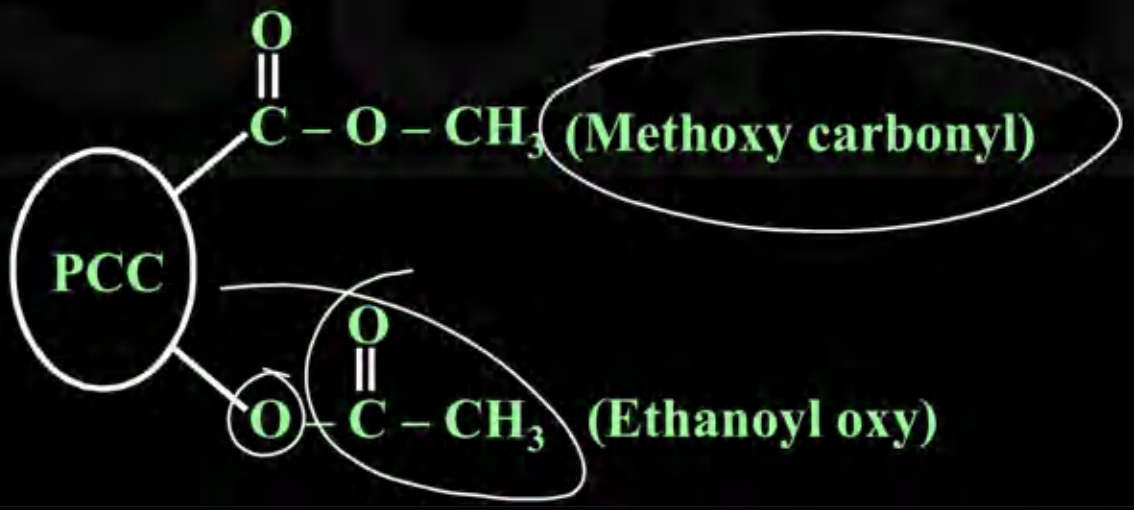
(a) Functional Group > Multiple Bond > No. of carbon atoms >Maximum no. of substituents > Nearest locant >Alphabetization.

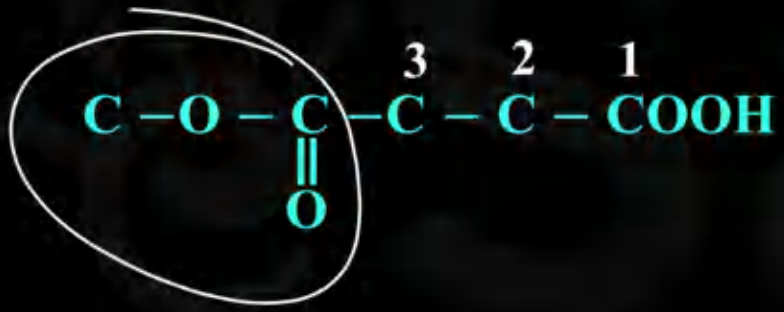


5-Sulphopentanoic acid

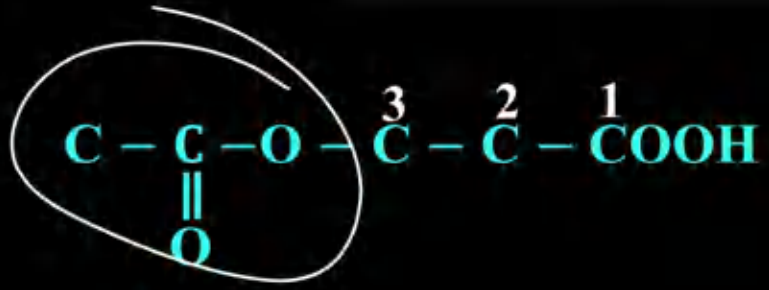
Ester

F-Group	Prefix	Suffix	IUPAC Name
$-\overset{\overset{O}{\|}}{C}-OR$ (Ester)	Alkoxy Carbonyl or alkanoyl oxy	Oate or Carboxylate	Alkyl....alkanoate or Alkyl.....Alkanecarboxyl ate



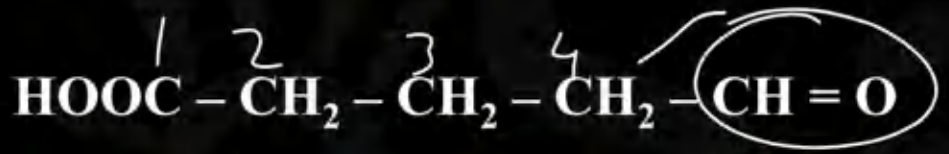


3-(Methoxycarbonyl) propanoic acid

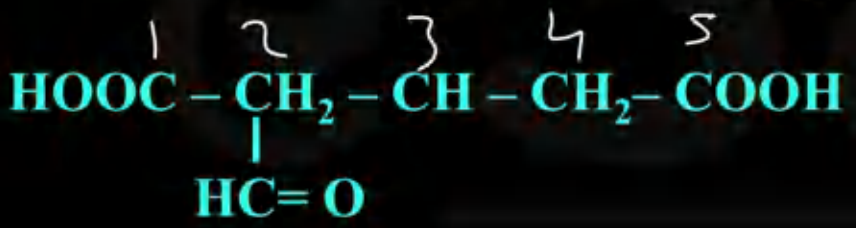


3-(Ethanoyloxy) propanoic acid

Whenever aldehyde or ketone are not behaving as functional group then ketone will be always included in PCC but if aldehyde is present at terminal then we use "Oxo" for it and if aldehyde is present at middle of the PCC then we use "Formyl".

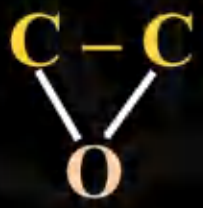


5-Oxopentanoic acid

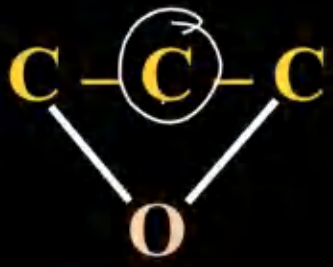


2-Formyl pentane-1, 5-dioic acid

(ii) Cyclic Ether



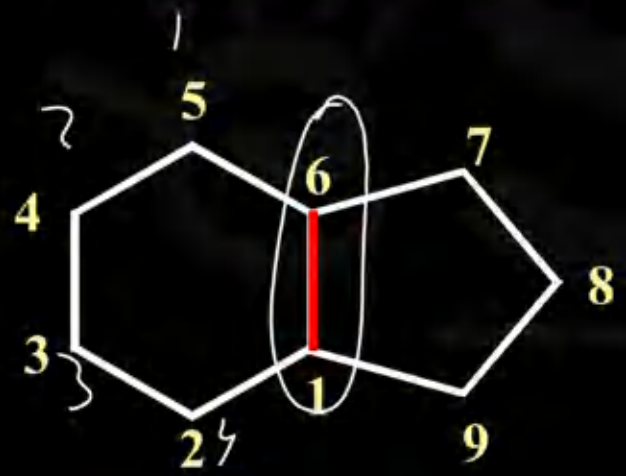
Oxirane or Epoxyethane



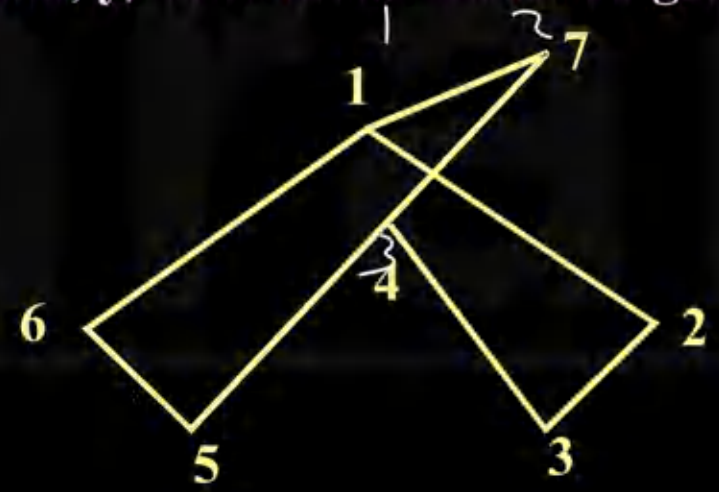
1, 3- Epoxy propane

Bicyclic Compounds

The name is written as bicyclo [x. y. z] alkane. x, y, z are in the decreasing order.



Bicyclo [4.3.0] nonane

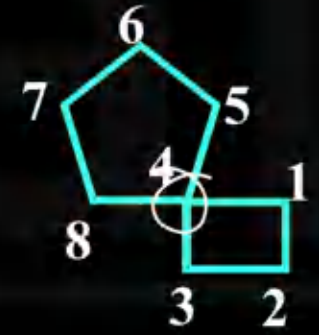


Bicyclo [2.2.1] heptane

Spiro

The numbers are written in ascending order and enclosed in square brackets.

Numbering of a spiro bicyclic hydrocarbon starts with a ring carbon next to the spiro atom and proceeds first through the smaller ring and then through the spiro atom and around the second ring.



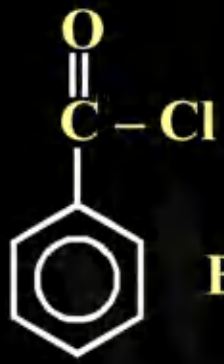
Spiro [3.4] octane

Rule

Common name of some organic compounds are retained in I.U.P.A.C. nomenclature.

Benzonitrile
Benzene carbonitrile

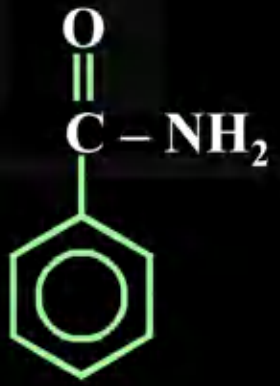
Phenol
Hydroxy benzene



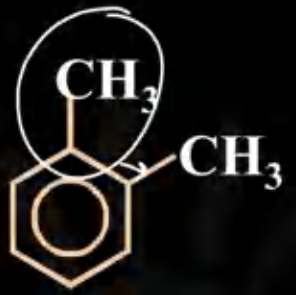
Benzoylchloride

Toluene

Aniline

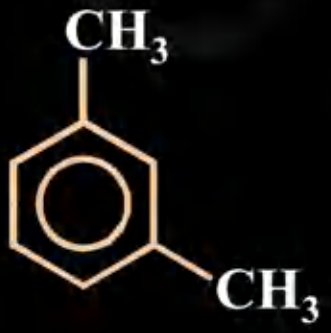


Benzamide



o-xylene (1, 2)-ortho

p-xylene (1, 4)-para



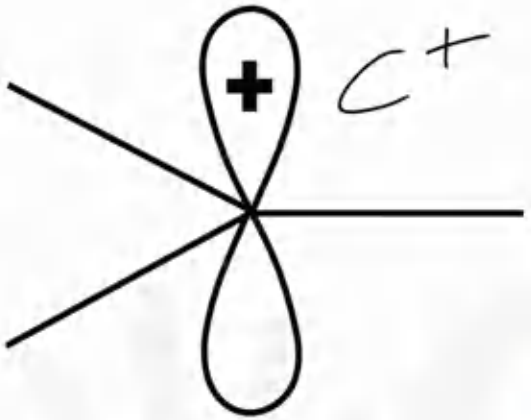
m-xylene (1, 3)-meta

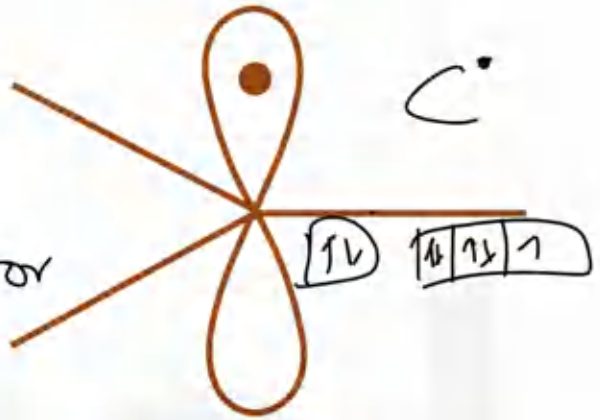
Electronic Displacement Effect (EDE)

Like charges
maximum door $K\frac{Q_1 Q_2}{r}$

Effect due to displacement of electron is known as EDE.

opposite
max pays





Trigonal Planar

Carbocation

Incomplete Octet

Electrophile

sp^2

Lewis Acid

Trigonal Pyramidal

Carbanion

Complete Octet

Nucleophile

sp^3

Lewis Base

Trigonal Planar

Carbon Free Radical

Incomplete Octet

Electrophile

sp^2

Neither

Inductive Effect

$R_3\overset{+}{N}$ → bulky → BA↑ → % s character → Zeff

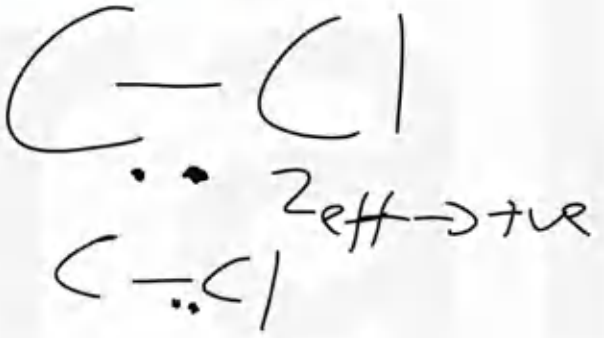
Partial displacement of σ - bond electrons toward more electronegative atom is known as inductive effect.

$H_3C\text{-}Cl$

$\overset{+}{N}F_3 > \overset{+}{N}R_3 > \overset{+}{N}H_3 > -NO_2 > -CN > -SO_3H$

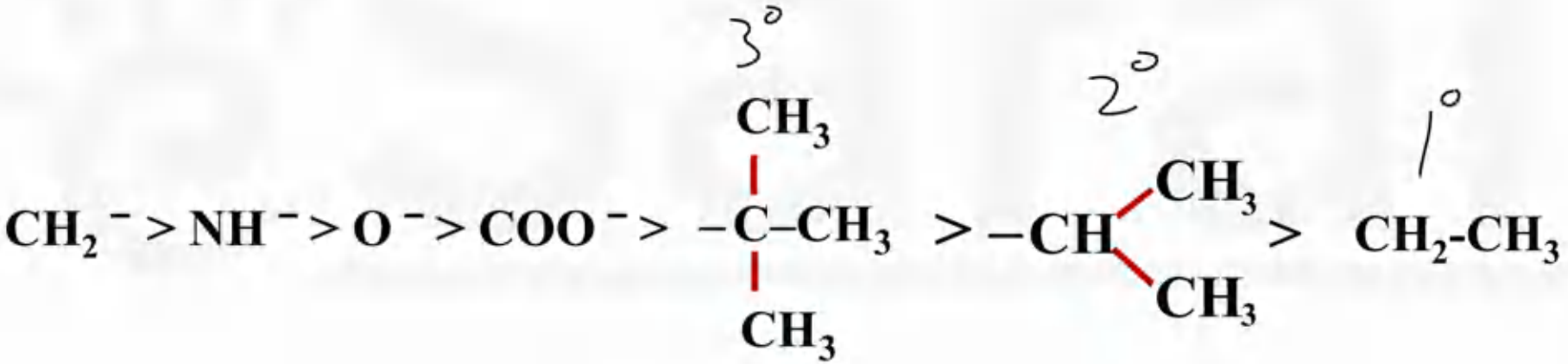
$> -CHO > -COOH > -F > -Cl > -Br > -I > -OH$

$> -C \equiv CH > -NH_2 > -Ph > -CH = CH_2 > H$

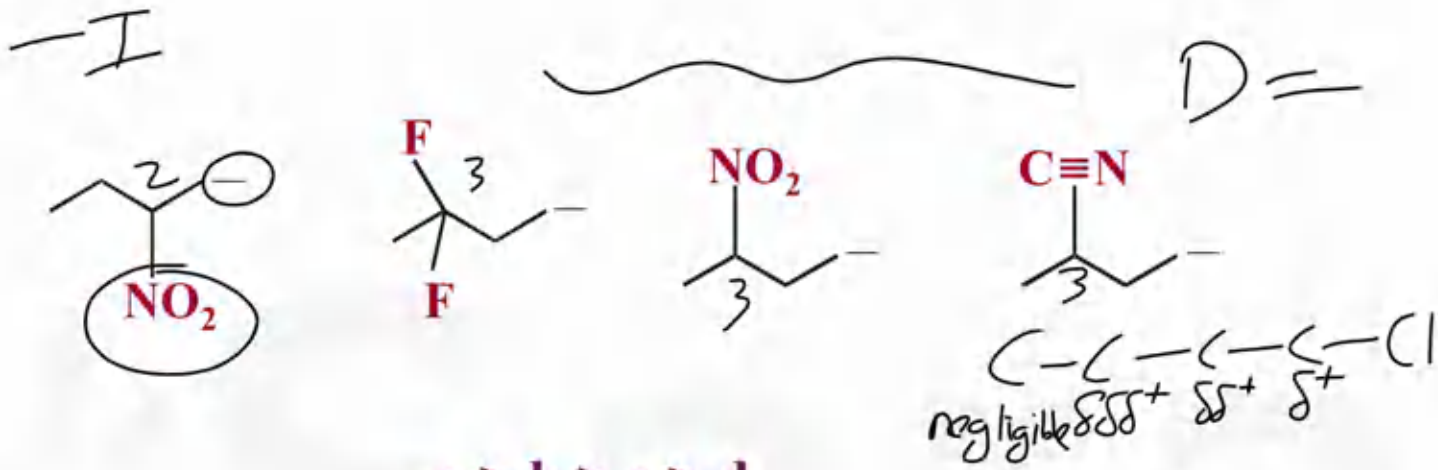


+I series

$T > D$



$> CT_3 > CD_3 > CH_3 > T > D > H$



a > b > c > d

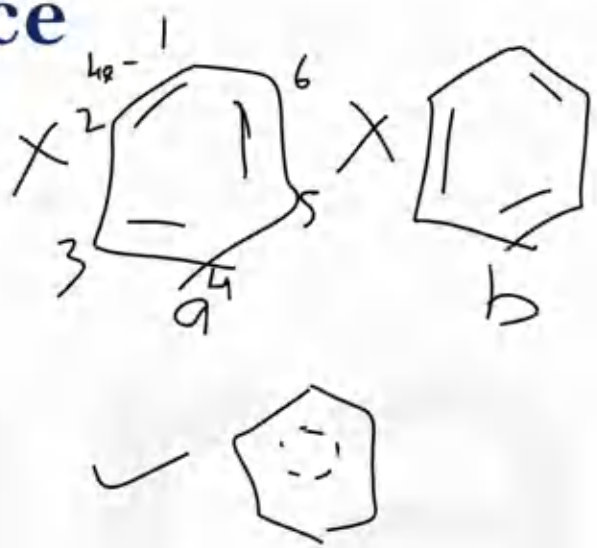
[D N P]

Distance **Power**

No. of groups

Resonance

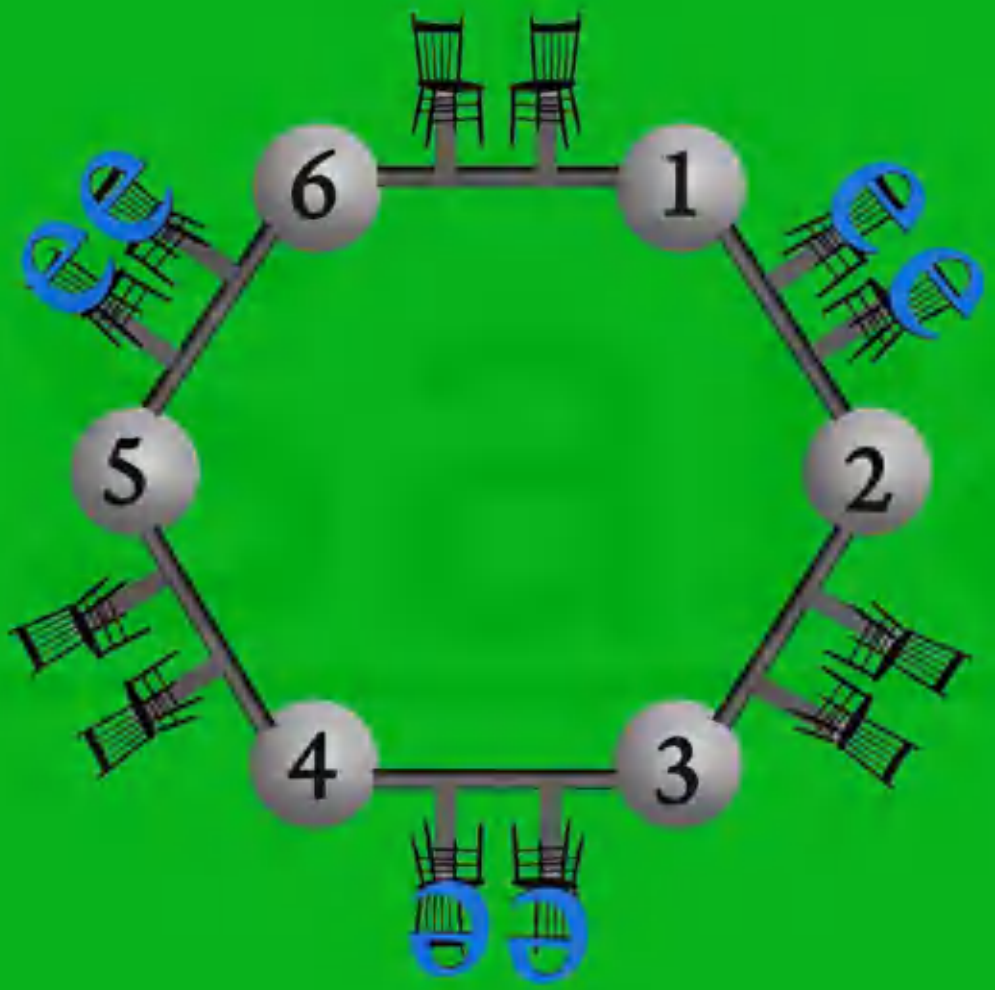
It is due to the delocalization of electrons within the molecule.



All the contributing structures in the resonance are called resonating structures or canonical structures.

1. **System must be planar.**

2. **System must be in conjugation**
   (i.e. parallel p orbitals are required)



Stability Of Resonating Structure

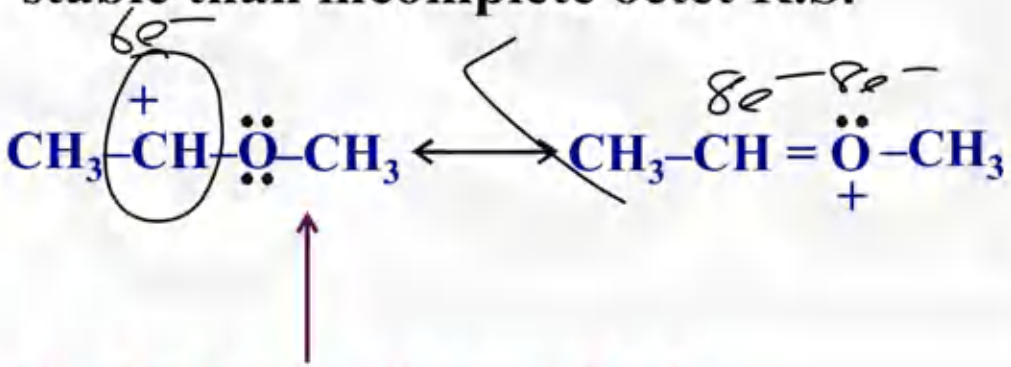
Rules

1. **Neutral or non-polar resonating structure (R.S.) is more stable than polar-resonating structure.**

(I) **(II)**

Stability of (I) > (II)

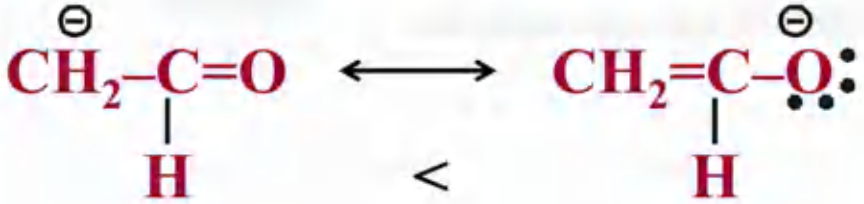
2. **Resonating structure with complete octet of all atom is more stable than incomplete octet R.S.**



Carbon octet (Incomplete)

(Incomplete) < (complete)

3. Negative charge on more E.N. atom is more stable, positive charge on less E.N. atom is more stable.

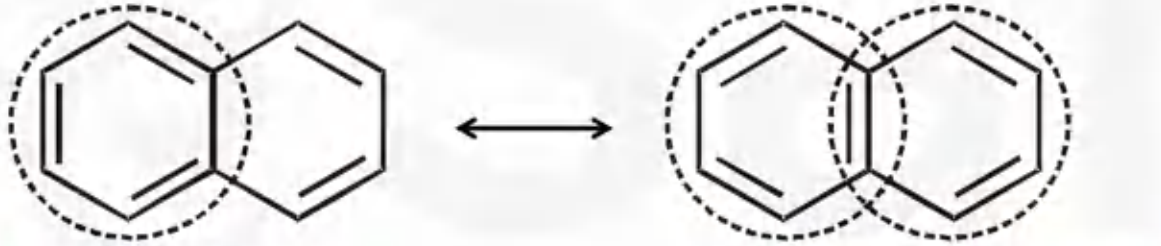


4. According to Coulomb's law like charges should be away from each other & unlike charges should be closer.

I II

I > II

5. Fries rule : Resonating structure having more number of benzenoid ring is more stable.



1 benzenoid ring

I

2 benzenoid ring

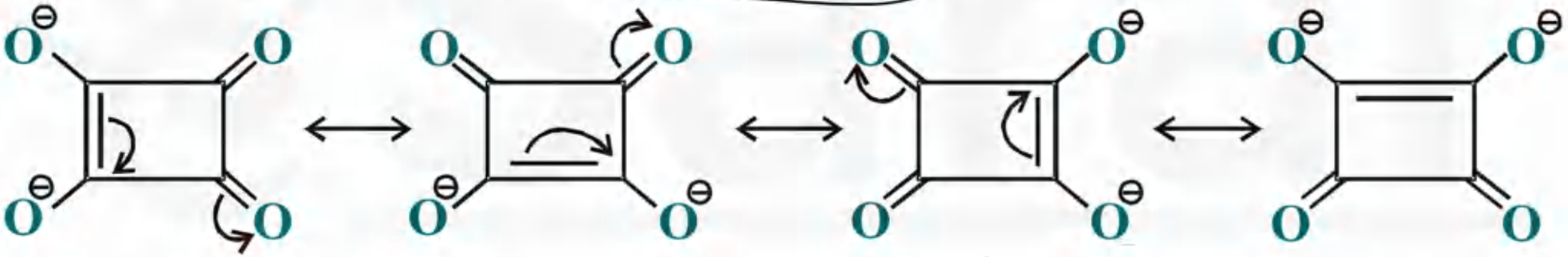
II

I < II

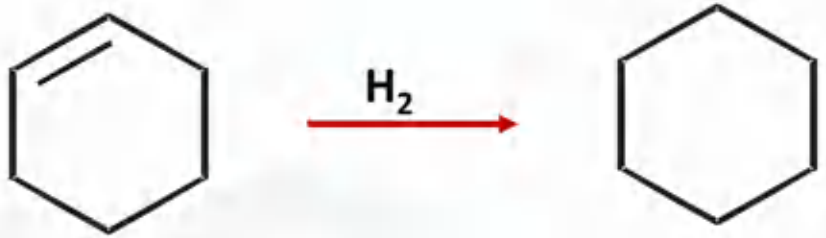
Equivalent Resonating Structure

Squaric Acid $\longrightarrow$ CH_3-SO_3H

4 Eq RS



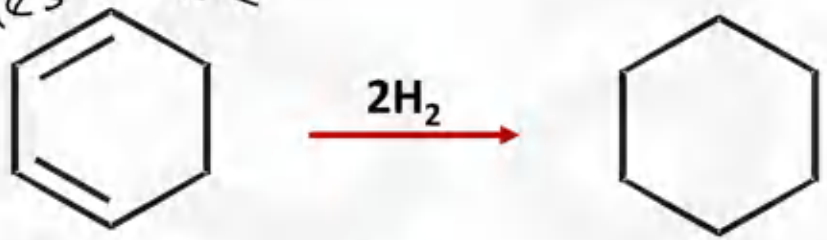
Aromaticity



$\Delta H = -28.6$ KJ/mol

X2

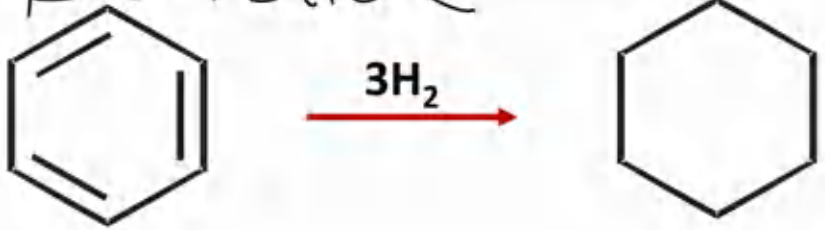
Resonance



−57.2

$\Delta H = -55.4$ KJ/mol

Extra stable



−85.8

$\Delta H = -49.6$ KJ/mol

Superstable Superunstable NA

S.No.	Aromatic	Anti-aromatic	Non-aromatic
1.	Planarity  $6\pi e^-$ $4\times1+2$	Planarity  $4e^-$	Non-planarity (presence of sp^3 atom)
2.	Complete cyclic resonance or conjugation	Complete cyclic resonance or conjugation	Not complete resonance in cyclic ring
3.	Compound should follow Huckel's Rule. $(4n+2)\pi$ delocalized e^- $n = 0$ to ∞	Compound should not follow Huckel's Rule. $4n\pi$ delocalized electron. $n \neq 0$	———

Mesomeric Effect or Resonance Effect

The atoms or groups which donate or withdraw electrons from conjugated system via resonance show resonance or mesomeric effect.

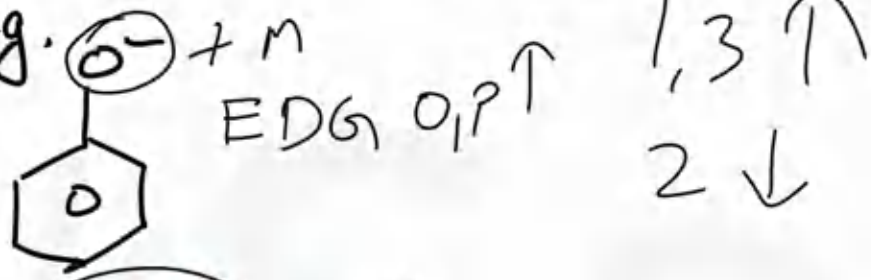
Group which show –M effect are -

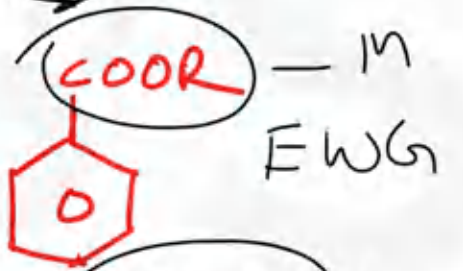
$-NO_2$, $-CN$, $-SO_3H$, $-CHO$, $-COR$, $-COOH$, $-COOR$, $-COX$, $-CONH_2$ etc.

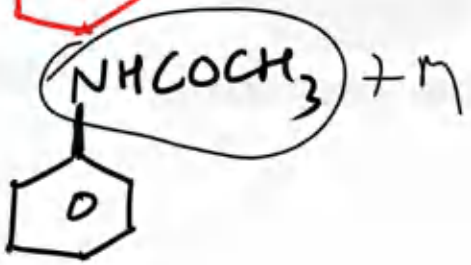
Group which shows + M effect are -

O^-, NH^-, $-\ddot{N}R_2$, $-NHR$, $-NH_2$, $-OH$, $-OR$, $-SH$ $-SR$, $-F$, $-Cl$, $-NHCOR$, $-O-COR$ etc.

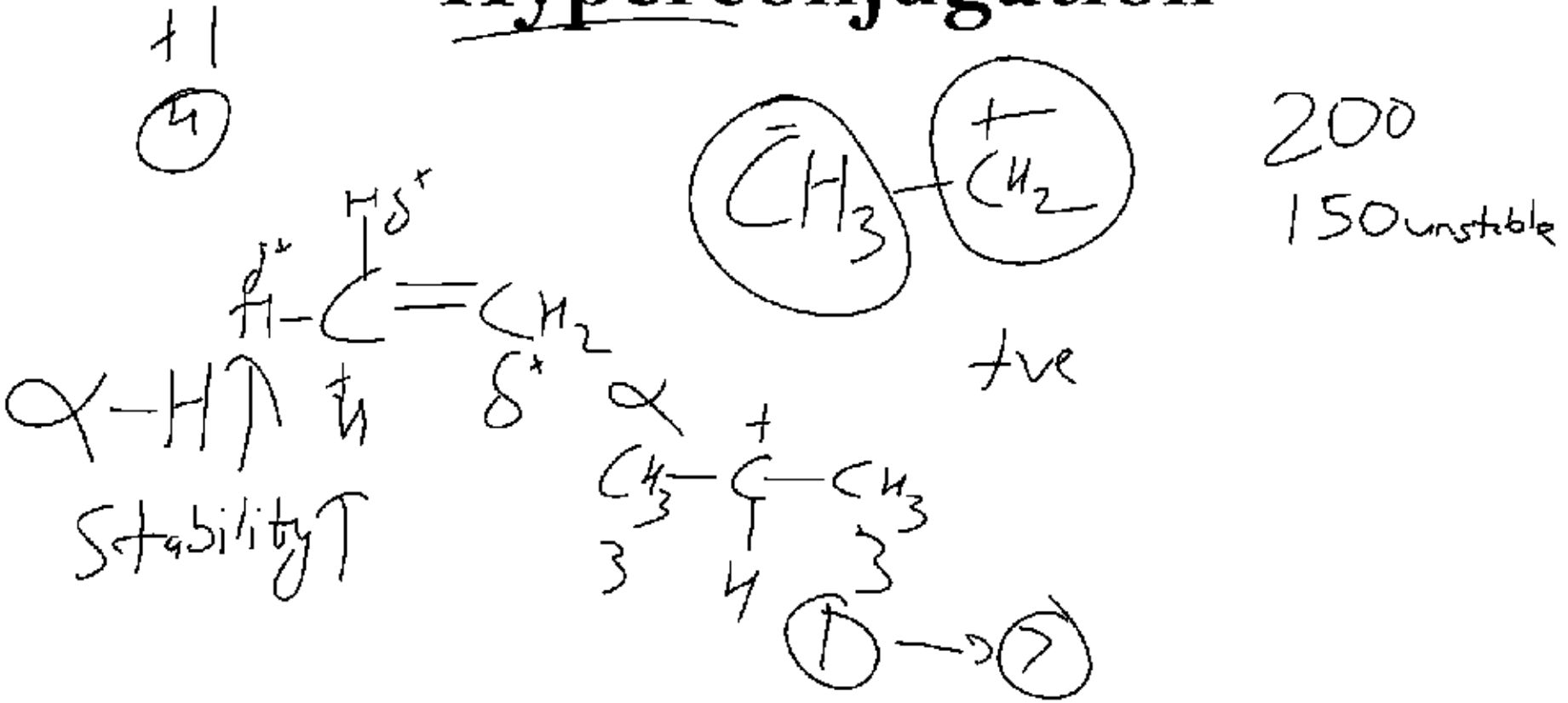
Q) Decide whether the following groups will increase or decrease the electron density on Benzene ring.

1) 

2) 

3) 

Hyperconjugation

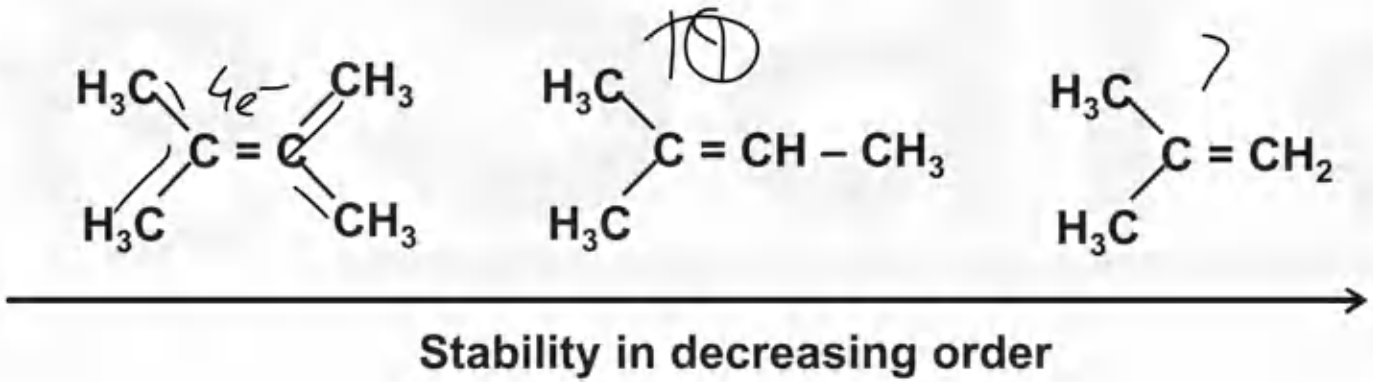


1. Hyperconjugation In Carbocation

2. Hyperconjugation In Free Radical

3. Hyperconjugation In Alkene

Q)



(4) Heat of Hydrogenation

Heat evolved when one mole of Alkene undergoes Hydrogenation

opposite of stability of alkene

(1) HOH $\propto$ no of π bond

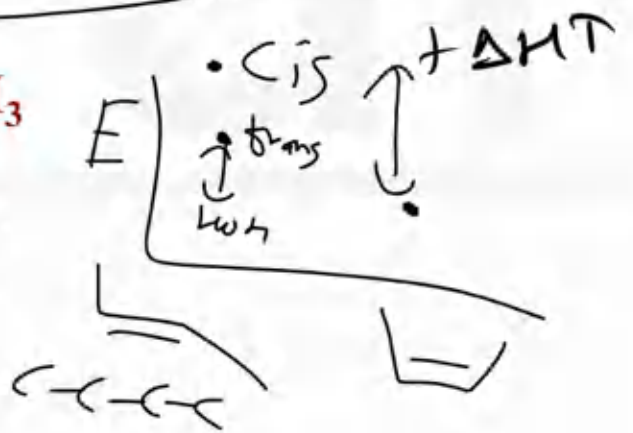
$\propto \frac{1}{\text{stability (if no of } \pi \text{ bonds are same)}}$

$C=C \xrightarrow[\text{catalyst}]{H_2}$

CH_2-CH_2 (H, H)

$CH_2 = CH_2 > CH_3-CH=CH_2 > CH_3-CH=CH-CH_3$

$C-H$ BS $> C=C$

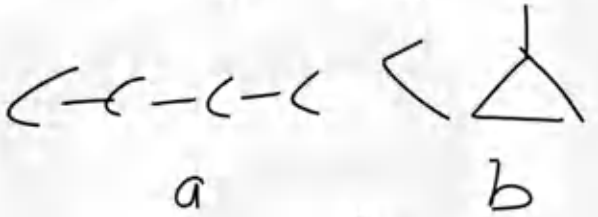


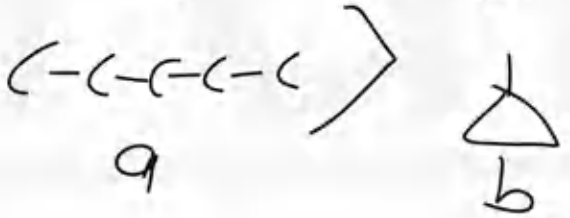
5. Heat of Combustion (HOC)

1 mole complete combustion

$C_{10}H_{22}$

$C=C + 3O_2 \rightarrow 2CO_2 + 2H_2O + \Delta H_2\uparrow$





Enthalpy change when 1 mole of compound is oxidized.

$$\text{HOC} \propto \text{No. of C-atom} \propto \frac{1}{\text{stability}} \propto \text{strain}$$

Yaad

C–H < C–D < C–T

T > D > H

$CH_3 - CH_2^+$, $CD_3 - CH_2^+$, $CT_3 - CH_2^+$

I > II > III

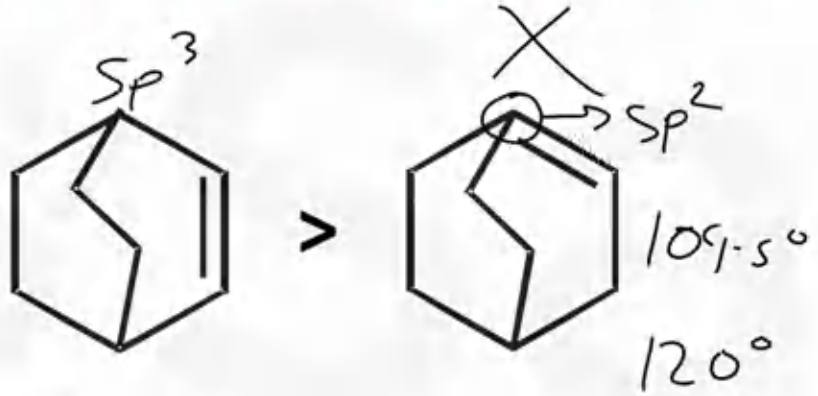
CH_3^+ CD_3^+ CT_3^+

III > II > I

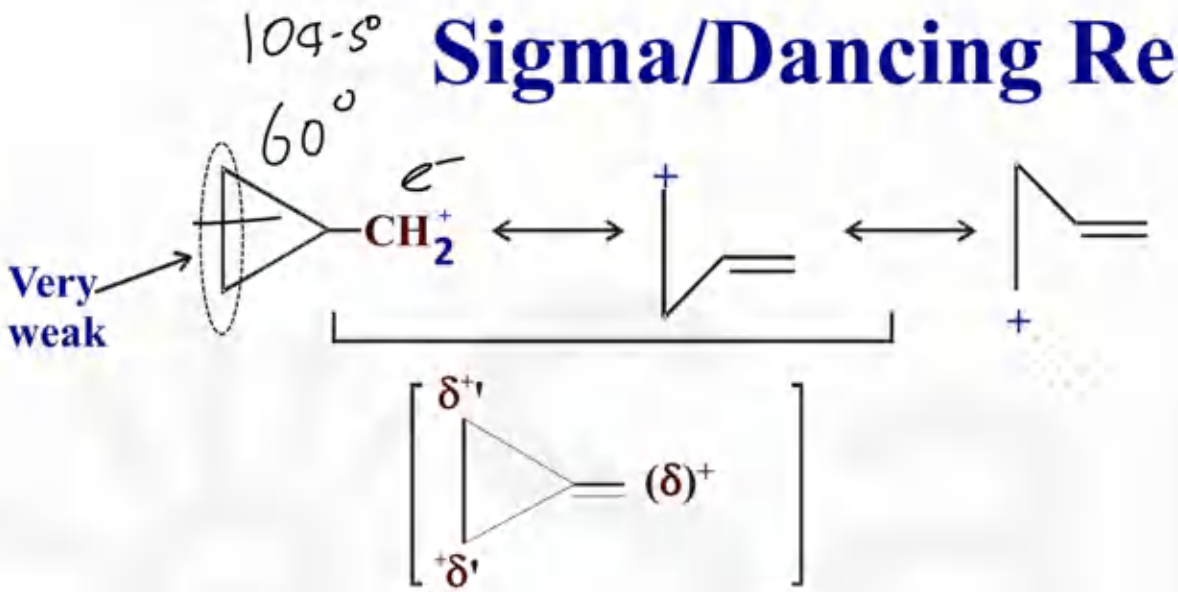
Bredt's Rule

VVVV Imp

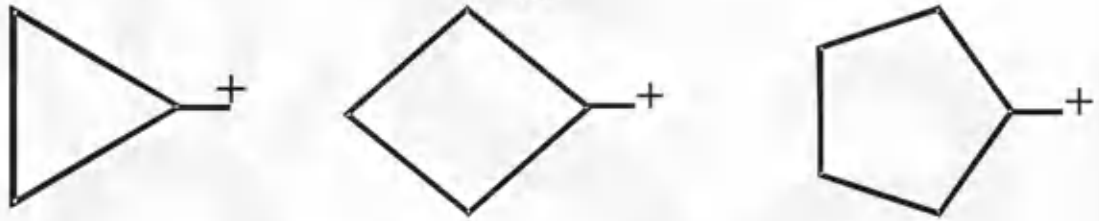
According to this rule, planarity (sp^2 hybrid) can't be acheived at bridge head centre of bicyclic compound having less than 8C.



Sigma/Dancing Resonance

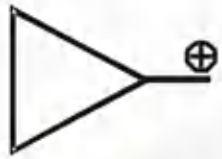


3 membered Ring

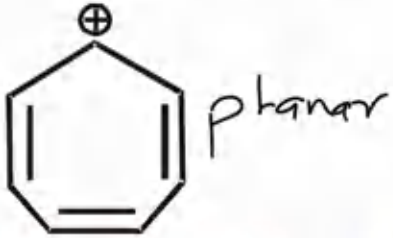


I > III > II , 1-σ-resonance, +I effect is higher in III than in II

Stability of Intermediates



(Dancing Reso)



(Aromatic)

$(Ph)_3C^{\oplus}$

Reso

(3 phenyl ring)

$Ph - \overset{\oplus}{C}H_2$

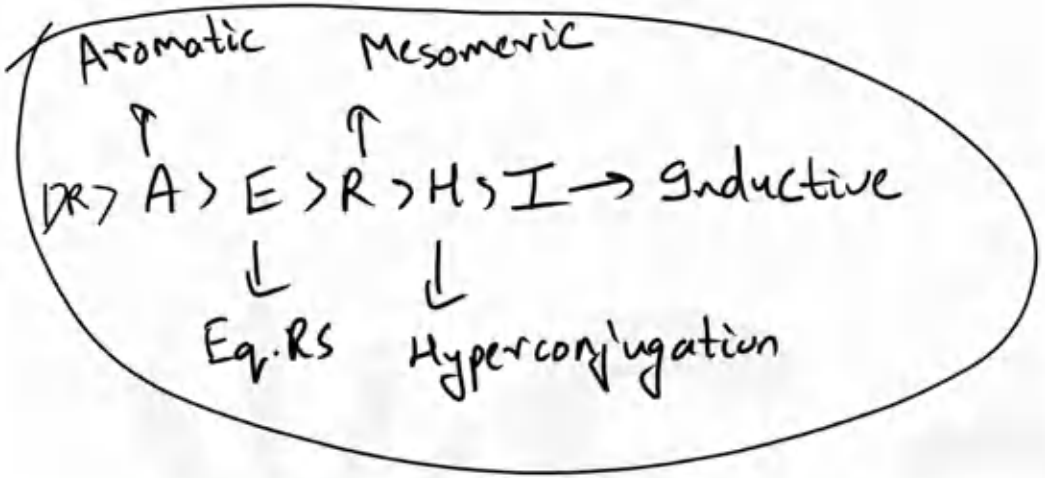
Reso

(1 phenyl ring)

Reso (x)

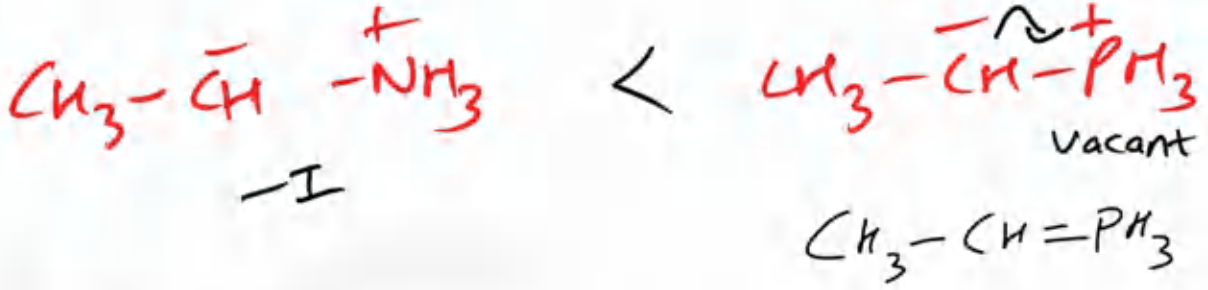
Dancing (x)

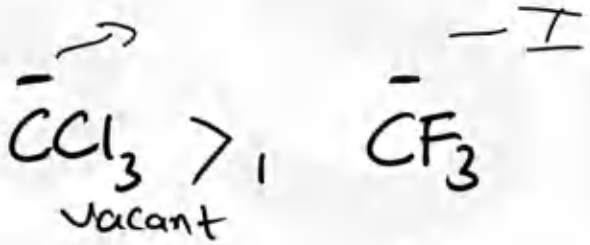
Ans. 1 > 2 > 3 > 4 > 5

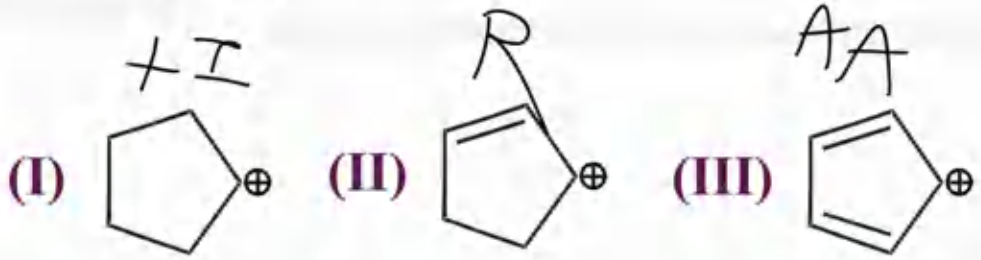


Stability of carbocation/free radical ∝ EDG (+M / +H / +I / _ / -I / -M)

Stability of carbanion ∝ EWG (–M / –I / _ / +I / +H / +M)







II > I > III

Acid Strength Order

$A \rightarrow CB$

Stability

$CH_3COOH \rightarrow CH_3COO^-$

Acid

Conj. Base stability $\propto$ acidic strength

negatove charge

$HF > H_2O$

$HI \rightarrow I^-$

$HBr \rightarrow Br^-$

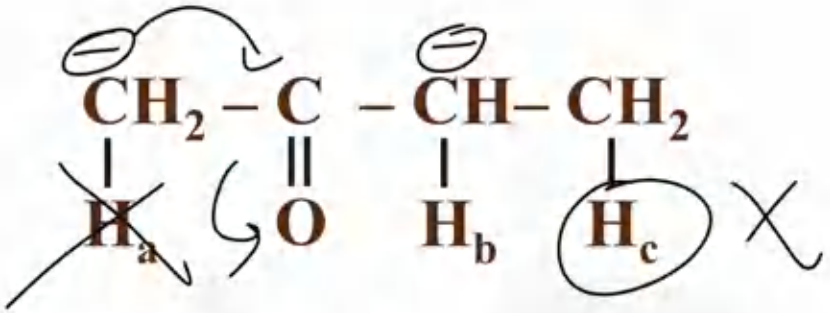
$HCl \rightarrow Cl^-$

AS $\propto$ |-M/-I| neutral > +I > +H > +M

$HI > HBr > HCl > HF$ → size dominates

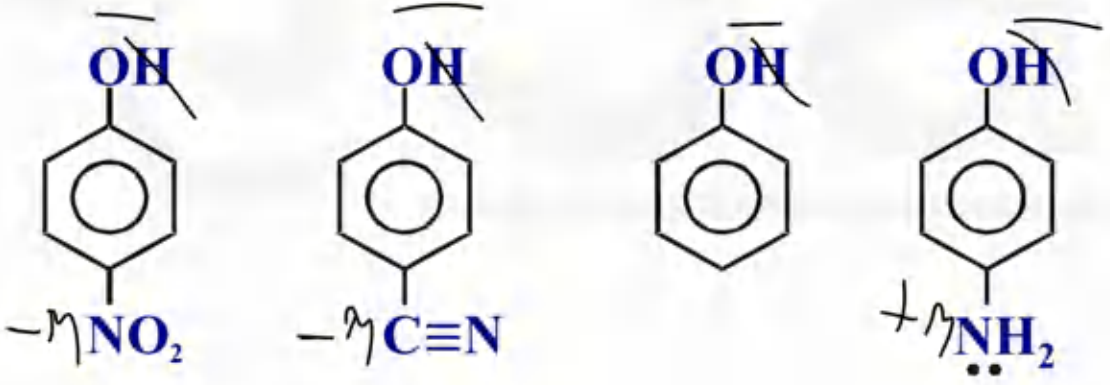
EN

Effects

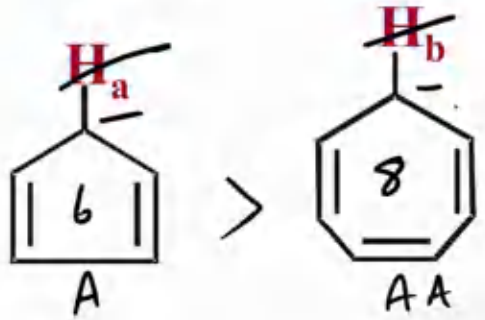


1° > 2° > 3°

Ans. a > b > c



Ans. 1 > 2 > 3 > 4



-I

$CF_3 - SO_3H$

3 EQ RS

+I

$CH_3 - SO_3H$

3 EQ RS

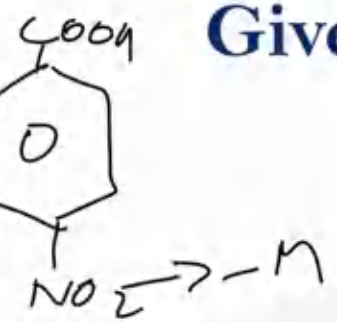
$CH_3 - \underset{\underset{O}{\|}}{C} - OH$

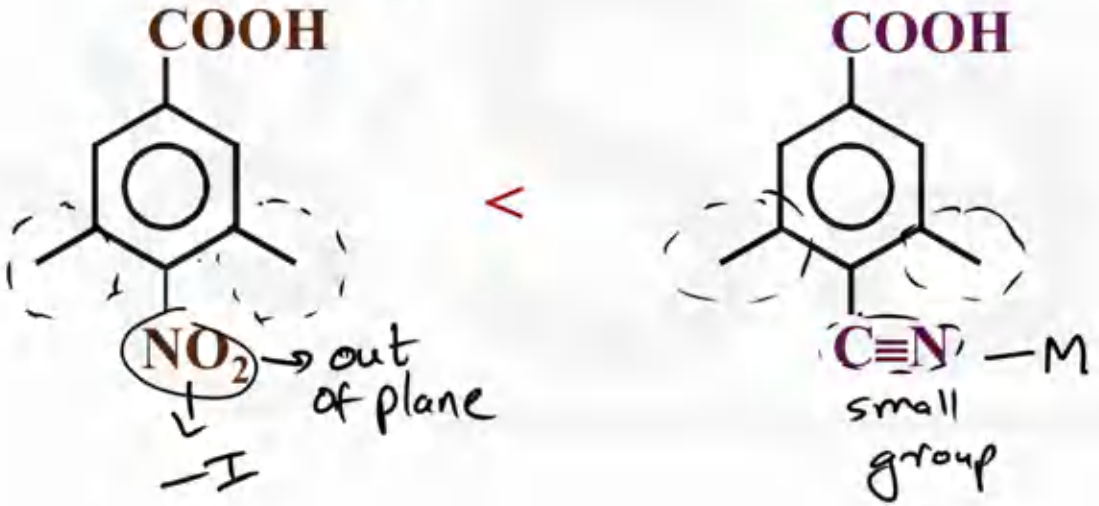
2 EQ RS

Give Acidic Strength Order

SIR

(1)





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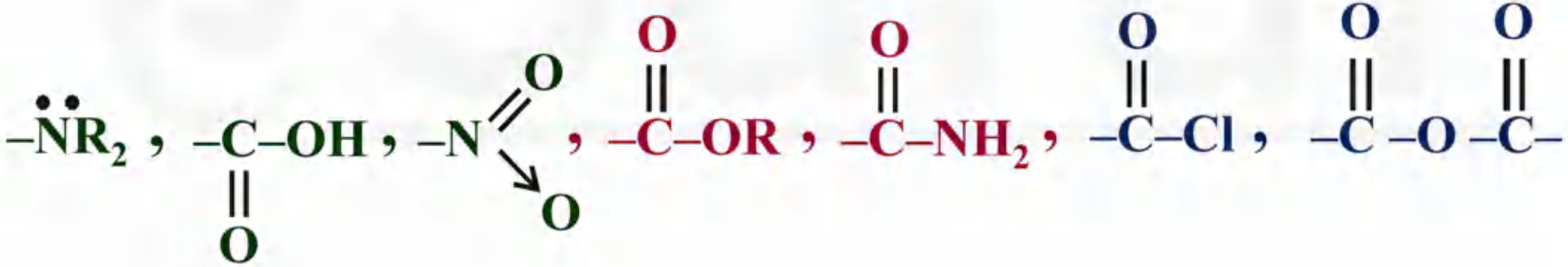
Some Large Groups Which Show S.I.R.

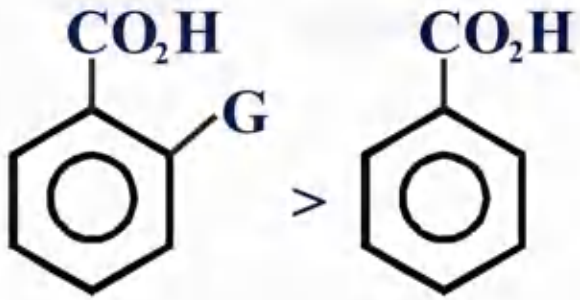


Some small groups and linear group which do not show SIR are –OH, –NH_2, –C≡N, F etc.

Steric crowding of some group is not considered H, T, D, F, –OR

Ortho Effect

Ortho derivative of benzoic acid is generally more acidic than benzoic acid itself. It is called ortho effect



Basic Strength Order

e^- density ↑

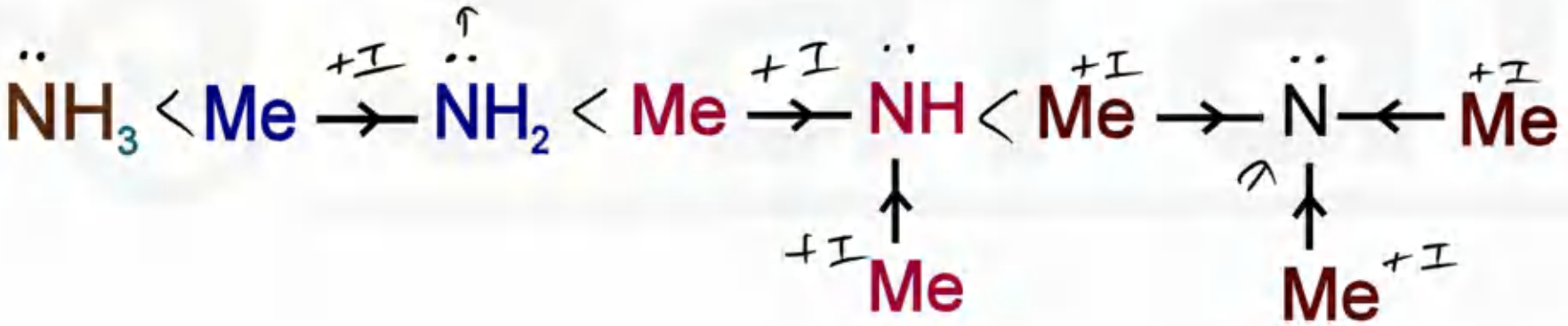
Base ↑

+H acceptor

Base → anion, electron donor

Basic strength ∝ +M | +H | +I | no effect | -I | -M

gir



EN ↓ Base ↑

Period

$CH_3^- > NH_2^- > OH^- > F^-$

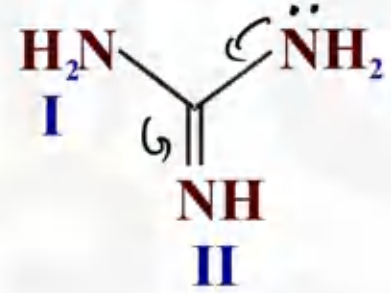
→ (EN ↑)

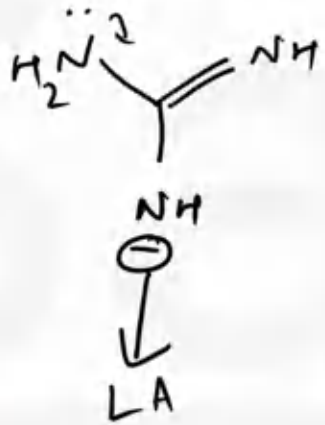
Learn

Guanidine

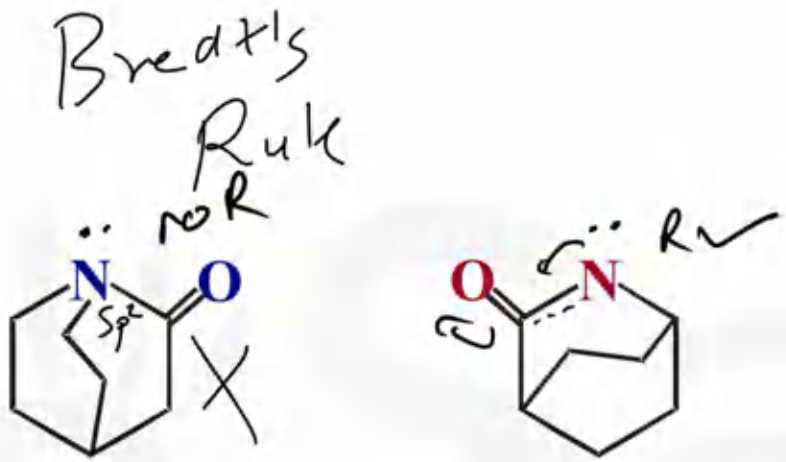
BS ↑

II > I





(Guanidine) → most basic



I > II as l.p. is localized by bredt's rule

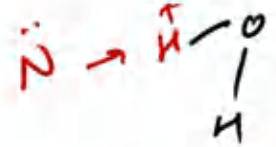
Basic Strength in Aqueous Medium

air

By considering + I effect of methyl we may expect basic nature as

$NH_3 < MeNH_2 < Me_2NH < Me_3N$

(Which is not true always)



Solvation → steric crowding

$NH_3 > MeNH_2 > Me_2NH > Me_3N$ ←

Basicity

$Me_3N > Me_2NH > MeNH_2 > NH_3$ ←

NH_3, RNH_2, R_2NH, R_3N

Thus, due to two opposite effects i.e. solvation of cation and + I effect, the jumbled order comes to be

R group is methyl

$Me_2NH > Me-NH_2 > Me_3N > NH_3$ ←

2° 1° 3° 0°

2130

R_3N, R_2NH, RNH_2, NH_3

Basis strength →

R is Methyl — 2130

R is Ethyl — 2310

Similarly on the same reasons ethyl amines and other amine follow the following order for basic strength

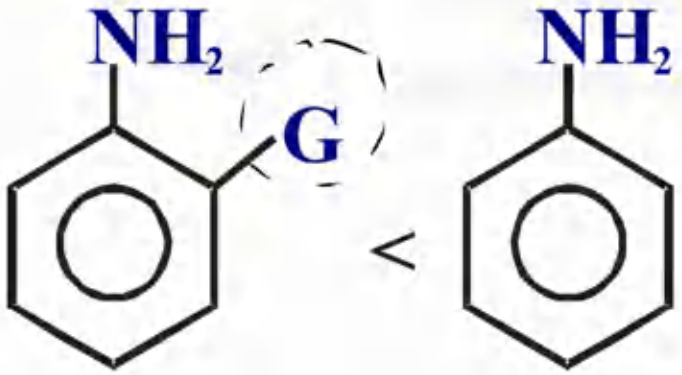
$Et_3N > Et_2NH > EtNH_2 > NH_3$
(gas phase)

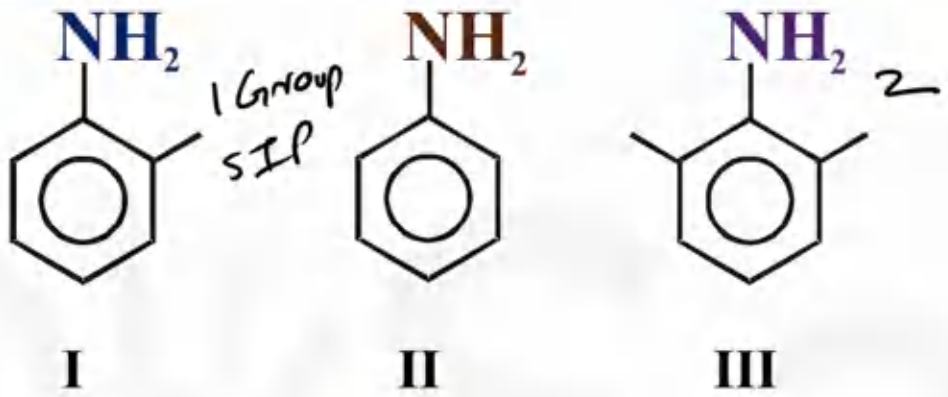
$Et_2NH > Et_3N > EtNH_2 > NH_3$ when R group Ethyl
(water as solvent) 2310

SIP Effect(Steric Inhibition of Protonation)

Learr

Ortho derivative of aniline is generally less basic than aniline itself and it's p,m derivatives.





I II III

low SIP

III < I < II ⟶ No SIP

high SIP

Q) Compare bond length of C-Cl bonds.

$C-C=\overset{+}{Cl}$ 50% SB

Double bond character

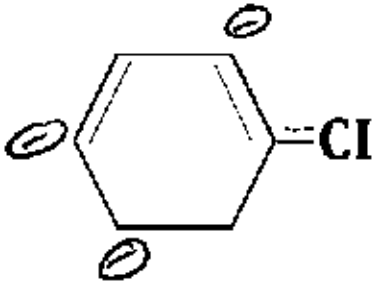
SB↑ BL↓

(a) $CH_2 = CH - \ddot{Cl}:$ BO↑ DB↑ BL↓

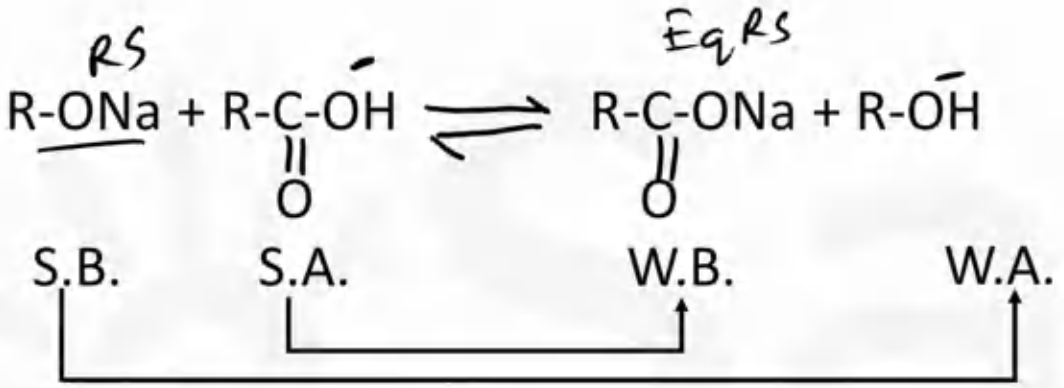
Reso

single bond

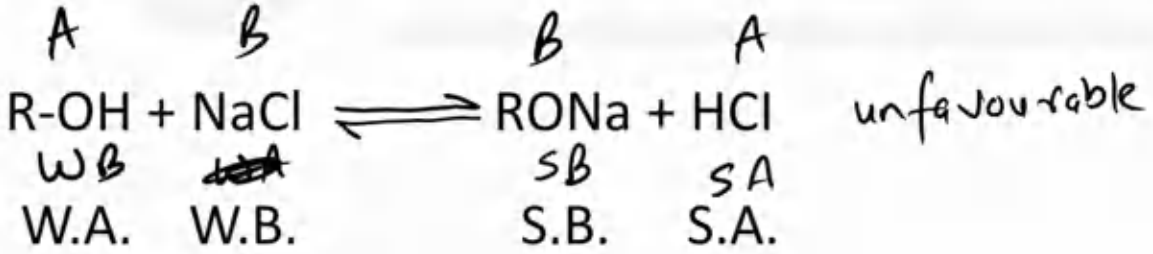
(b) $CH_3 - CH_2 - CH_2 - Cl$ BL b>a>c 100% SB

(c)  $R_c > R_a$ 25% SB

Acid-Base Equilibrium



(favourable)



unfavourable

(Q) $R-\underset{\underset{O}{\|}}{C}-OH + NaOH \rightleftharpoons R-\underset{\underset{O}{\|}}{C}-ONa + H_2O$ **favourable**

S.A. S.B. W.B. W.A.

(Q) $Ph-OH + NaOH \rightleftharpoons Ph-ONa + H_2O$ **favourable**

S.A. **W.A.**

Solubility In Aqueous NaOH & $NaHCO_3$

$HA + NaOH \rightleftharpoons H_2O + NaA$

SA SB WA WB

solubility fav in NaOH

$HA > H_2O$

Comp soluble in NaOH

$HA + NaHCO_3 \rightleftharpoons H_2CO_3 + NaA$

SA SB WB

$HA > H_2CO_3$

Comp solu $NaHCO_3$

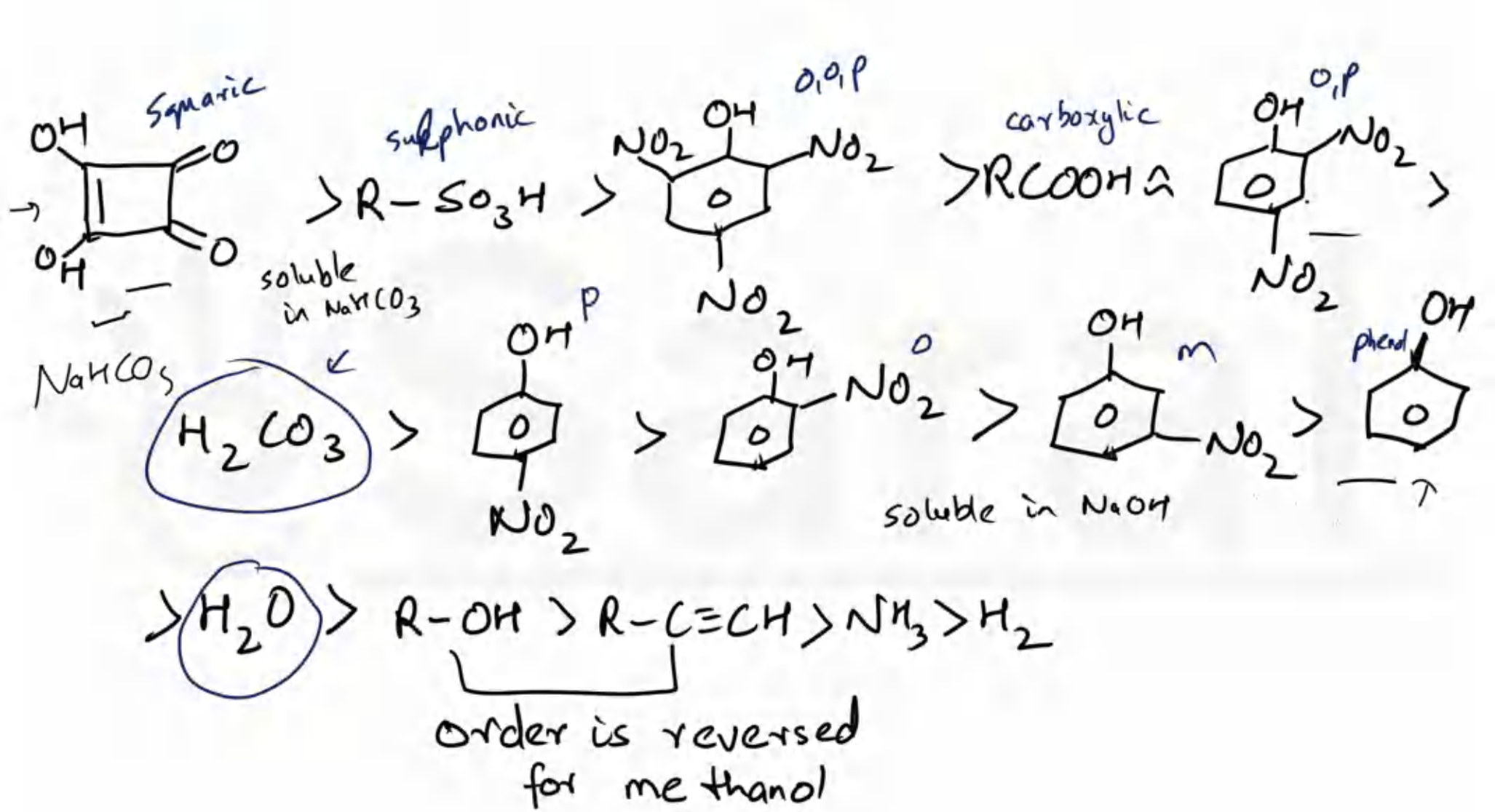
H_2CO_3 unstable

$\downarrow$

$H_2O + CO_2\uparrow$ effervescence

Compounds which are more acidic then water are soluble in aqueous NaOH.

Compounds more acidic then H_2CO_3 are soluble in aqueous $NaHCO_3$ and will liberate CO_2 gas.



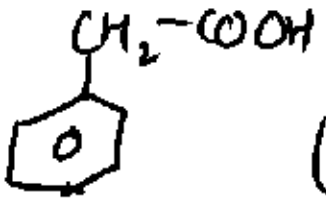
Q) Number of compounds which are soluble in

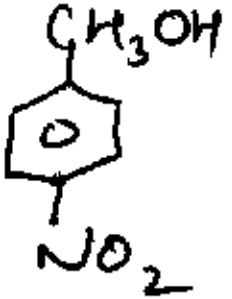
(i) aq. NaOH more acidic than H_2O a, b, c

(ii) aq. $NaHCO_3$ b, c

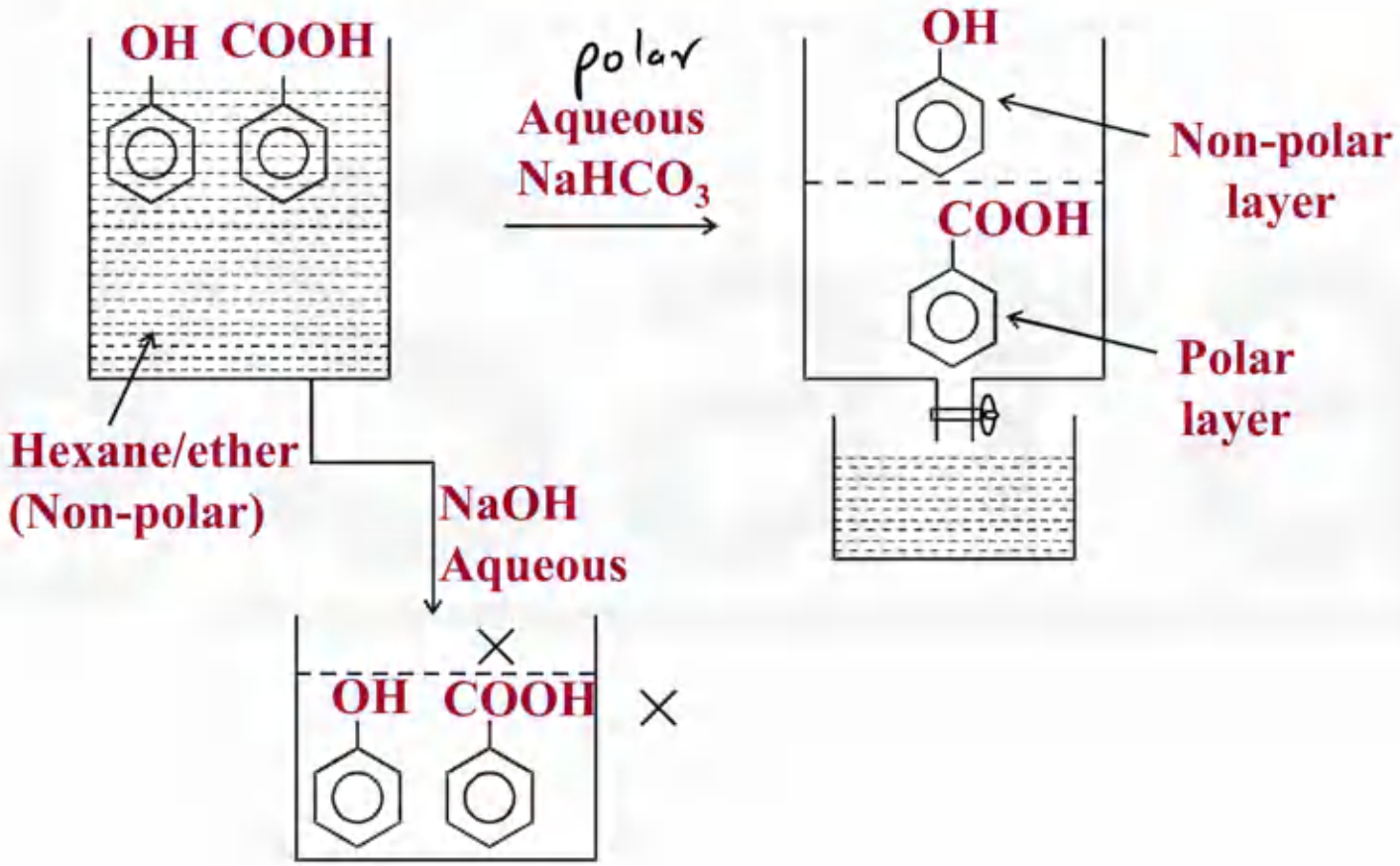
(iii) both in NaOH & $NaHCO_3$ b, c

(iv) gives $CO_2(g)$ with $NaHCO_3$ b, c

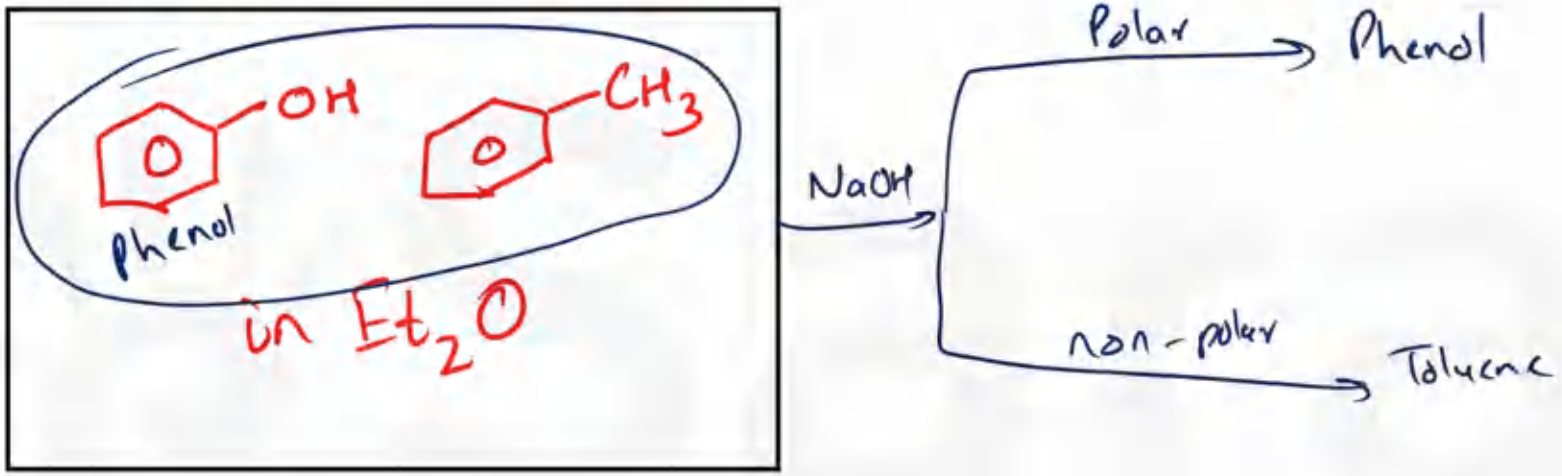
(a) Phenol (b) Benzoic acid (c) 

(d) 

Extraction method



Q) How can we separate following binary mixture?



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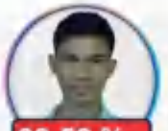

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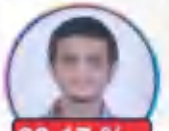

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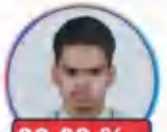

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