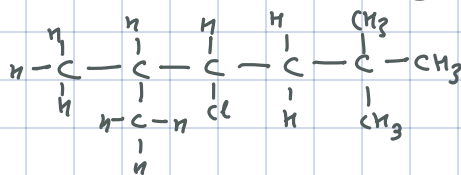
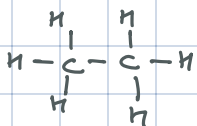


# Organic

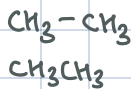
## carbon-hydrogen compounds



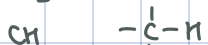
complete



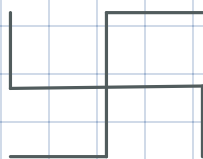
condensed



\* CH<sub>3</sub> always at the terminal



Q: determine no. of H & C's in the given structure.



$$\text{C} = 9$$

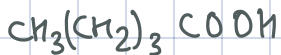
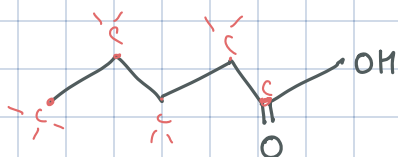
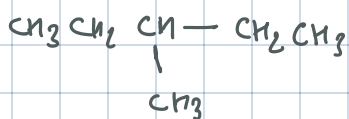
$$\text{H} = 12 + 8 \Rightarrow 20$$

Bond line formula: Every point is a carbon

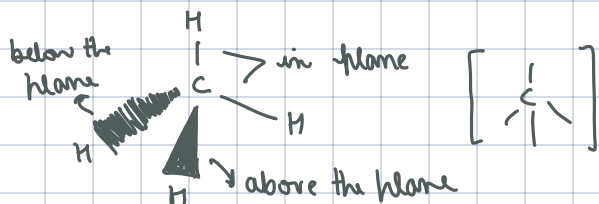
→ = & ≡ are also mentioned

→ all remaining valencies of C are supposed to be filled with H.

Practice:

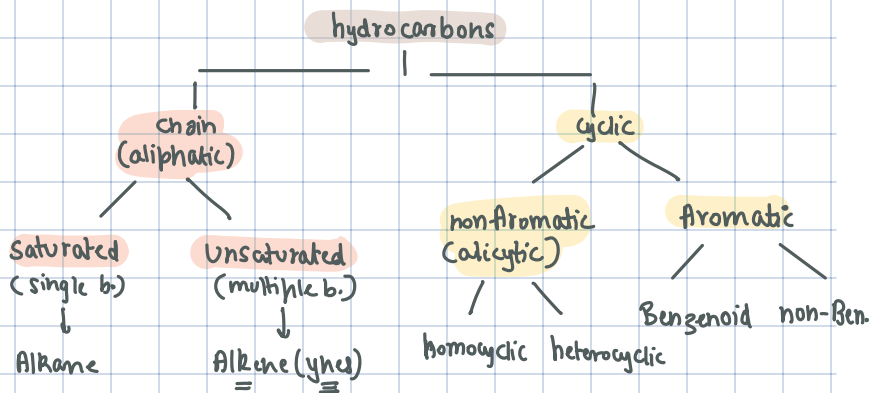


## 3D Structure



Tetrahedral (sp<sup>3</sup>)

## Classification



Practice:-

# Nomenclature

ALKENE  
( $C_nH_{2n+2}$ )

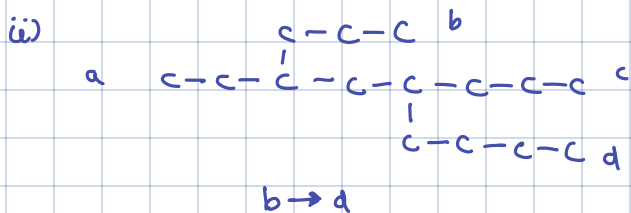
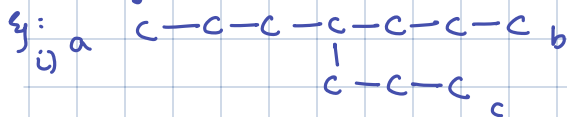
Common

IUPAC

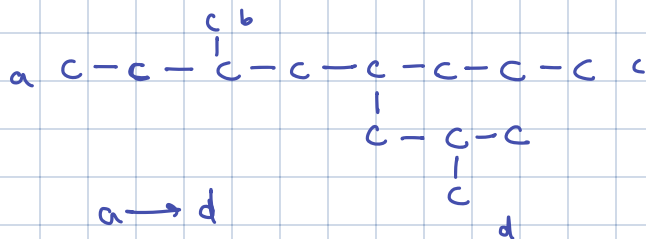
↓  
3 STEPS

- i) Selection
- ii) Numbering
- iii) Naming

## i) Longest carbon chain to be selected



If two chains are having same no. of C's  
 select one with more substituents. (more branches)

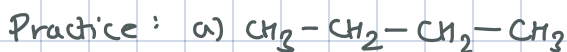


• bc more no. of substituents

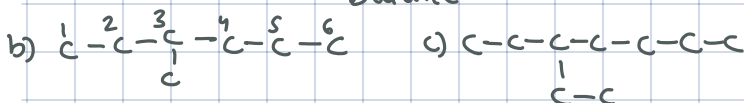
Practice:



Ans: b → d

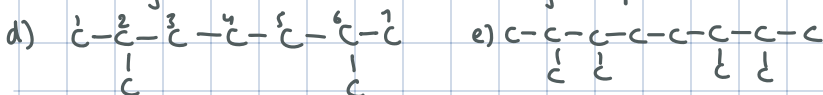


Butane



3-Methyl Hexane

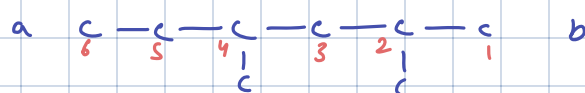
3-Ethyl Heptane



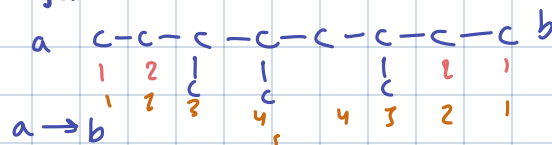
2,6-Dimethyl Heptane

2,3,6,7-tetraMethyl Octane

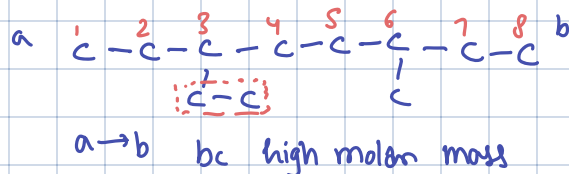
## ii) Numbering → Nos. are put from that end, where substituents are near



→ If 2 substituents are getting same no. look for next.



→ If 2 diff. substituents are present on same C from both sides, look for priority.  
 [high molar mass]



## iii) Naming → (alkyl-) prefix, word root, (ane) suffix

all substituents one put with their no.  
 no. of C's in longest chain  
 main function grp.

no. of substituent grps.

- 2 → di
- 3 → tri
- 4 → tetra
- 5 → penta
- 6 → hexa

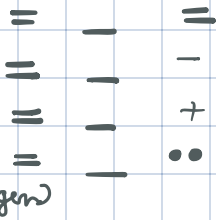
C's	Root (alk)
1	Meth
2	Eth
3	Prop
4	But
5	Pent
6	Hex
7	Hept
8	Oct
9	Non
10	Dec



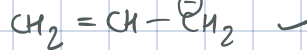
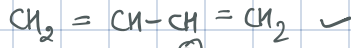
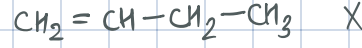
# Resonating Structures

## - Resonance effect/mesomeric effect

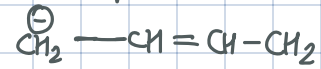
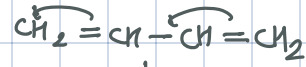
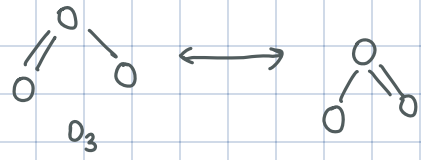
Conjugation is there



Resonating on not?

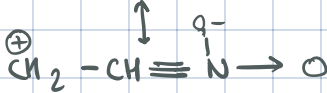
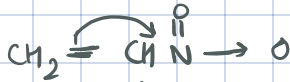


\* Resonance: delocalization of  $e^-$

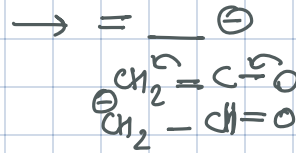
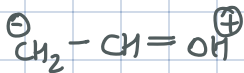
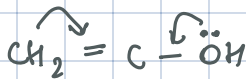


→ if resonance is present like  $\text{CH}_2 = \text{CH} - \overset{\text{O}}{\parallel}{\text{N}} - \text{O}$

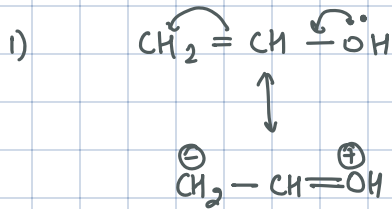
Start resonance from that = which is present in b/w diff. elements.



→ In system like = \_\_\_ .. Start resonance from IP.

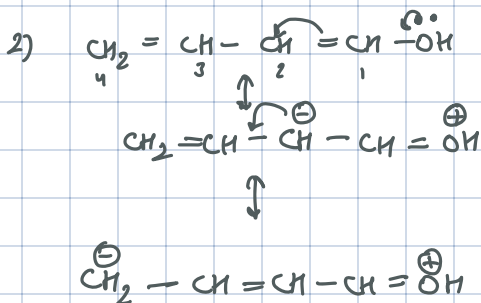


## → MESOMERIC EFFECT



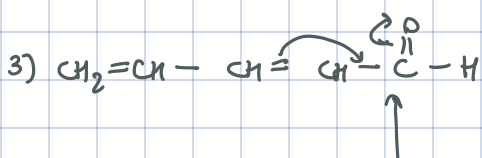
→ OH grp increases  $e^-$  density on 2nd C.

This is called as EDG in terms of resonance effect +M

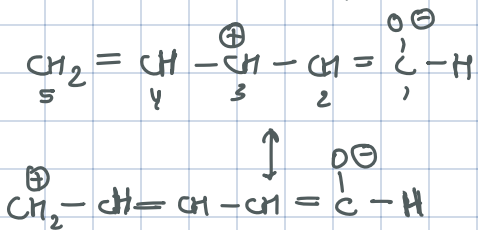


→ Mesomeric effect doesn't work on all C's. It works on alternate C's, but if it works, it works with full intensity.

\* Inductive works on all C's but its intensity decreases.



→ CHO (aldehyde) group is working as EWG, in terms of resonance & its known as -M/-R effect.



Practice:

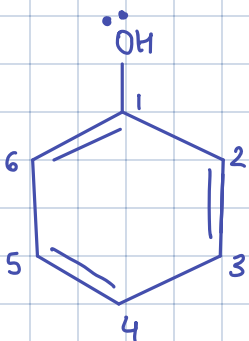
- a)  $\ominus \text{CH}_2 = \text{CH} - \overset{\cdot\cdot}{\text{N}}\text{H}_2$  +M (lone pair containing)
- b)  $\text{CH}_2 = \text{CH} - \ddot{\text{X}}$  +M
- c)  $\text{CH}_2 = \text{CH} - \ddot{\text{O}}\text{R}$  +M
- d)  $\overset{\oplus}{\text{CH}_2} = \text{CH} - \overset{\ominus}{\text{N}} = \text{O}$  -M (double bond having)
- e)  $\text{CH}_2 = \text{CH} - \overset{\ominus}{\text{C}} - \text{R}$  -M

### INDUCTIVE

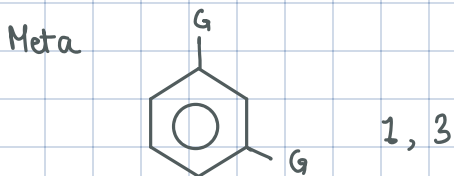
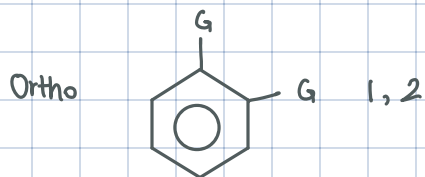
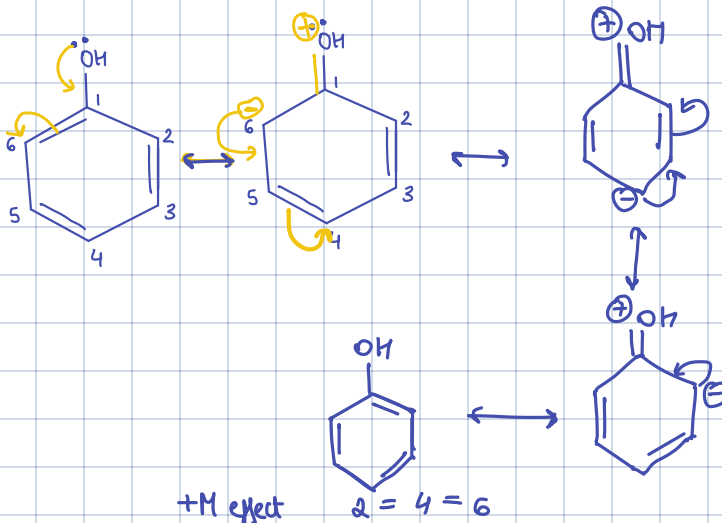
- always works
- we'll have to see the overall effect of any grp.

### RESONANCE (mainly aromatic compounds)

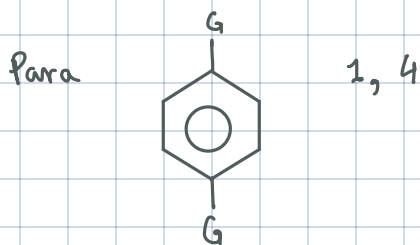
- works only if Resonance is present.
- both effect works



-I effect  $1 > 2 = 6 > 3 = 5 > 4$

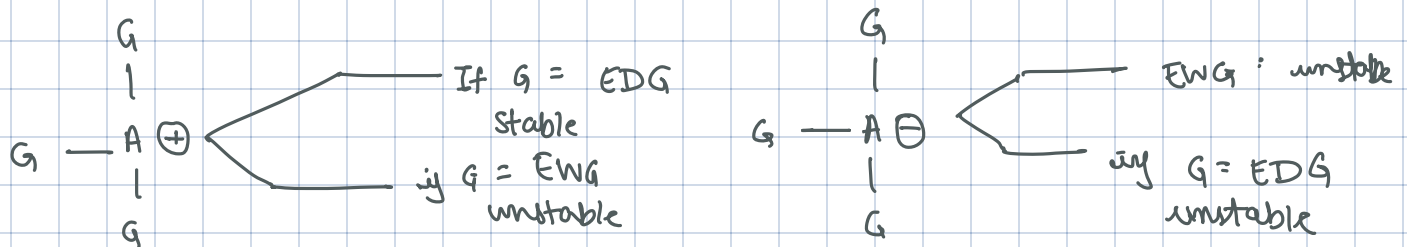


\* Mesomeric effect never works on meta-position.



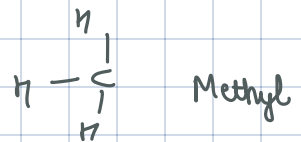
Group	Inductive		Mesomeric	Overall
$\ddot{O}H / \ddot{O}R$	-I	<	+M	EDG
$\ddot{N}H_2$	-I	<	+M	EDG
$\ddot{X}$	-I	>	+M	EWG
$NO_2$	-I		-M	EWG
R	+I			EDG
$\begin{array}{c} O \\    \\ C-H \end{array}$			-M	EWG
$-C \equiv N$	-I		-M	EWG

### STABILITY OF IONS

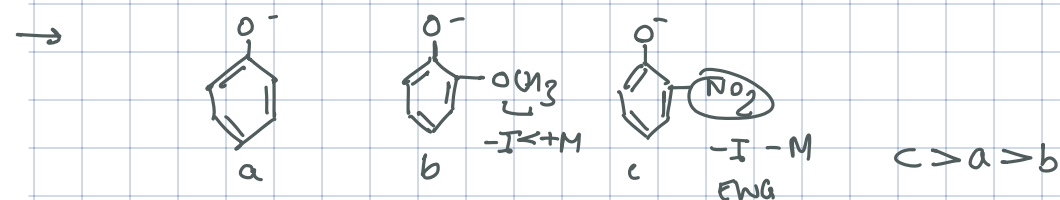
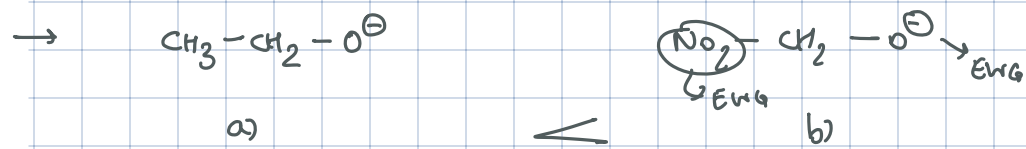
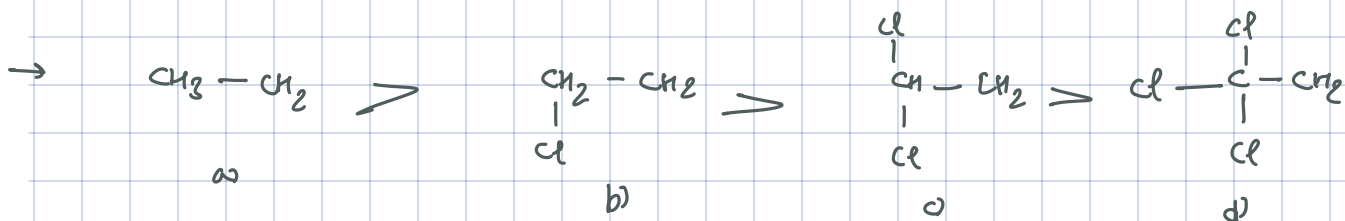


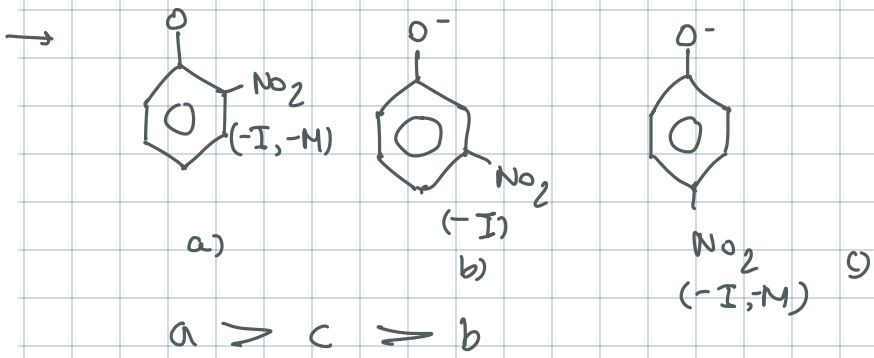
stability

Tertiary > Secondary > Primary

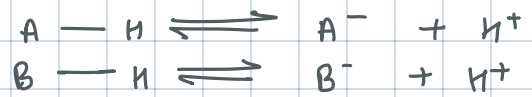


### Practice:





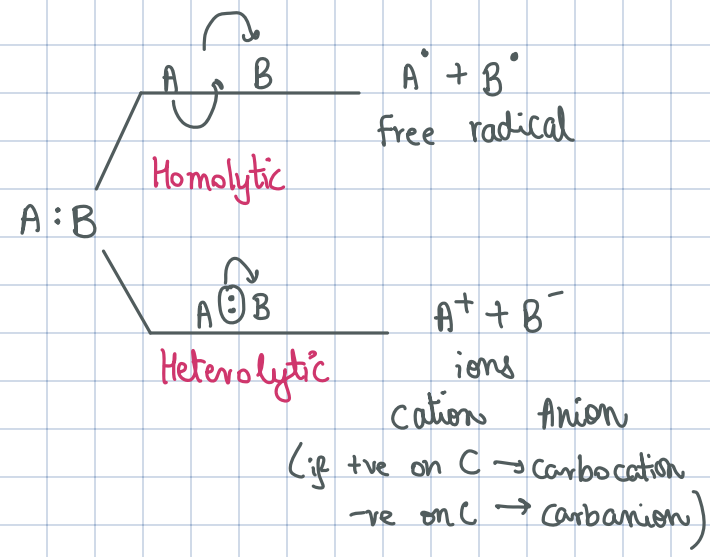
APPLICATION:



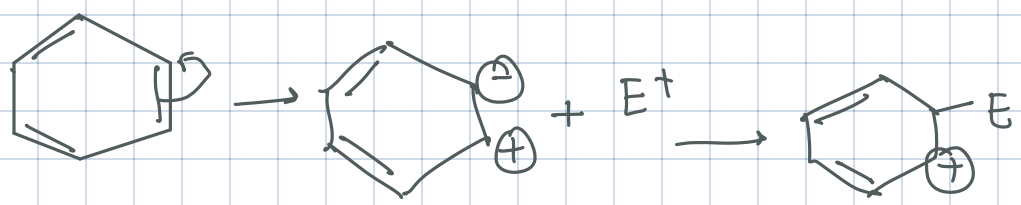
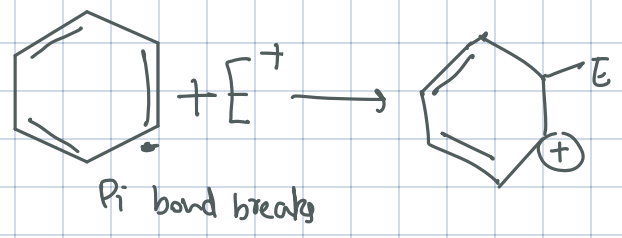
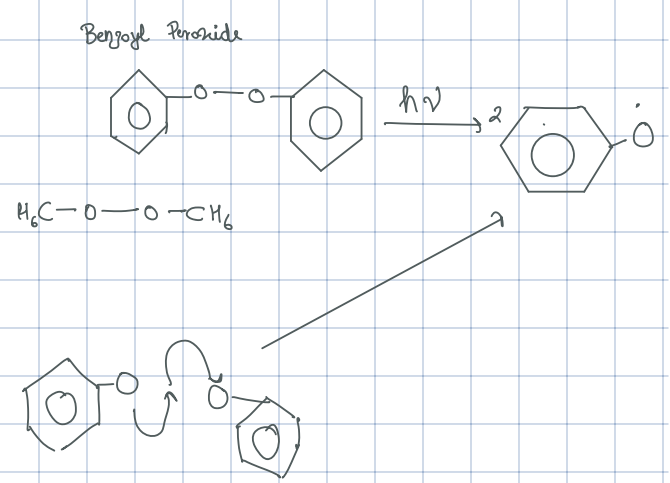
Stability of anion  $\propto$  ENG  $\rightarrow$  more acidic

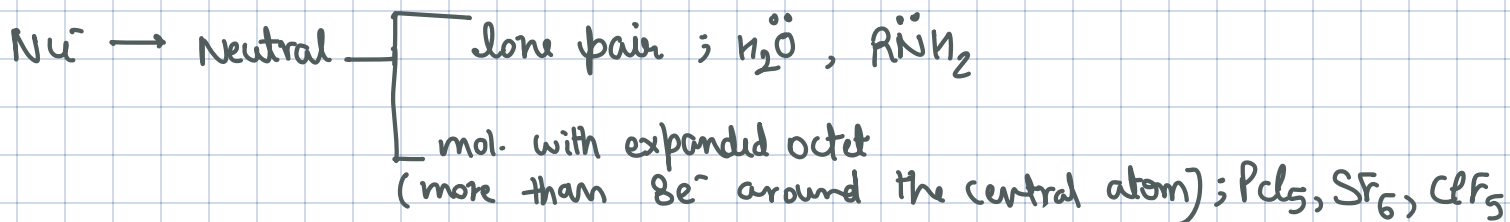
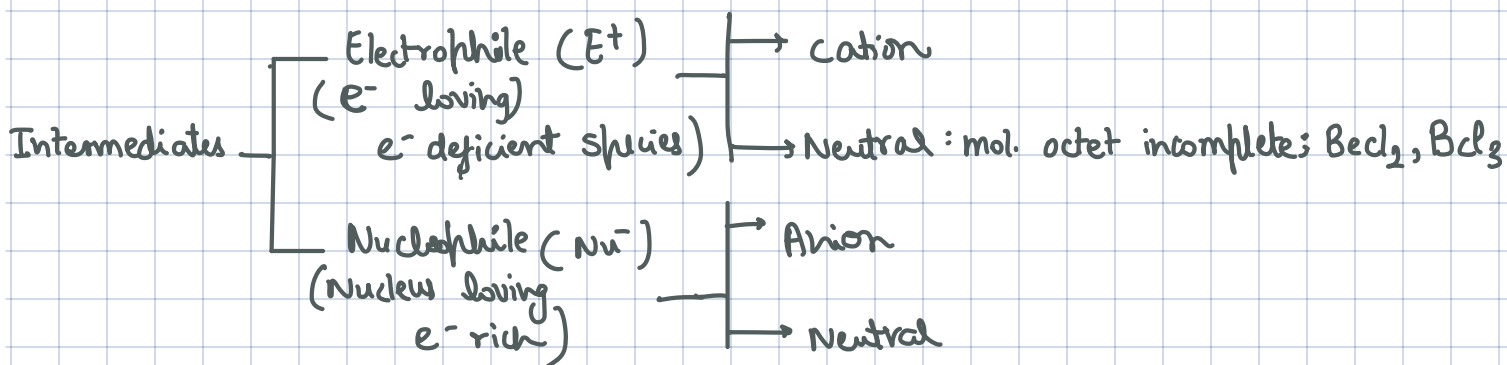
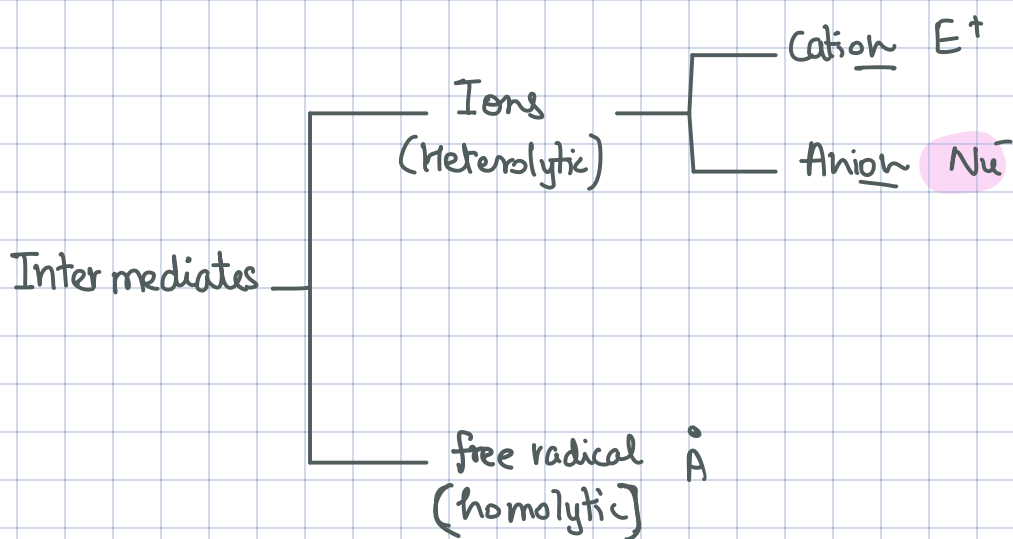
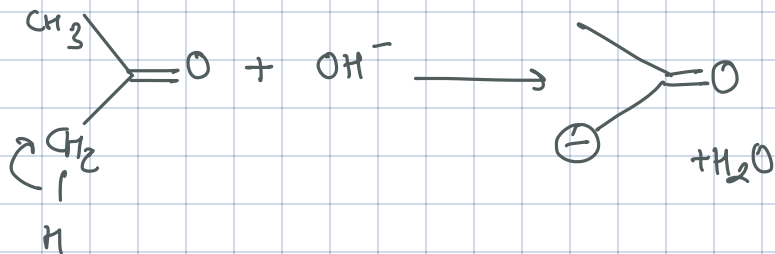
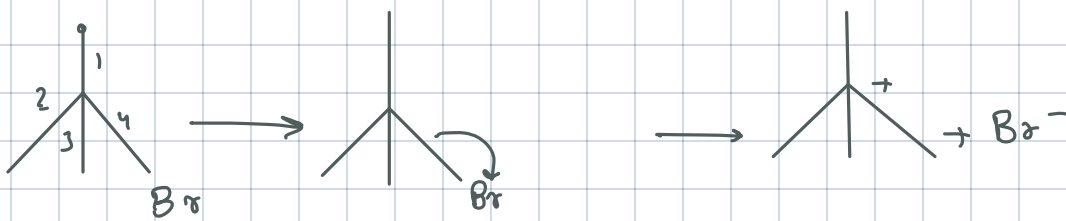
Stability  $ENG \propto \frac{1}{EDG}$

Q 12.17



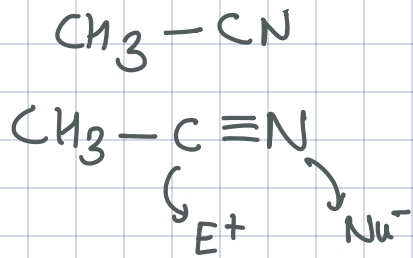
Practice:





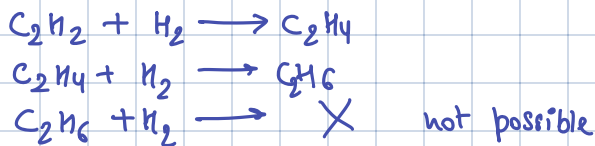


Q 12.11, 12.12, 12.13



- Types of Organic —
- 1) Addition  $A + B \rightarrow C$
  - 2) Elimination  $A \rightarrow B + C$
  - 3) Substitution  $A - B + C \rightarrow A - C + B$
  - 4) Oxidation
  - 5) Reduction

Addition:

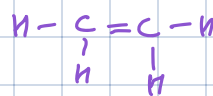
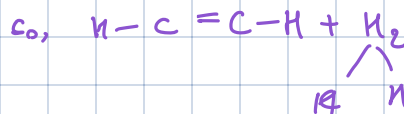


∴ Unsaturated → Saturated or less saturated  
only unsaturated compounds give addition.

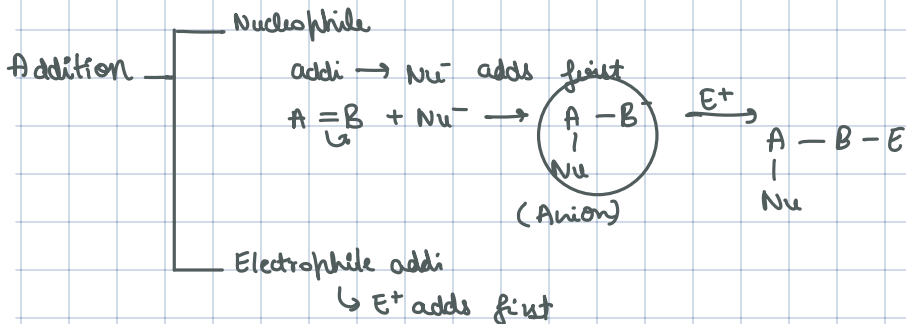
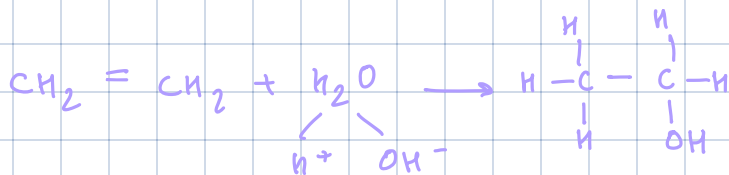
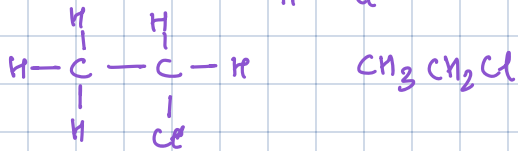
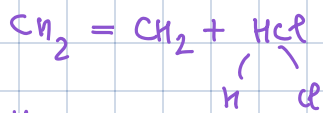
strategy: How it takes place?



- \* Remove 1 π bond
- \* Make two parts of mol. coming to be combined.
- \* Add one part with one C, another with next C.

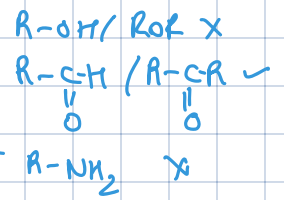
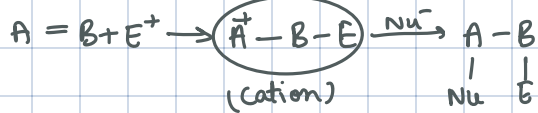


Practice



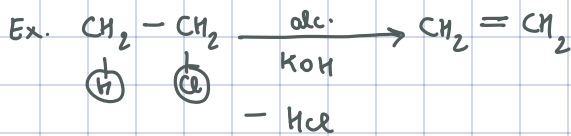
Electrophile ← Alkene X  
 ene —  
 yne —

Nucleophile ← R-X X

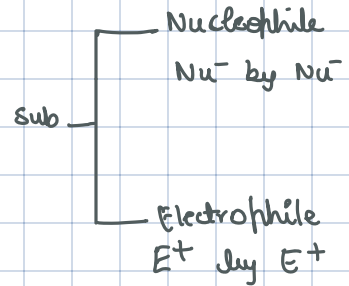
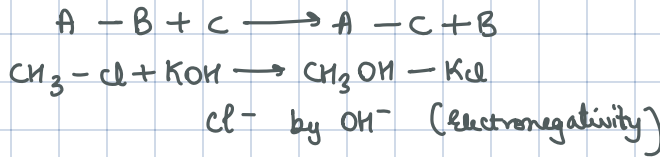


## Elimination

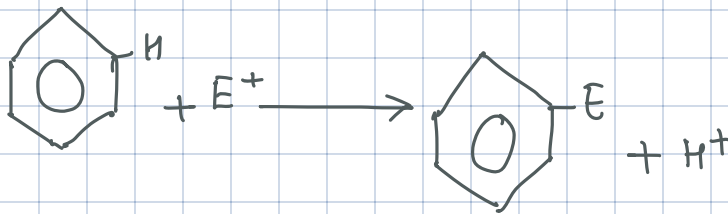
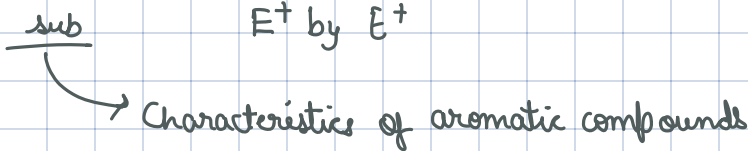
\* Saturated → unsaturated



## Substitution



## Electrophile substitution



Unsaturated → Saturated  
 Saturated → Unsaturated  
 no difference

Addition (Alkenes/ynes)  
 Elimination  
 Substitution