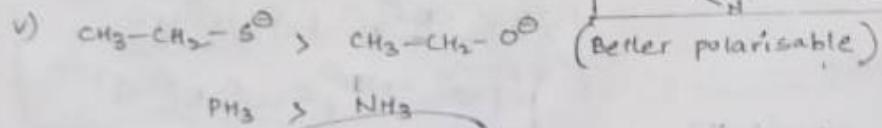
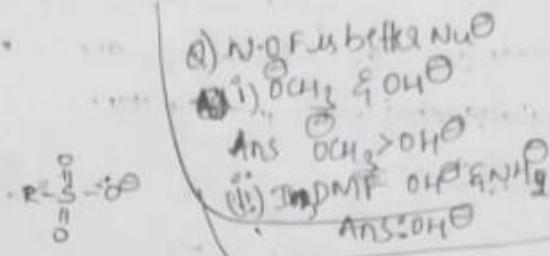
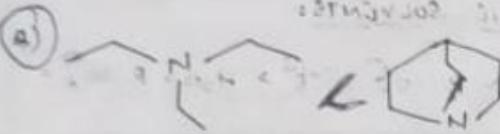
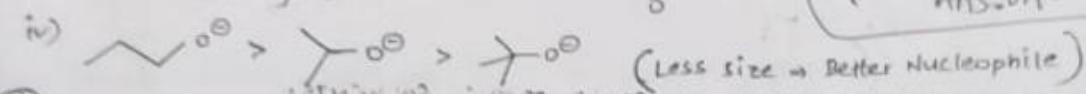
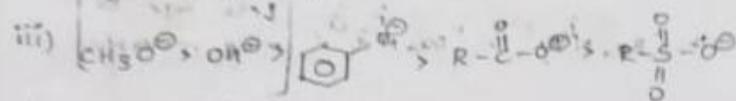
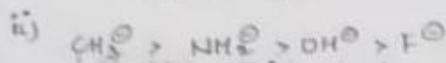
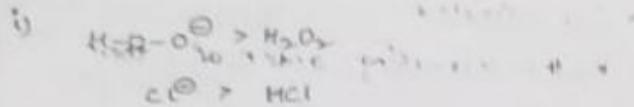


ALKYL HALIDES

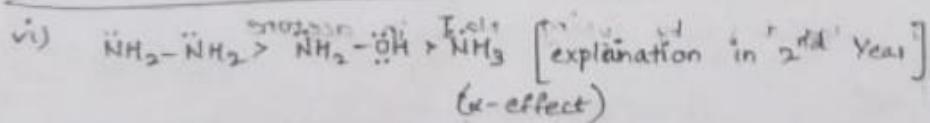
NUCLEOPHILICITY:-

→ It is tendency of to make a bond with δ^+ deficient carbon.
Mainly 3 factors are important:

- Donating ability
- Less steric
- Should be better polarisable



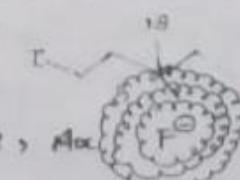
→ According to Fajans Rule, Not much larger size, but a little big size helps in better polarising.



Nucleophilicity of Halides:- (Nax/Lix)

Case-(i): In polar protic solvents (like H_2O (80), CH_3OH (33), HCOOH (59), EtOH (24), CH_3COOH (6), etc....) \rightarrow Dielectric constant

[H_2O is utilitarian
grants > partiality]



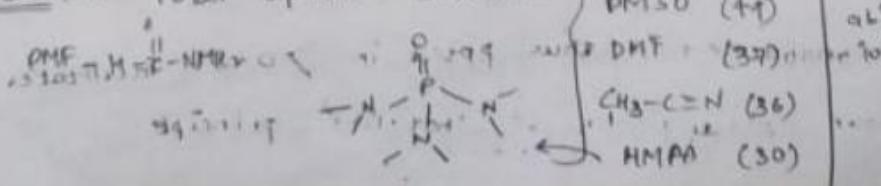
$\rightarrow \text{NaI} > \text{NaBr} > \text{NaCl} > \text{NaF}$

HCOOH (59) EtOH (24)

CH_3COOH (6) etc....

Solvent S + ..

Case-(ii): Polar aprotic Solvents

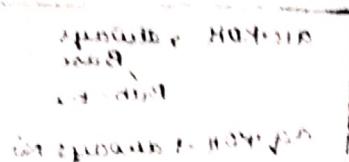


Dielectric const. (Mr.)

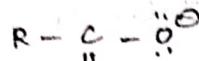
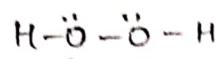
Measure of - solvent
ability to solvate
ion + ..

STEWART'S REACTION: (Read NCERT)

→ The synthesis of alkyl fluorides is best accomplished by heating an R-Cl/R-Br in presence of metallic fluoride such as AgF, HgF₂, CuF₂, SbF₅.

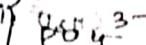
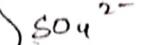
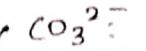


AMBIENT NUCLEOPHILE:-



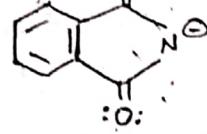
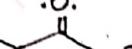
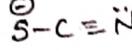
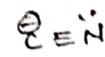
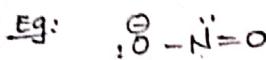
O!

Ambident
Nucleophiles

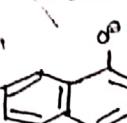
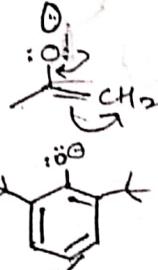
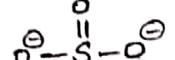


(Confy o-
donors)

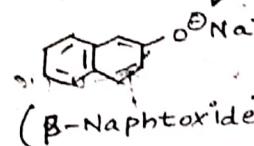
→ possess more than one type of donor atoms.



(Pthalimide anion)



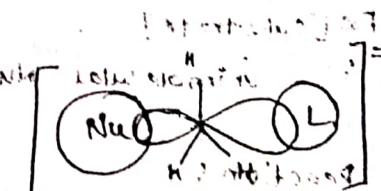
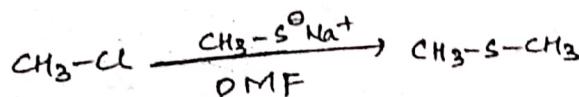
(Phenoxide)



(β-Naphthoxide)

S_N^2 Reaction:

→ Bimolecular Nucleophilic substitution

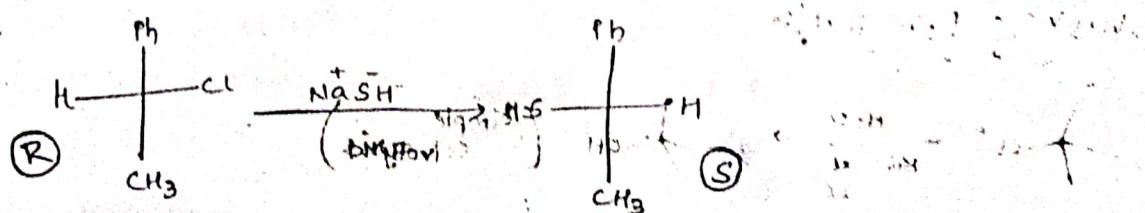


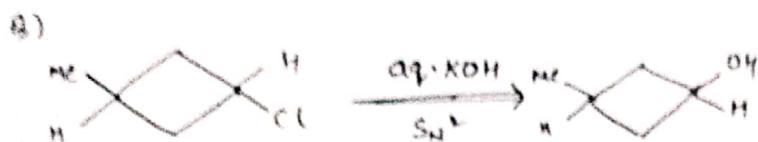
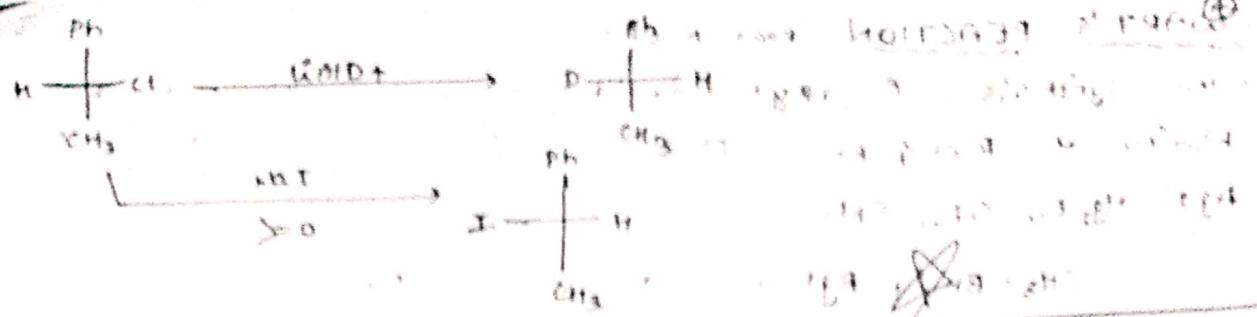
→ Always product obtained with not 100% inversion of configuration

also known as Walden Inversion (or) Umbrella Inversion

→ 100% Inversion does not mean $R \rightarrow S$, $d \rightarrow t$
 $S \rightarrow R$, $t \rightarrow d$.

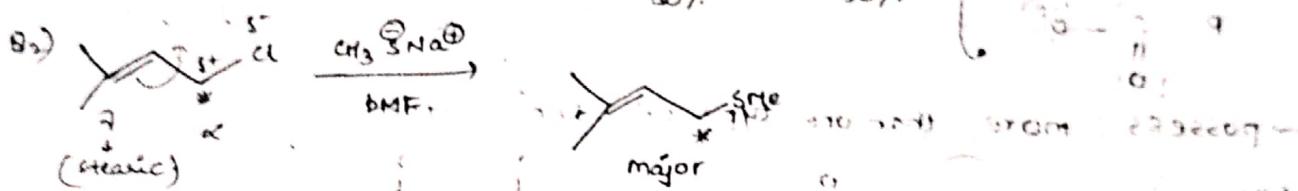
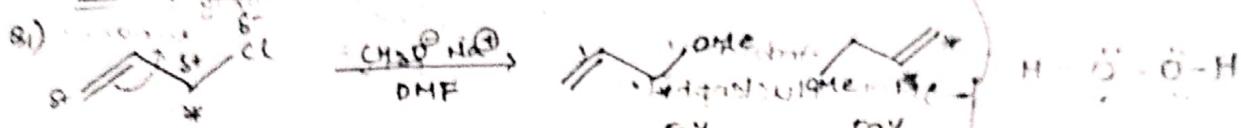
Eg:



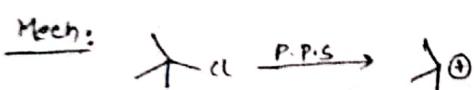
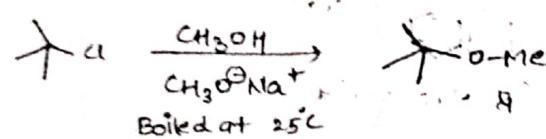


alc-KOH \rightarrow dehydrating
 Base Path - Et₂O
 aq-KOH \rightarrow always rx
 \rightarrow CH₃CH₂OH from Et₂O Path of rxn

(S_N2) Reactions:



S_N1 Reaction:

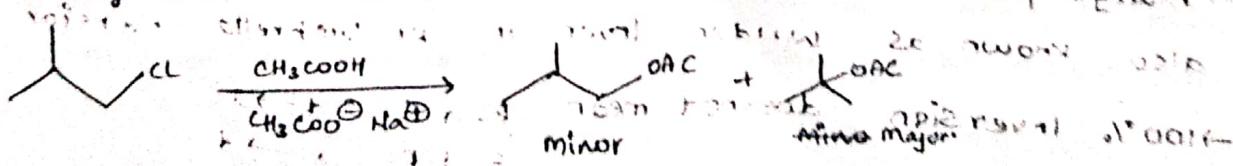


Rac [substrate]

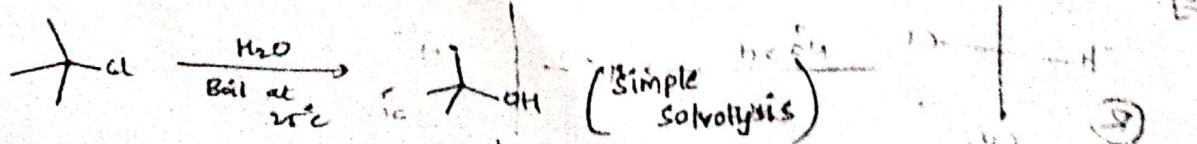
\therefore It is Unimolecular nuc. Substitution.

(S_N1) Reactions:

\rightarrow Rearrangements are most common:



SOLVOLYSIS REACTION:



→ Reagent acts as a Nucleophile

→ If Solvent is water, it is hydrolysis

→ If Solvent is alcohol, it is alcoholysis } $\xrightarrow{\text{SN}^2 \text{ type / } \text{S}_{\text{N}}^2}$

→ If Solvent is acetic acid, it is acetalysis

→ If there is no rearrangement, it is simple solvolysis.

(Q) No. of transition states in a simple solvolysis:

Sol: $\xrightarrow[\text{① Int}]{\text{② } \text{O}_2} \xrightarrow[\text{③ Int}]{\text{④ } \text{O}_2\text{H}_2} \xrightarrow{\text{⑤ } \text{OH}_2}$

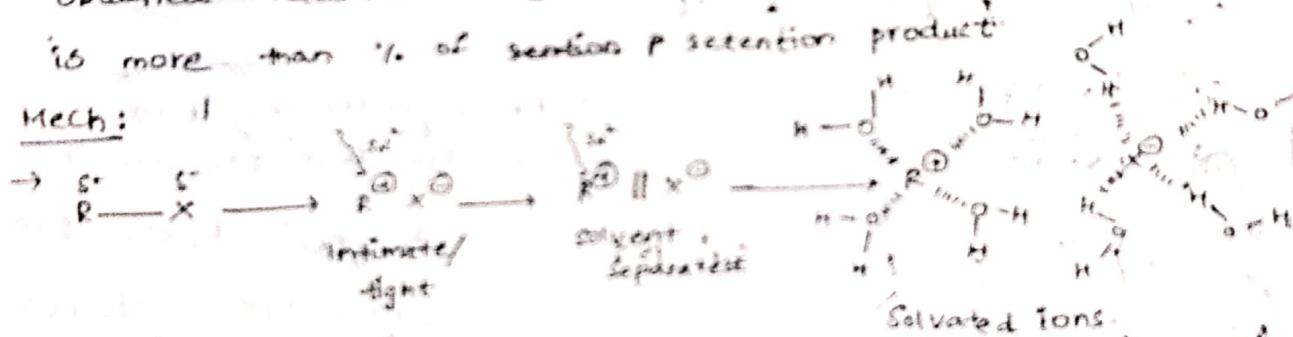
\Rightarrow 2 intermediates; 3 transition states.

STEREO-CHEMISTRY FOR S_N^2 PRODUCT:-

→ Assume reaction occurs at asymmetric carbon; obtained obtained with 100% Racemic. [But option is suitable if option is not there]

→ 100% Racemisation is not possible since product satisfies obtained Racemic along with inversion / percentage of inversion is more than % of s enantiopure product

Mech 3



18

Ans: Some substrate molecules participate in nucleophilic substitution either in (intimate/equilibrium) pair / solvent separated ion

Part 4

- (g) Substrate $\xrightarrow{?}$ max (\pm)

- a) 99% DMSO, 50% H_2O + 20% H_2O_2

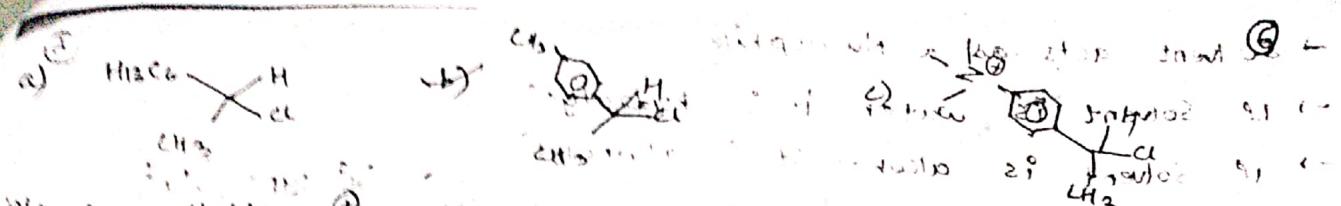
- $$b) 60\% \text{ H}_2\text{O} + 40\% > 0$$

- $$c) 40\% \text{ H}_2O + 60\% > 0$$

$\Delta S = 20\% \text{ H}_2O + 85\% \text{ } \rightarrow 93\%$

Soln: Even 5% H₂O & 95% acetone (≥ 0), we get more than 95% acetone. Hence, ② is correct.

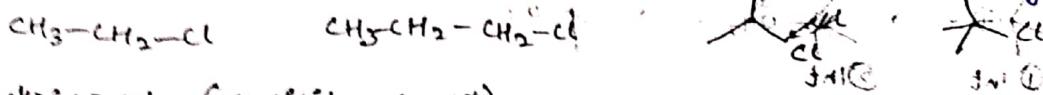
- (g) Under same exp. condns, which substrate gives more
Recognised product.



More stable C \Rightarrow More paramagnetic mixtures of nuclei

FACTORS AFFECTING NUCLEOPHILIC SUBSTITUTION RXNS: $(S_N^1 \text{ vs } S_N^2)$

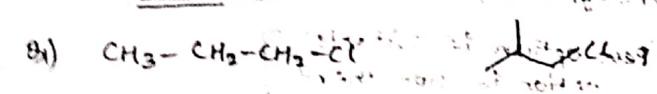
i) Substitution: - Branching: Carbonium ion formation
Stability



$SN^1: 4 > 3 > 2 > 1$ (Stability of C_1^+)

SN^2 : $1 > 2 > 3 > 4$ (steric is less)

ii) β -Branching:



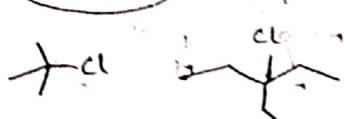
$S_N \geq 2 > 1$

$$S_N^2 : 1 > 2$$

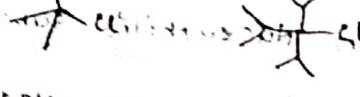


$$S_N^1: 2 > 1 > 3.$$

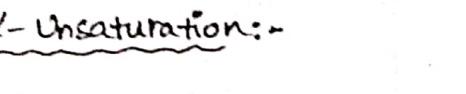
$$S_N^2: \quad 1 > 2 > 3$$



1



• 075



511

$\rightarrow 2, 3, 4$ does not give s_n^1 as well as s_n^2

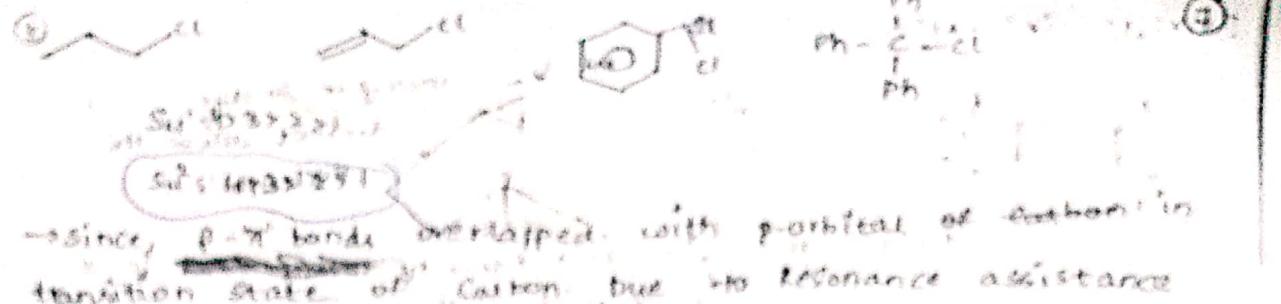
S⁺ [Carbocation is Unstable]

S_N: [High BDE] due to +M effect

iv) β -Unsaturation:

• *प्राचीन भूगोल का विवरण*

Scanned with CamScanner



the of transition state

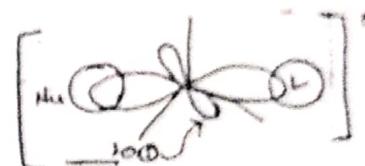
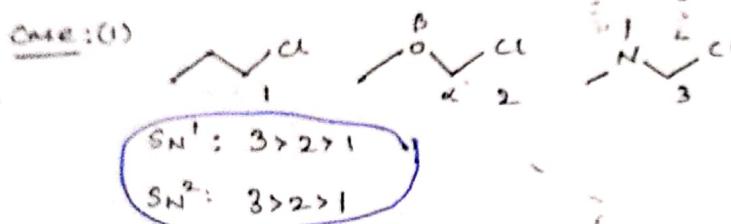


Pentax 4x4

Hyp of carbon's sp

\rightarrow sp² carbon possesses vacant p-orbital.

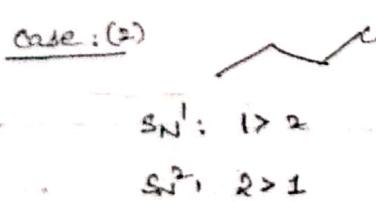
x-Substituents



Reason: β lone pair overlapped with adjacent p-orbital in the transition state (or)

Resonance assistance by lone pair

→ Due to this ,activity

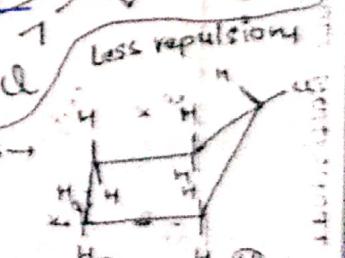
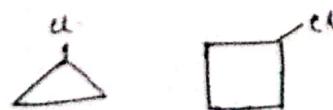


most stable ins
at 15°

T-S stability. $\text{O}_2 \rightarrow \text{O}_2$

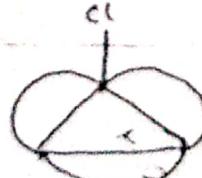
Promotes the I-3 stability

CYCLIC SYSTEM:

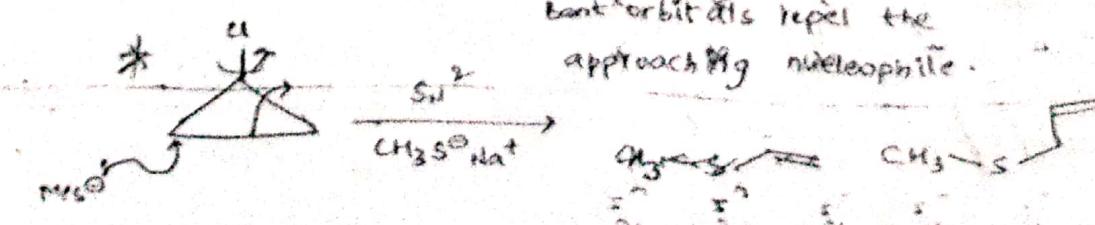


$S_N^1: 4 \geq 3 \geq 2 \geq 1$

Sn^2+ $\xrightarrow{\text{JEE}}$ $2 \times 1_{\text{N}}$



but orbitals repel the approaching nucleophile.



Scanned with CamScanner

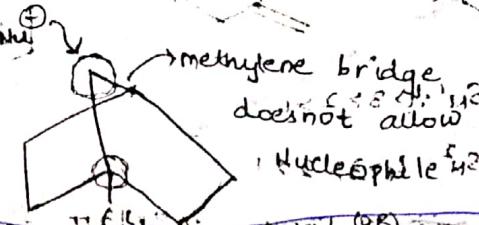
BICYCLIC SYSTEMS:-



SYSTEMS:-



S_N^1 :



↳ Does not give S_N^1 & $S_N^2 \rightarrow$ Planarity doesn't exist in #. The charge doesn't exist, still one of the ring is 8 membered.

NATURE OF MEDIUM:-

How an increasing in solvent polarity affects the rate?

Large ↑ is observed.

Small ↓ is observed.

Large ↑ is observed.

Small ↓ is observed.

Large ↑ is observed.

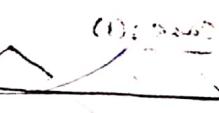
Small ↓ is observed.

Large ↑ is observed.

Q) Rate of S_N^2



Ans) (B) > (A). Because (A) is more substituted - X.



rate : (C) > (D)

rate : (B) > (A)

charge in the Transition state → to starting reactants

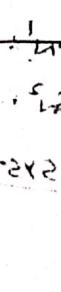
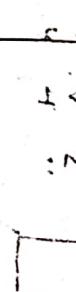
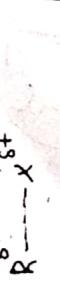
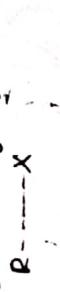
sep. of unlike charges (increases)

dispersal of charge

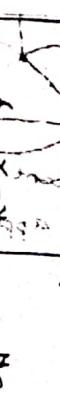
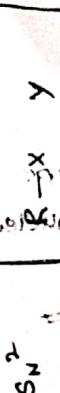
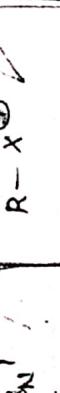
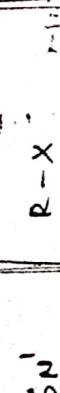
separation of unlike charges

dispersal of charges

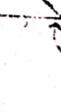
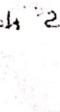
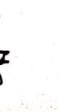
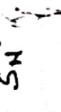
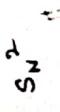
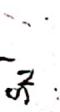
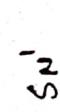
REACTANTS TRANSITION STATE



PATH



PATH



DEPOLARISATION & THERMODYNAMIC BUTYL BROMIDE IN 50% aq. EtOH is 3×10^4 ⑨.
 Which is faster than EtOH alone? + Br

Ans: Faster. (comes under SN₂ type) → ↑ Polarity + Steric.

SUBSTITUTION vs ELIMINATION: (SN₂ vs E₂)

1) Nature of Reagents:

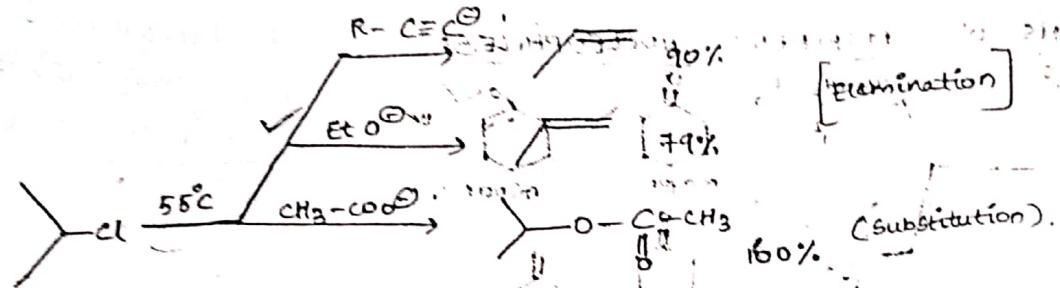
a) Strong Basic like: R-NH₂, R-C≡C[⊖]

b) Moderately Basic like: RO[⊖]

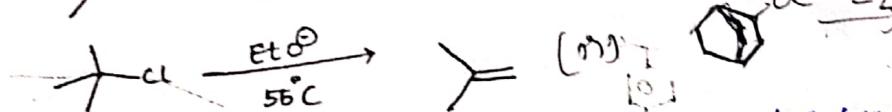
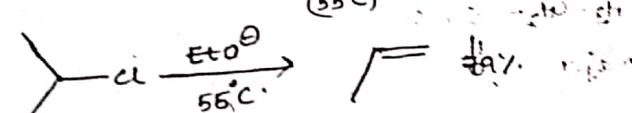
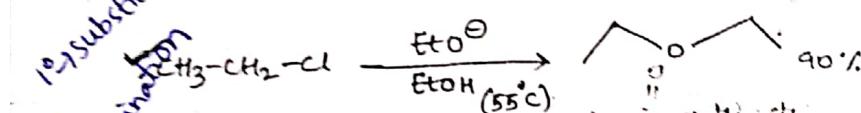
c) Weakly Basic like: Cl[⊖], RC₂H₅O[⊖]

d) Shows High polarisability like: I[⊖], Br[⊖], RS[⊖]

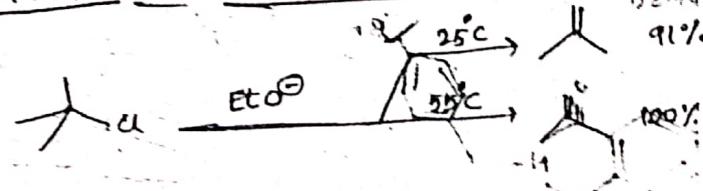
Eg:-



2) NATURE OF SUBSTRATE:-

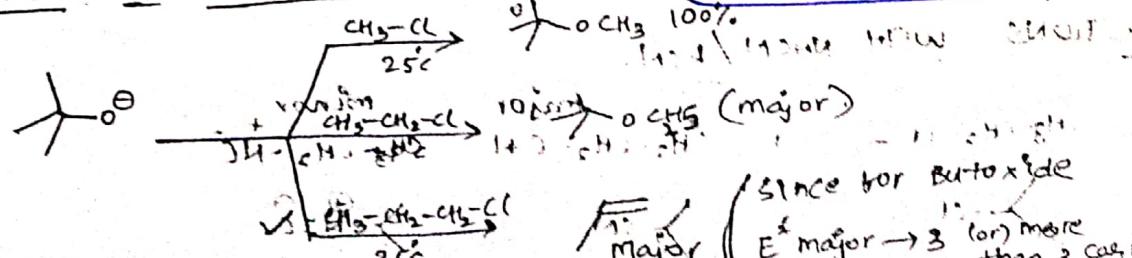


3) EFFECT OF TEMPERATURE:-

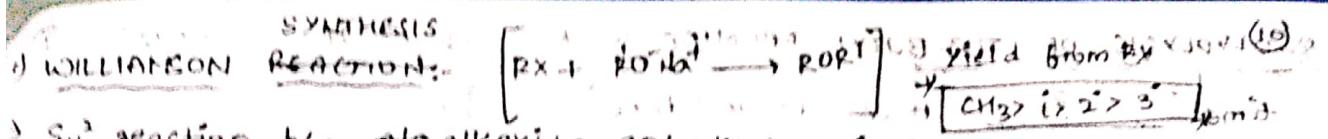


- at 0°C (or) less Kinetic product is stable
- at room temp, Δ, or temp not mentioned then it must be thermodynamic stable product

4) BULKINESS OF REAGENT:-



Since for Butoxide E major → 3 (or) more than 3 carb atoms



2) S_{N}^2 reaction b/w alkoxide and alkyl halide

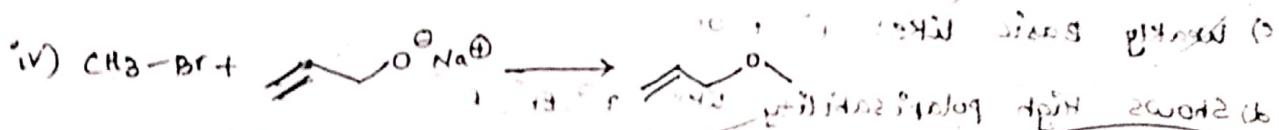
Synthesize the following ones by using Williamson synthesis:



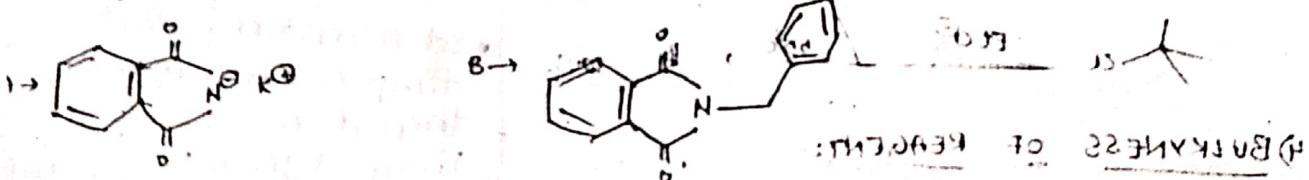
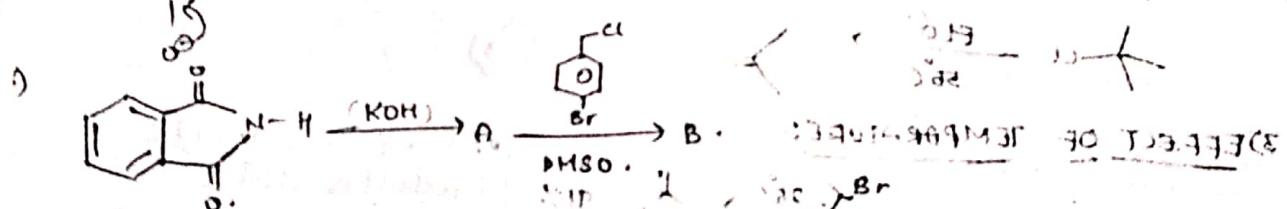
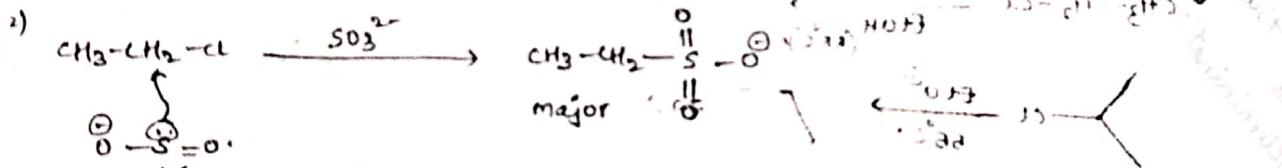
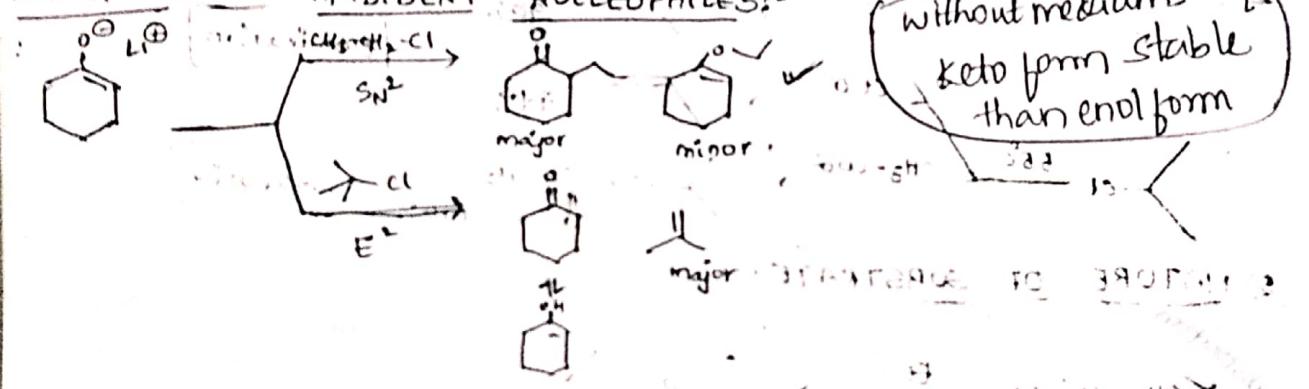
3) $\text{E}-\text{REACTIONS}$: i) $\text{CH}_3\text{CH}_2\text{Br} + \text{NaOEt} \xrightarrow{\text{Et}_2\text{O}} \text{Et}_2\text{O} + \text{EtCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ (Ans: EtCH₂CH₂CH₂CH₃)

ii) Cannot be synthesized

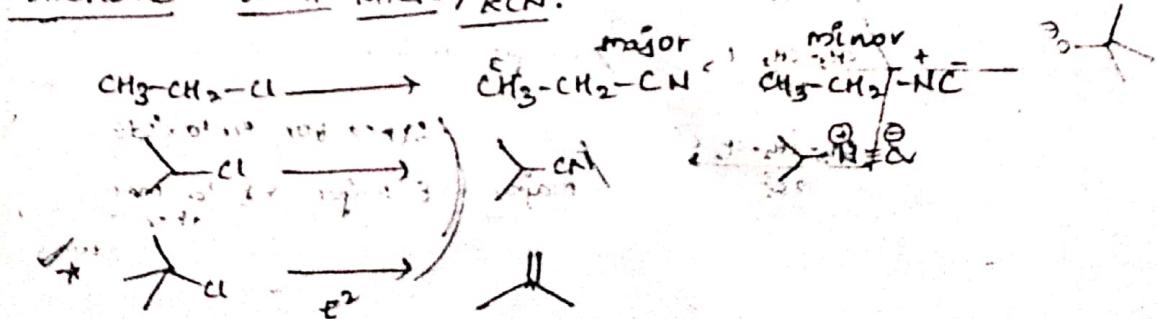
iii) Cannot be synthesized



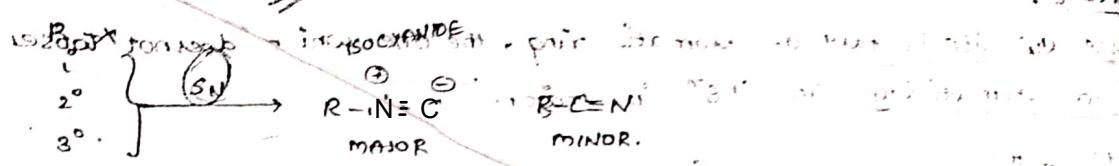
REACTIONS OF AMBIGENT NUCLEOPHILES:-



REACTIONS WITH NaCN/KCN :



Reactions with AgCN:

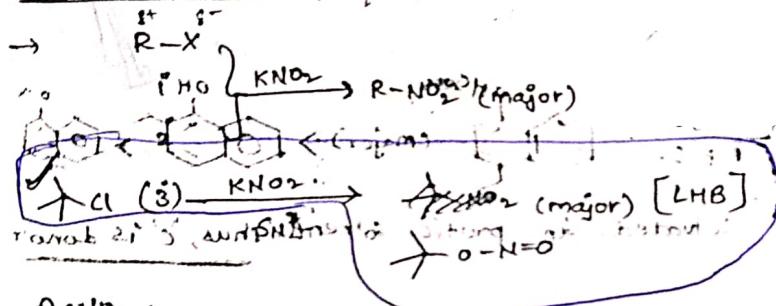


HSAB PRINCIPLE (Hard soft acid-base):

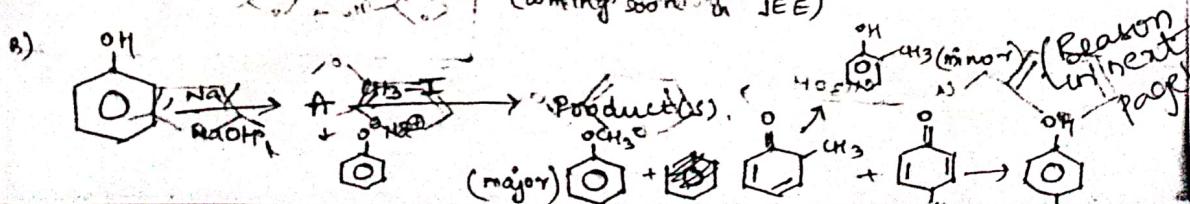
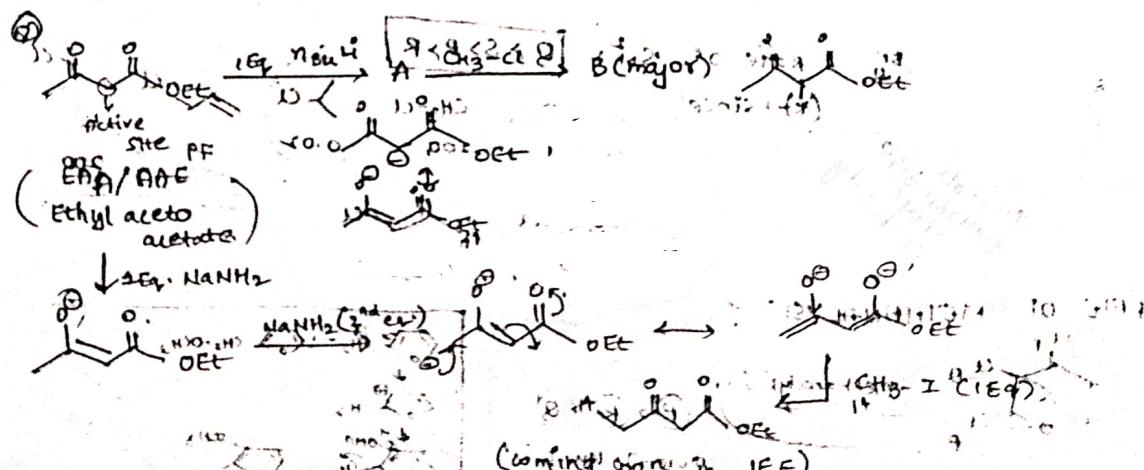
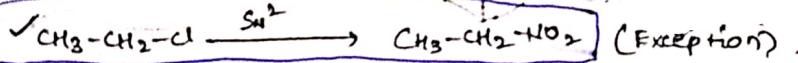
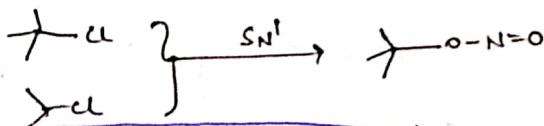
→ {Hard acid, Hard Base} are more stable, others are least stable.

→ HB: more (ENHILICATOR) SB: less EN DONOR
 HA: Sn^1 Carbo cation SA: Sn^2 Carbo cation

REACTIONS WITH KNO_2 :



AgNO_2 :

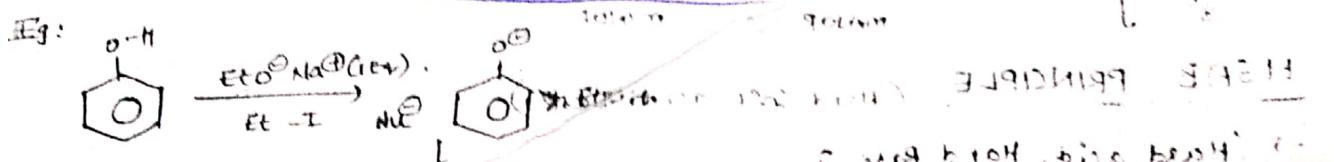


NOTE:

Impact Attic envelope (3)

If Nu[⊖] site is part of aromatic ring, the electron loss does not affect its aromaticity in TS is major.

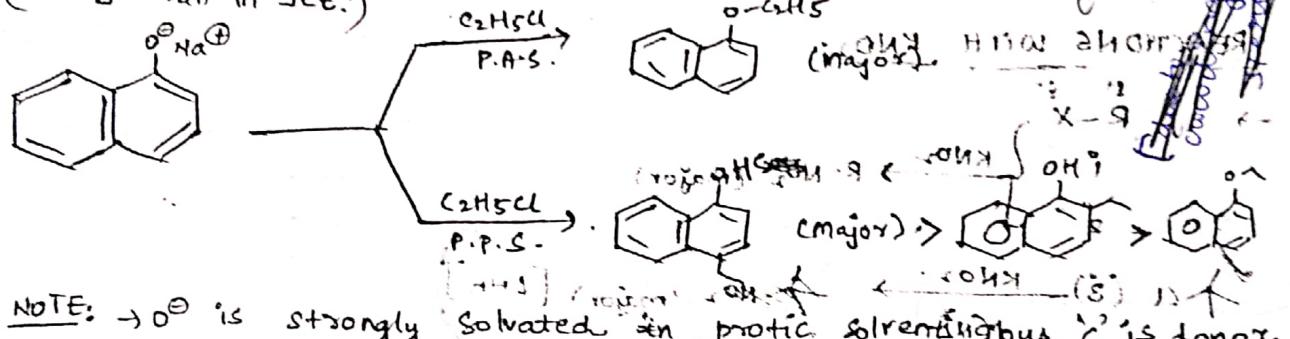
日期：二〇一九年五月二十一日



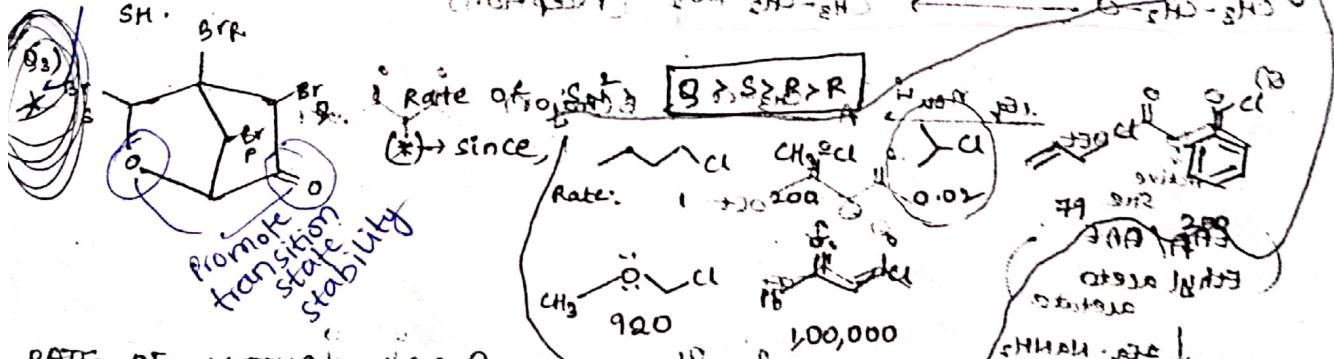
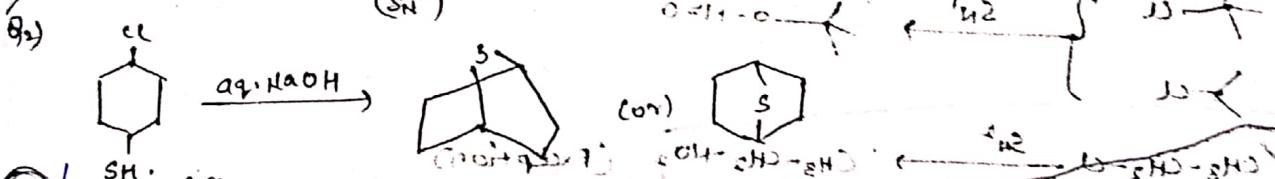
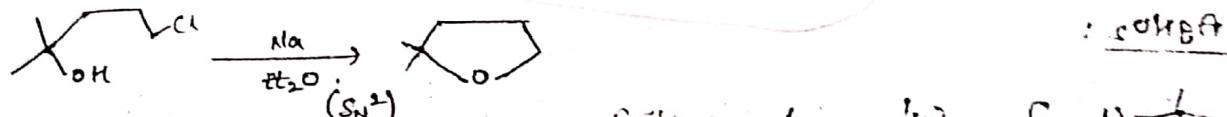
$\text{O}-\text{H}$ O^{V} Phenoxide (major)

=) Product:

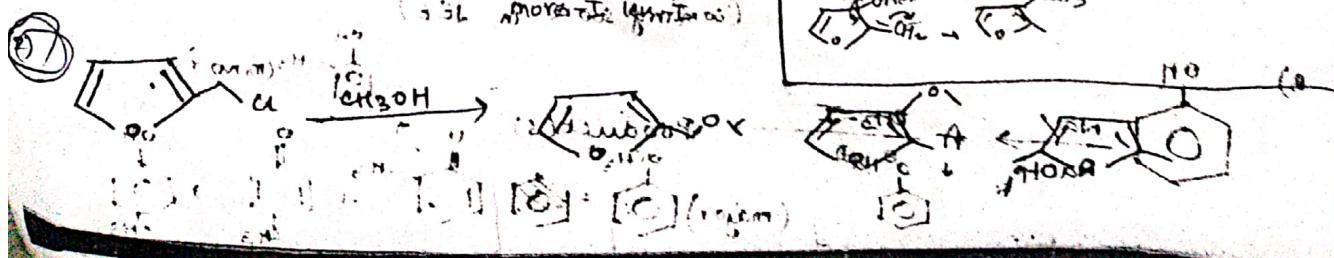
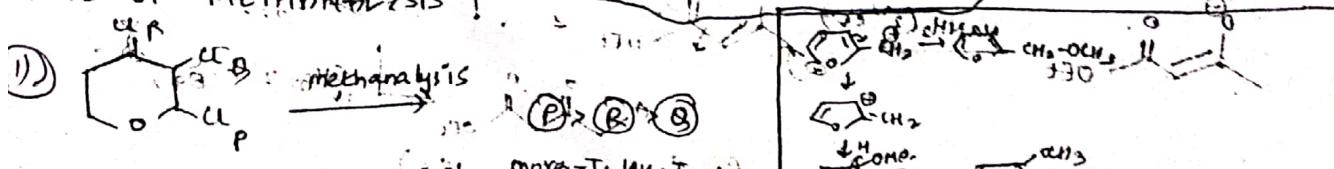
*Coming soon in JEE:)

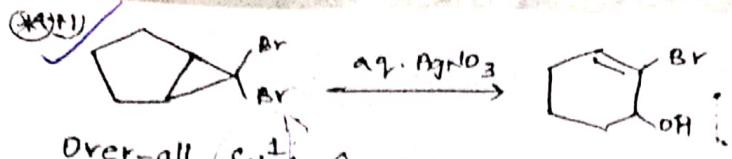


Note: $\rightarrow O^\ominus$ is strongly solvated in protic solvents, 'C' is donor.

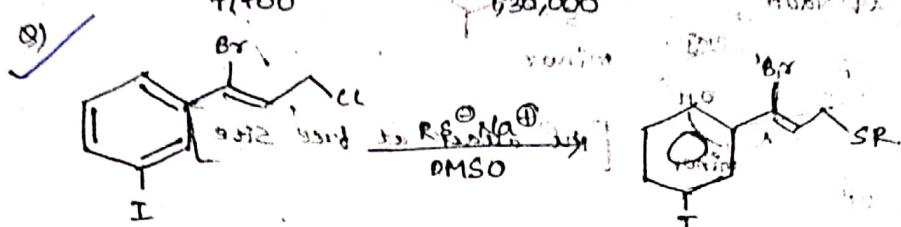
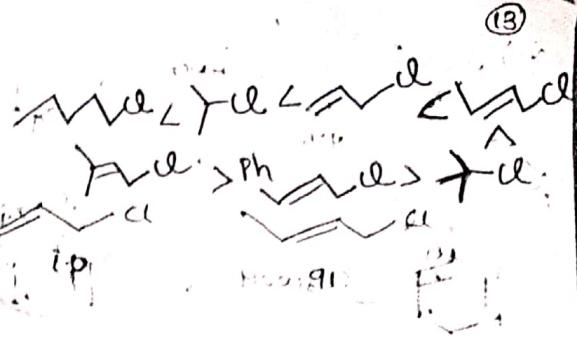


RATE OF METHANALYSIS ?

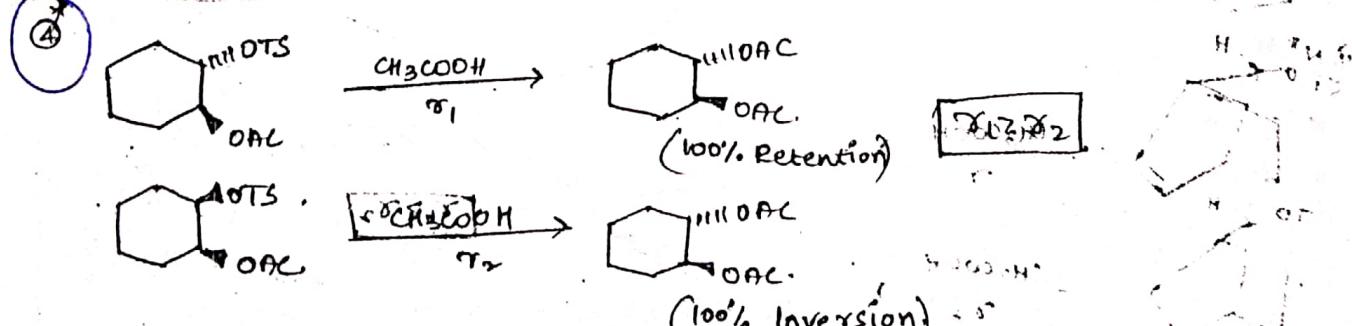
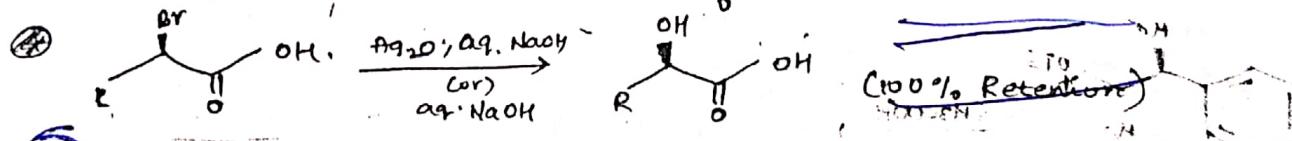
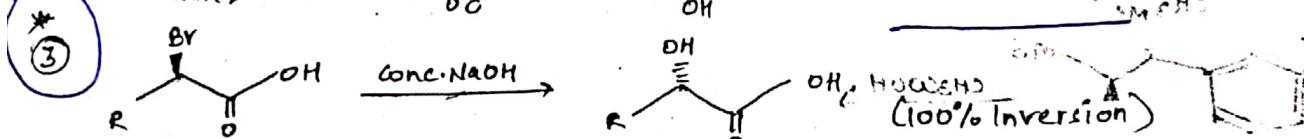
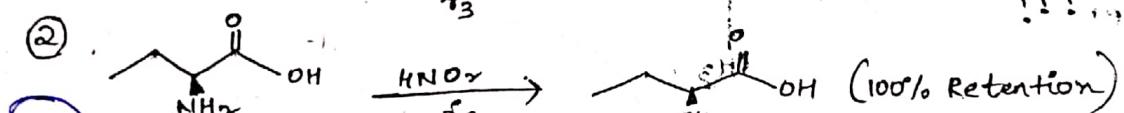
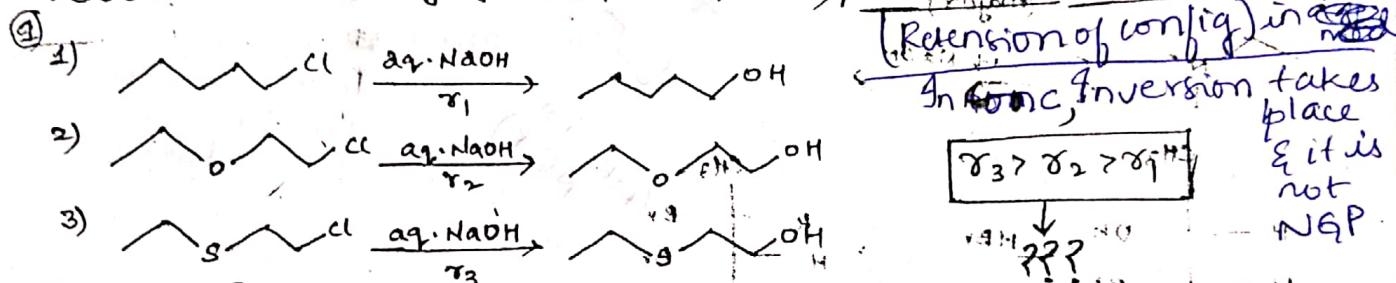




Overall S_{N}^1 (Coming soon in JEE)

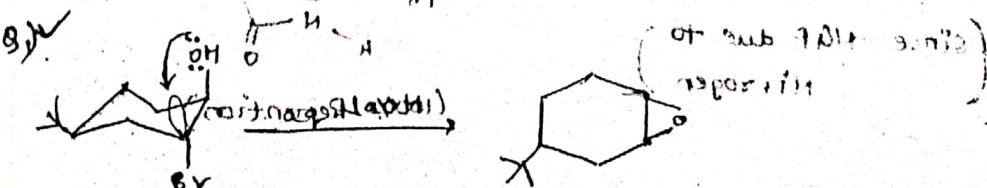


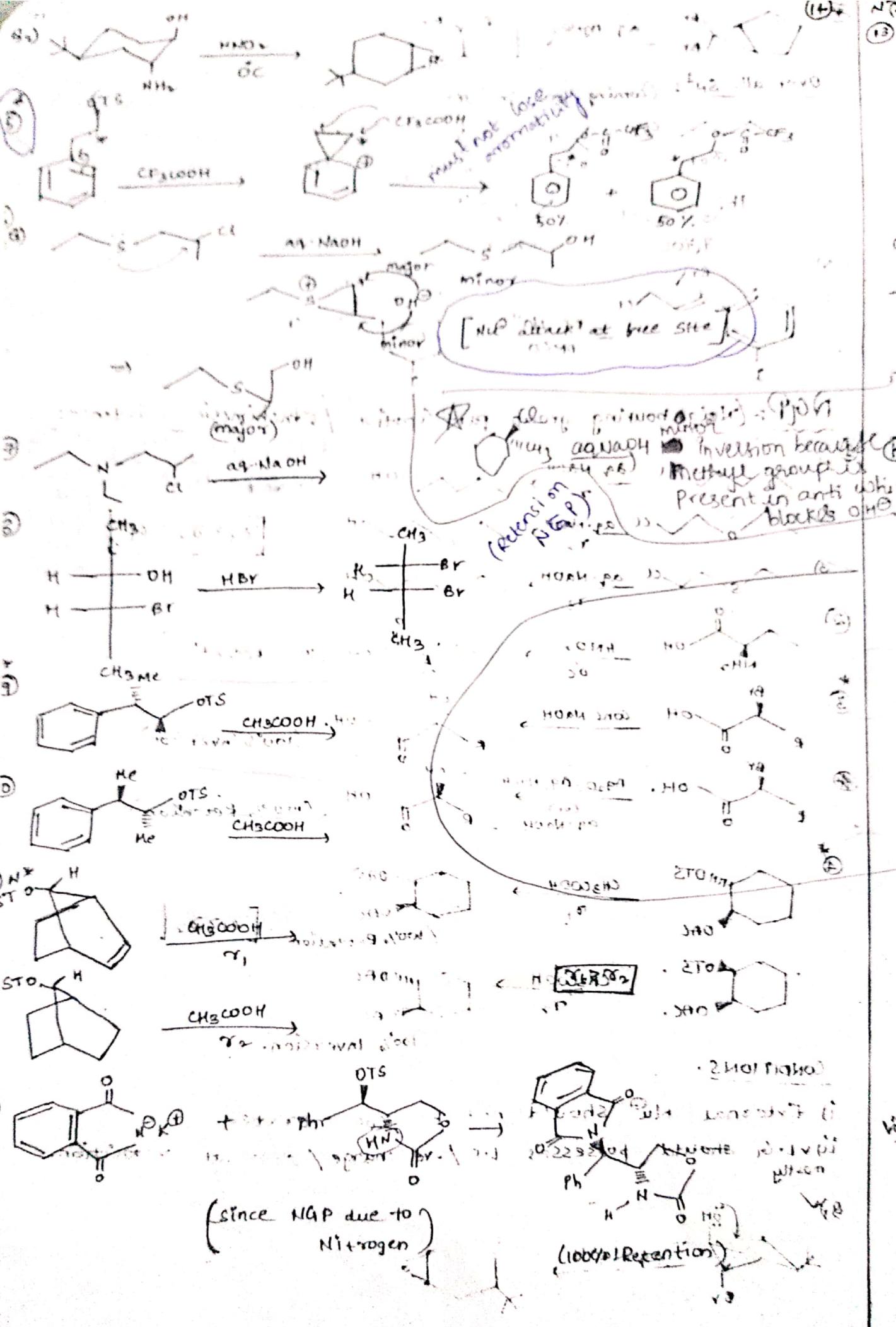
NGP :- (Neighbouring group participation) / Anchimeric assistance: non conc med reg



CONDITIONS:

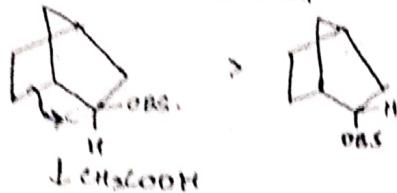
- External Nu^+ should not be concentrated.
- rL.G should possess L-P / -N⁺ charge / C=C at β -position.
- mostly





N(3)

(13) Lone pair acts as NAP



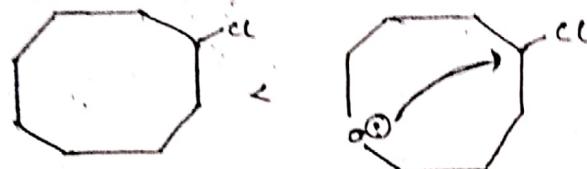
→ Leaving group ability in SN₂ reactions:

- OTS > -I > -Br > -Cl

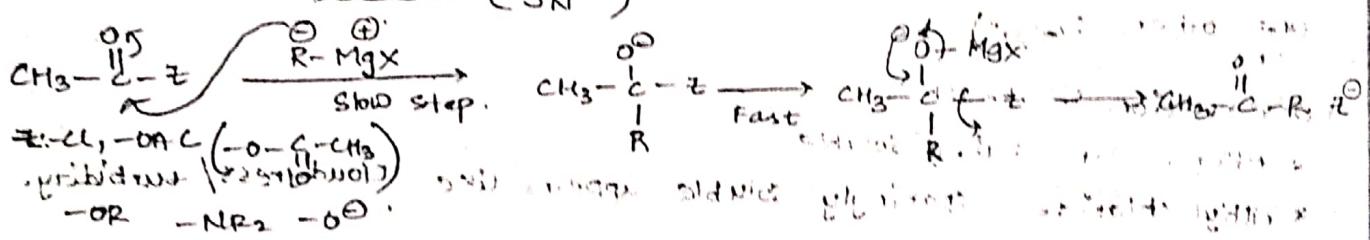
In SN₂ reaction:

- I > -Br > -Cl > -O-C(=O)-R (SN₂)

(H) Rate:



NUCLEOPHILIC SUBSTITUTION REACTION PROCEEDS THROUGH TETRAVALENT CARBON: (SN₂)



Net Rxn: Nucleophilic Sub. Rxn

Intermediates steps: Nucleophilic addn.

Rate: -Cl > -OAc > -OR > -NR₂ (Good leaving group)

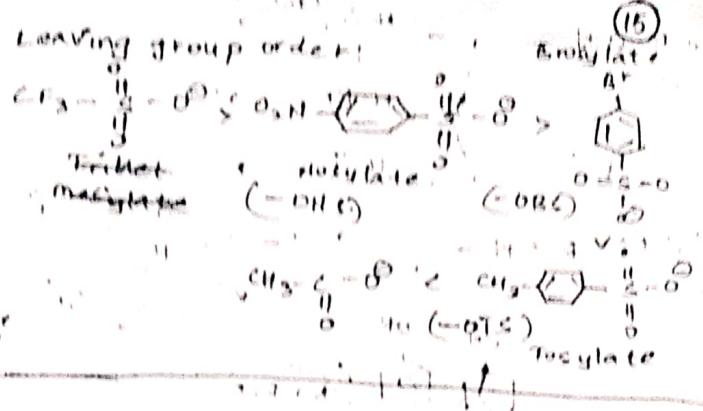
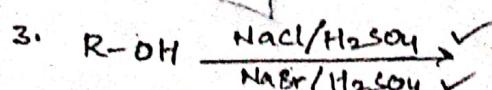
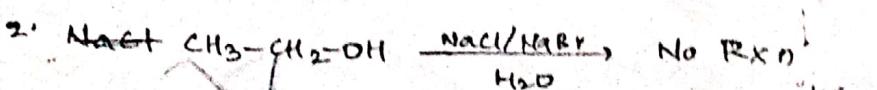
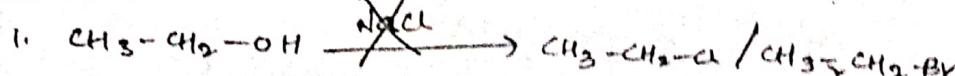
PREPARATION OF ALKYL HALIDES: By

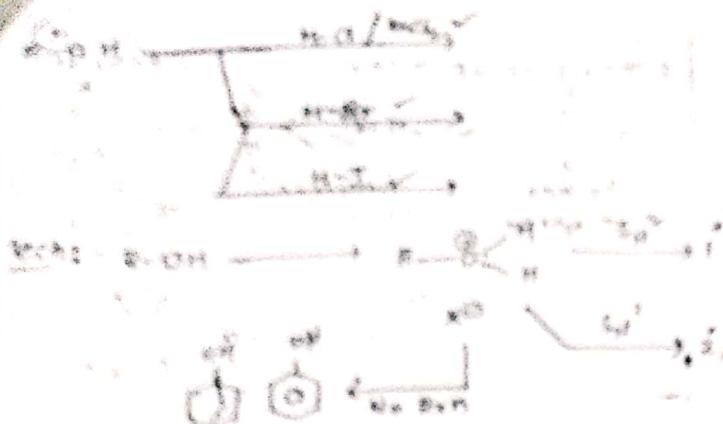
i) Alkane: iv) From vinyl acetylene. vi) From alcohols

ii) From alkene (using HX) v) From cumulated dienes

iii) From alkyne vi) From allylic and benzylic carbons + iridium

vii) ALCOHOLS: ~~With NaCl~~ Reactions in the presence of H₂O



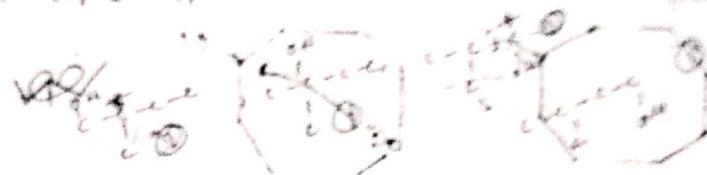


3 A^- reacts with 1 eq. of H_3BO_3 , major (?) when quenched.



2) how many alcohols gives H_2 upon run with "Red Phosphorus" see 50

6



WELL'S TEST.

Sometimes is fortified entirely Known as Local's Reagent

Used for identification of as well as to distinguish alkohols from
one other. (1/2/2)

observation in the lab.

- * Alcohols are fairly soluble
- * Ethyl chlorides sparingly soluble appears like (cloudiness) turbidity.

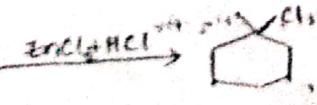
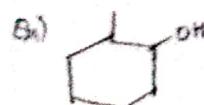
reactions: $\text{R}-\ddot{\text{O}}-\text{H} + \text{ZnCl}_2 \longrightarrow \text{R}-\overset{\text{H}}{\underset{\text{H}}{\text{O}}}^+-\text{Cl}$? alk-oxides met with
 \rightarrow g and similar kind (allylic/Bentley) type of alcohols? immediately generated

→ 3 and similar. Kura (allylic) bearing in turbidity. (Within 1 minute) by ~~so~~ Repath: 90° - < 90° - < 30° - < 30° : start within 5 minutes

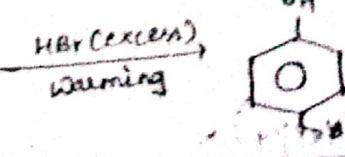
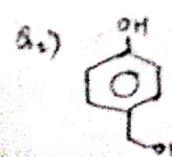
+ and similar type of alcohols gives intermediate by S_N2 path.

→ alcohols do not give any turbidity at room temp., upon boiling

+ phenols and similar kind of carbons do not give this test



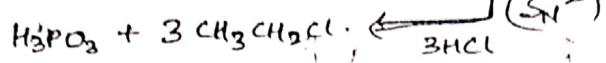
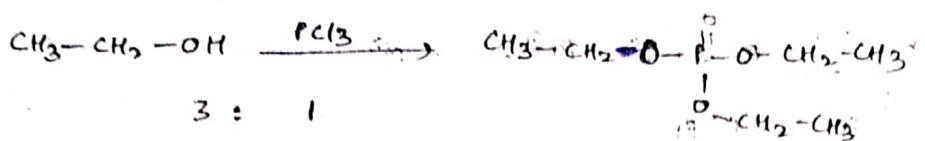
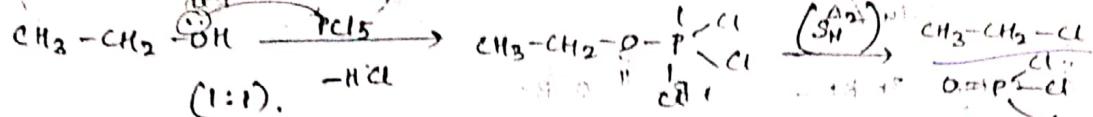
Test apart from $\text{NO}_2^{\text{+}}$ - more stable O^{2-} H_2O



5. By using $\text{H}_2/\text{Red P}_t$ $\xrightarrow{\text{CH}_3}$

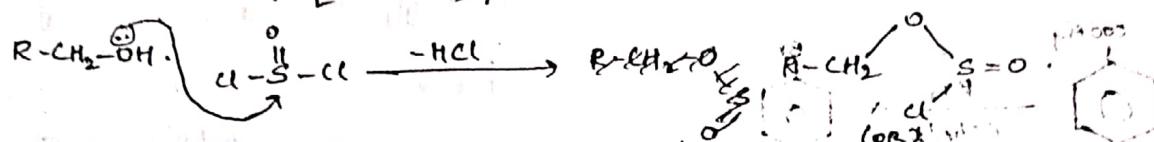


6. By using $\text{PCl}_3/\text{PCl}_5$

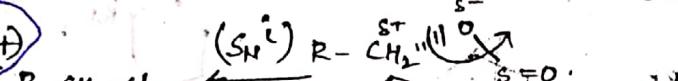


Basicity: 2

7. By using $\text{SOCl}_2 / [\alpha-\text{S-Cl}] / \text{Cl-Et}_2\text{O}$

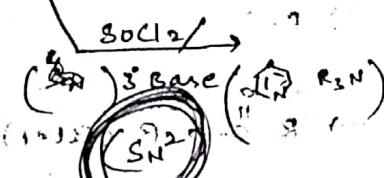
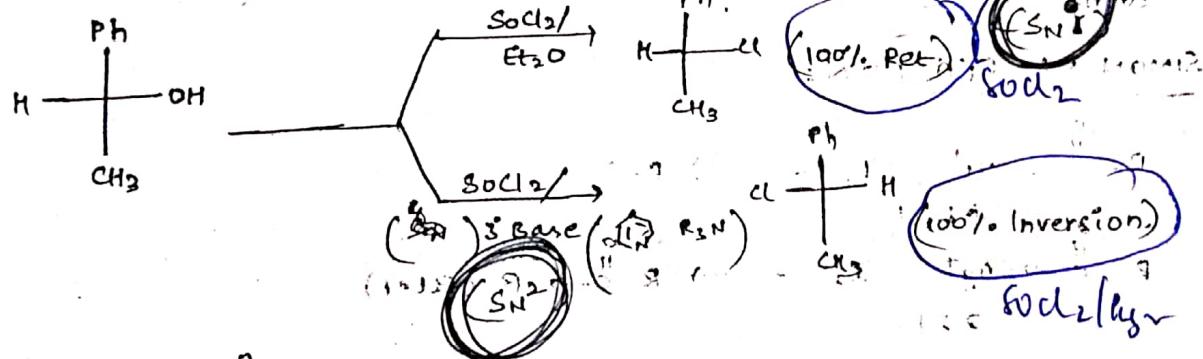


(100% Ret.)

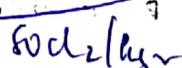


[ion pair Nucleophilic substitution]

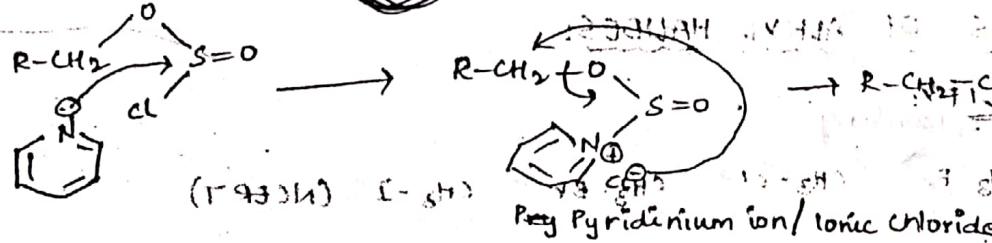
8)



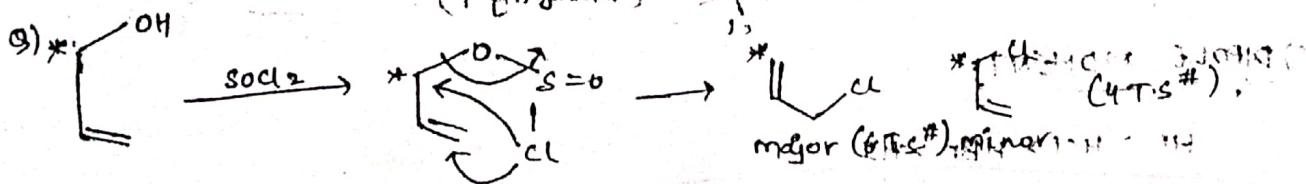
(100% Inversion)



→ Since,



→ Due to high N^+ , S^- promoted



→ allylic carbons undergo 1 rearrangement

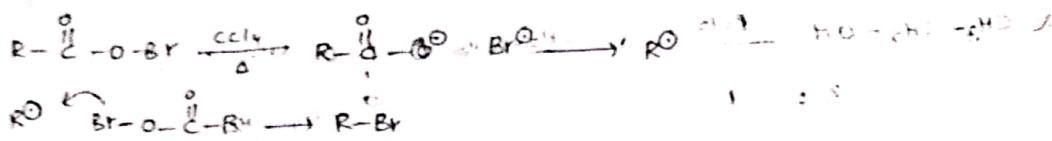
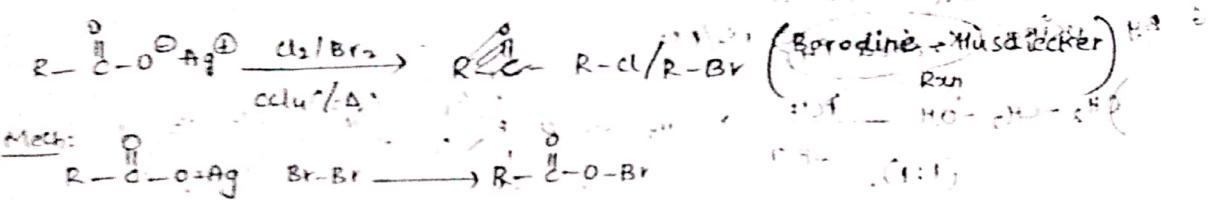
→ Due to 6-membered ring T.S^\ddagger rearrangement one is major.

NOTE: Among all the above methods, the best method is SOCl_2 .

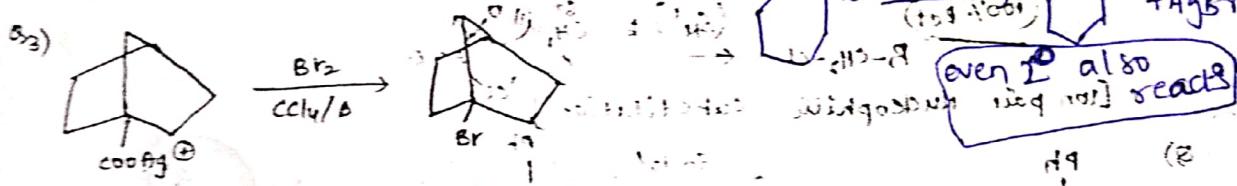
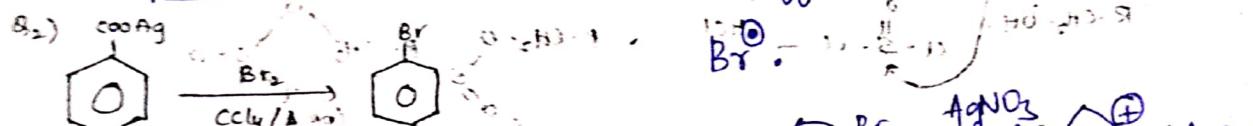
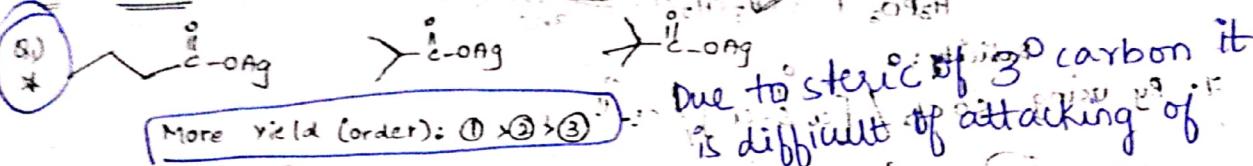
Since, both the bi-products HCl and SO_2 are gases.

∴ product obtained in pure form.

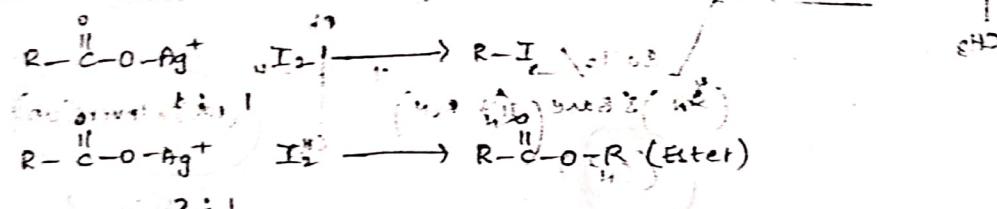
vii) By Using Silver Salt of Carboxylic acids: (18)



Imp. Questions:

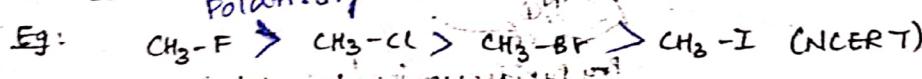


f) SIMONINI REACTION:



PROPERTIES OF ALKYL HALIDES:

1) SOLUBILITY: Polarising



2) DIPOLE MOMENT: $\text{CH}_3\text{Cl} < \text{CH}_3\text{I}$ (Branching)

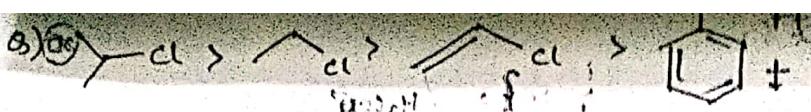
3) $\text{HF} > \text{HCl} > \text{HBr} > \text{HI}$

$\text{CH}_3\text{Cl} > \text{CH}_3\text{F} > \text{CH}_3\text{Br} > \text{CH}_3\text{I}$

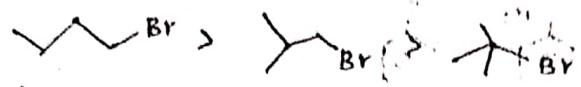
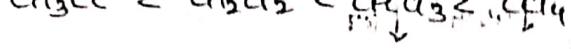
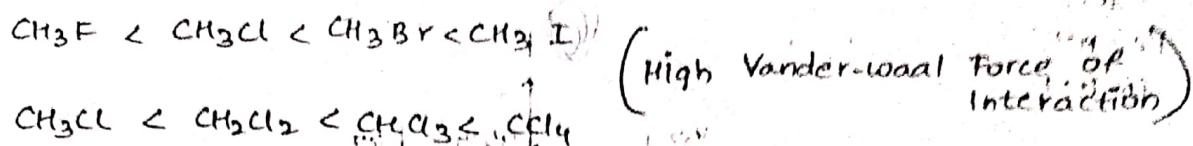
4) $\text{CH}_3\text{X} > \text{CH}_2\text{X}_2 > \text{CH}_3\text{X}_3 > \text{CX}_4$ (Unit branching at CH_2)

$\text{X}^- > \text{Cl}^- > \text{Br}^- > \text{I}^-$ (Solvability: $\text{HO}-\text{CH}_2-\text{CH}_2-\text{OH}$)

$\text{F}^- > \text{Cl}^- > \text{Br}^- > \text{I}^-$ (Solvability: $\text{HO}-\text{CH}_2-\text{CH}_2-\text{OH}$)

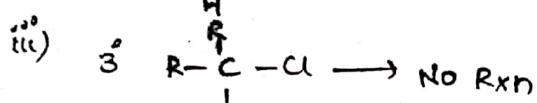
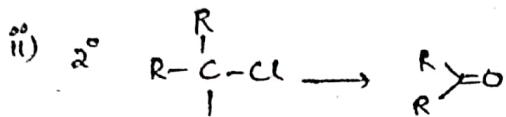
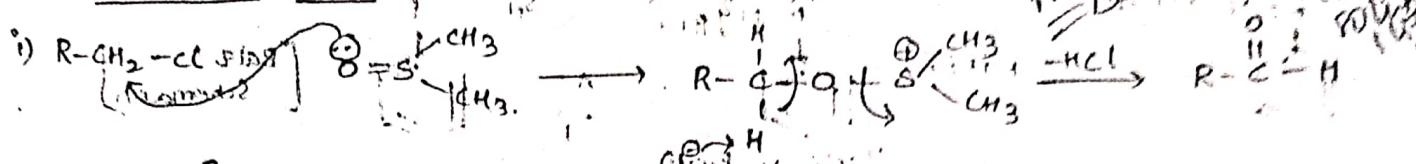


3) BOILING POINT:



B.p. & Molar Surface area

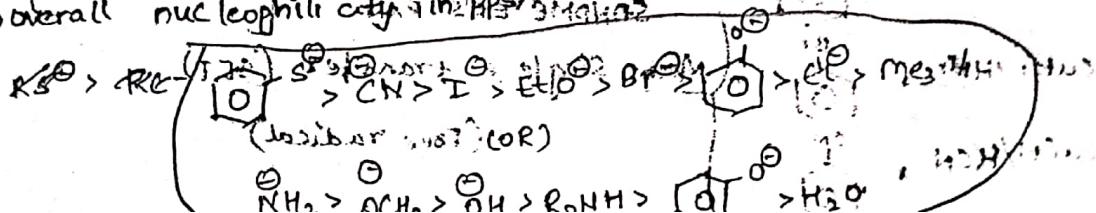
N*) REACTION WITH DMSO^- :



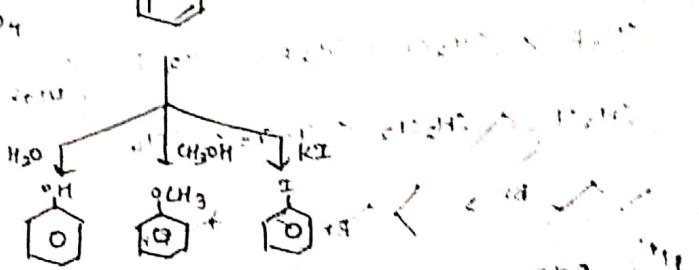
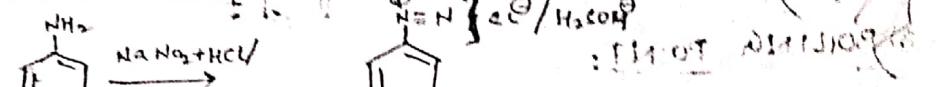
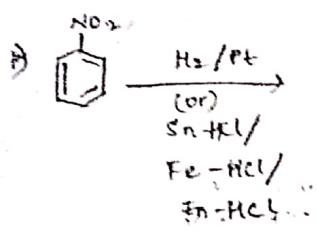
m.p. & L d packing
Molwt

NOTE: $\text{R} \rightleftharpoons \text{R}'$

Overall nucleophilic order in PPs b mol wt



ARYL HALIDES



PROBLEMS

→ Insolubility

→ Molar mass

→ Dipole

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

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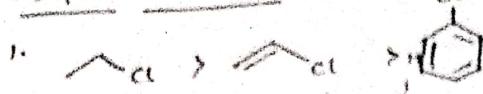
PROPERTIES OF ARYL HALIDES:

Class Royal Trainer

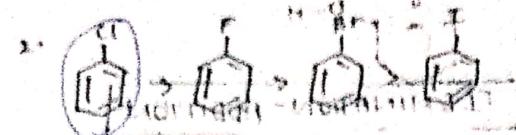
→ Insoluble in water.

→ More denser than water.

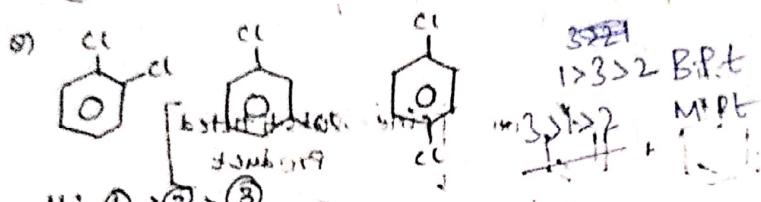
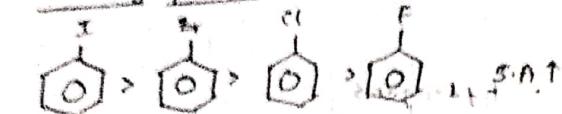
→ Dipole moment:



Dipole moment



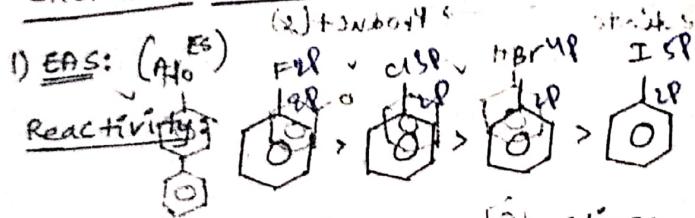
→ Boiling point:



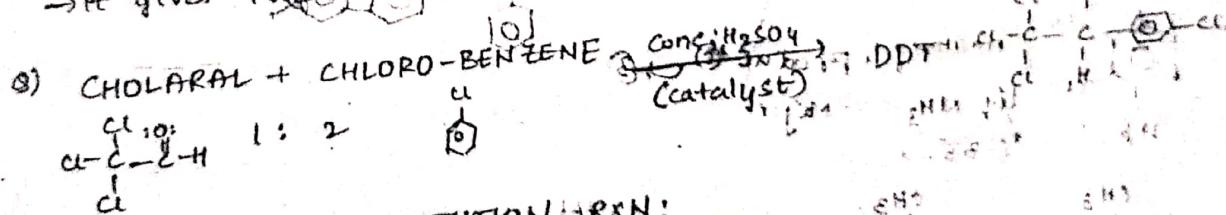
B.P.: ① > ③ > ②

M.P.: ③ > ① > ②

CHEMICAL PROPERTIES:



→ It gives Friedel-Crafts reaction.



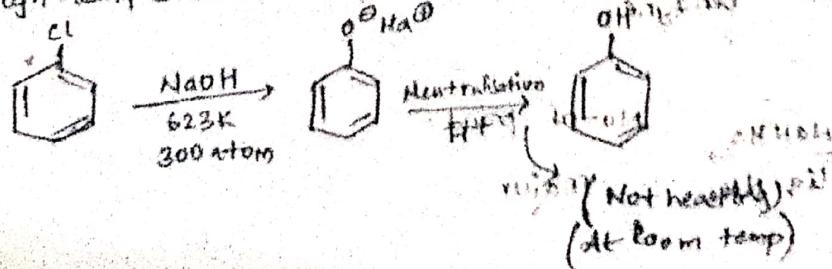
NUCLEOPHILIC SUBSTITUTION RXN:

→ Does not give $\text{S}_{\text{N}}^{\text{Ar}}$ products.

→ Under suitable conditions, they give substituted products (only for $\text{S}_{\text{N}}^{\text{Ar}}$)

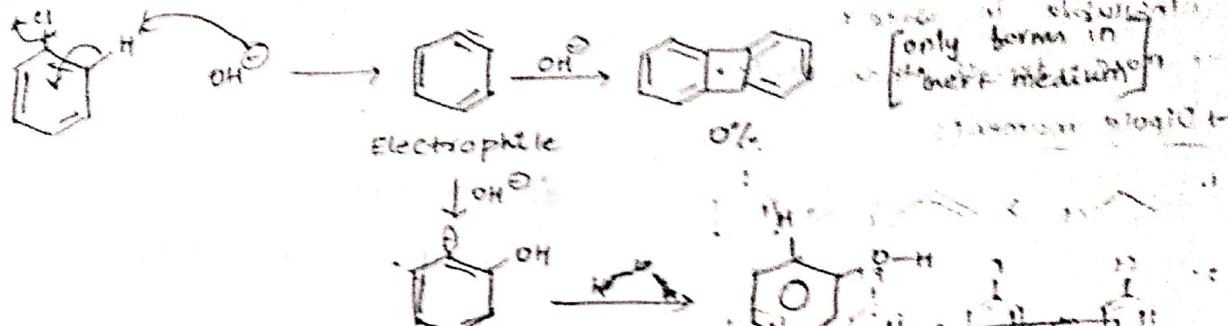
Case 2: (Proposed by DOWS) $\text{Ar}-\text{X} + \text{NaO}^- \xrightarrow[300 \text{ atm}]{623 \text{ K}}$ $\text{Ar}-\text{O}^- \text{Na}^+$ (Only for JEE-MAINS)

→ High temperature & pressure [623 K; 300 atm] and ortho NaDT.



NaOH Na^+O^-
e- delocalization
(Solvation)
+ e- C=C \rightarrow C=C
(150° running time)
 $\text{C}=\text{C}-\text{Cl} \rightleftharpoons \text{C}=\text{C}-\text{C}=\text{C}$

Mech:

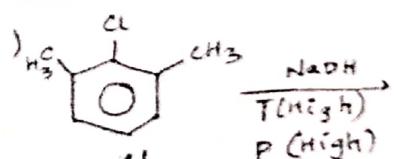


→ Another name for Dow's process is

ELIMINATION - ADDITION

(b) Benzyne Mechanism

vidences;



No Rxn

$$\begin{array}{c} \text{OH} \\ |^* \\ \text{C}_6\text{H}_5 \\ \text{SO}_3^- \end{array} +
 \begin{array}{c} \text{V} \\ \text{C}_6\text{H}_5 \\ \text{CO}^- \end{array} \xrightarrow{50\%}$$

14)  (Excess)

$$\xrightarrow[\text{30 min}]{\substack{\text{NaOH} \\ 623 \text{ K}}}$$

immediat

21

Product

(a) 

~~5-3 N.M.~~

430

$$\text{CH}_3 \begin{cases} \text{H}_2 \\ \text{O} \\ \text{H}_2 \end{cases}$$

NH₄NO₂; 1. Product (2-
methylbutane)
liq. NH₃ 2. Major
(2-
methylbutane)

a) CHORTBLER A (ARTIGO SEGUINTE)

CH_3 $\text{CH}_3\cdot$

NH_2

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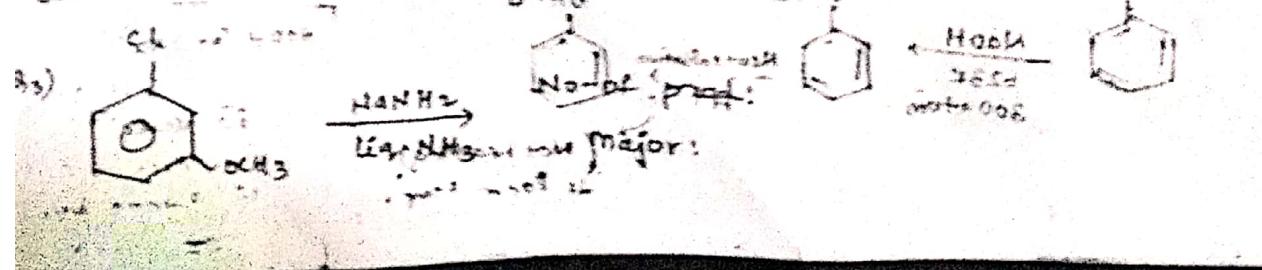
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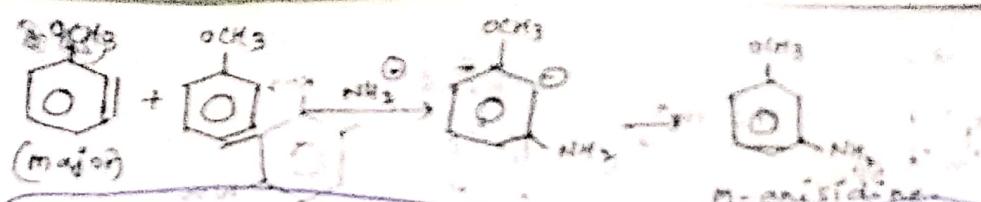
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→ Birth & Formation & its Reactivity depends only on (Inductive effect) and Electromeric effect. Resonance / Hyp. Conj. influence does not work on Benzene.

1. *Chlorophytum comosum* (L.) Willd. (Asparagaceae) (Fig. 1)

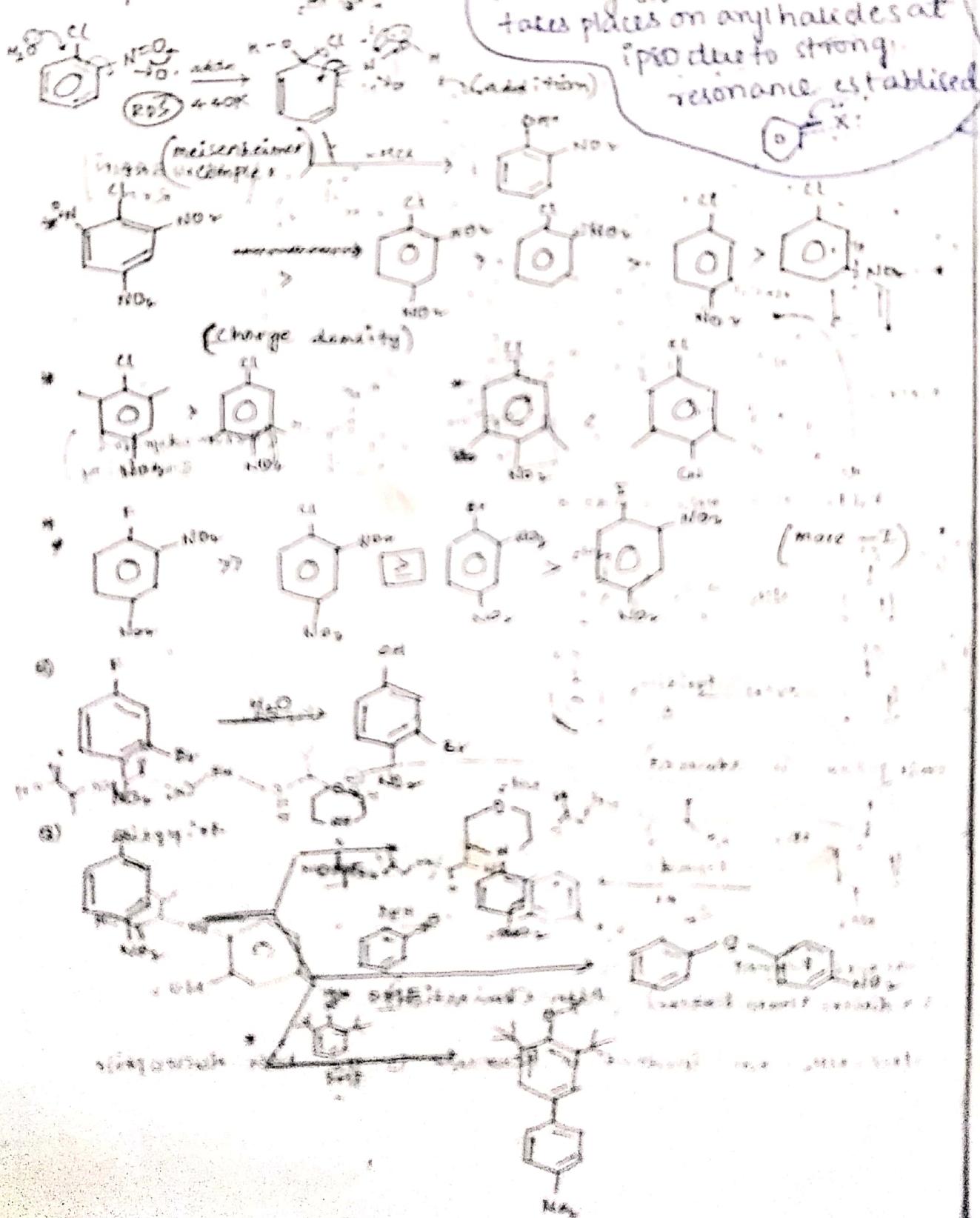




Care-II: ADDITION-ELEMENTATION

→ ENO₂ present at 'o_{2p}' positions. → they develops the charge at 'o_{2p}' position ipso to halo group, which enhances always Nucleophile.

Normally (N⁺) attack doesn't take place on aryl halides at ipso due to strong resonance established.



(26)

POLY-HALOGEN COMPOUNDS:

1) Chloroform (CHCl_3)

→ sparingly soluble in water.

→ Toxic

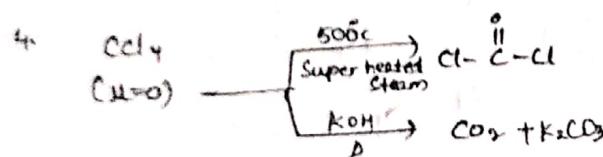
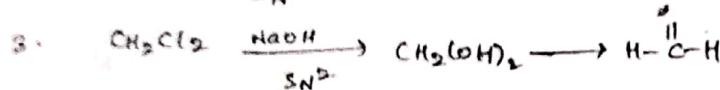
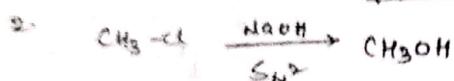
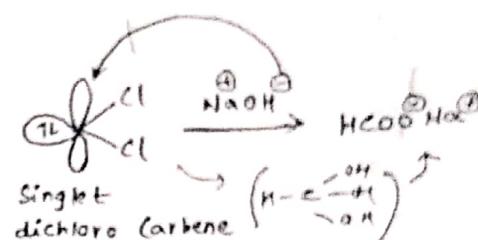
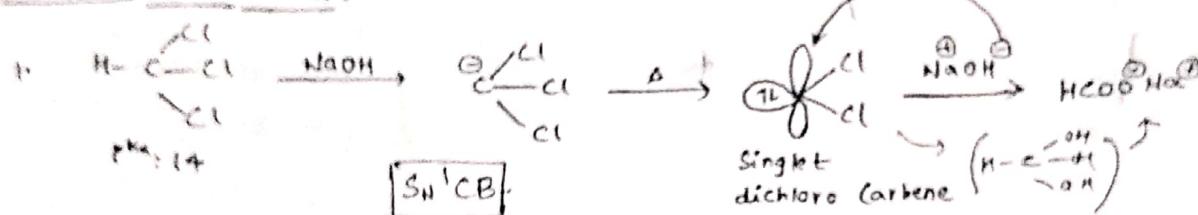
→ In older days, used as anaesthetic.

→ colourless liquid.

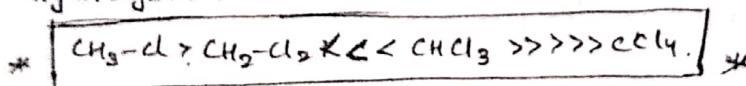
→ more density than water.

Chloroform heated with silver powder leads to formation of Acetylene.

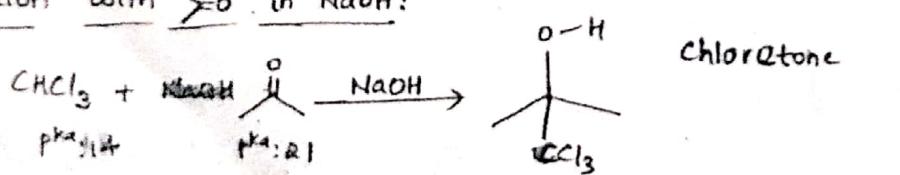
Reaction with NaOH:



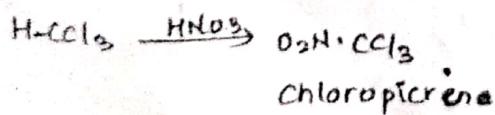
Rate of hydrolysis:



Reaction with O_2^- in NaOH:

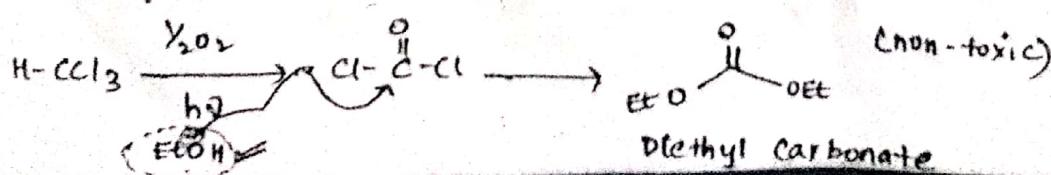


→ used as a hypnotic drug.



→ used as insecticide like gammahexane
and also used at

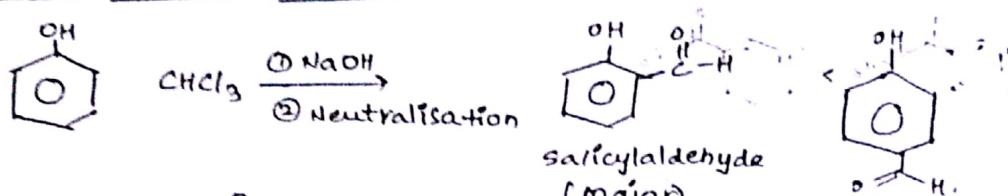
* Reaction with O_2 :



→ Used as a solvent, to prepare oils, fats, waxes. (C_6H_5Cl)
 (Benzoyl chloride)

→ Used as a reagent in following reactions. E.g. Phenyl Grignard.

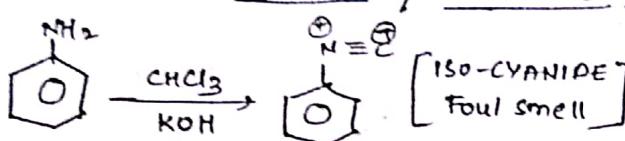
(i) Reimer-Tiemann reaction:



Electrophile: Cl^+

Nucleophile: phenoxide

(ii) Carbylamine reaction: / ISOCYANIDE TEST:



→ 3 eq. of base is consumed.

→ Both aliphatic & aromatic primary amines (all amines) will give this test.

→ Used to distinguish $18(2^\circ, 3^\circ)$ amines.

b) CHBr_3 : (Bromoform)

→ Pale yellow liquid.

c) CHI_3 : (Iodoform) and main application of iodine

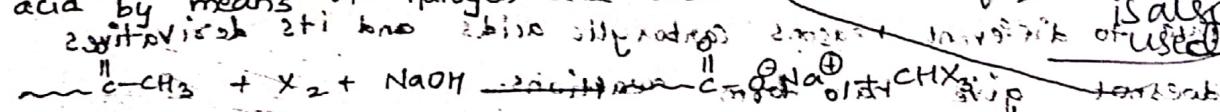
→ Insoluble

→ Yellow solid

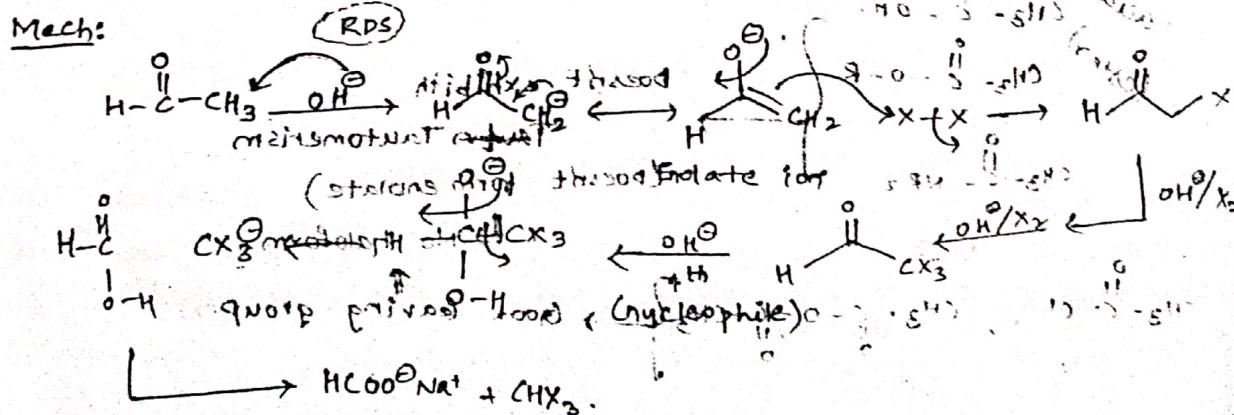
* → Antiseptic action due to (agent) [Reason: liberation of free iodine]

* d) Haloform Reactions:

→ Methyl carbonyls are converted into CHX_3 and salt of carboxylic acid by means of halogen and base.

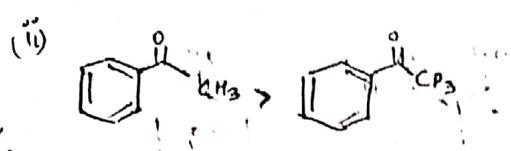


1 : 3 : 4

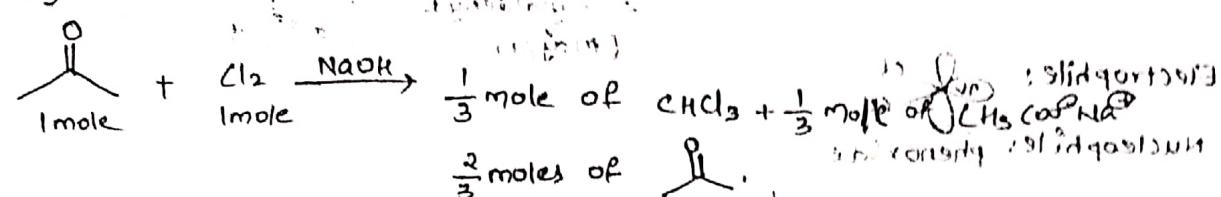


In laboratory, "I₂" is used to make the identification of product easily by colour.

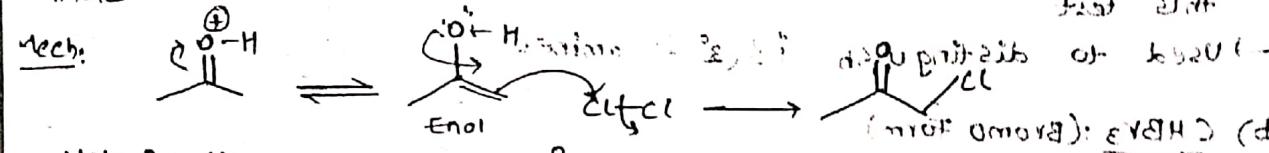
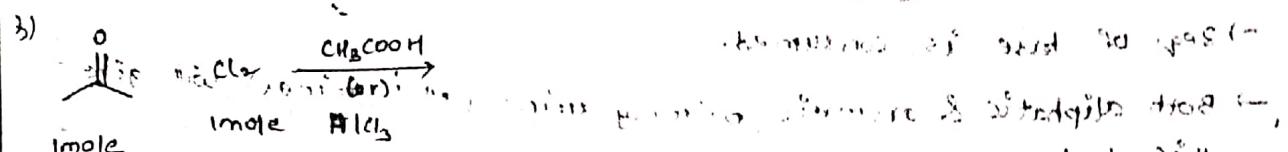
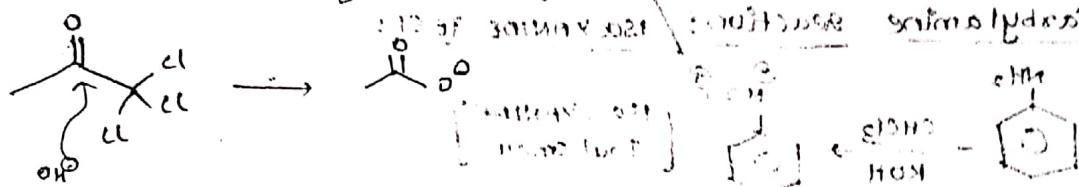
Rate: i) Cl₂ ≈ Br₂ ≈ I₂



Eg-2:

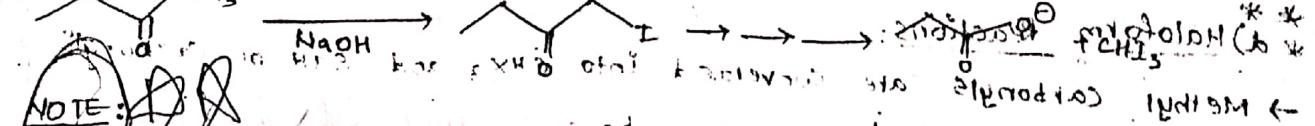
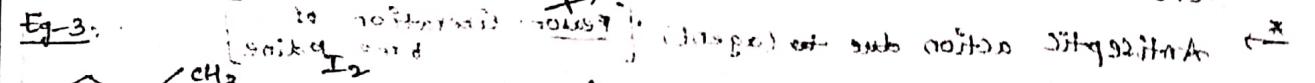
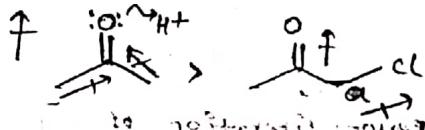


Mech:

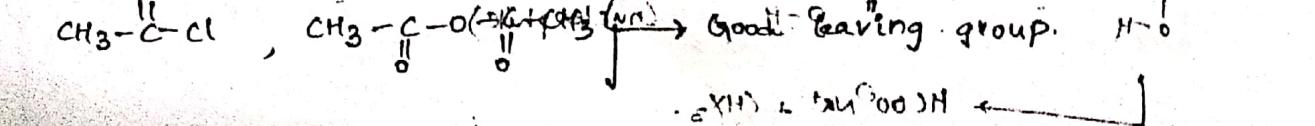
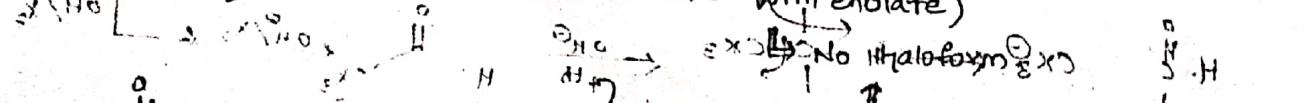
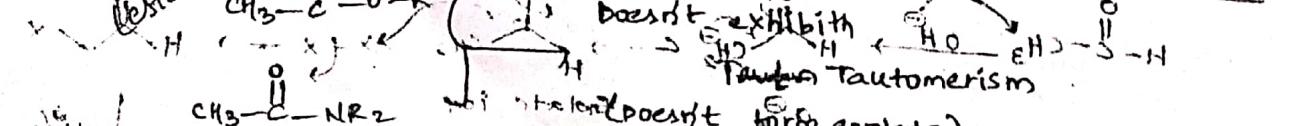
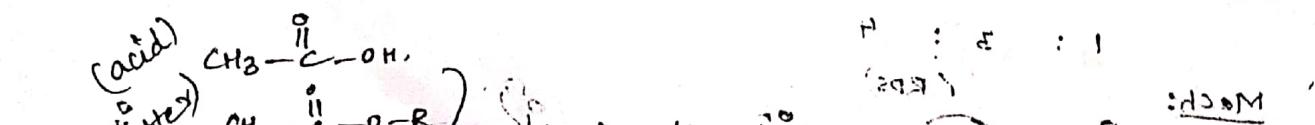


Net Result: 1 mole of CH_3COCl

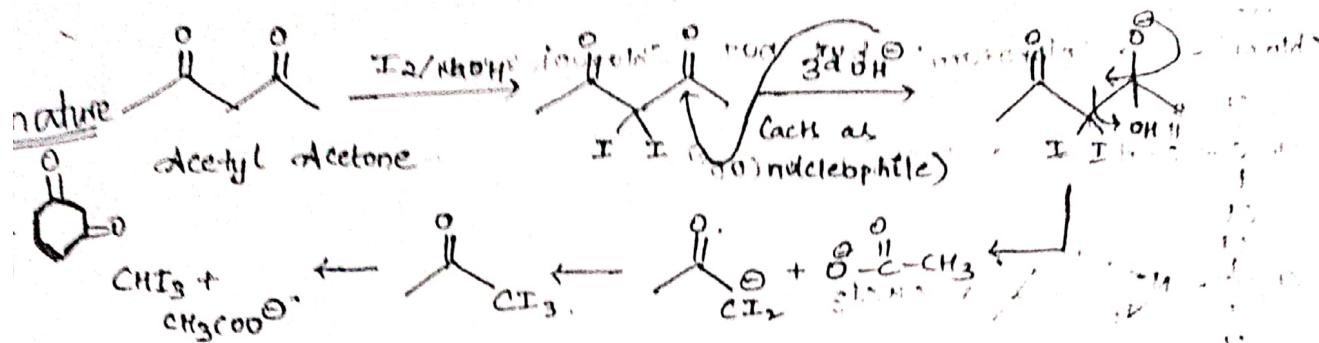
Reason: more is the net dipole, more ease of protonation; CH_3CO_2^-



Due to different reasons carboxylic acids and its derivatives does not give haloform reactions.

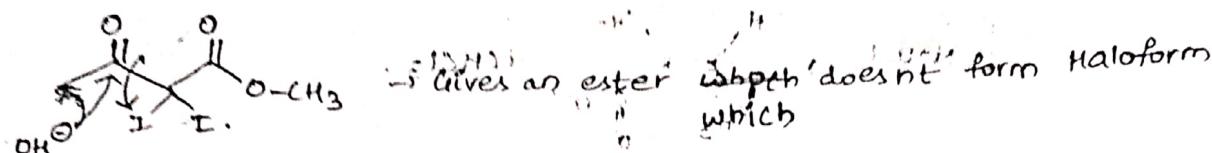


Molecules with active methylenes give haloforms:-



→ 1 mole of acetone gives 1 mole of iodoform.

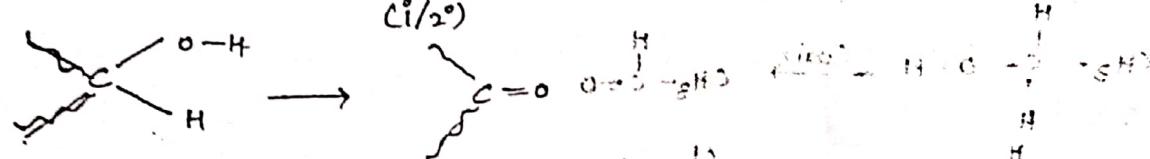
(8) 1 mole of methyl (acetoxyl)acetate gives 0 moles of iodoform.



Few alcohols give Haloform (if -ve) to different extent

→ since, the reagent $[X_2 + NaOH / OX^-]$ is oxidising agent.

→ It oxidises alcohols to corresponding carbonyl compounds.



Eg: 1) methanol (-ve) $\xrightarrow{CH_3OH}$ No iodo form $\xrightarrow{I_2 + NaOH}$ should consist of pso hydrogens and methyl group

2) Ethanol (+ve) $\xrightarrow{CH_3CH_2OH}$

3) n-propyl alcohol (-ve) $\xrightarrow{CH_3CH_2CH_2OH}$

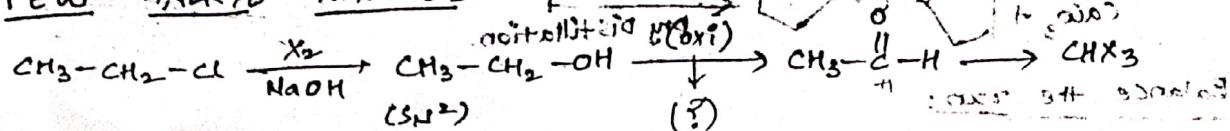
4) Iso-propyl alcohol (+ve) $\xrightarrow{CH_3CH(OH)CH_3}$

5) Pentane - 3 - ol (-ve) $\xrightarrow{CH_3CH_2CH_2CH_2CH_2OH}$

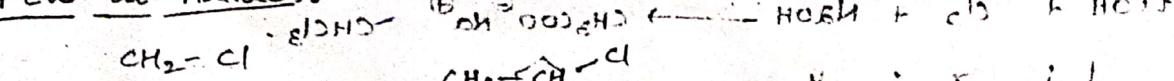
6) 3-methyl Butan - 2 - ol (+ve) $\xrightarrow{CH_3CH_2CH(OH)CH_3}$

7) tertiary butyl alcohol (-ve) $\xrightarrow{CH_3C(CH_3)_3OH}$

Few alkyl halides:-



Few di-halides:-



CH₂-Cl-C(=O)-Cl
di-chloroethane

CH₂-Cl-C(=O)-F₂
di-fluoroethane



CH₂-Cl-C(=O)-I₂
di-iodoethane

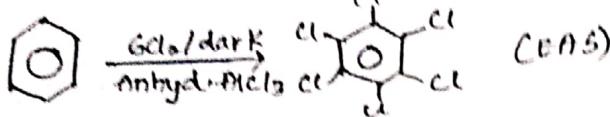
CH₂-Cl-C(=O)-Br₂
di-bromoethane

chloride

Note: (N*) CHCl_3 and CCl_4 does not give white precipitate with AgNO_3 solution. CHCl_3 gives yellow precipitate with AgNO_3

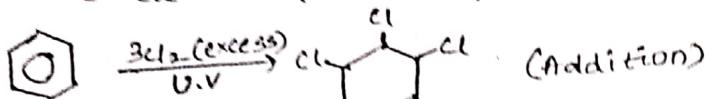
POLY HALOGEN COMPOUNDS

1) Hexa-chloro Benzene: (HCB)



2) BENZENE - HEXA CHLORIDE: (BHC)

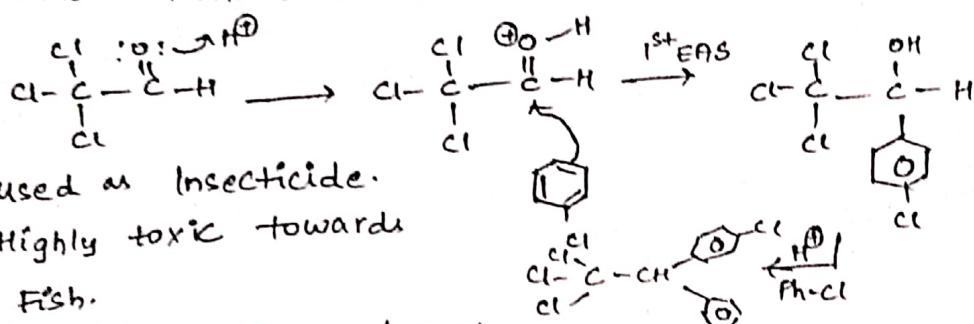
→ also called as Gammahexane / Lindane / G666



→ used as Insecticide

3) DDT:

→ chloral + chlorobenzene → DDT



→ Highly toxic towards Fish.

→ Usage of DDT was banned in U.S.

4) CCl_4 :

→ Inflammable

→ used as Fire extinguishers

→ Called as pyrene.

→ used to prepare phosgene and chloro-fluoro carbons.

5) FREONS:

→ $3\text{CCl}_4 + 2\text{SbF}_3 \xrightarrow{\text{SbCl}_5} 3\text{CCl}_2\text{F}_2 + 2\text{SbCl}_3 \leftarrow \begin{matrix} \text{(manufactured by)} \\ \text{(Swarts rxn)} \end{matrix}$

→ chloro-fluoro carbons are called as Freons.

→ Used in Refrigerators, air conditioners.

Eg: Freon - II CFCl_3 In general
 Freon - I₂ CF_2Cl_2