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Where Minds Pollinate

Class 12

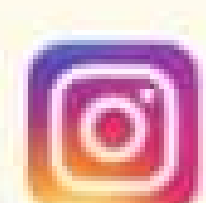
Chemistry

Chapter 10

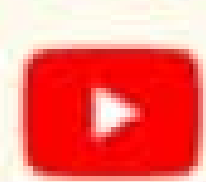
Hydroxy Compounds

Handwritten Notes

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Chap: 10

Hydroxy Compounds

There are three hydroxy compounds:-

- 1) Alcohol
- 2) Phenol
- 3) Naphthols

1) Alcohols:- ($R-OH$) When hydrogen atom of alkane is replaced by hydroxyl group then compound formed are called alcohols.

General formula:- $C_nH_{2n+1}OH$

Examples:-

1) CH_3-OH Methyl Alcohol (C.N) or Methanol (IUPAC)

Use:-

> It is used as a solvent and anti-freezing agent.

2) CH_3-CH_2-OH Ethyl Alcohol or Ethanol

Use:- - Used in alcoholic beverages

> It is used as a solvent, fuel and drinking purpose, Pyodine, cough syrups, and pharmaceutical industry

3) $CH_3-CH(OH)-CH_3$ Isopropyl Alcohol or 2-propanol

Use:-

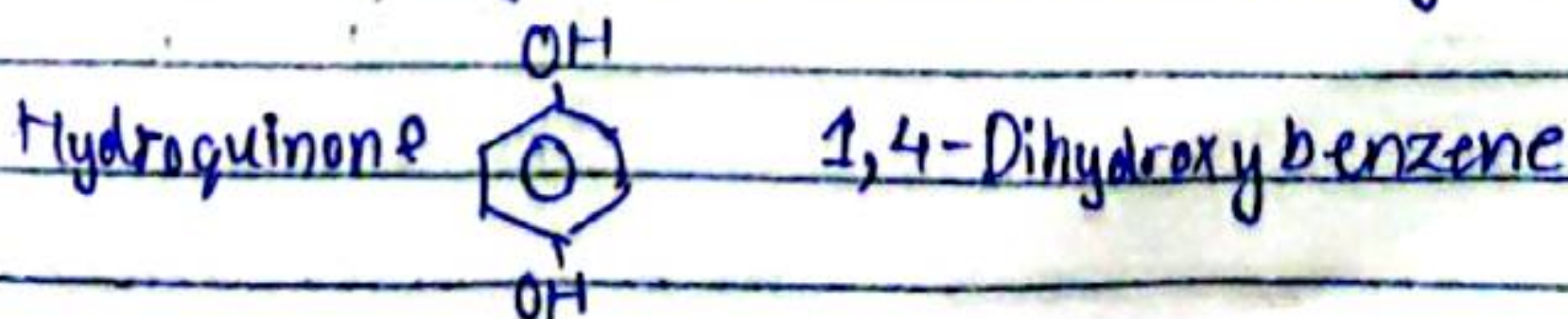
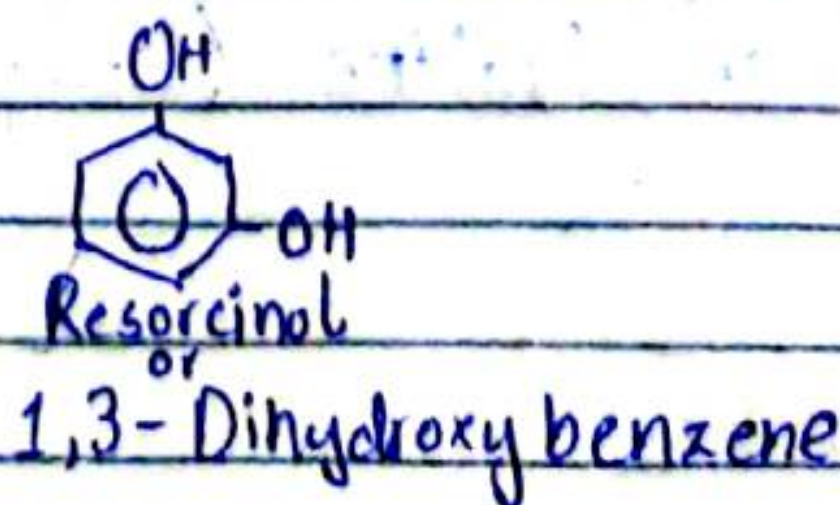
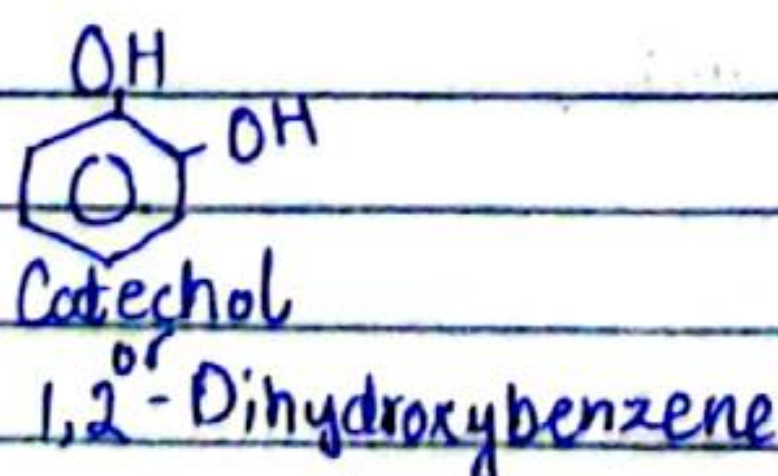
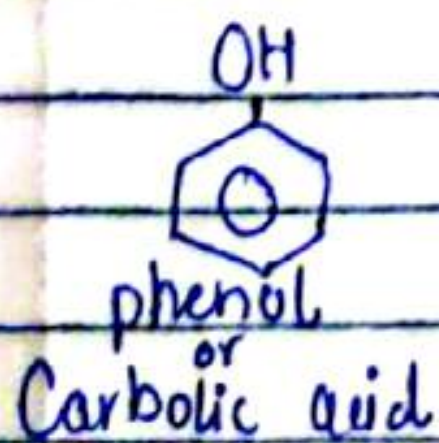
It is used as a solvent and disinfectant

2) Phenols:- Aromatic compound containing one or more than one OH group directly attached with the carbon of benzene ring is called phenol.

Use:- It is used in the manufacturing of plastics, medicine.

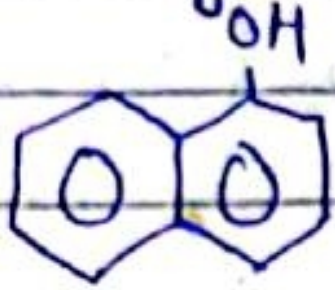
It is used as disinfectant, and as antiseptics.

Structures:-



3. Naphthols:- When hydrogen atom of naphthalene is replaced by Hydroxyl group compound formed are called naphthols.

Use:- It is used as pigment, dyes and in pharmaceutical industry, & agrochemicals.

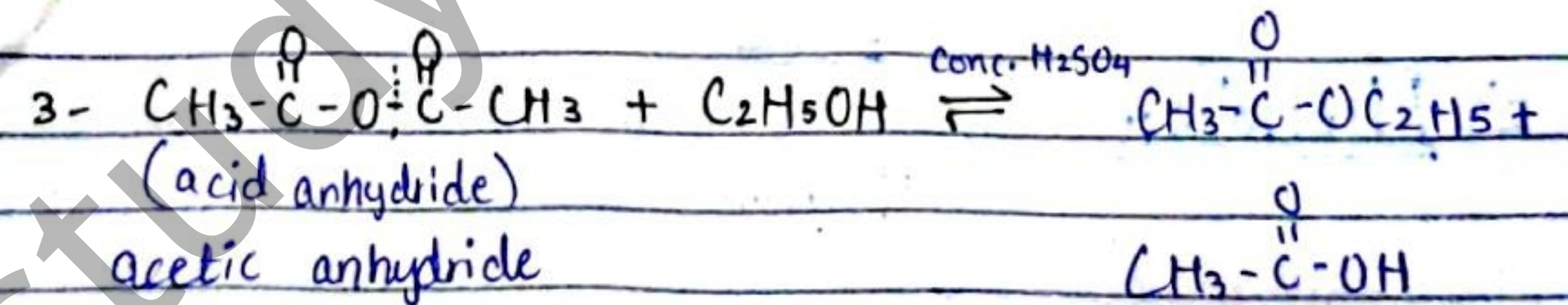
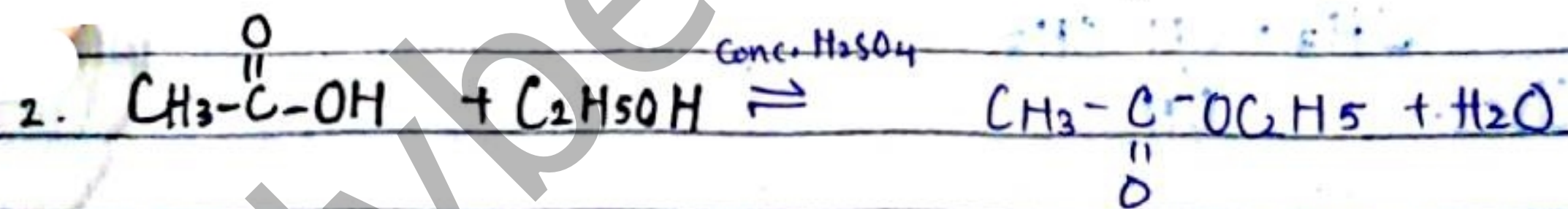
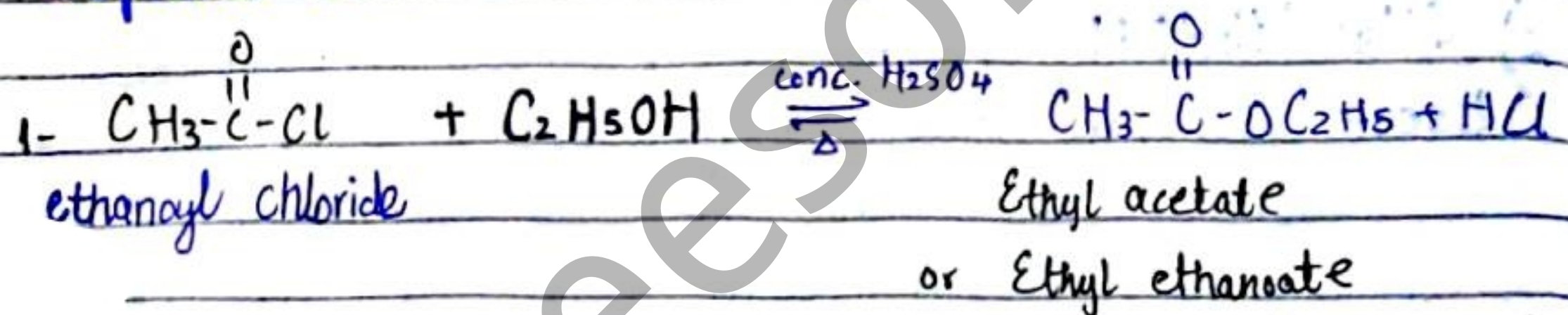


1-Naphthol or α -Naphthol



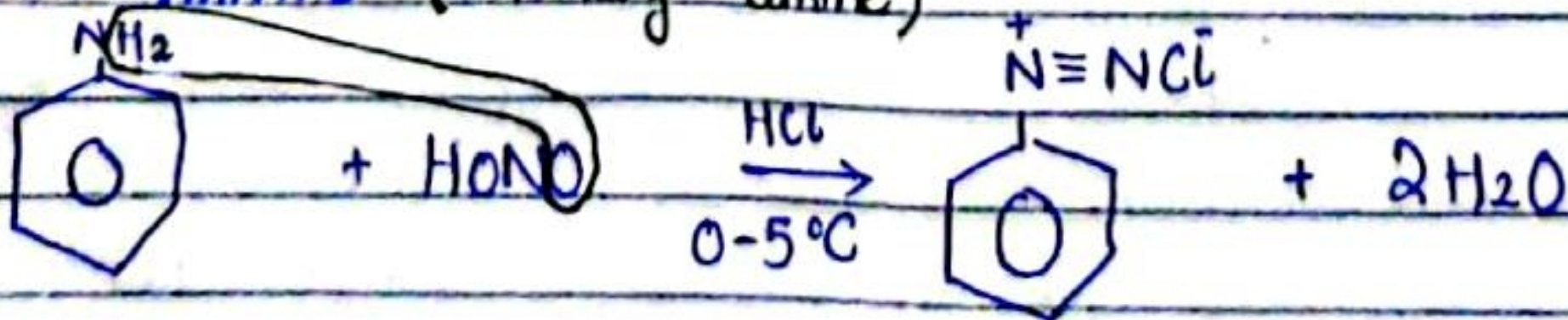
2- Naphthol or β -naphthol

Preparation of Esters



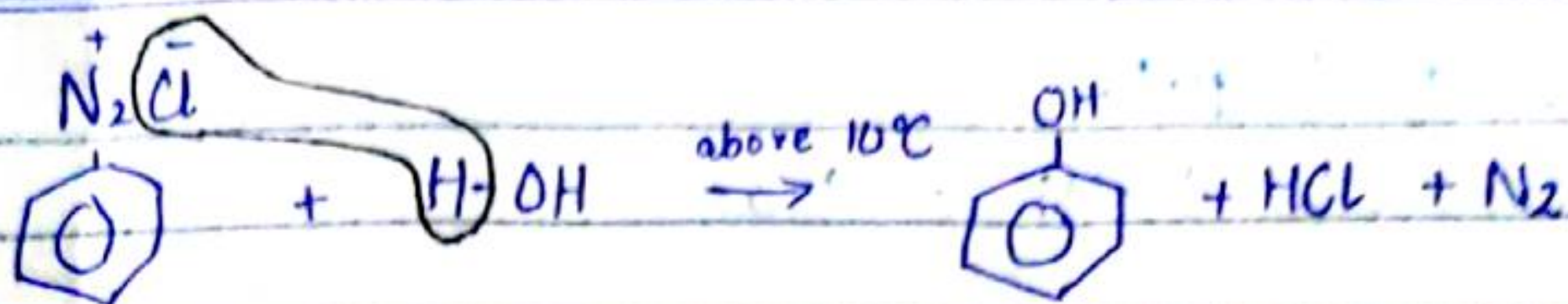
Preparation of Phenol:-

From Aniline (Primary amine)



aminobenzene
(aniline)

Aryl diazonium chloride

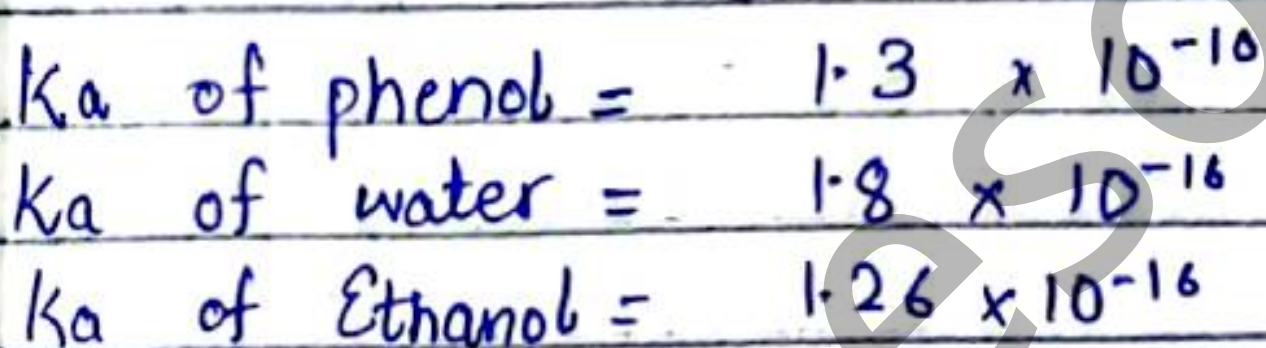


Aryl diazonium salt ($\text{R}-\text{N}\equiv\text{N}^+\text{Cl}^-$) is more stable than alkyl diazonium salt due to delocalization.

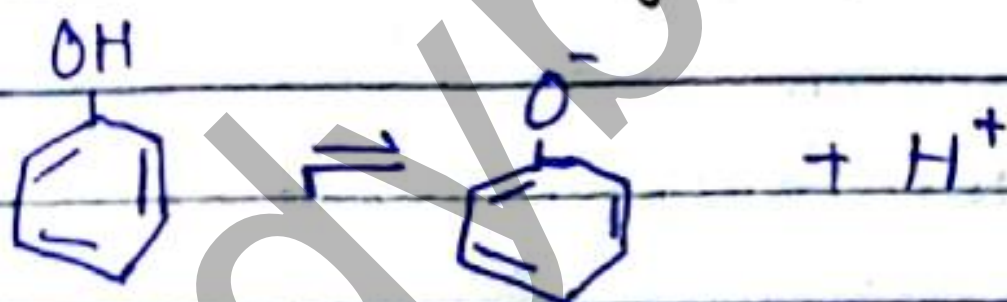
Acidity of Ethanol, Phenol and water:-

1- Acidity Order of ethanol, phenol and water is:-
Phenol > Water > Ethanol

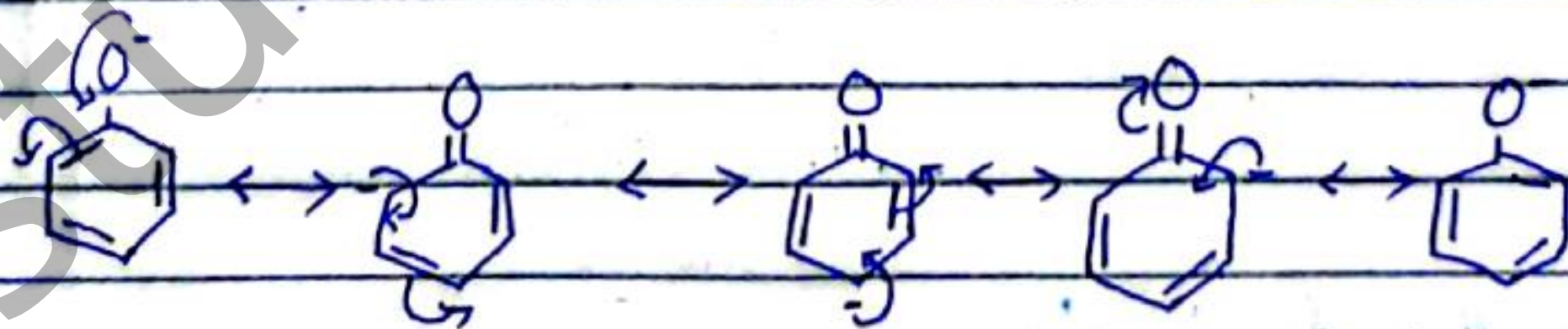
2- $K_a \propto$ acidic strength
 $\text{p}K_a \propto \perp$
acidic strength



3. Acidic strength $\propto$ stability of conjugate base



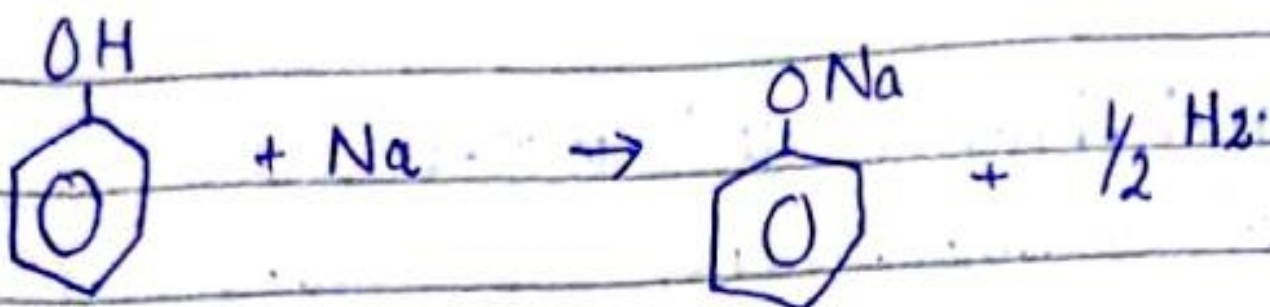
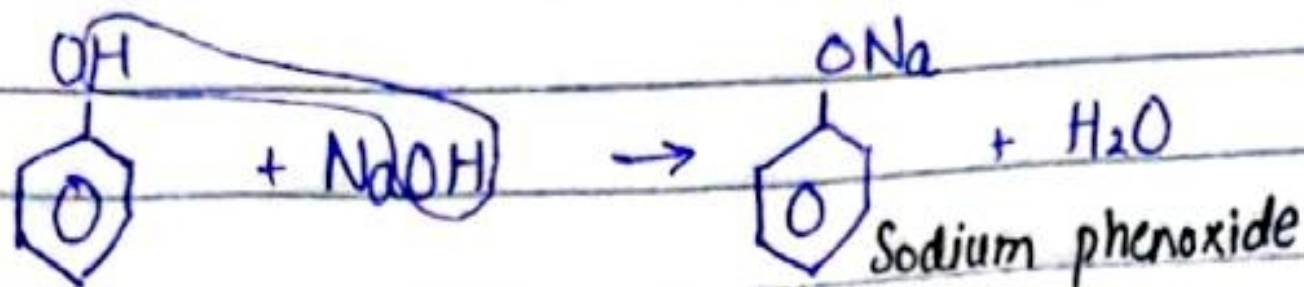
Phenoxide ion (stable)



4. Water is more acidic than ethanol because in ethanol OH bond is less polar due to presence of alkyl group which is electron donor.

Reaction of Phenol:-

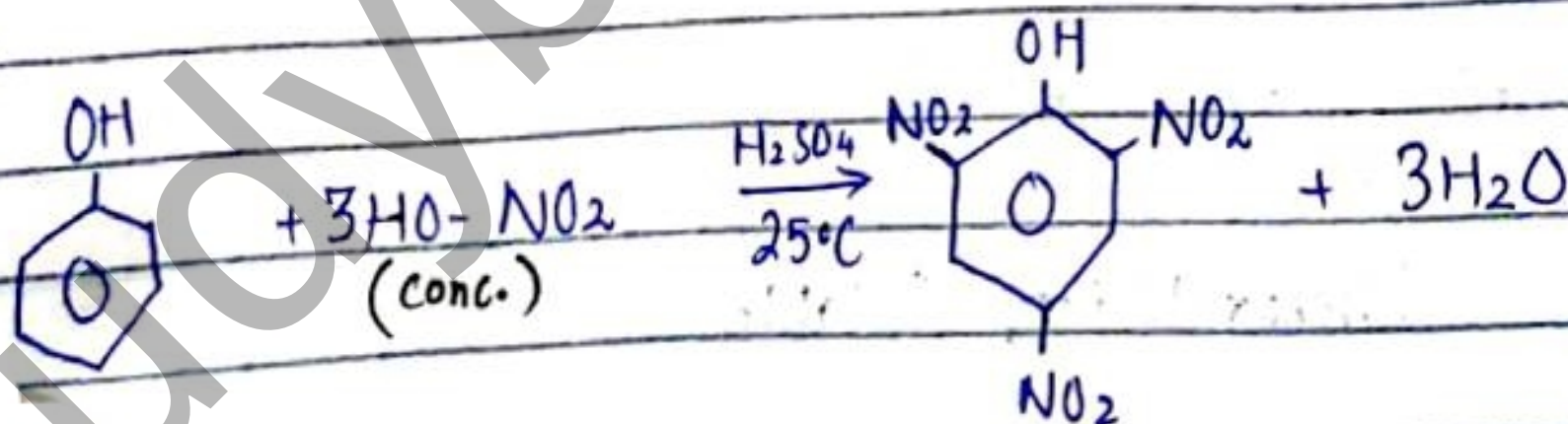
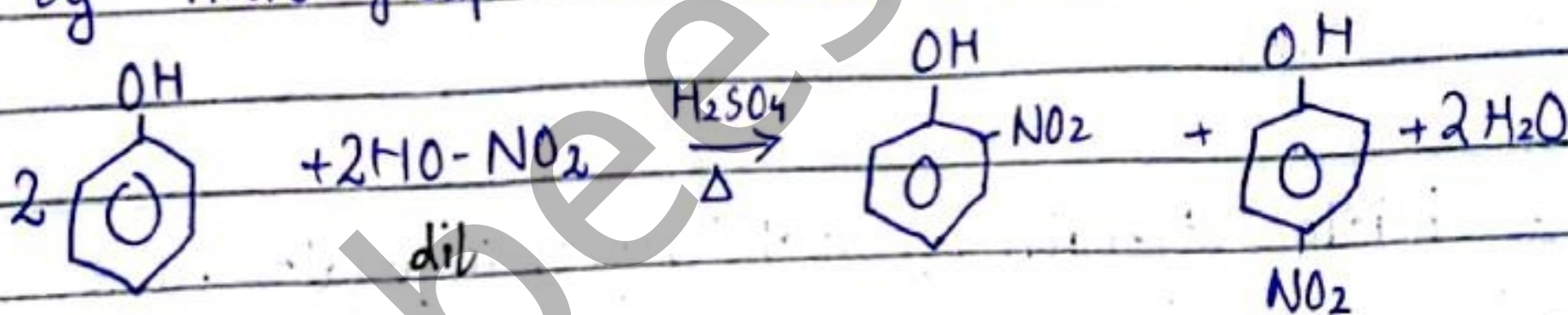
1- Reaction with NaOH or Na-



2- Electrophilic Substitution reaction of Phenol:-

Phenol is more reactive than benzene towards electrophilic substitution reactions due to presence of OH group which is electron donor.

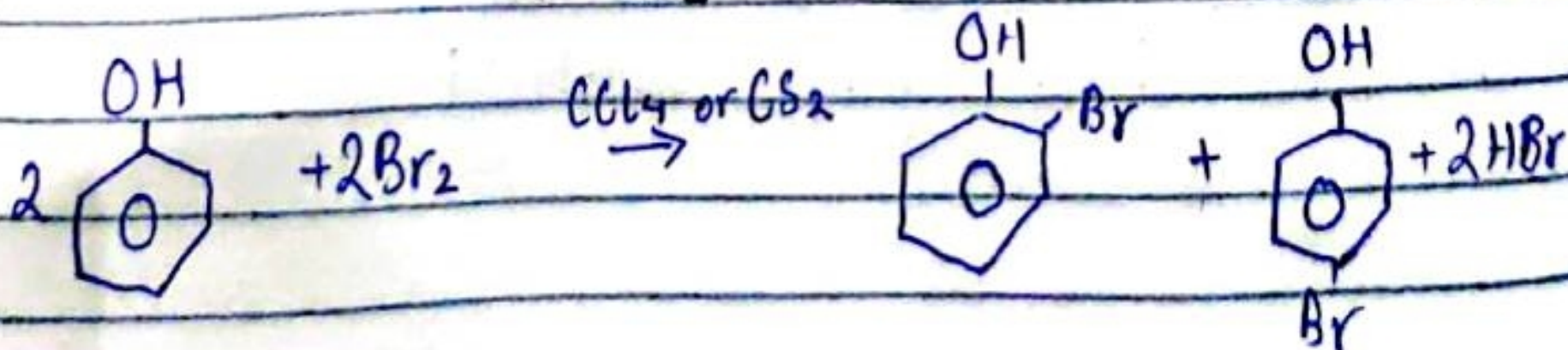
a- Nitration:- Replacement of hydrogen atom by nitro group is called nitration.



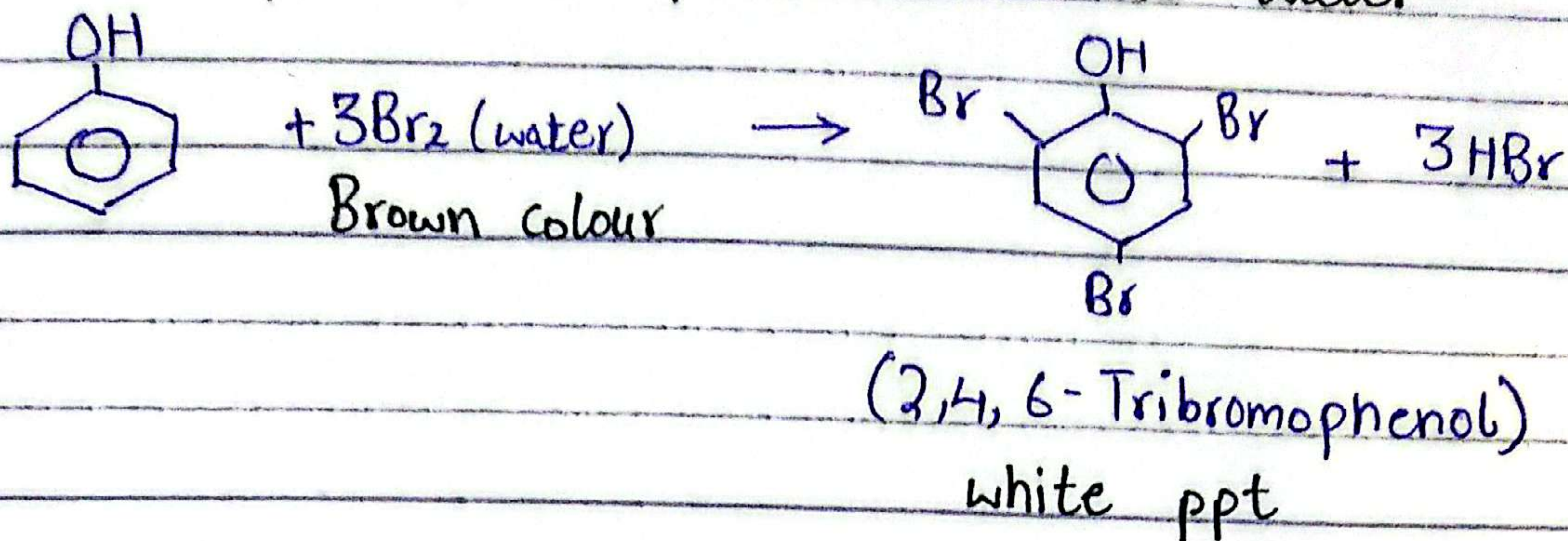
2,4,6 - Trinitrophenol
(picric acid)

b- Bromination of Phenol:-

i) In the presence of non-polar solvent like CCl_4 or CS_2

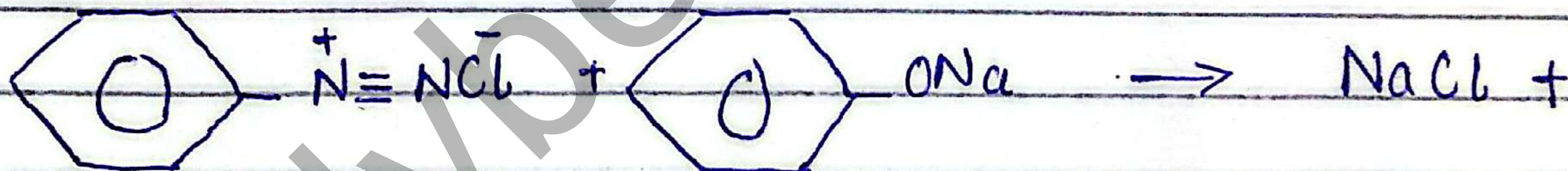
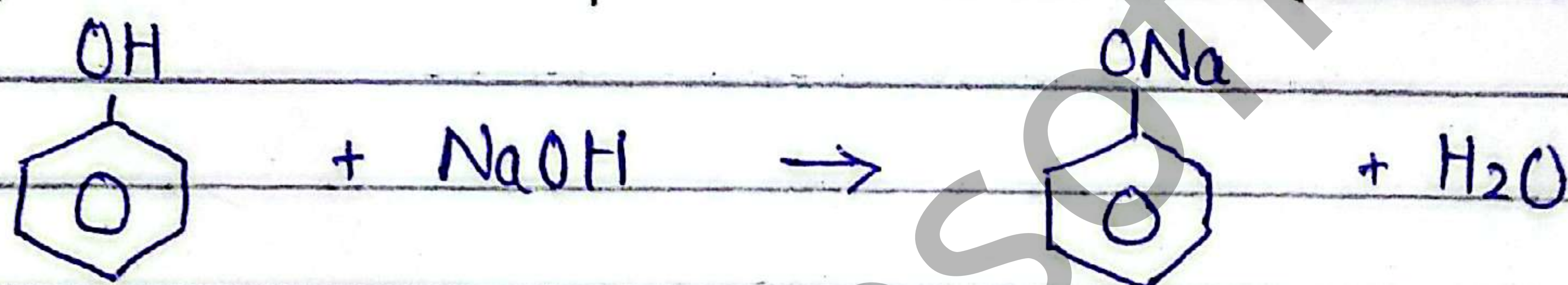


ii) In the presence of polar solvent like water

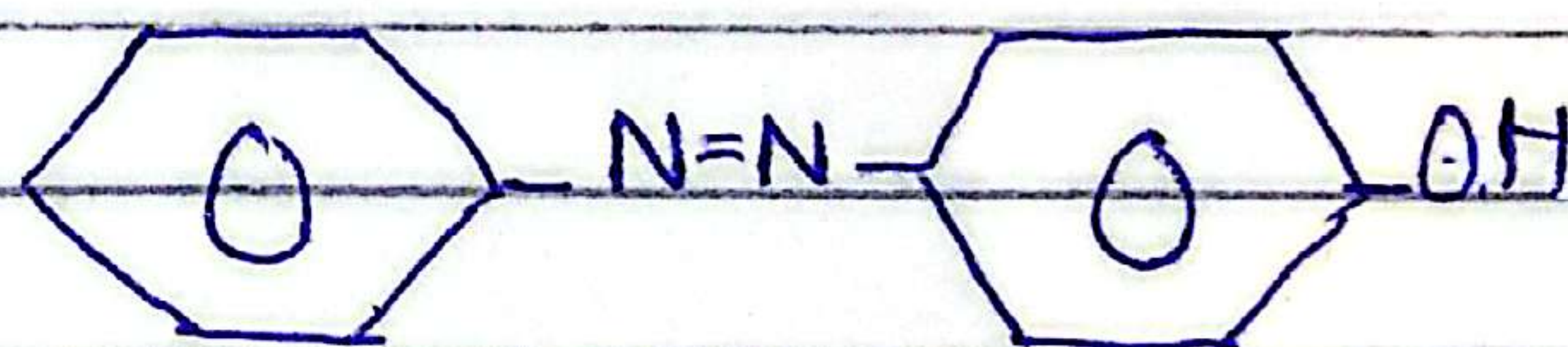


This test is used as confirmatory test for phenol. Brown colour of bromine disappears and white ppt is formed.

iii) Reaction of phenol with diazonium salt:-



Aryl diazonium chloride



Azodye

Orange-yellow ppt

MCQs:-

i- c

vii- b

ii- c

viii- b

iii- a

ix- c

iv- b

x- b

v- b

vi- c