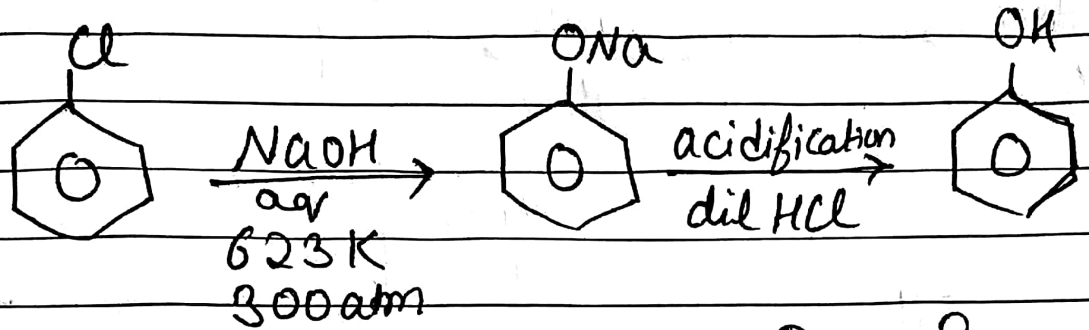
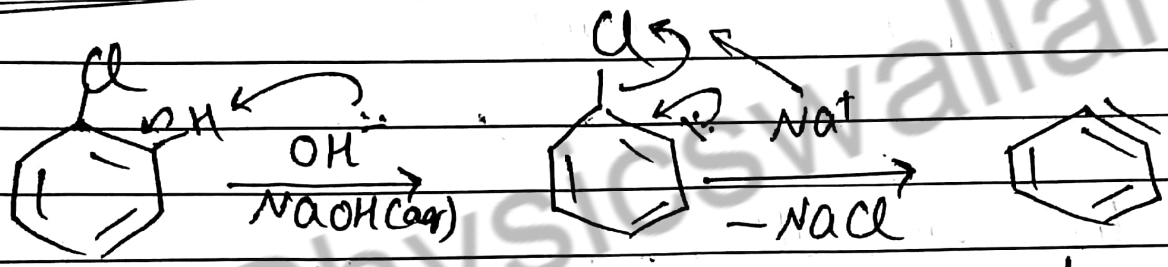
Preparation of Phenols :-

① From Haloarenes :-

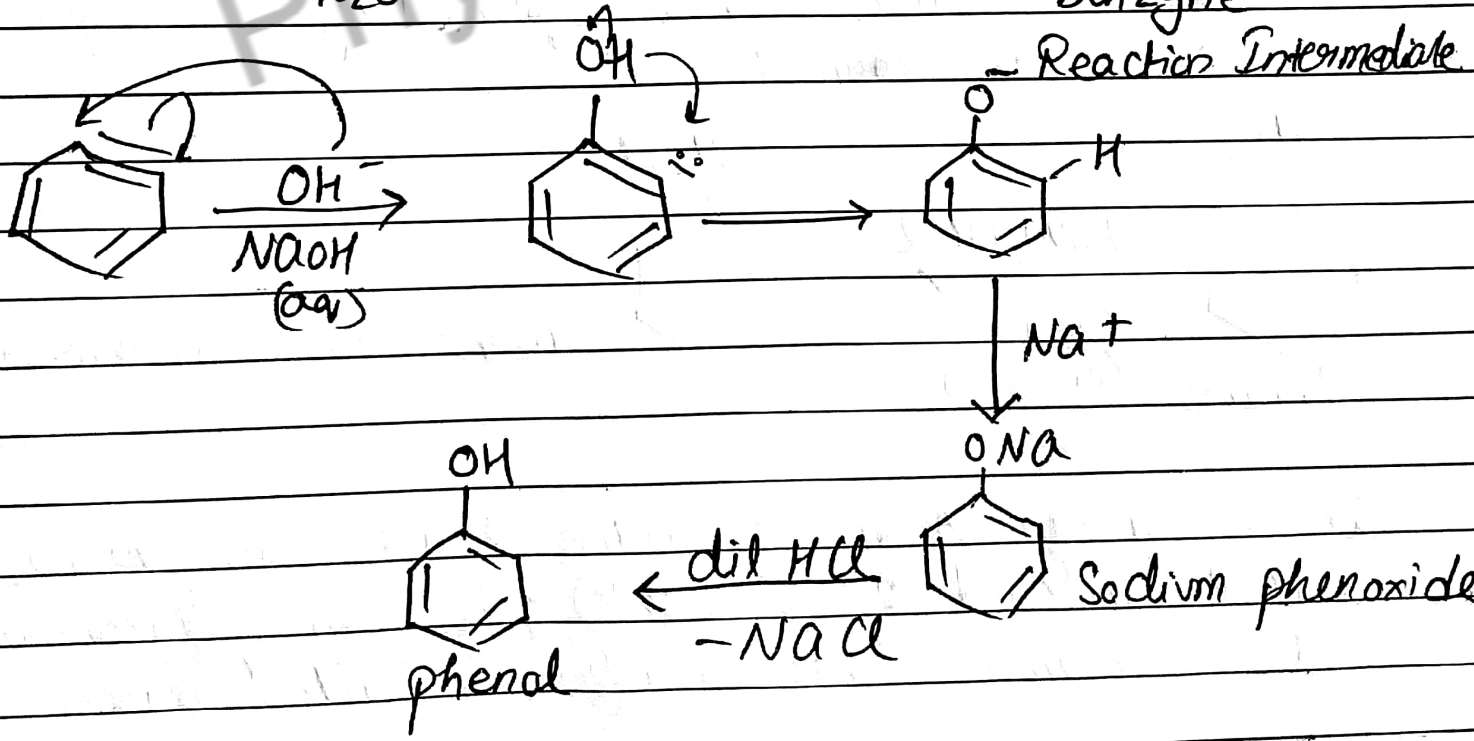


Dow's Process
(Industrial Method)

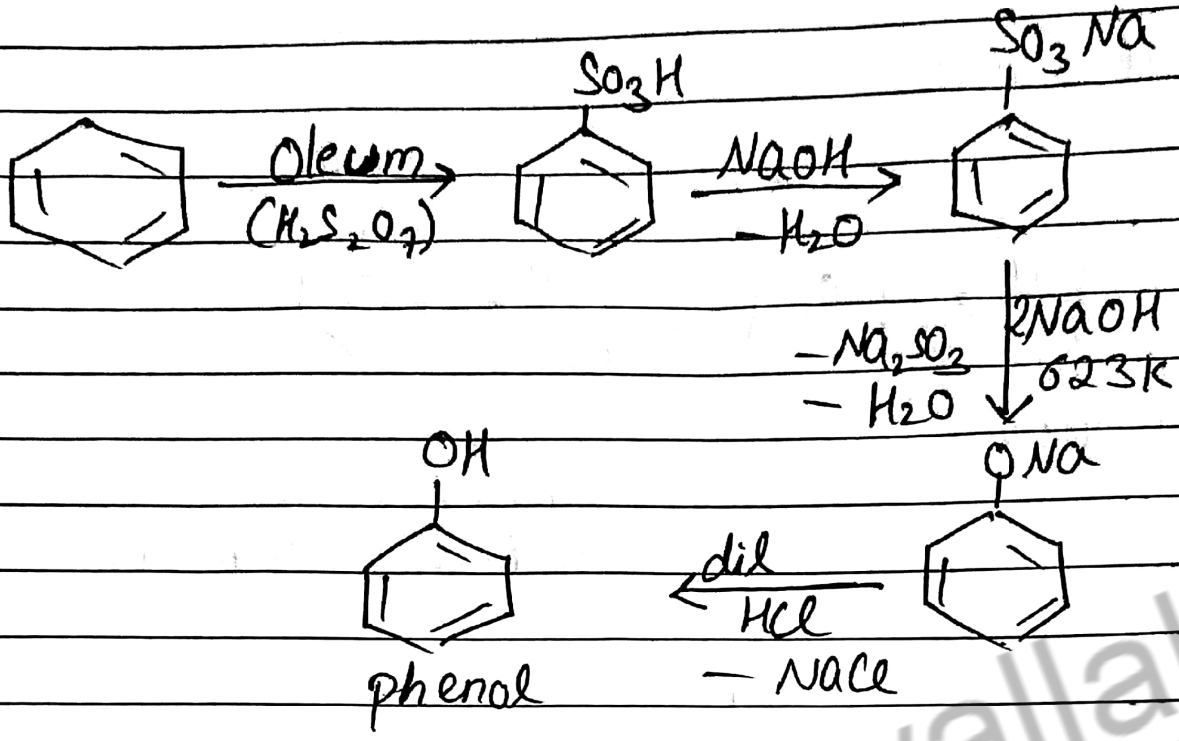
Mechanism:



benzyne
- Reaction Intermediate

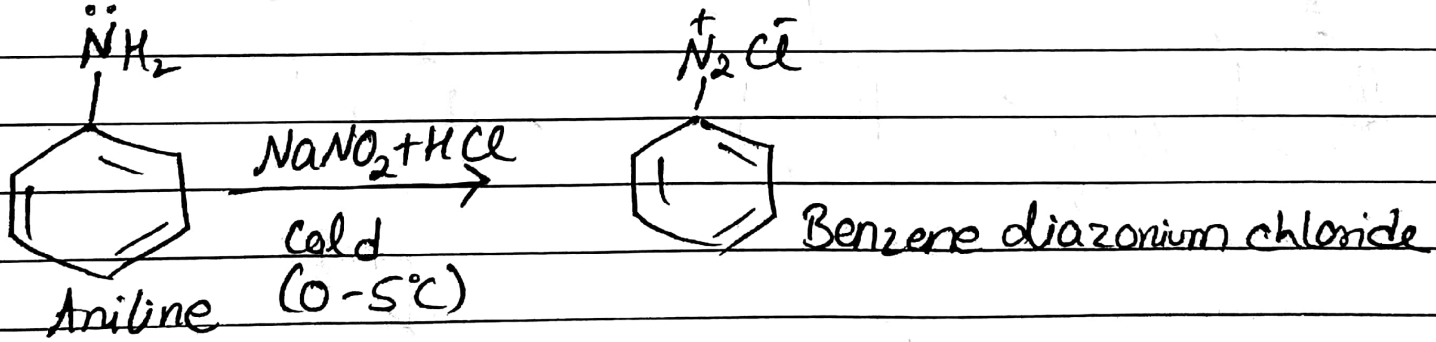


(2) From benzene sulphonic acid



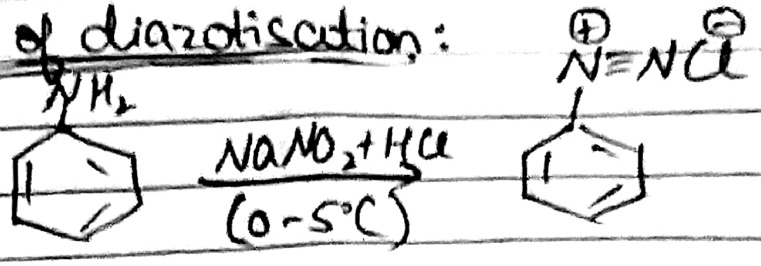
(3) From diazonium Salts:

By diazotisation of Aniline followed by hydrolysis with warm H_2O.



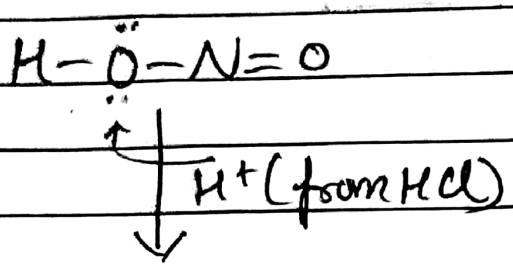
When Primary Aromatic Amine reacts with $NaNO_2$ & HCl in cold (273K-278K); it forms diazonium salt of benzene. This reaction is called diazotisation

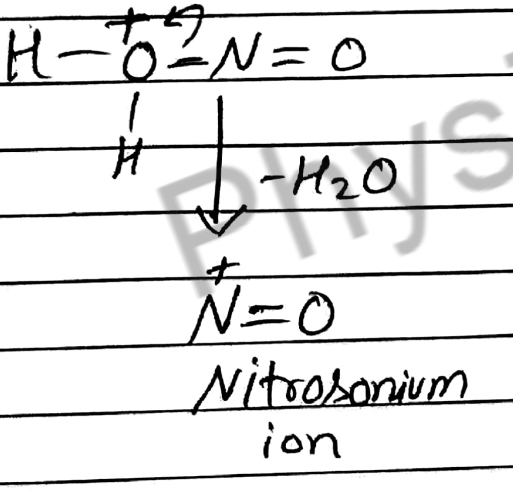
Mechanism of diazotisation:



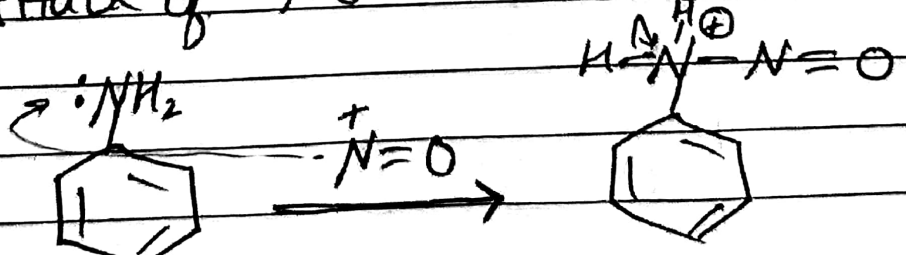
$$NaNO_2 + HCl \longrightarrow NaCl + HNO_2$$

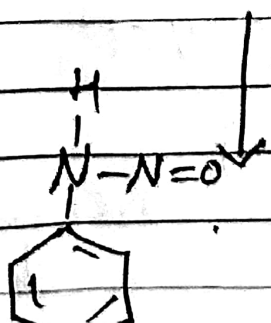
Generation of Nitrosonium ion ($\overset{+}{N}O$ ion)

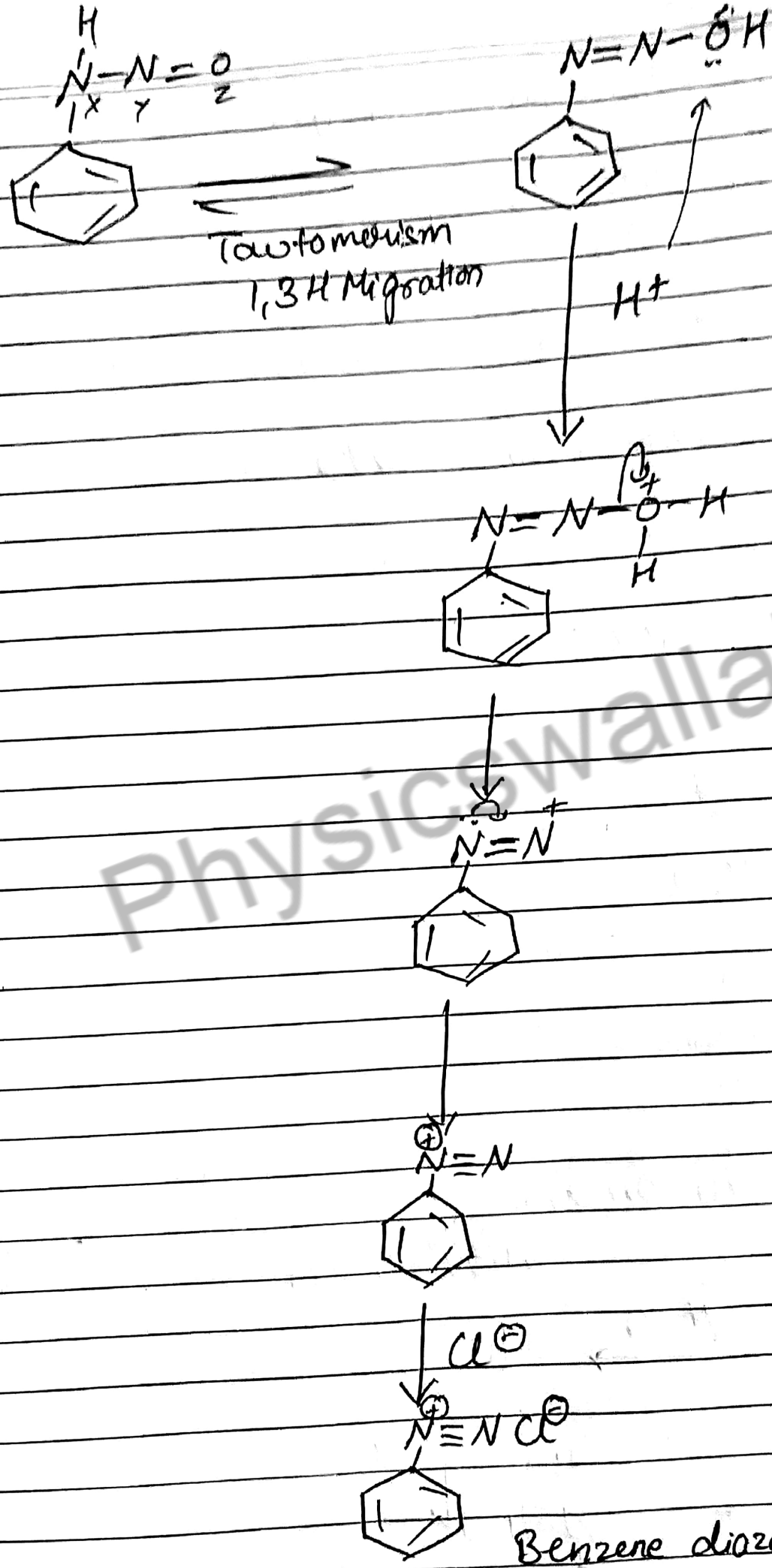


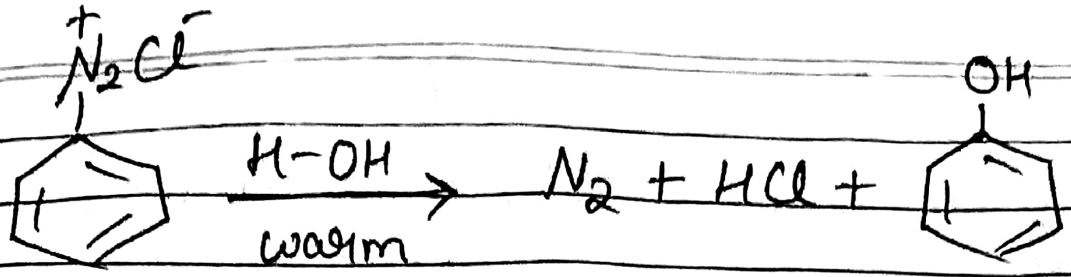


Attack of $\overset{+}{N}O$ on Aniline

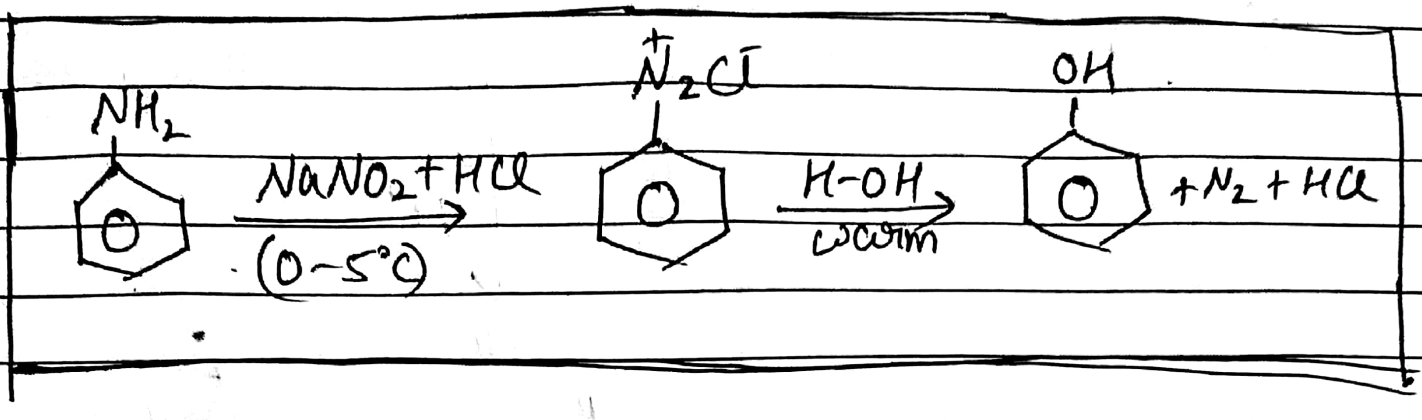




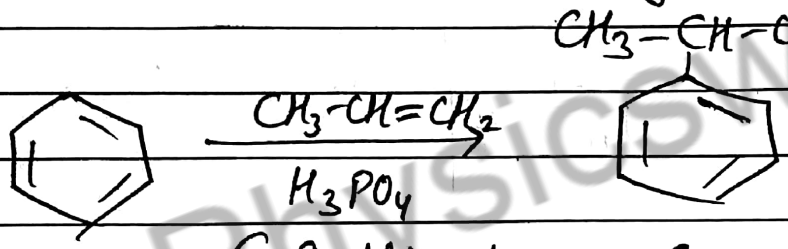




Phenol

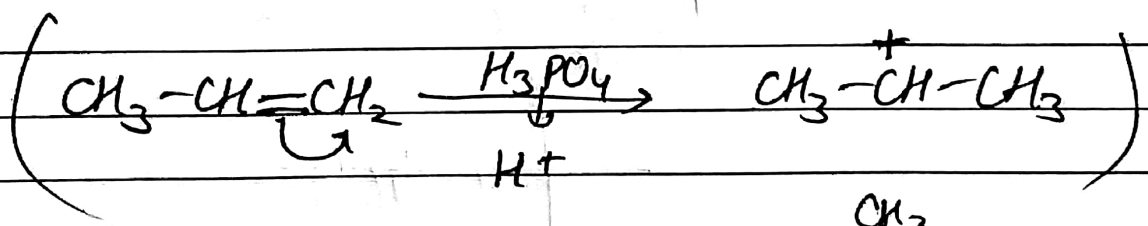


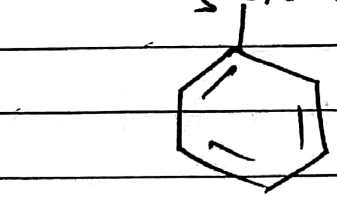
(4) From Cumene (Isopropyl benzene) (important)

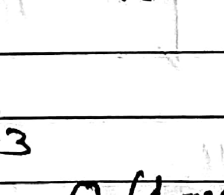


F.C. Alkylation (E^+ Substitution)

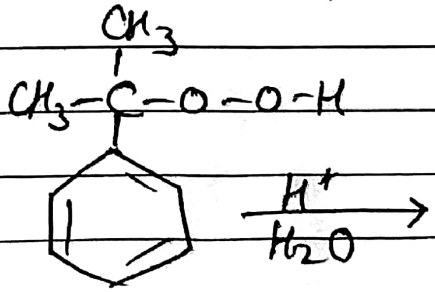
Cumene (Isopropyl benzene)



Now, 



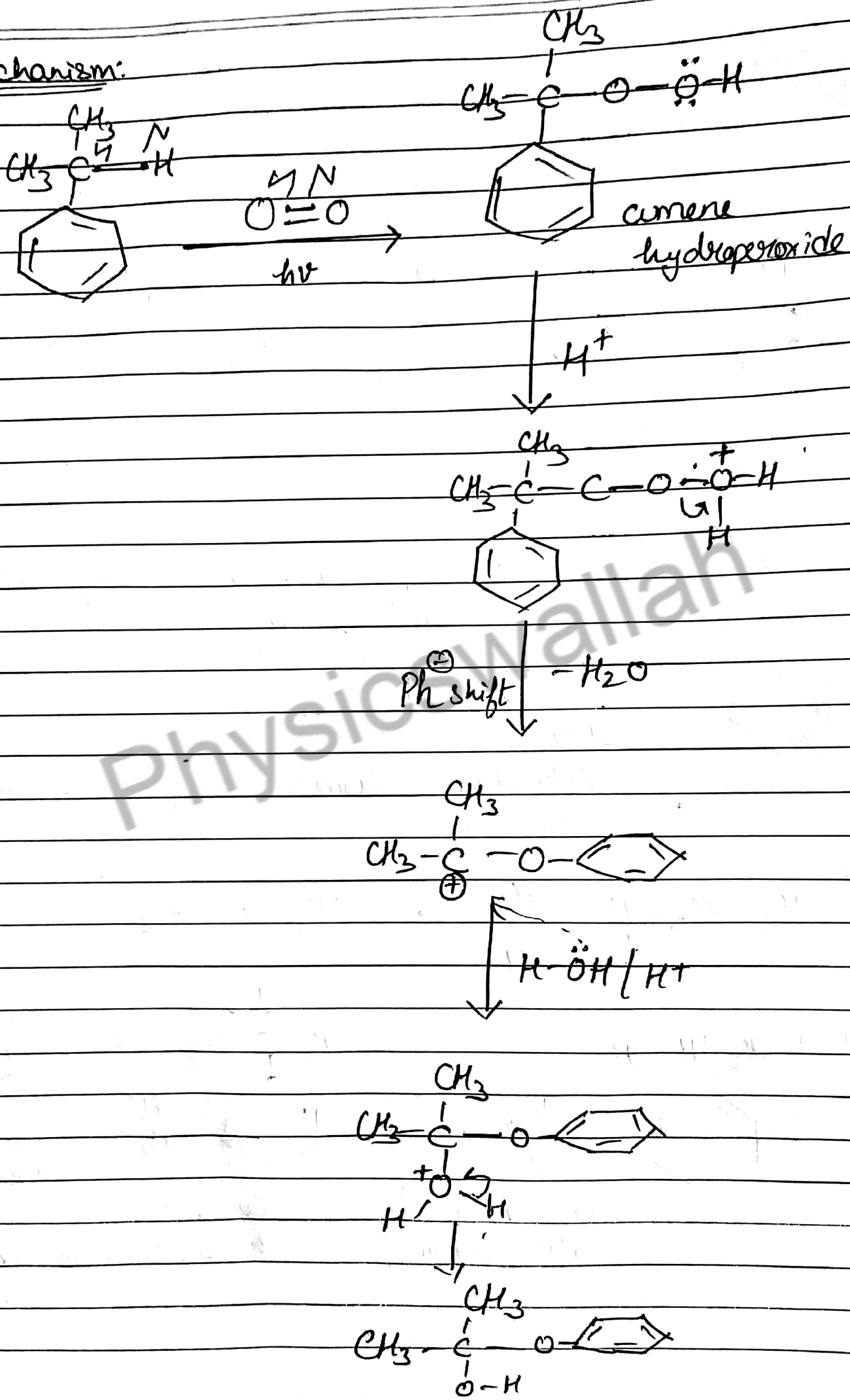
(Free Radical Mechanism)

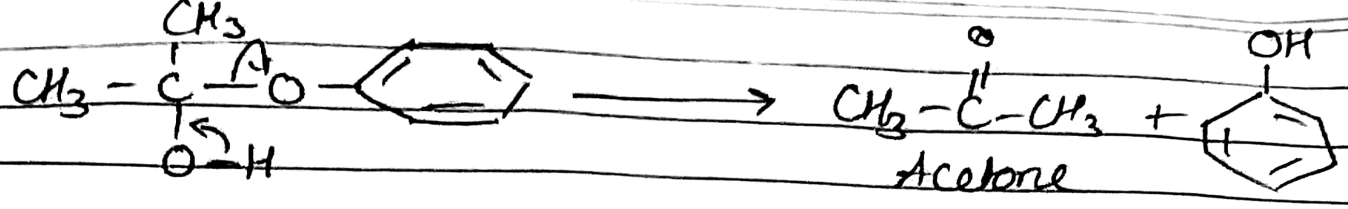


Cumene hydroperoxide

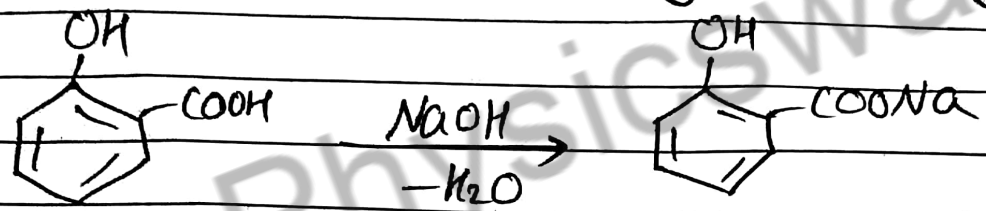
Phenol + $CH_3-\overset{O}{\overset{\|}{C}}-CH_3$ Acetone

Mechanism:





(5) From Salicylic Acid (By Decarboxylation)



Salicylic Acid
(2-hydroxy benzoic acid)