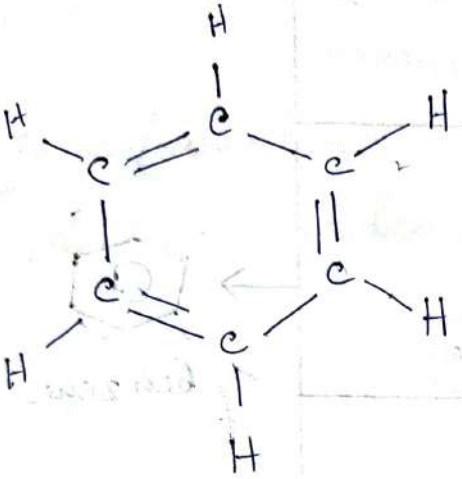
Benzene (C_6H_6) / Phenyl (Ph)



C_6H_6 → Aromatic

↓

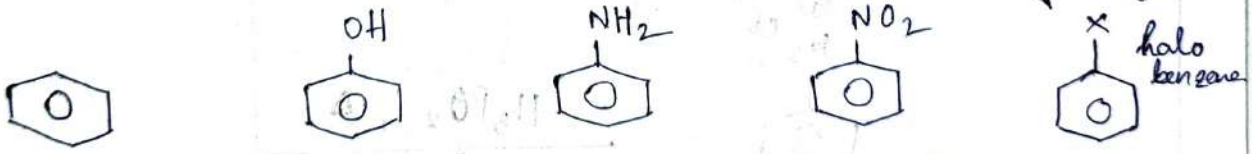
$4n+2$ no. of π electron present.

$4n+2 = \pi e^{\ominus}$

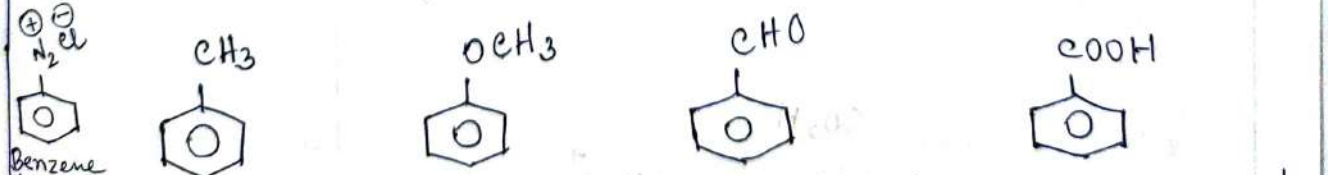
$\therefore 4n+2 = 6$

or, $n = 1$

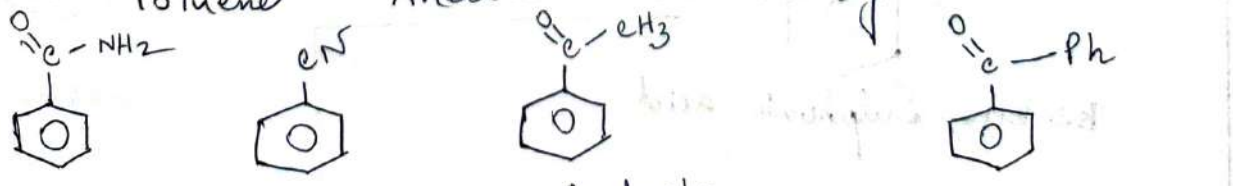
∴ Benzene is Aromatic. (Huckel's Aromaticity Rule).



Benzene Phenol Aniline Nitrobenzene



Benzene diazonium chloride Toluene Anesole Benzaldehyde Benzoic acid.



Benzamide Benzonitrile / Cyanobenzene. Acetophenone Benzophenone

Preparation Of Benzene :

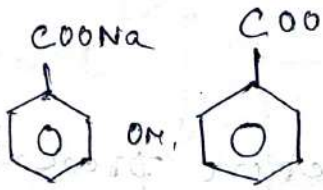
Phenol (বেনজিন তৈরির কাঁচামাল)

$$H_3C-CH_2-CH_2-CH_2-CH_2-CH_3 \xrightarrow[500^\circ C]{Al_2O_3}$$

n-hexane

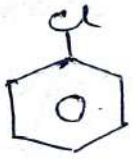
$$3\,HC\equiv CH \xrightarrow[600^\circ C]{Cu\ Tube}$$

benzene

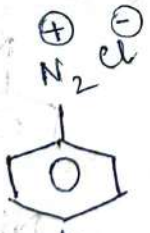


Sodium benzoate + Benzoic acid

$$\xrightarrow[\Delta]{Sodalime\ (NaOH+CaO)}$$



$$\xrightarrow[ii)\ H_2O]{i)\ Mg/ether}$$

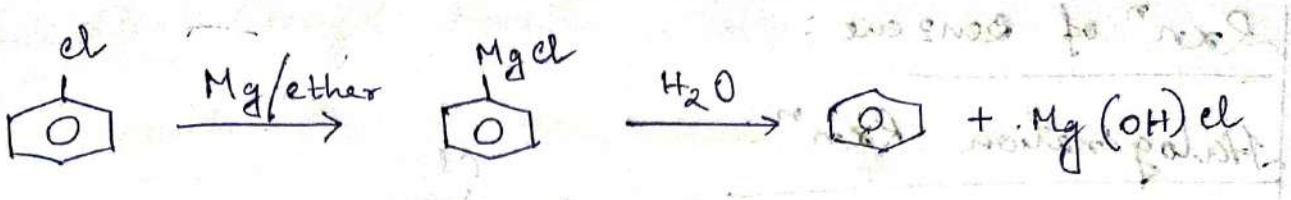


Benzene diazonium chloride

$$\xrightarrow[OH.\ EtOH,\ \Delta]{H_3PO_2,\ \Delta}$$

Benzene Sulphonic acid

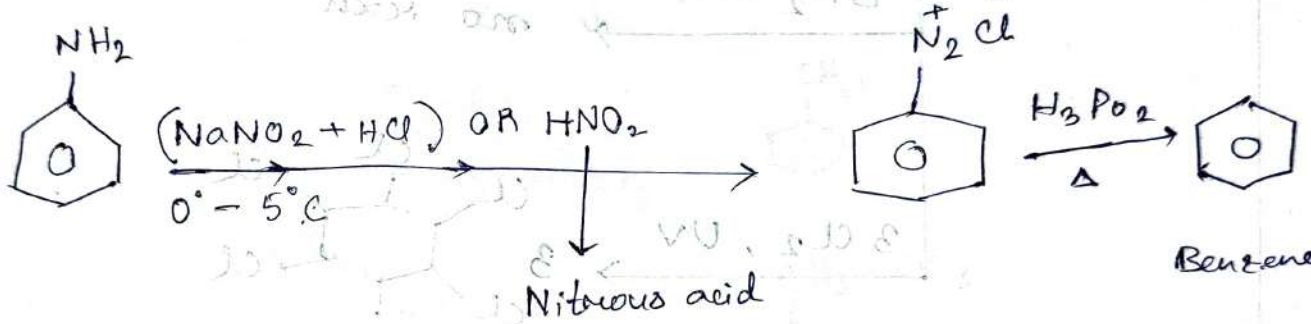
$$\xrightarrow{H_3O^+,\ 150^\circ-200^\circ C}$$



phenyl magnesium chloride.

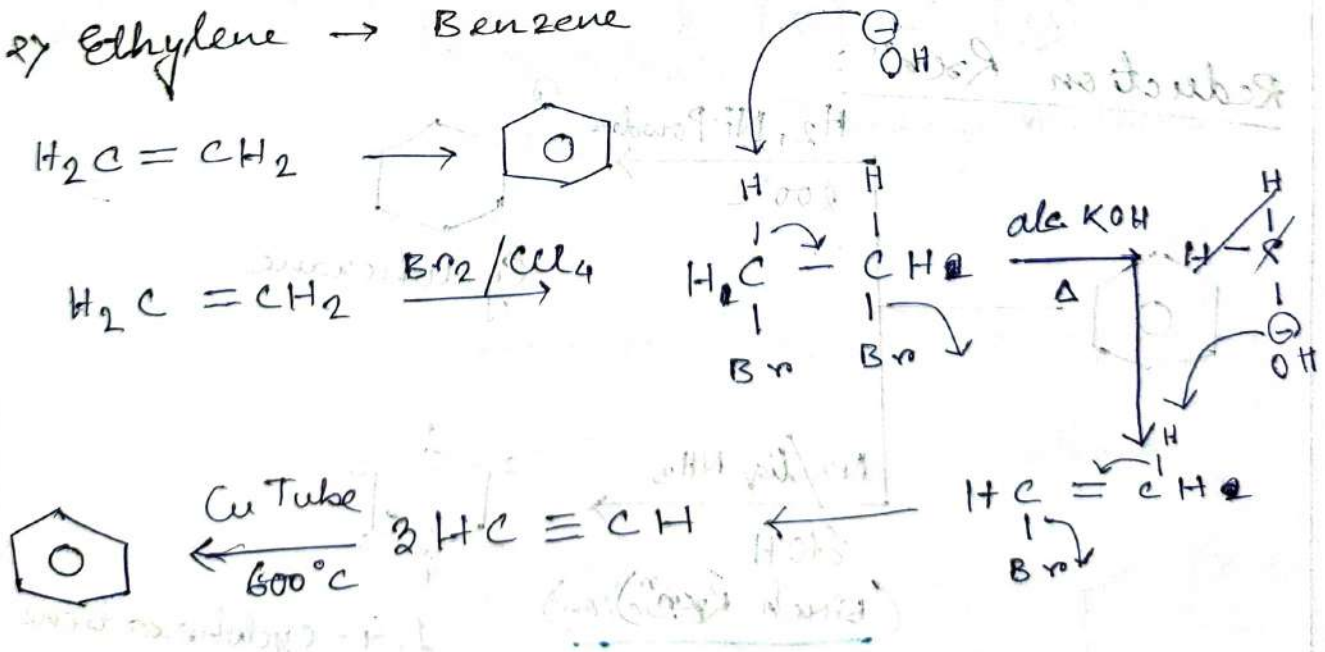
Transformation:

1) Aniline → benzene



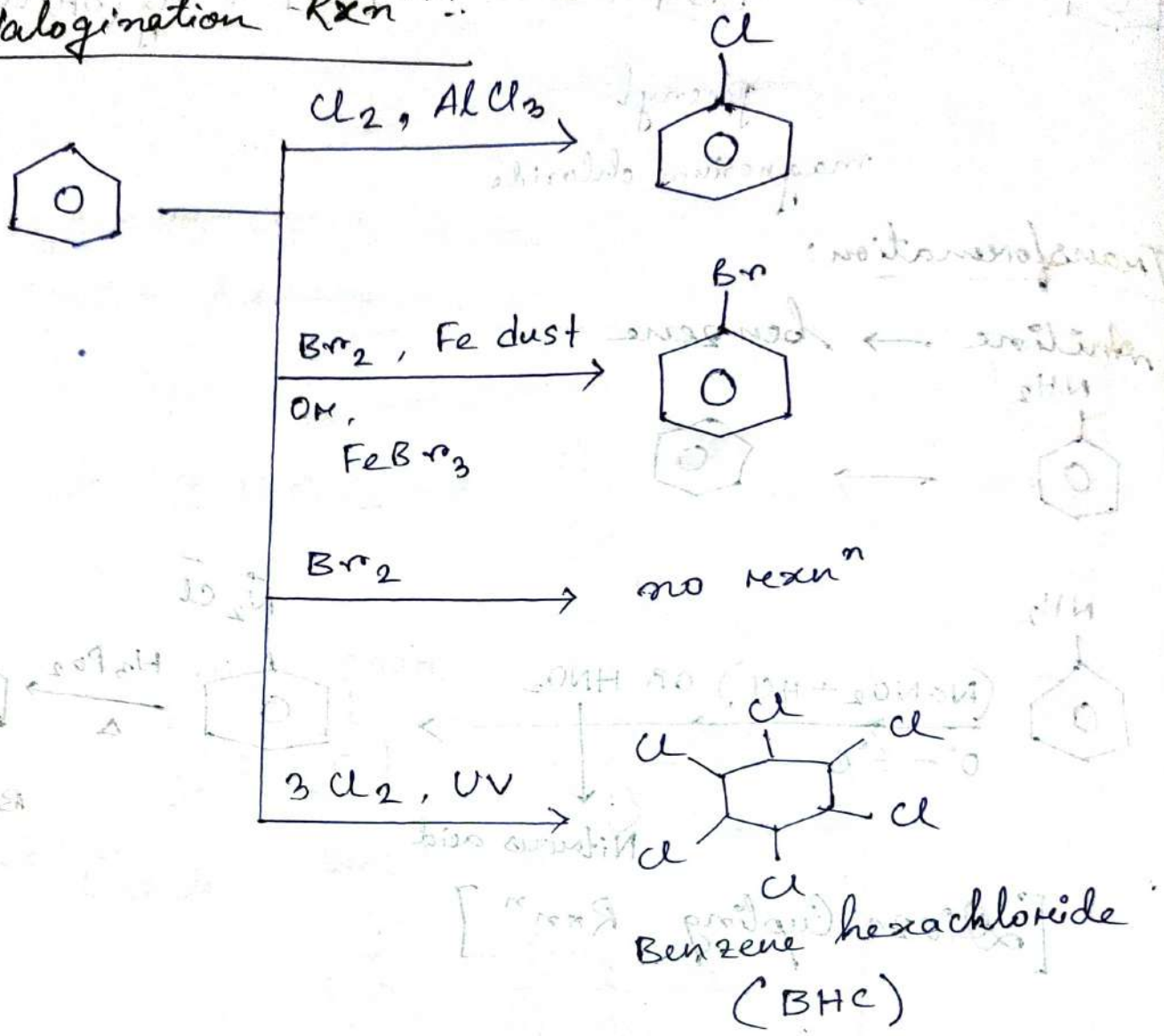
[Diazo Cupling Rxn]

2) Ethylene → Benzene



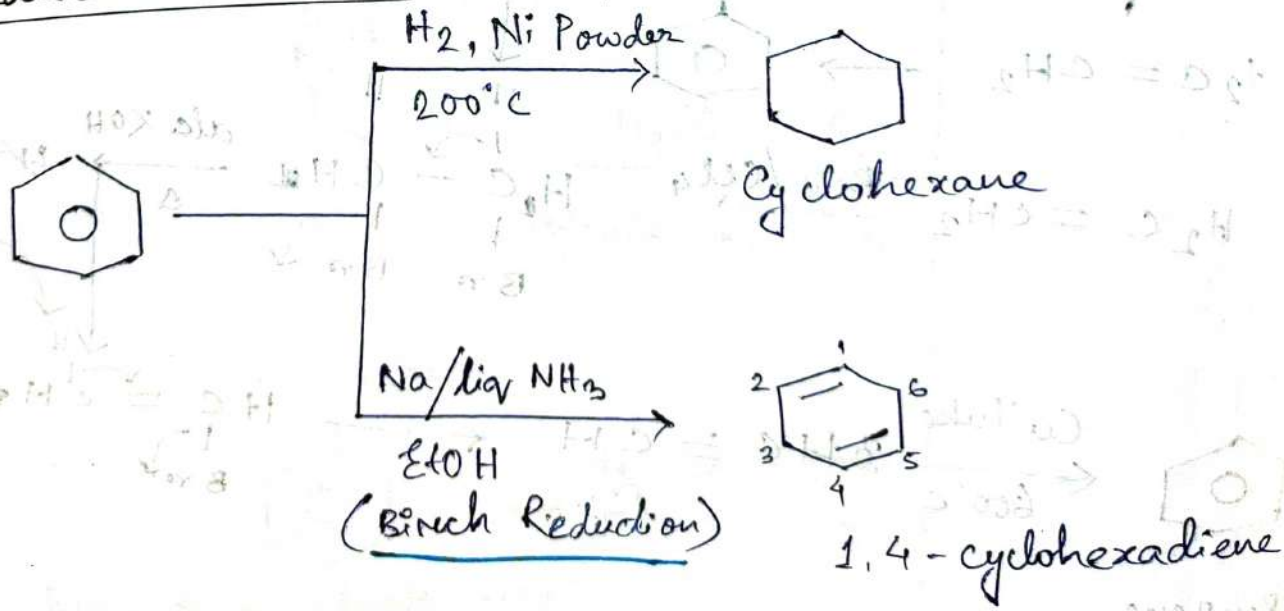
Rxn^n of Benzene :

Halogination Rxn^n :



Benzene hexachloride
(BHC)

Reduction Rxn^n :

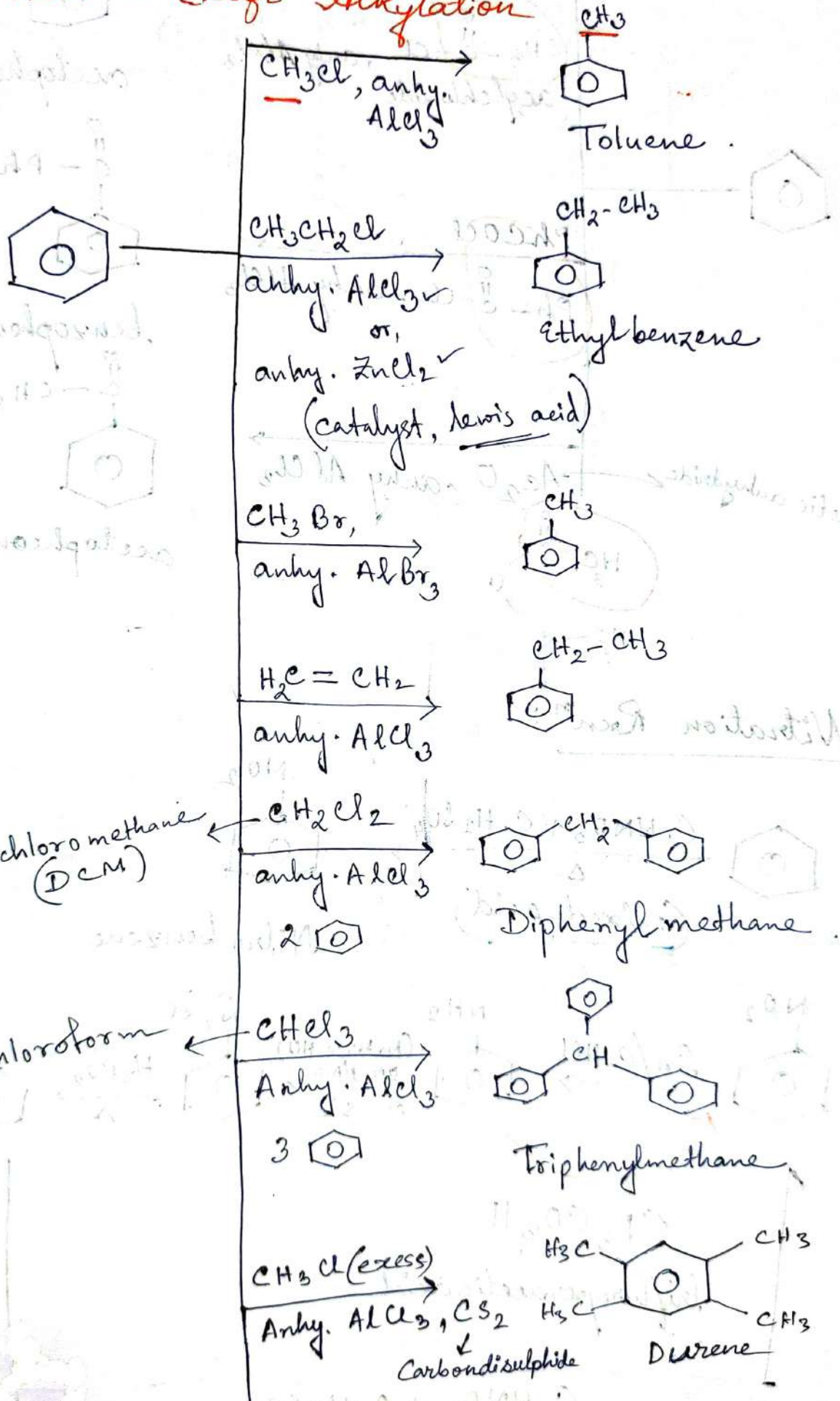


Cyclohexane

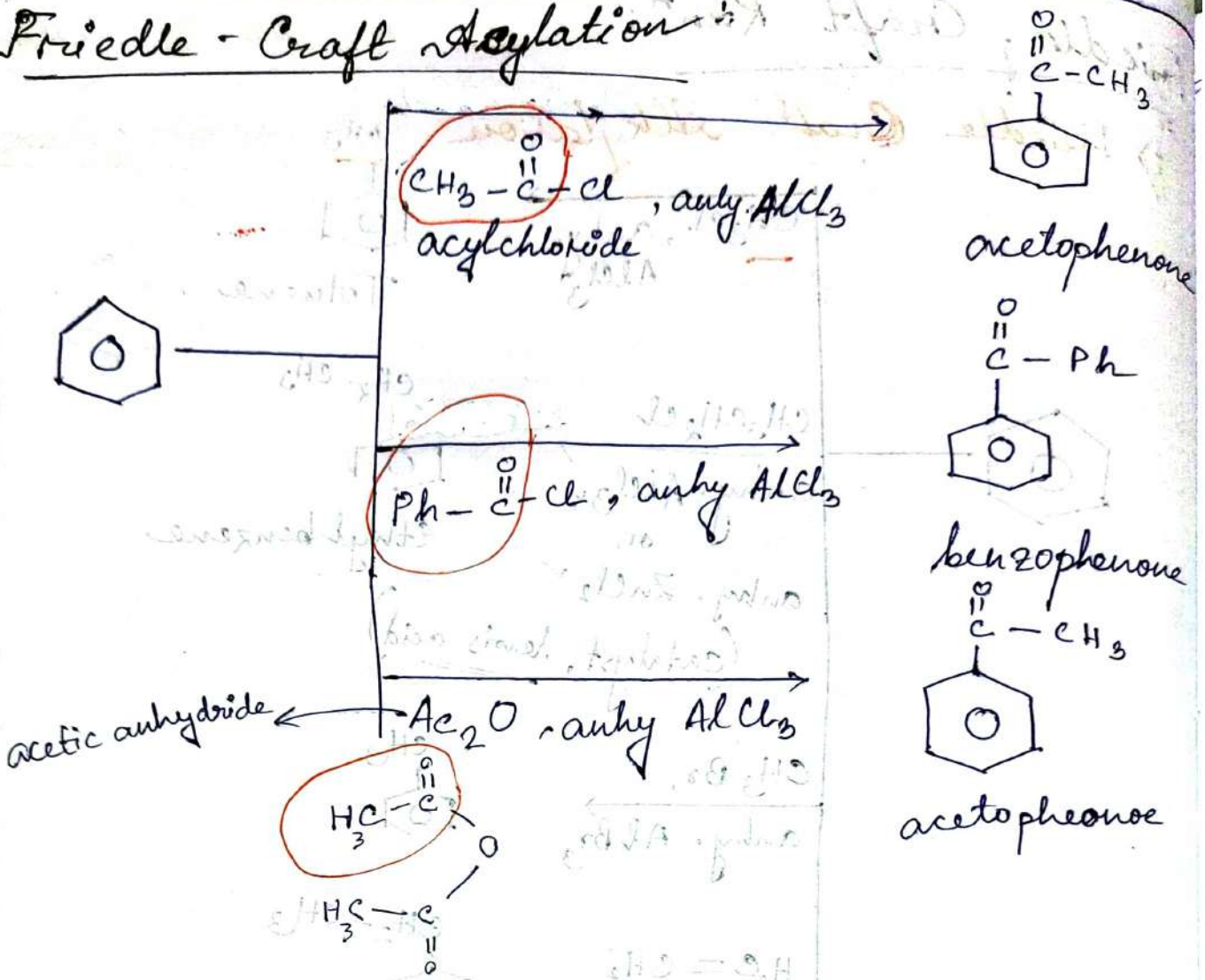
1,4-cyclohexadiene

Friedle - Craft Rxn

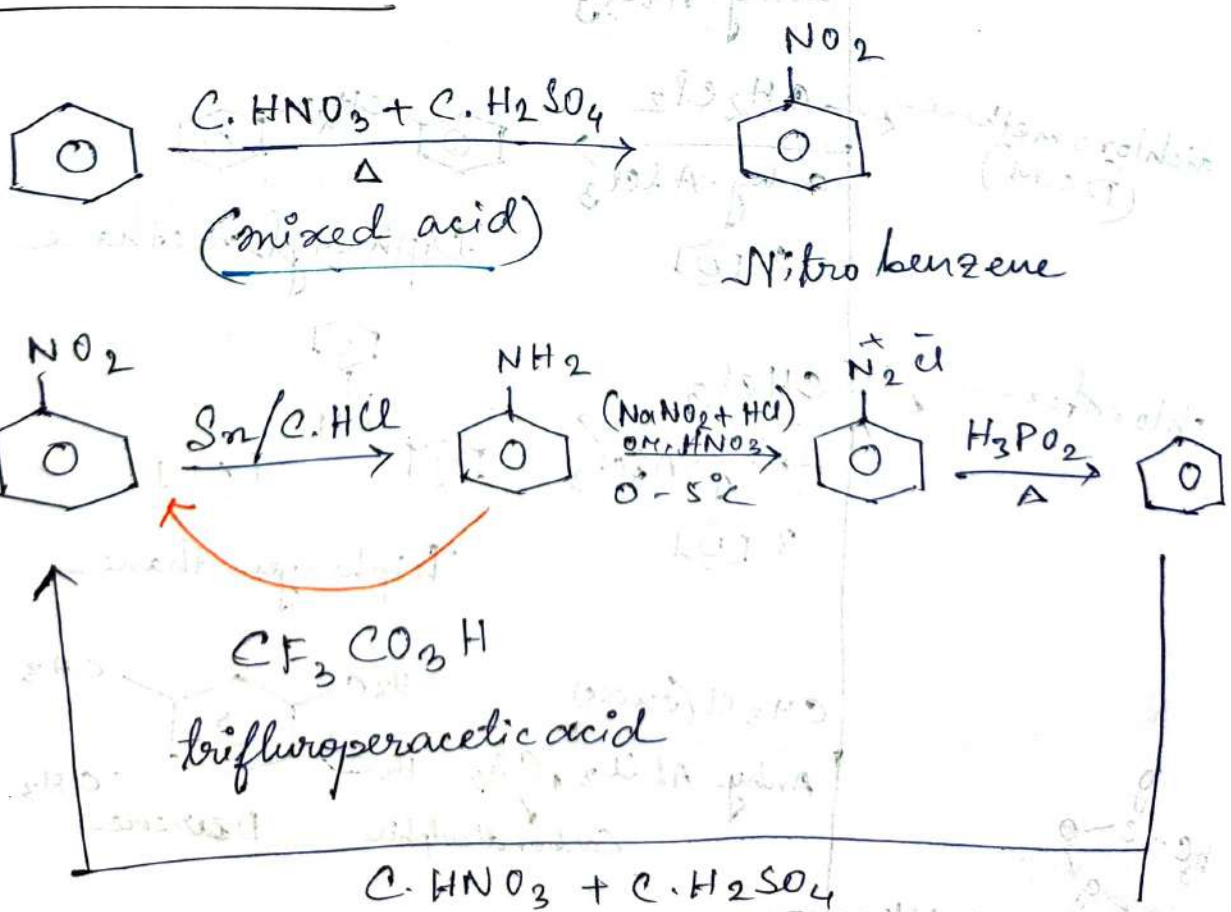
:) Friedle - Craft Alkylation



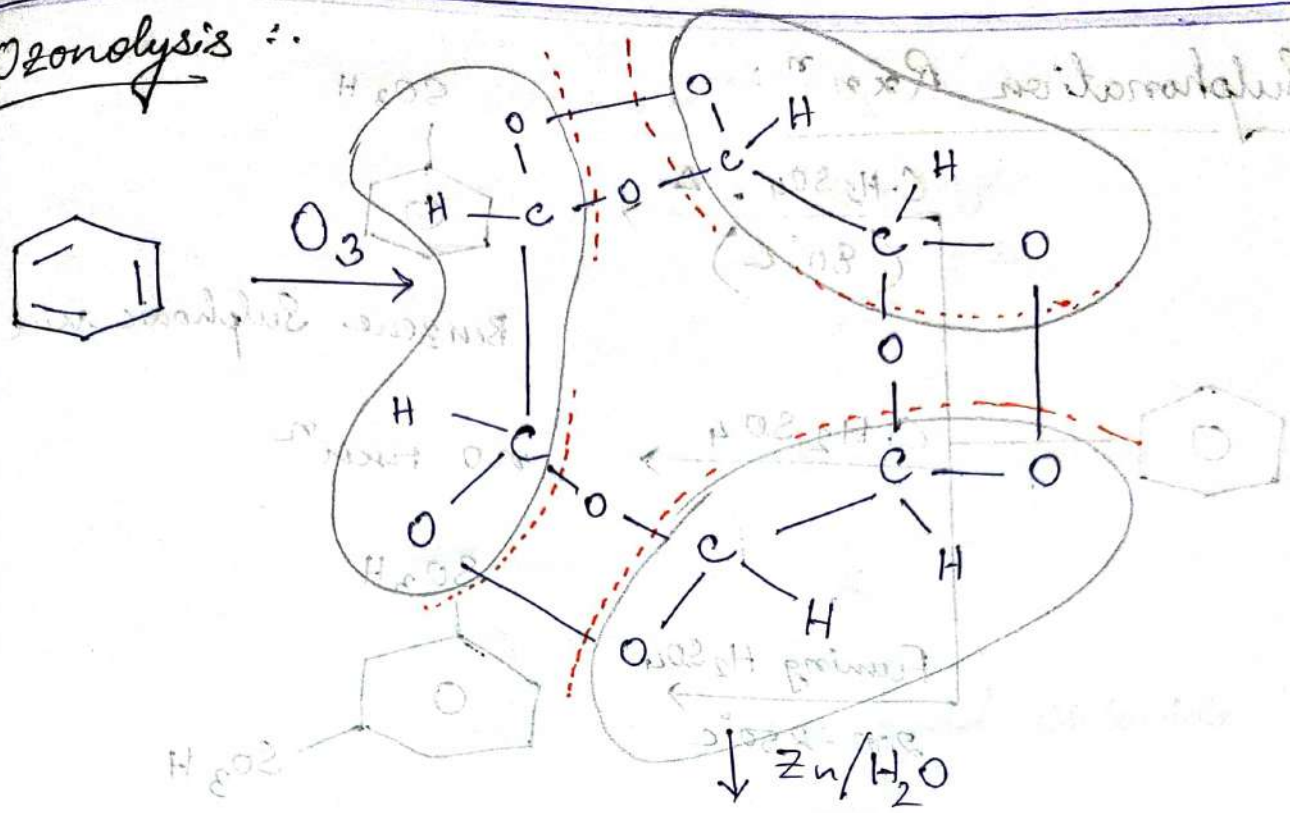
Friedle - Craft Acylation

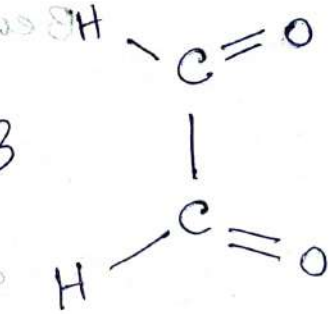


Nitration Rxn :

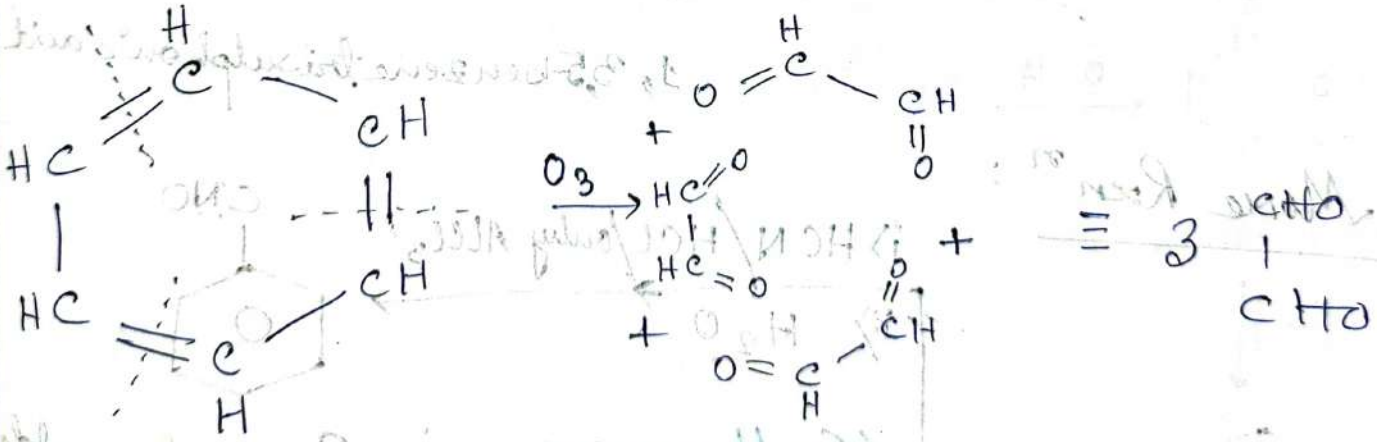


Ozonolysis :-

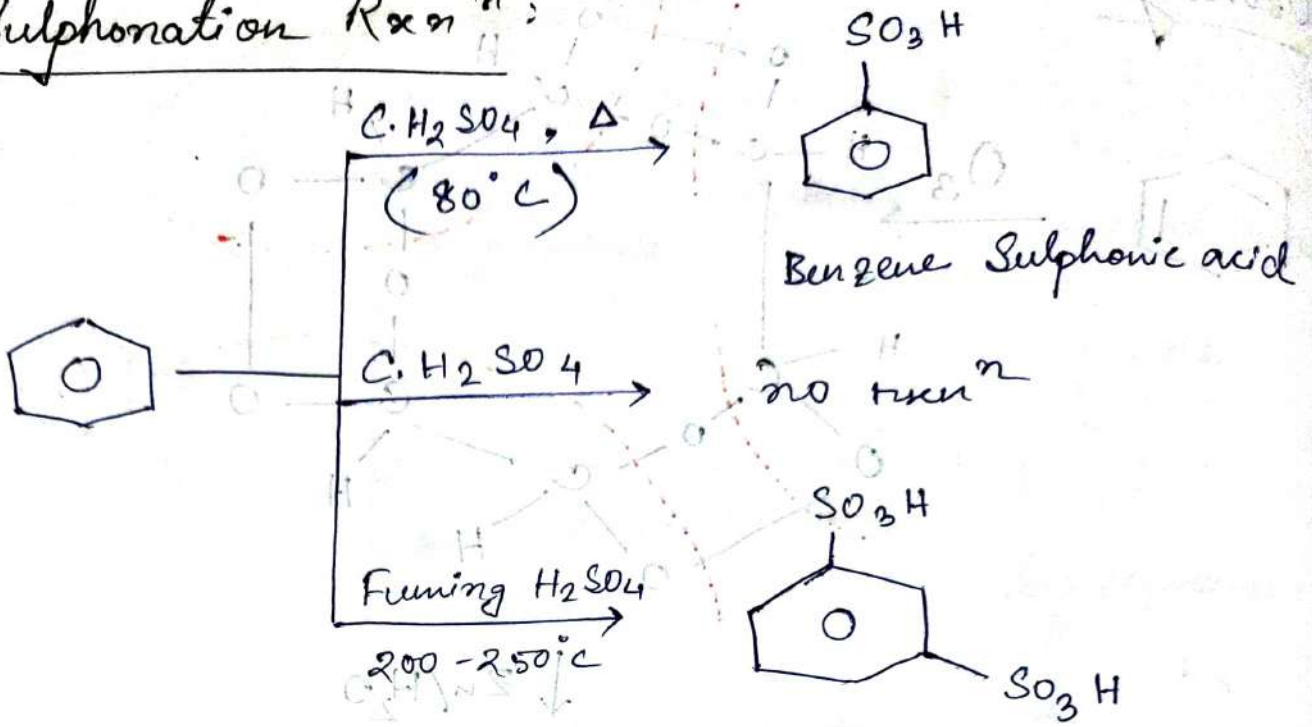




Glyoxal.

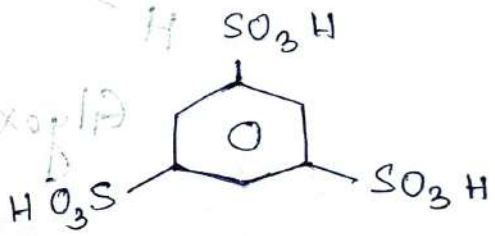


Sulphonation Rxn :



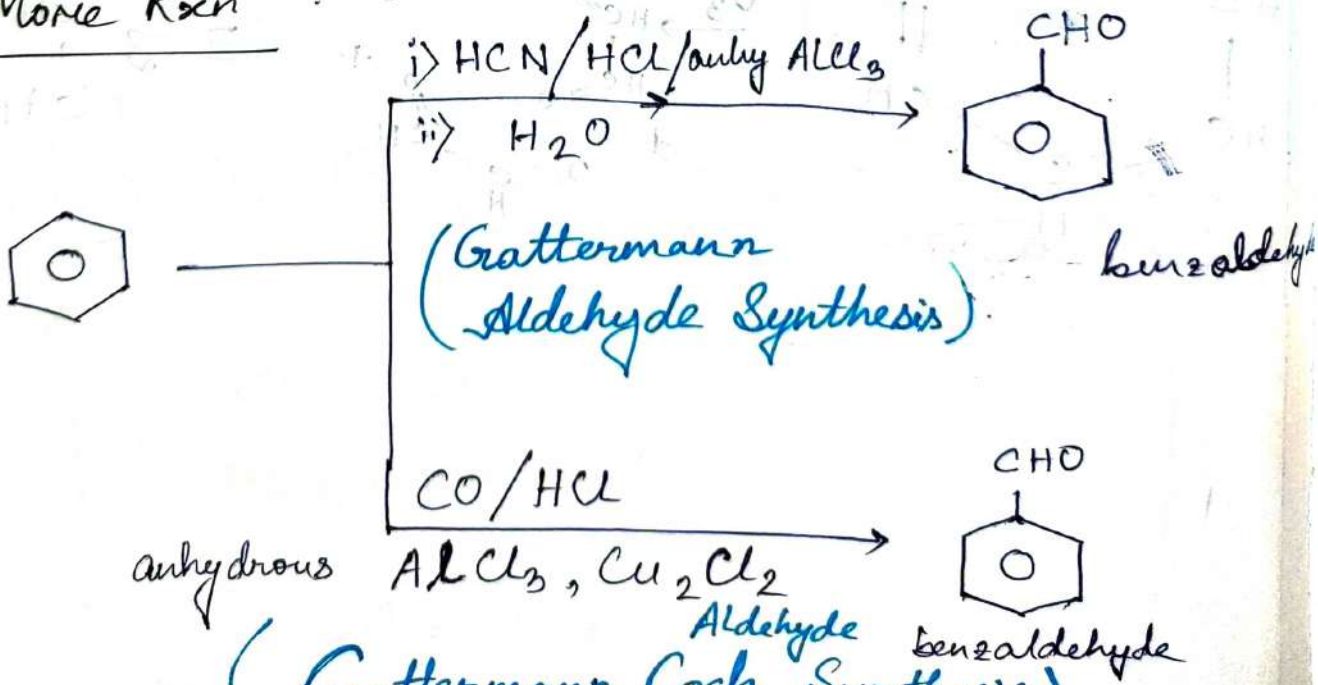
Benzene - m - disulphonic acid

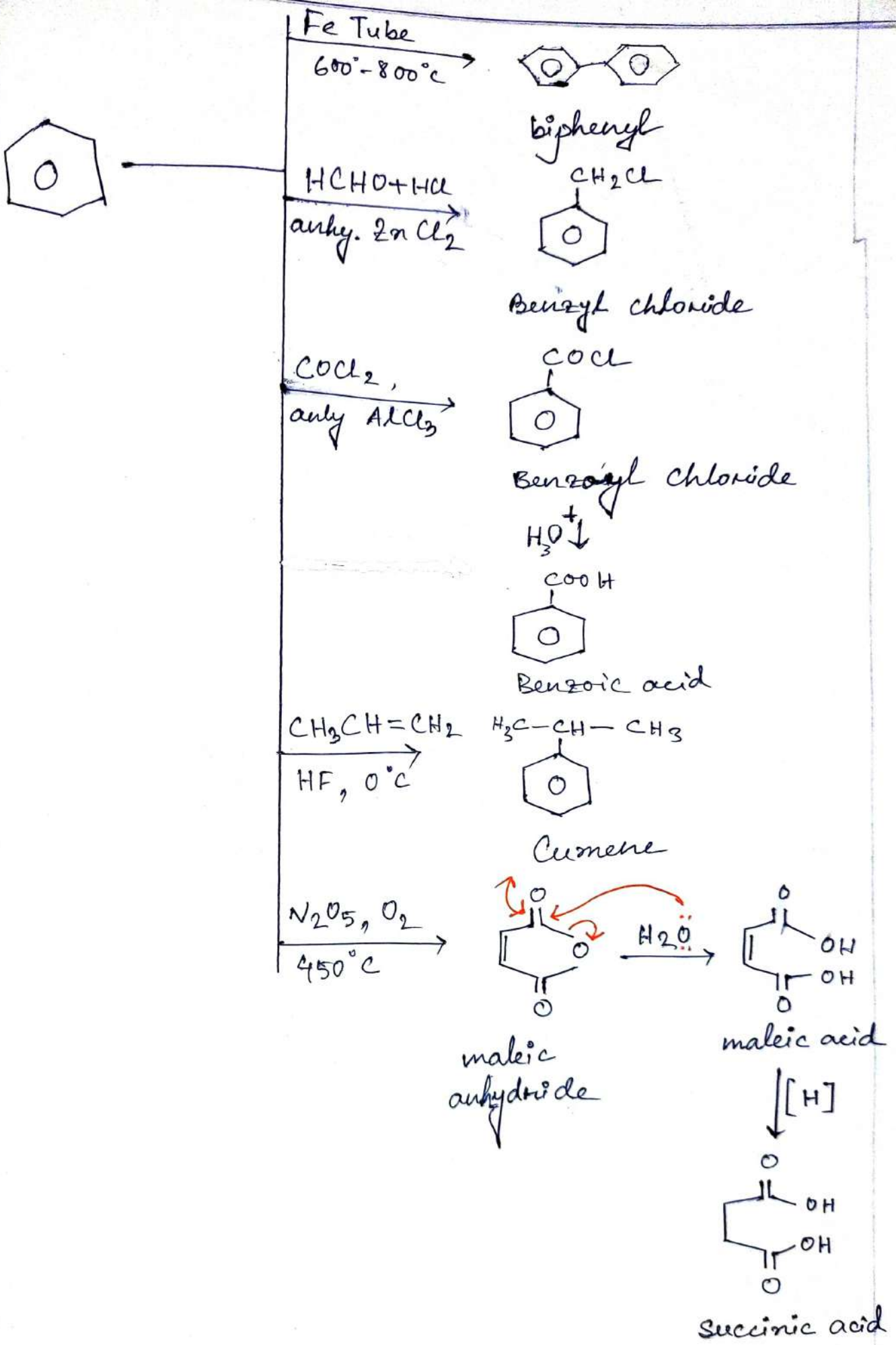
Fuming H_2SO_4
(280° - 300° C)



1, 3, 5-benzene trisulphonic acid

More Rxn :




Fe Tube
600°-800°C
biphenyl
HCHO+HCl
anhy. ZnCl2
CH2Cl
Benzyl chloride
COCl2,
anhy AlCl3
COCl
Benzoyl Chloride
H3O+
COOH
Benzoic acid
CH3CH=CH2
HF, 0°C
H3C-CH-CH3
Cumene
N2O5, O2
450°C
H2O
maleic anhydride
OH
OH
maleic acid
[H]
succinic acid