

# CHEMISTRY STUDY MATERIALS FOR CLASS 12

## (NCERT Based Notes of Chapter - 11)

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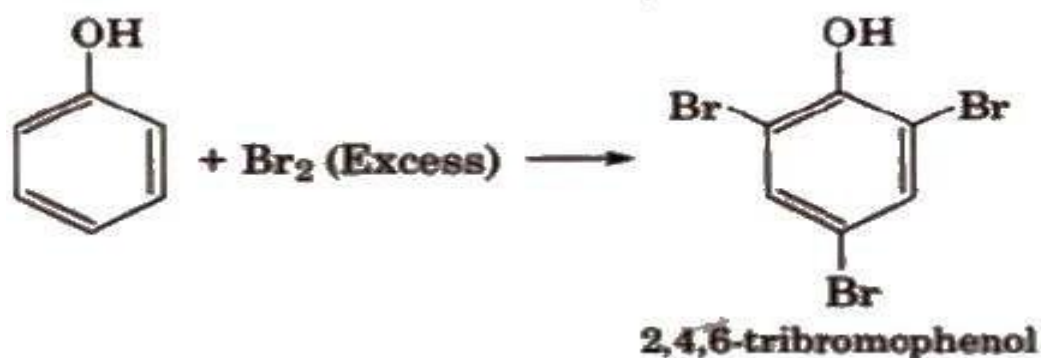
DATE:- 05/10/2020

### Alcohols, Phenols and Ethers

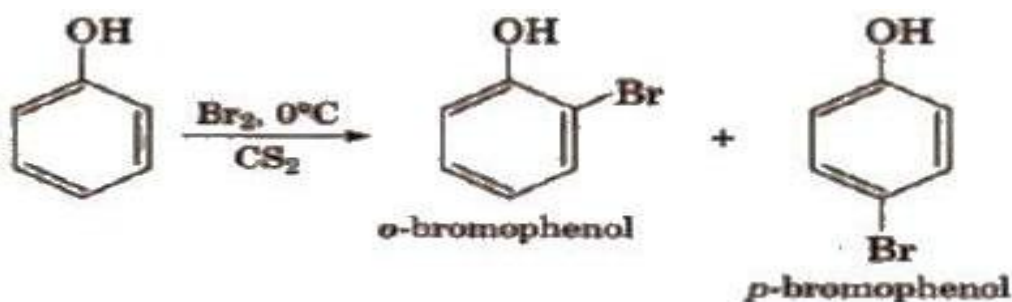
#### Reactions of Phenols

(i) **Electrophilic substitution reactions** The -OH group attached to the benzene ring activates it towards electrophilic substitution at ortho and para positions .

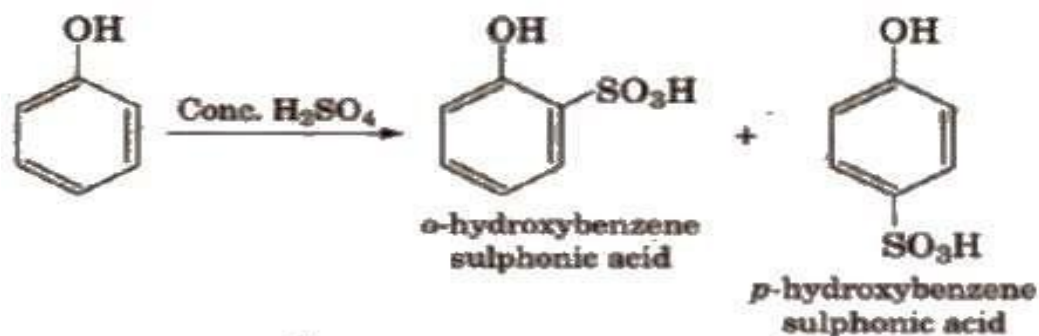
##### (a) Halogenation



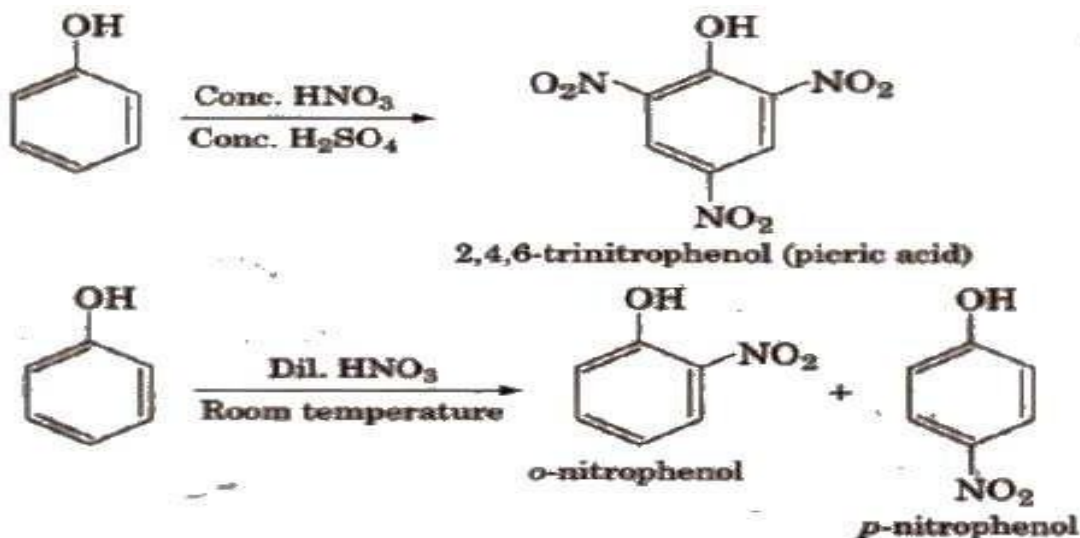
With calculated amount of Br<sub>2</sub> in CS<sub>2</sub> or CHCl<sub>3</sub> it gives ortho and para product.



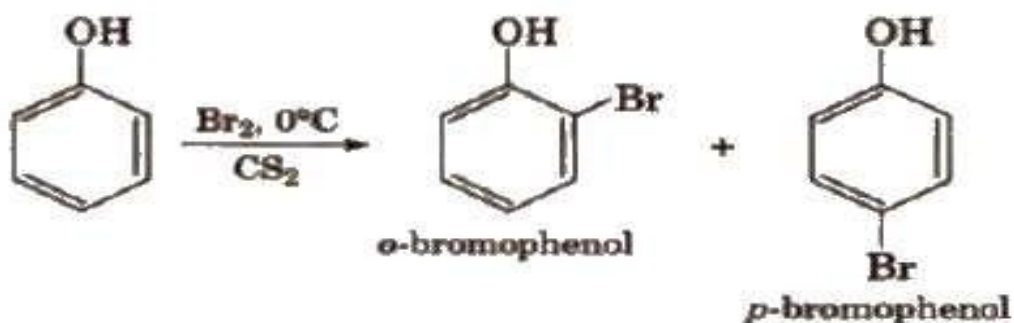
##### (b) Sulphonation



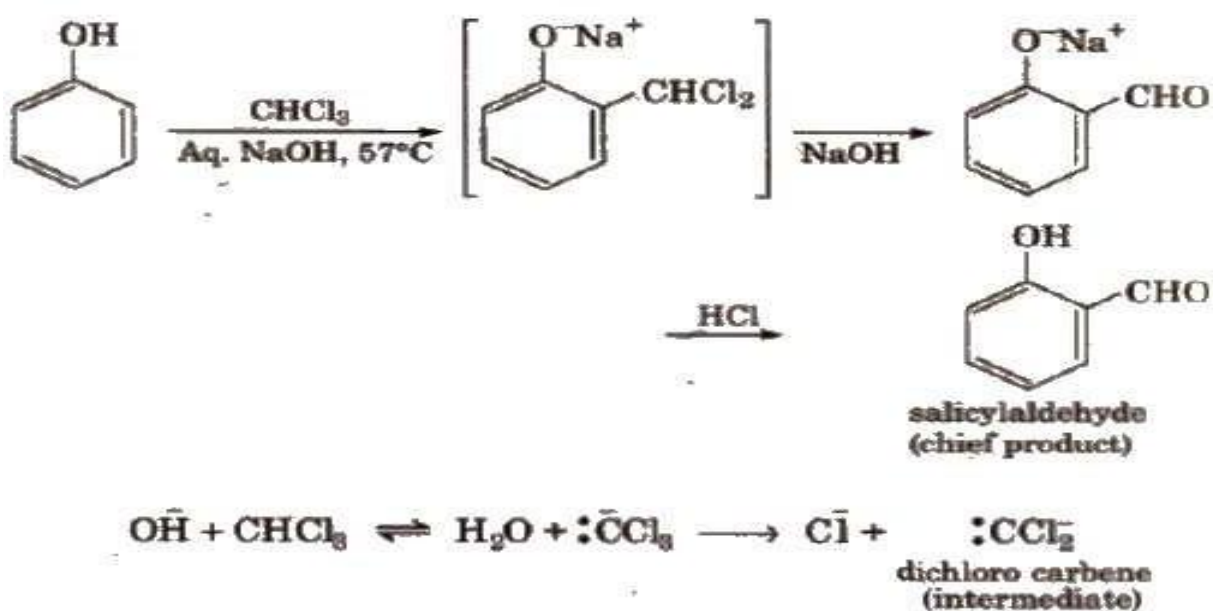
### (c) Nitration



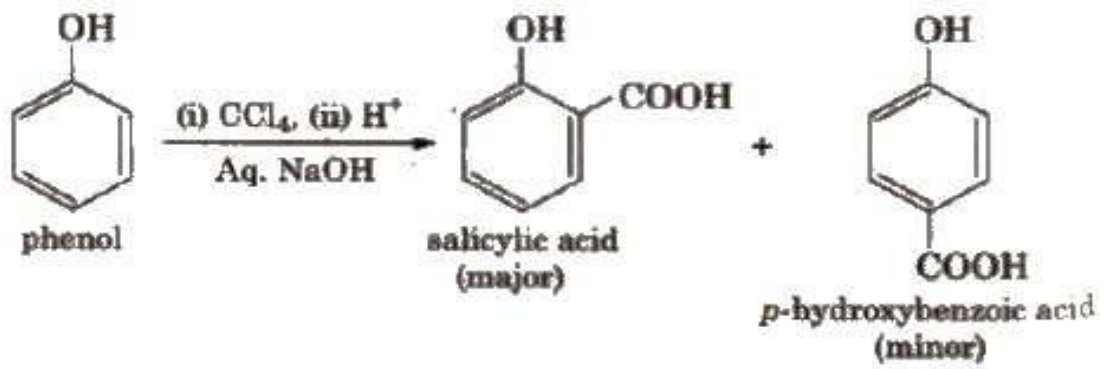
The ortho and para isomers can be separated by steam distillation. This is because *o*-nitrophenol is steam volatile due to intramolecular hydrogen bonding while *p*-nitrophenol is less volatile due to intermolecular hydrogen bonding which causes the association of molecules.



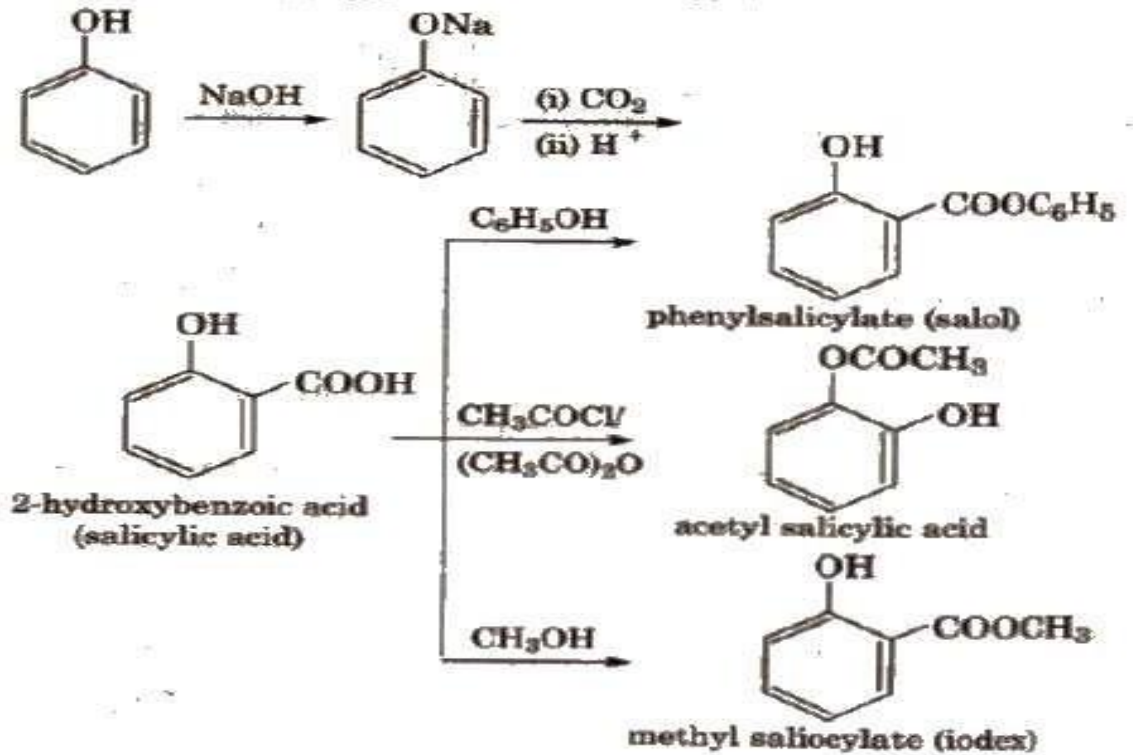
### (d) Reimer-Tiemann reaction



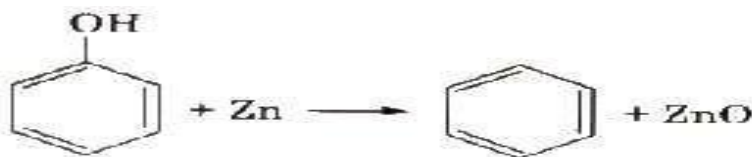
This reaction is an electrophilic substitution reaction and electrophile is dichlorocarbene. Similarly with carbon tetrachloride and alkali, *o*- and *p*-hydroxybenzoic acid are obtained



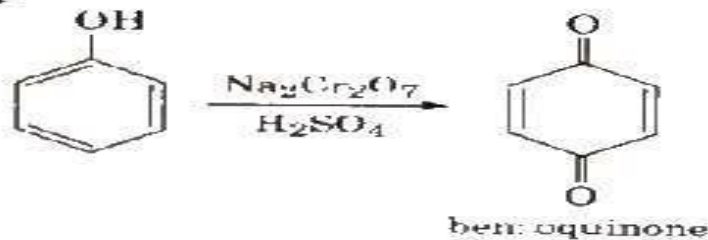
(ii) Kolbe's reaction



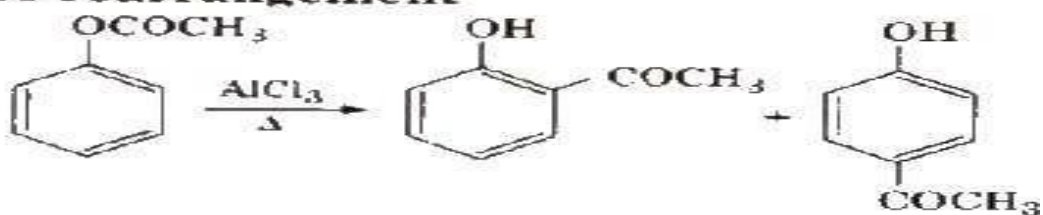
(iii) Reaction with zinc dust



(iv) Oxidation



(v) Fries rearrangement



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