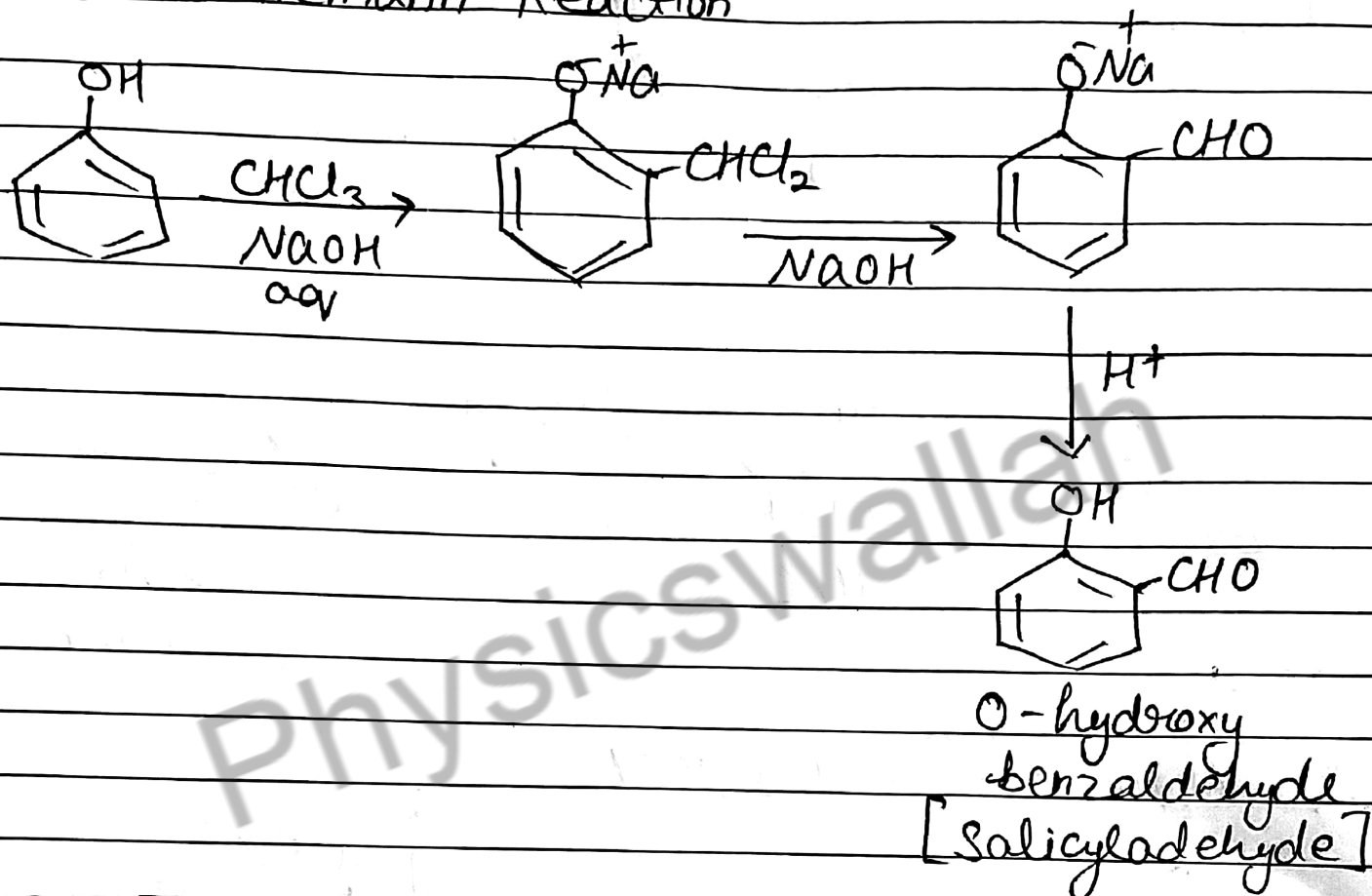


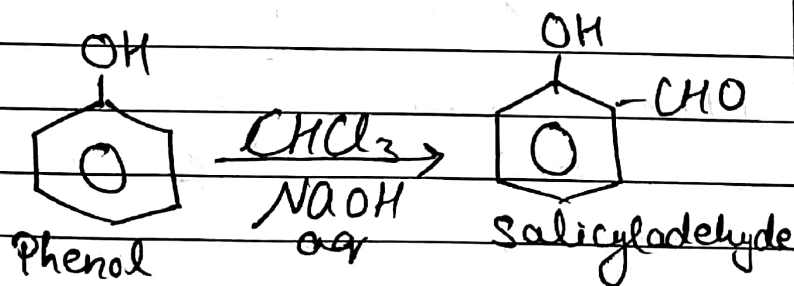
Alcohols, Phenols & Ethers - 12

Properties of Phenols - 3

① Reimer Tiemann Reaction

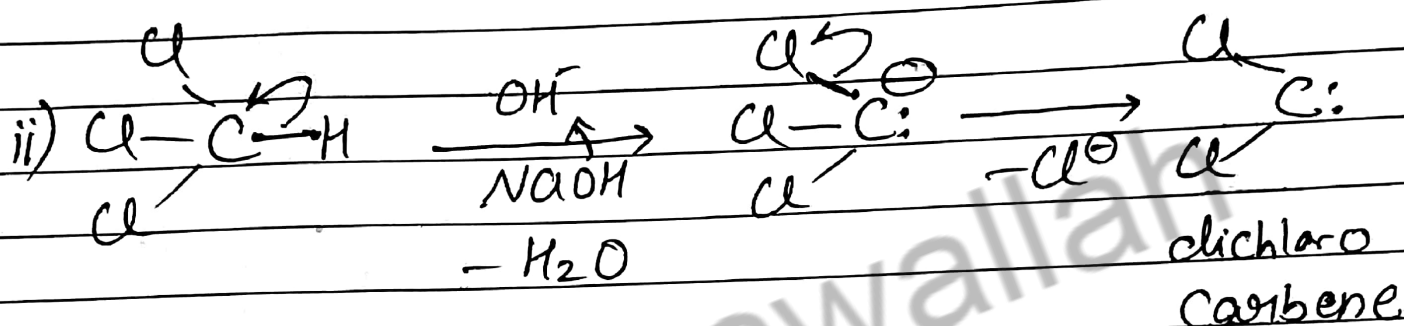
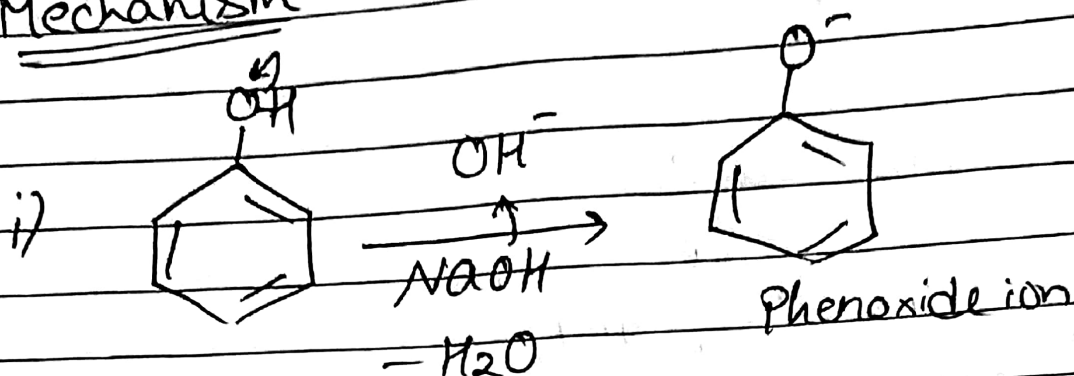


In a nutshell

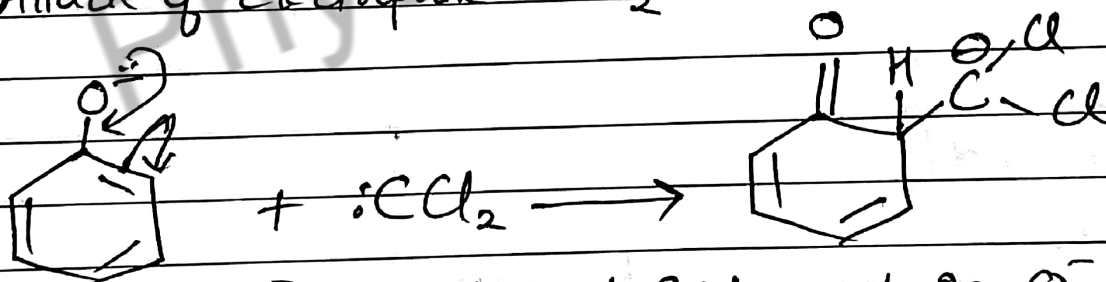


When phenol is treated with chloroform in presence of alkali (NaOH), Salicylaldehyde is formed. This Reaction is called Reimer Tiemann Reaction.

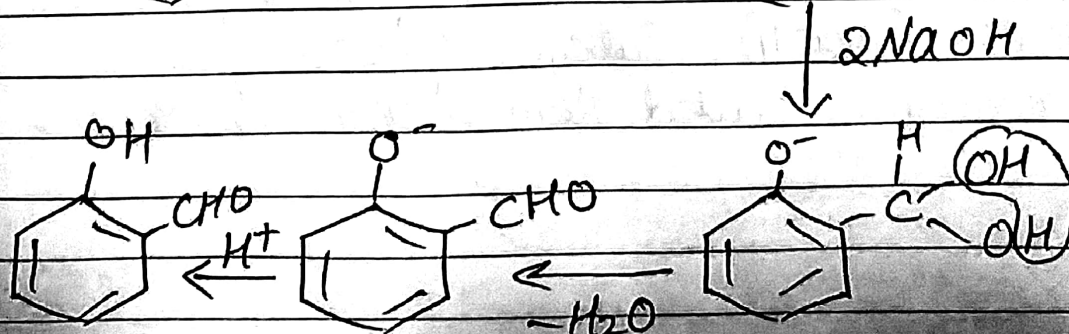
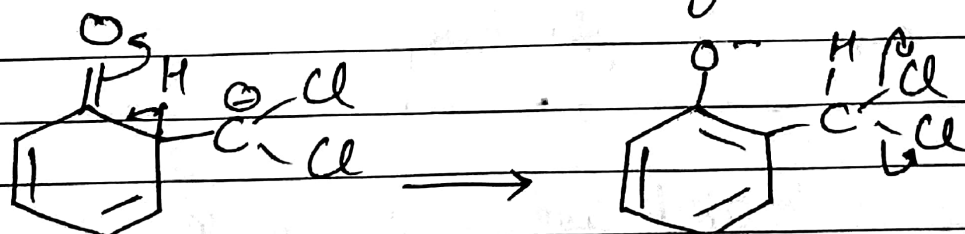
Mechanism



iii) Attack of Electrophile $:\text{CCl}_2$



[$:\text{CCl}_2$ attack at Carbon not on O^- as C^\ominus is stronger Nucleophile than O^-]



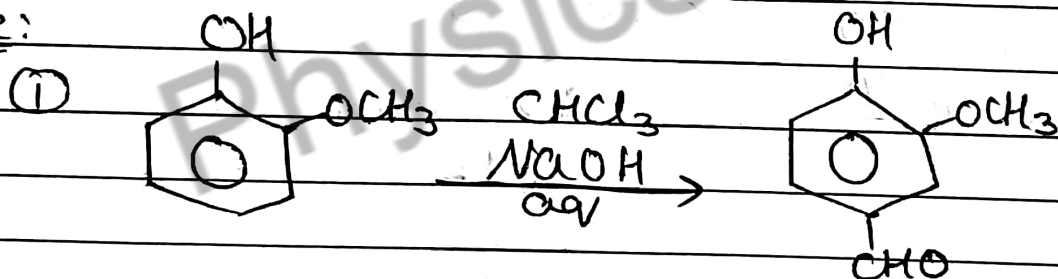
E^+ substitution of $:CCl_2$ can occur both at ortho & para but it occurs at ortho in this case, because :-

i) at ortho, there is H-bonding

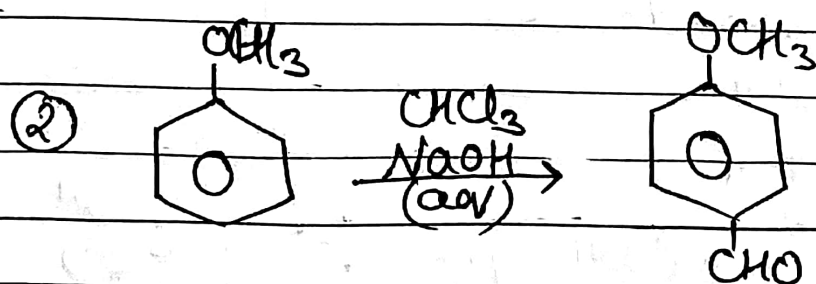


ii) O^+ has strong +I effect, & +I effect is more at ortho than para (+I effect decreases with distance). +I effect increases e^- density at ortho attracting Electrophile (E^+) $:CCl_2$

Note:

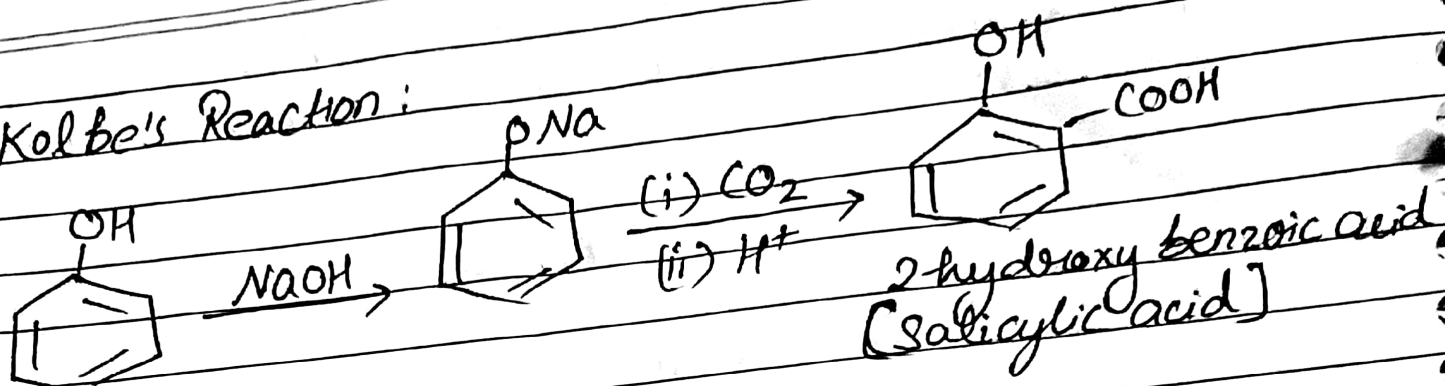


if one ortho position is occupied, $:CCl_2$ do not attack at other ortho position due to steric hindrance

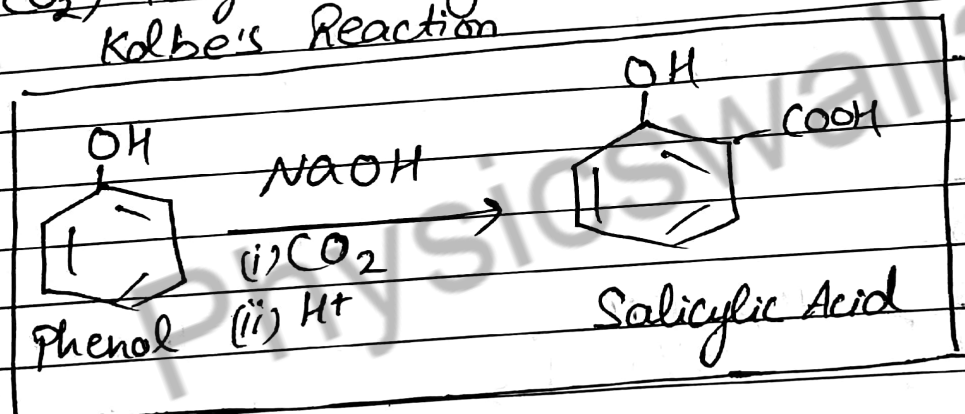


$-OCH_3$ has $-I$ effect so $:CCl_2$ attacks at para position where $-I$ effect is less

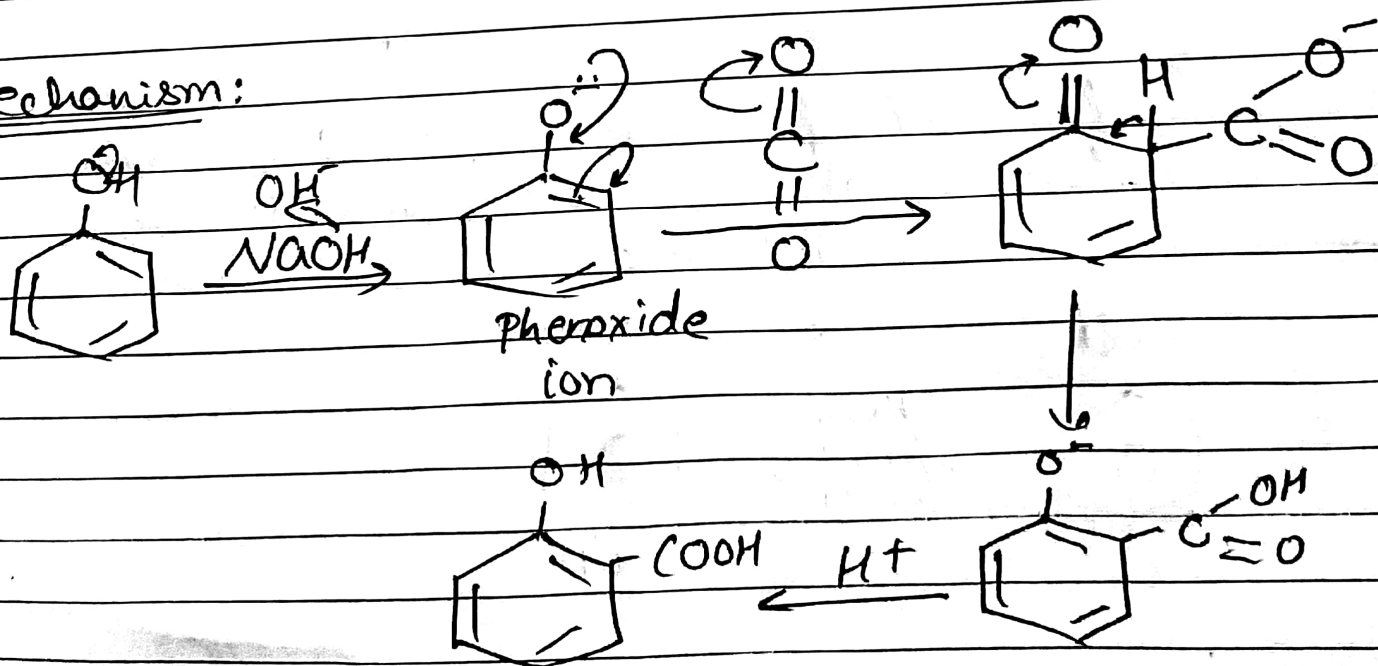
② Kolbe's Reaction:



When phenol is treated with CO_2 in presence of alkali (NaOH), it undergoes E^+ substitution (weak electrophile CO_2) to give Salicylic Acid. This is called Kolbe's Reaction.



Mechanism:



② Reaction with Zn dust

(imp. for Conversions)

