class — B.Sc. Part II (Honours)
Subject — chemistry
Paper — III C
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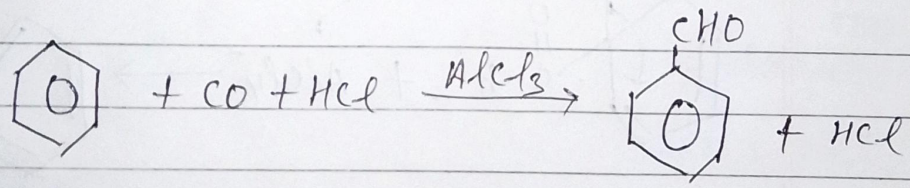
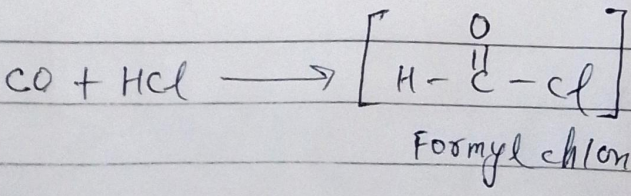
Gatterman-Koch reaction :—

This reaction involves the treatment of Benzene (aromatic compⁿ) with carbon monoxide and hydrogen chloride in the presence of $AlCl_3$. This reaction is generally limited to benzene and alkylbenzene. It does not take place with Phenols, phenolic ethers and rings which contain meta-directing substituents. The formylation takes place mostly at the para-position.



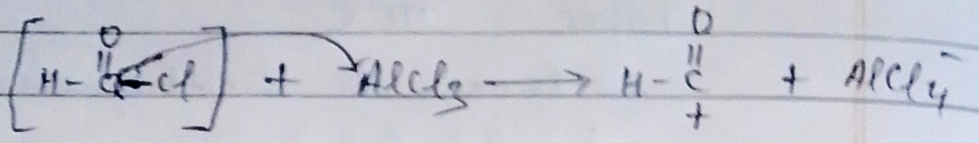
Mechanism :— The mechanism consist in following steps :—

Step I :— CO and HCl react to form unstable formyl chloride.

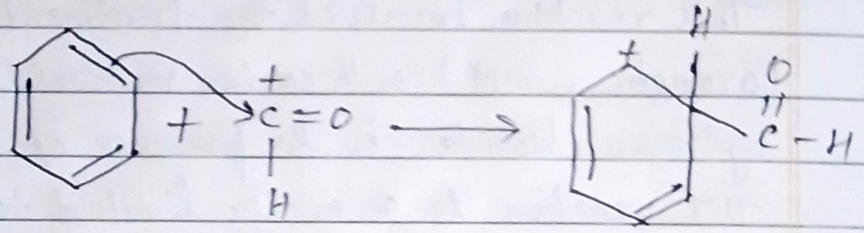


Formyl chloride

Step II :- Formation of the electrophile $H-\overset{+}{C}=O$ (Formyl cation).

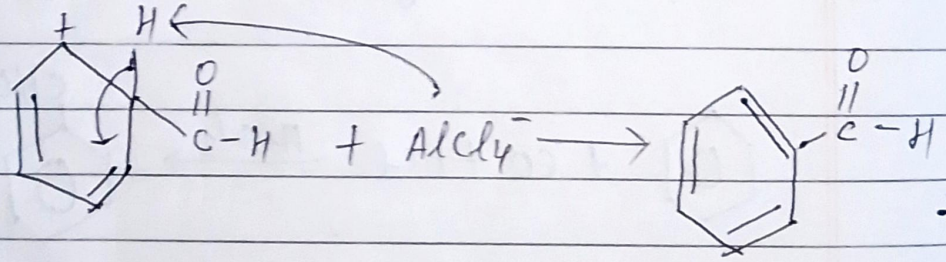


Step III :- The electrophile attacks the benzene-ring to give a carbonium ion.



carbonium ion

Step IV :- Removal of Proton to gives Benzaldehyde.



Benzaldehyde

$HCl + AlCl_3$