Class - B.Sc Part II (Honours)
Subject - chemistry
Topic - Name and Reaction
Paper - III C
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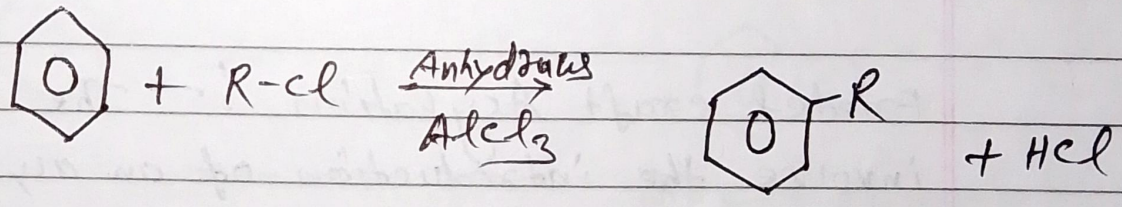
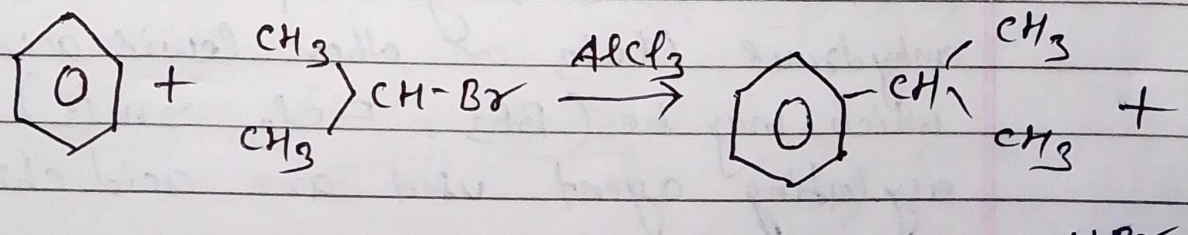
(1) Friedel craft reaction :- The reaction involve the introduction of an alkyl gr. in Benzene for the synthesis of alkyl benzene.

The alkylating agent used in Friedel craft alkylation is alkyl halide the catalyse employed is Lewis acid which may be $AlCl_3$, BF_3, $FeCl_3$





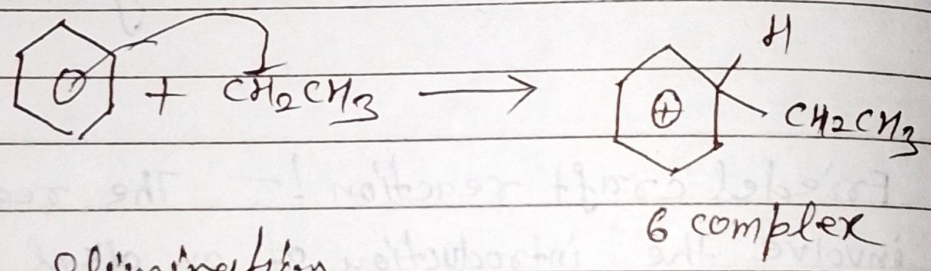
Mechanism :-

a. Generation of electrophile :-

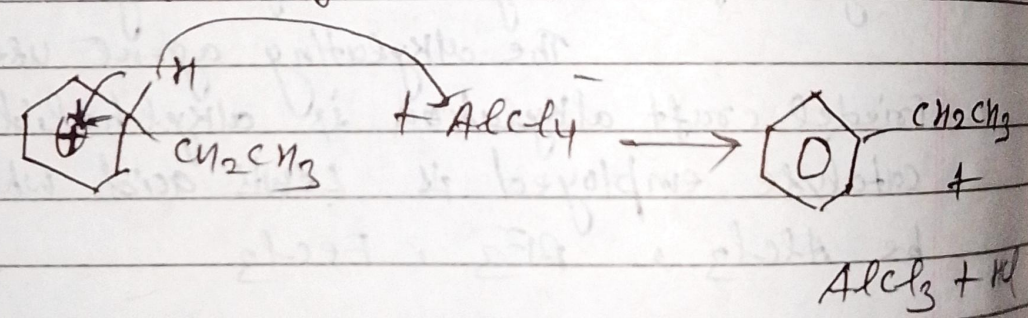
$$CH_3CH_2-Cl + AlCl_3 \longrightarrow CH_3\overset{+}{C}H_2\,[AlCl_4]^-$$

$$\longrightarrow CH_3\overset{+}{C}H_2 + AlCl_4^-$$

b. Formation of σ complex :-

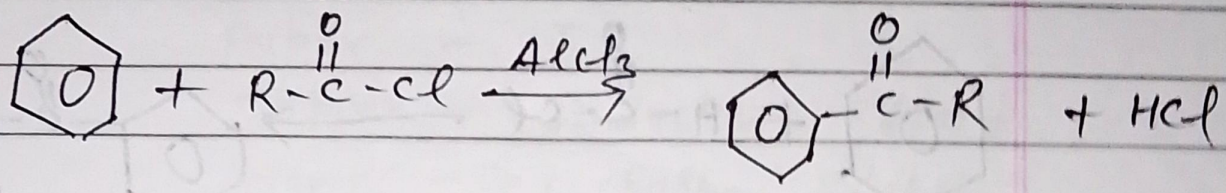


c. ~~elimination~~ elimination of proton :-

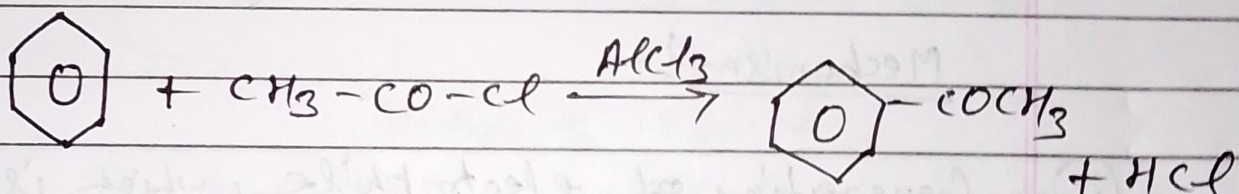


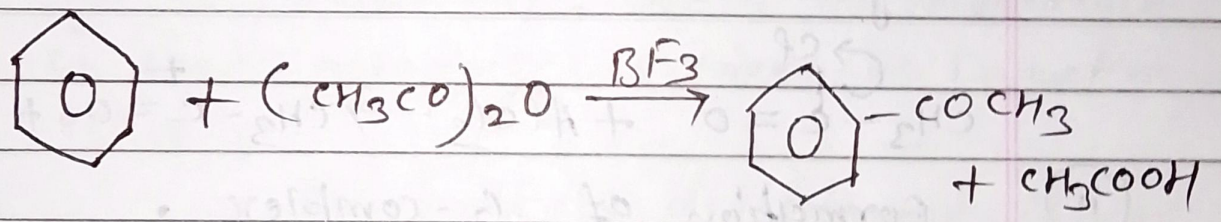
Friedel craft Acylation :- The reaction involve the introduction of an acyl gr. (-RCO) in the aromatic ring in presence of anhydrous $AlCl_3$ or other lewis acid catalyst which may be (BF_3, $FeCl_3$, $ZnCl_2$) the acylating agent used are acid chloride,

acid anhydride and ester.

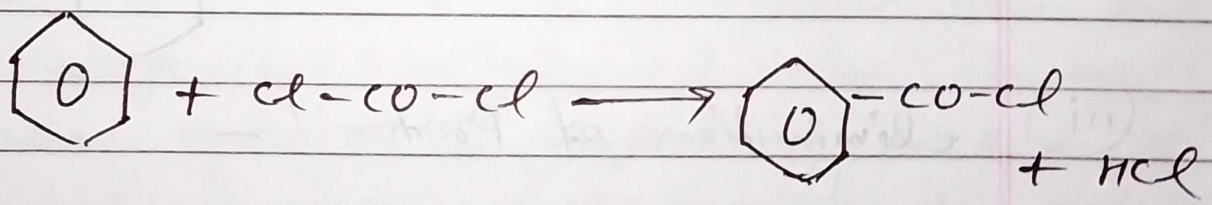


a. synthetic application of Friedel craft acylation

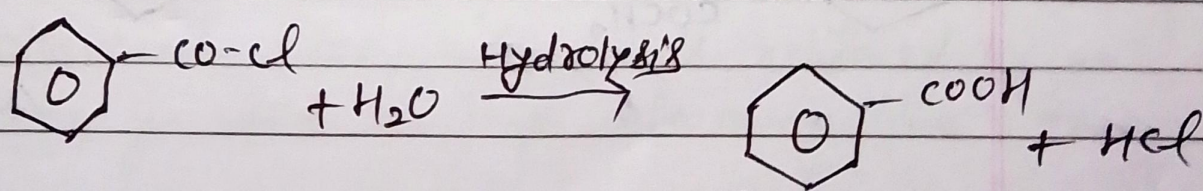




b. Synthesis of acid chloride and carboxylic-acid :-

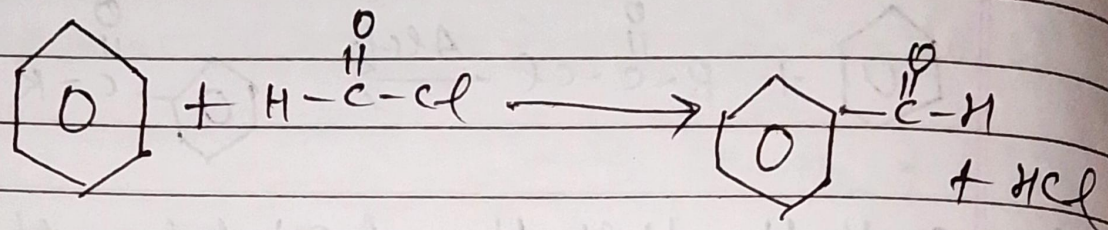


Benzoyl chloride
(acid chloride)



Benzoic acid

c. synthesis of aldehyde (Formylation) :-



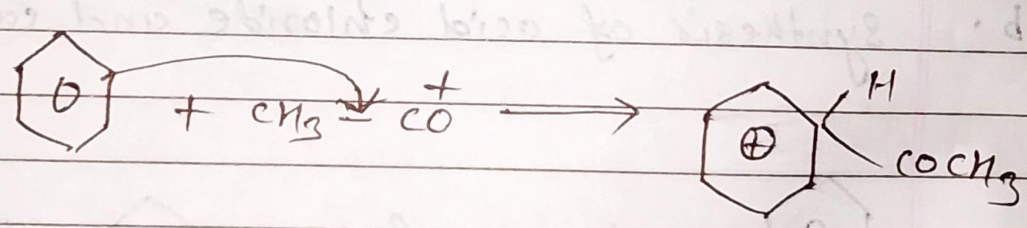
Benzaldehyde

Mechanism :-

(i) Generation of electrophile, which is an acylium ion :-

$$CH_3-\overset{\curvearrowright Cl}{C}=O + AlCl_3 \rightarrow CH_3-\overset{+}{C}=O + AlCl_4^-$$

(ii) Formation of σ-complex.



(iii) elimination of Proton :-