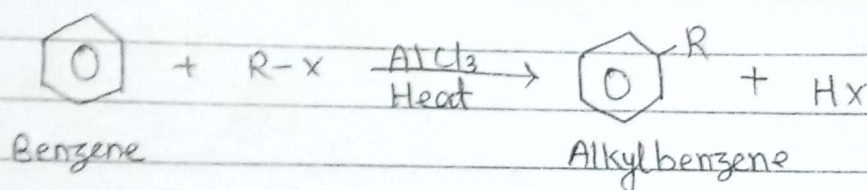


5) Friedel Craft Reaction :-

A) Friedel craft alkylation :-

The replacement of hydrogen atom by alkyl group by using alkylhalide as reagent in presence of Lewis acid is called Friedel craft alkylation.

$AlCl_3$ is most commonly used Lewis acid and known as Friedel craft catalyst.

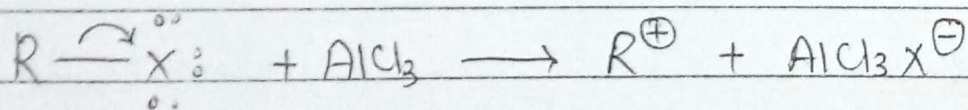


Mechanism of the reaction :-

Following steps are involved in the reaction

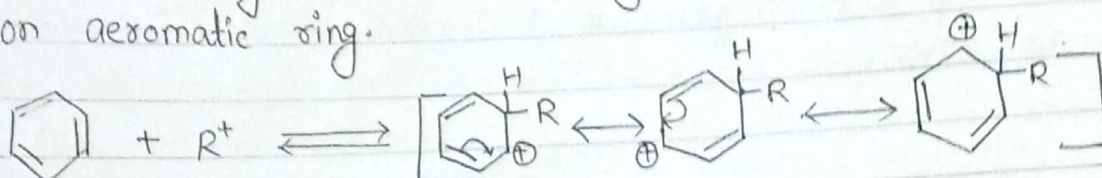
STEP -1 :-

Formation of carbocation as electrophile.



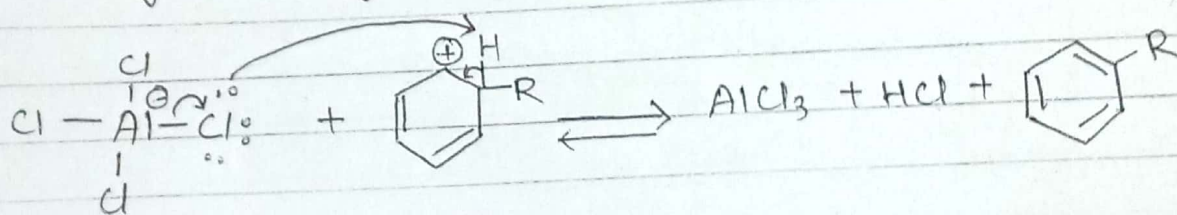
STEP 2 :-

Formation of arenium ion by attack of electrophile on aromatic ring.



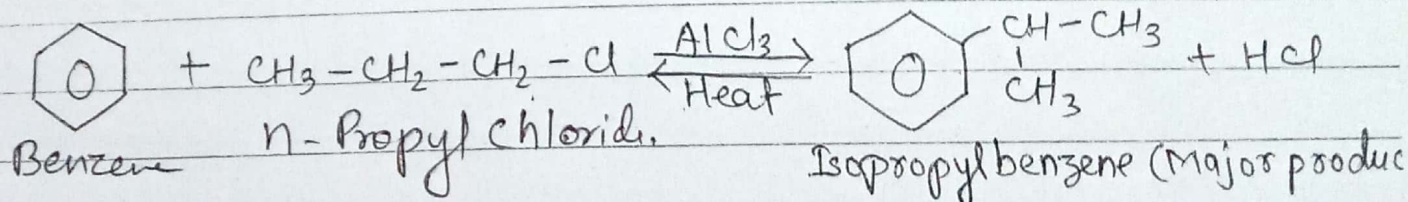
STEP 3 :-

Loss of proton from arenium ion.



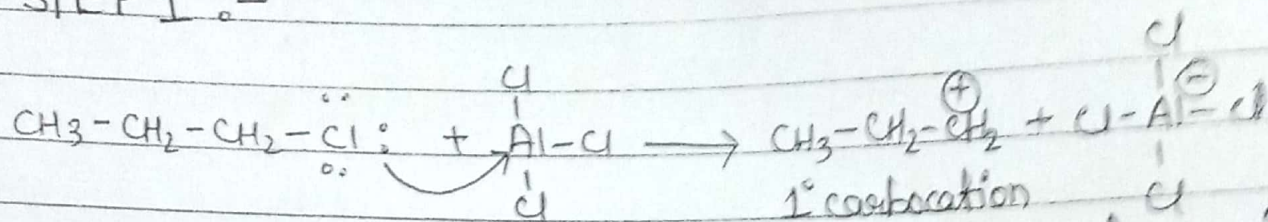
Limitation of Friedel Craft alkylation :-

Straight long alkyl carbon chain ^{can't} introduced on aromatic ring by Friedel craft reaction because carbocation is the electrophile which have tendency to undergoes to rearrangement to form more stable carbocation.

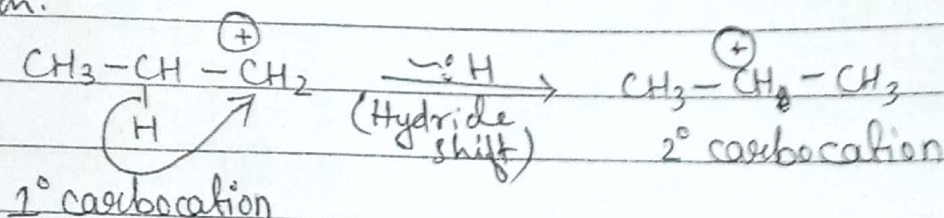


Mechanism :-

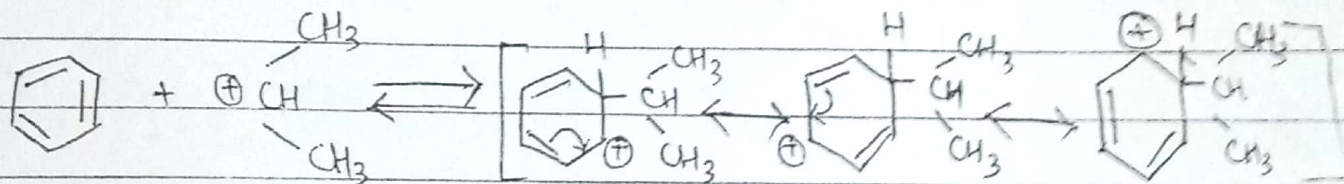
STEP 1 :-



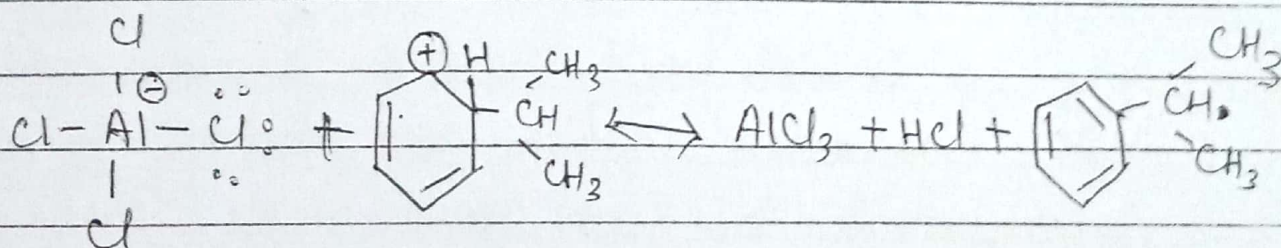
By rearrangement 1° carbocation is converted in 2° Carbocation.



STEP 2 :-

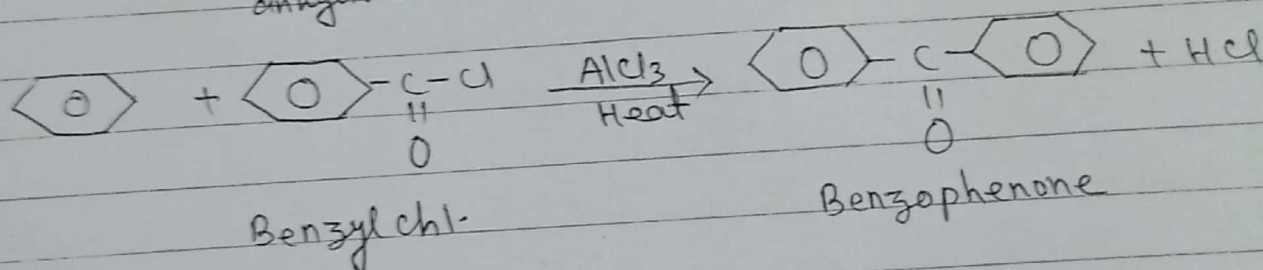
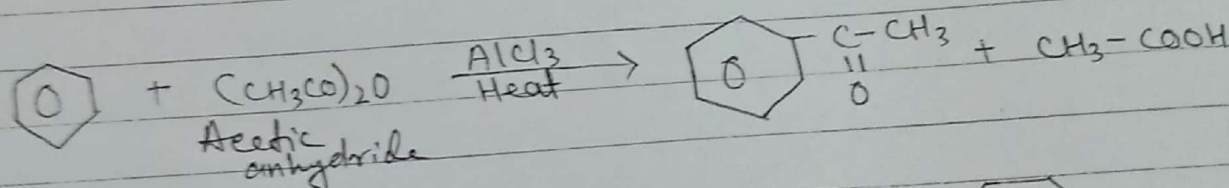
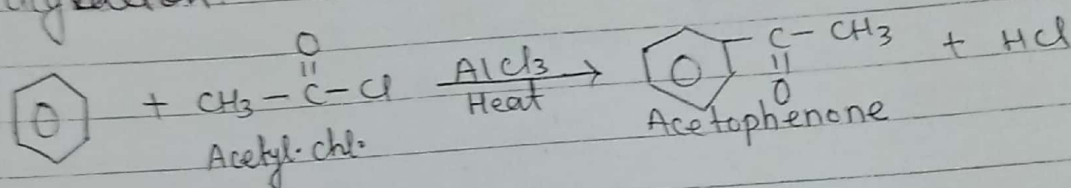


STEP 3 :-



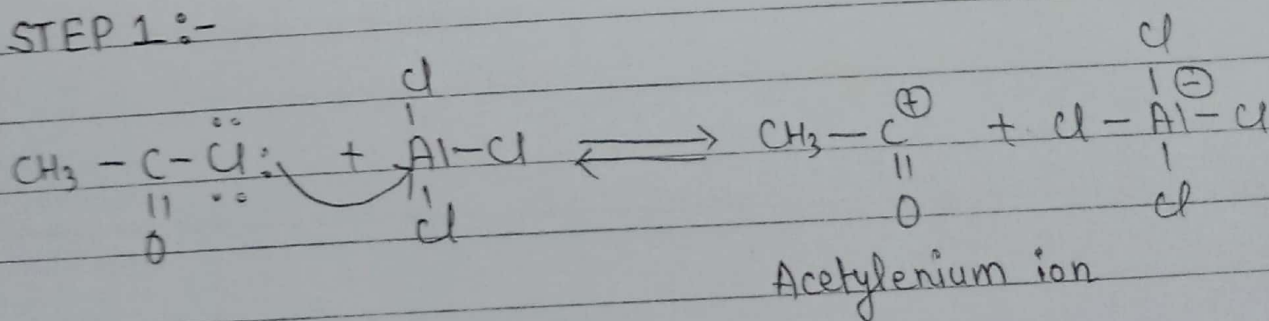
B) Friedel Craft Acylation Reaction :-

The replacement of hydrogen atom of aromatic ring by acyl group ($R-\overset{\overset{O}{\parallel}}{C}-$) by using acid chloride or acid anhydride in presence of $AlCl_3$ is called Friedel craft acylation.

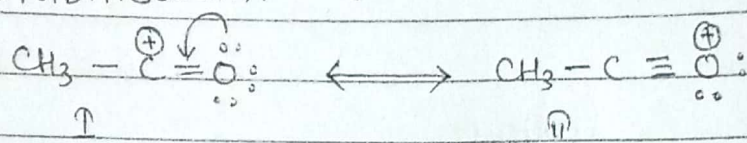


Mechanism :-

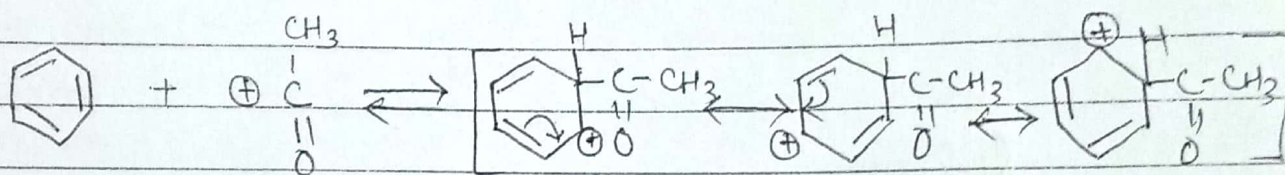
STEP 1 :-



Acetylium ion does not undergo rearrangement due to carbon oxygen π -bond. Which provides resonance stabilisation.



STEP 2 :-



STEP 3 :-

