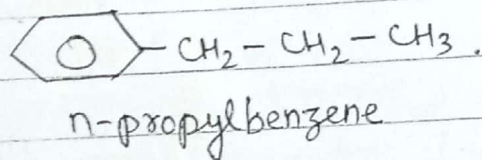
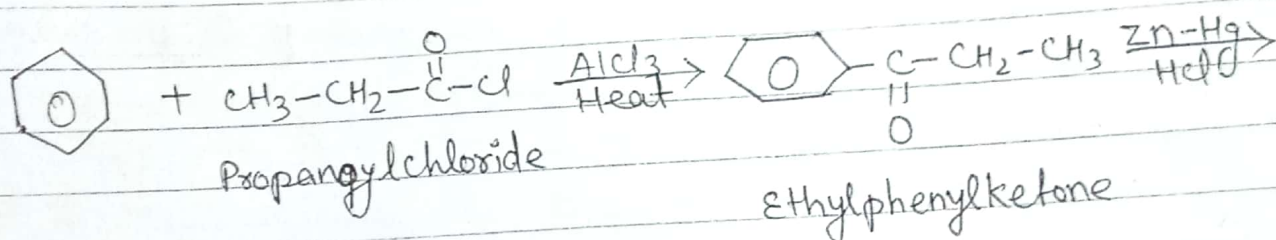


* Synthesis of n-propyl benzene :-

It can be synthesised by Friedel-Craft acylation followed by clemmensen's reduction.



Orientation on aromatic ring :-

The determination of relative position of a substituent in the benzene nucleus is known as orientation.

There can be three possible disubstitution product (ortho, meta or para) and the method of knowing where the two substituted groups located at benzene ring is called orientation.

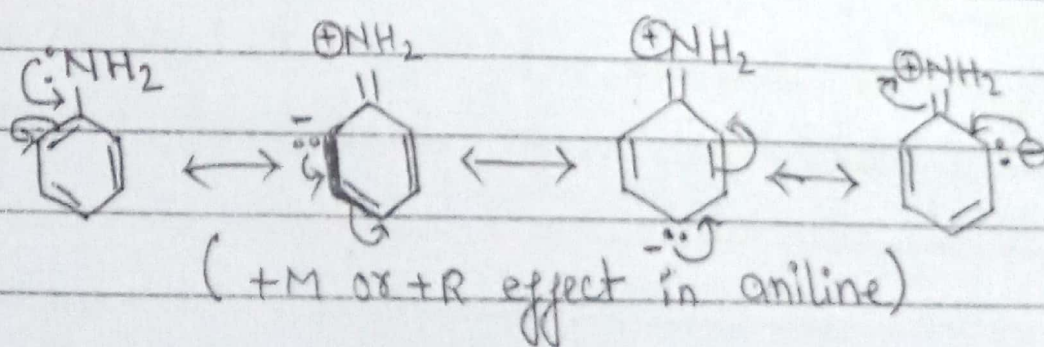
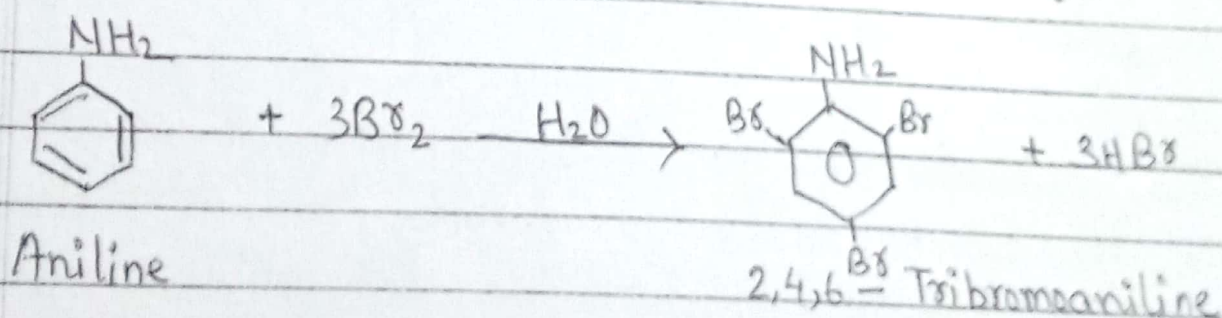
Directive influence of substituents :-

As a result of experimental studies it has been established that there are two classes of the substituent present on aromatic ring.

1) Ortho and Para directive substituents :-

A group present on aromatic ring directs the new substituent to enter the ring at ortho and para positions with respect to themselves - p the preexisting group.

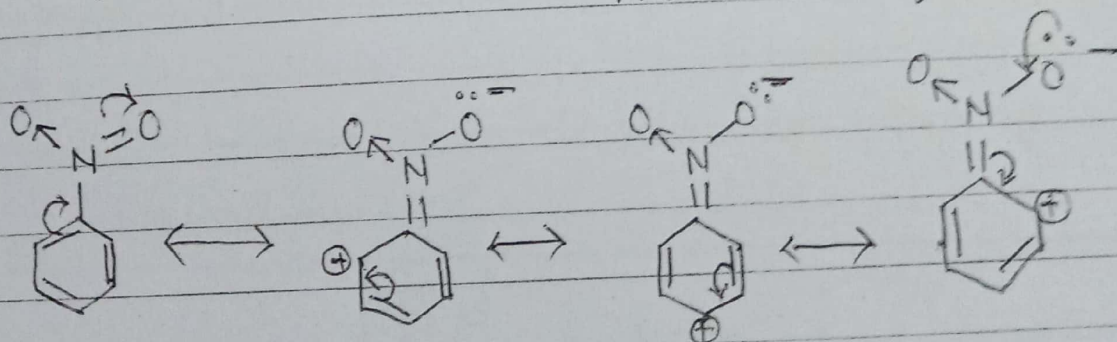
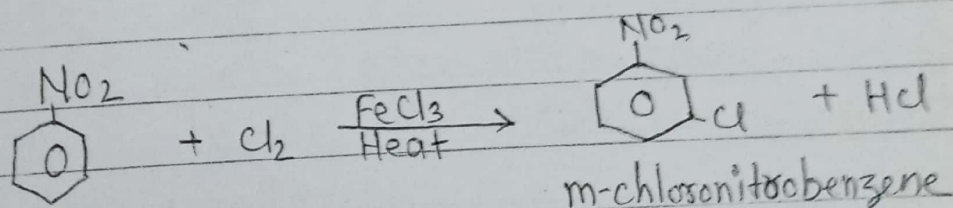
Generally saturated groups such as $-\ddot{\text{O}}-\text{H}$, $-\ddot{\text{N}}\text{H}_2$, $\text{R}-\ddot{\text{O}}-$, $\text{R}-$, $-\ddot{\text{X}}:$ etc. are ortho and para directing groups, due to positive mesomeric effect (+M) or hyperconjugation (alkyl group). In presence of these groups aromatic ring has high electron density at ortho and para positions therefore affinity of electrophile will be more towards ortho and para positions. This can be represented in aniline as follows:



② Meta directing groups :-

A group present on aromatic ring directs the new substituent to enter the ring at meta position with respect to themselves. i.e.

Generally unsaturated groups like $-\text{COOH}$, $-\text{CHO}$, $-\text{C}\equiv\text{N}$, $-\text{NO}_2$, $-\text{SO}_3\text{H}$ etc are meta directors. These groups have a multiple bond conjugated to the benzene ring and strongly electronegative atom (N or O) is attached through this multiple bond. Due to conjugation electron ~~from~~ attracting atom cause withdrawal of π -electron from the aromatic ring towards the group and thus deactivating the nucleus. The effect is more pronounced at ortho and para position. Hence affinity of electrophile will be more towards meta position of the ring which has relatively high electron density than ortho and para position. e.g.,



-M or -R effect of $-\text{NO}_2$ group in nitrobenzene