PHARMACEUTICAL ORGANIC CHEMISTRY-II- BP301T

UNIT: 2 Aromatic acids

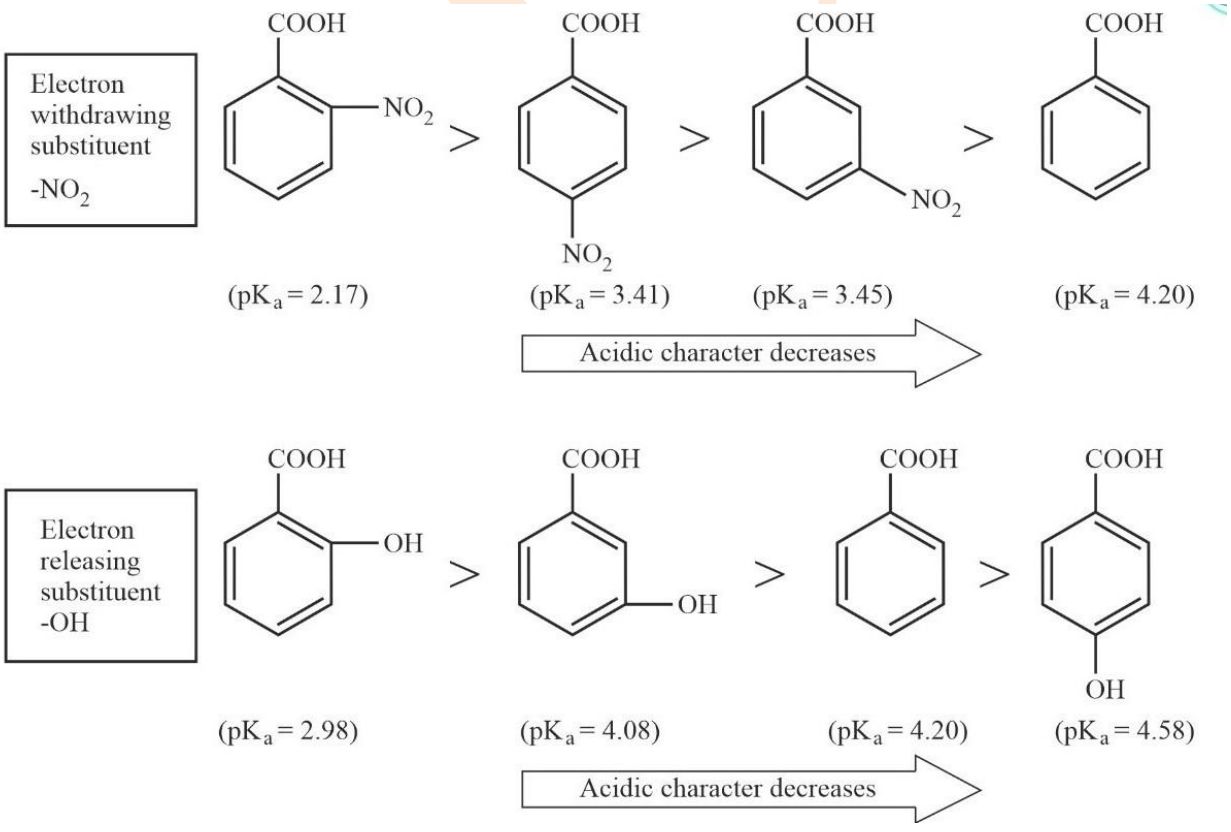
CLASS: 9

TOPIC Effect of substituent on acidity:

The effect of substituent's present on benzene ring on the acidic strength of aromatic acid depends upon both the nature and substituent on the ring.

Electron releasing groups like $–CH_3$, $-OCH_3$, $-NH_2$ decrease the acidic strength of aromatic acid this is due to fact that electron releasing groups tend to destabilize the carboxylate ion relatively to the un dissociated aromatic acid by intensifying the negative charge on the carboxylate ion. As a result this substituent's decreases the acid strength of substituted aromatic acids.

Electron with drawing groups like –CN, $-NO_2$, -CHO, -COOH increase acid strength of aromatic acid. This can be explained by the fact that electron with drawing groups tend to stabilize the carboxylate ion relative to un dissociated aromatic acid by dispensing the negative charge on carboxylate ion.

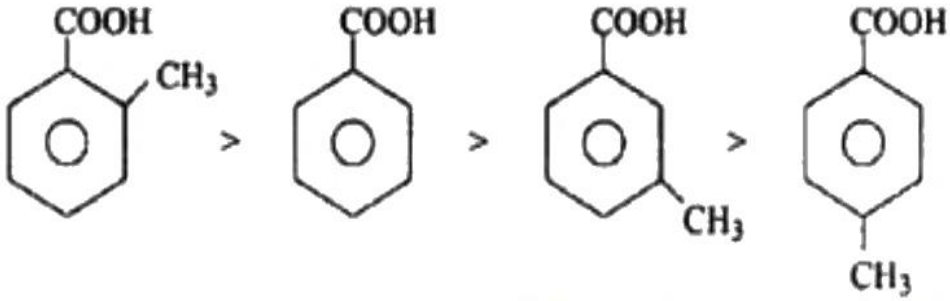


Depending upon the nature of substituents the following possibilities are there

Group showing + I effect:

Groups having electron releasing inductive effect such as methyl and ethyl groups tend to increase the electron density on the oxygen atom of –OH group.

As a result decrease its polarity and make the release of H^+ ions is difficult. In other words these groups decrease the acid strength of aromatic acid such groups have acid weakening effect when present in para and meta position but effect relatively more in meta position.



O- Methyl benzoic acid Benzoic acid M- Methyl benzoic acid M- Methyl benzoic acid