PHARMACEUTICAL ORGANIC CHEMISTRY-II- BP301T

UNIT: 2 Phenols

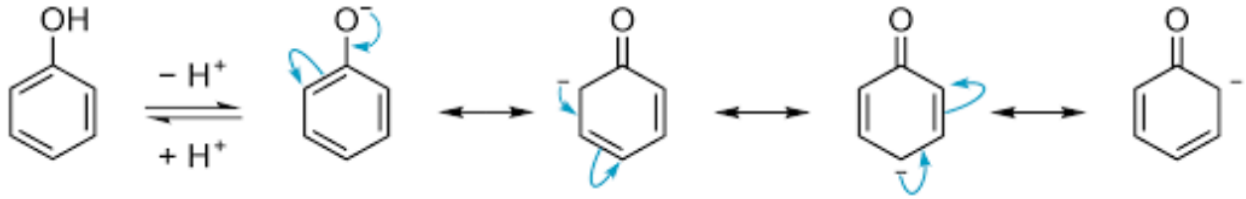
CLASS:2

TOPIC Acidity of phenols:

Phenols are much more acidic than alcohols but less than carboxylic acids

Phenols are acidic in nature due to the formation of phenoxide ion.

Phenol is reacting with water molecule to form Phenoxide ion.



The negative charge is spread throughout the benzene ring and there by effectively dispersed.

This charge delocalization is a stabilizing factor in the phenoxide ion on other hand no resonance formed in the alkoxide ion (RO^-) derived from the alcohols.

The negative charge concentrated on a single oxygen atom consequently alcohols are much weaker than phenols.

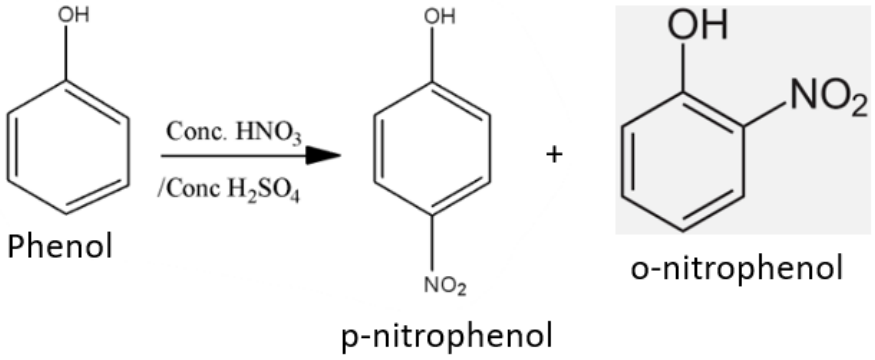
Effect of substituent's on acidity:

Effect of electron withdrawing substituent's an electron with drawing groups (-NO_2, -Cl, -CN,

-CHO, -COOH) on the aromatic ring is acid strengthening.

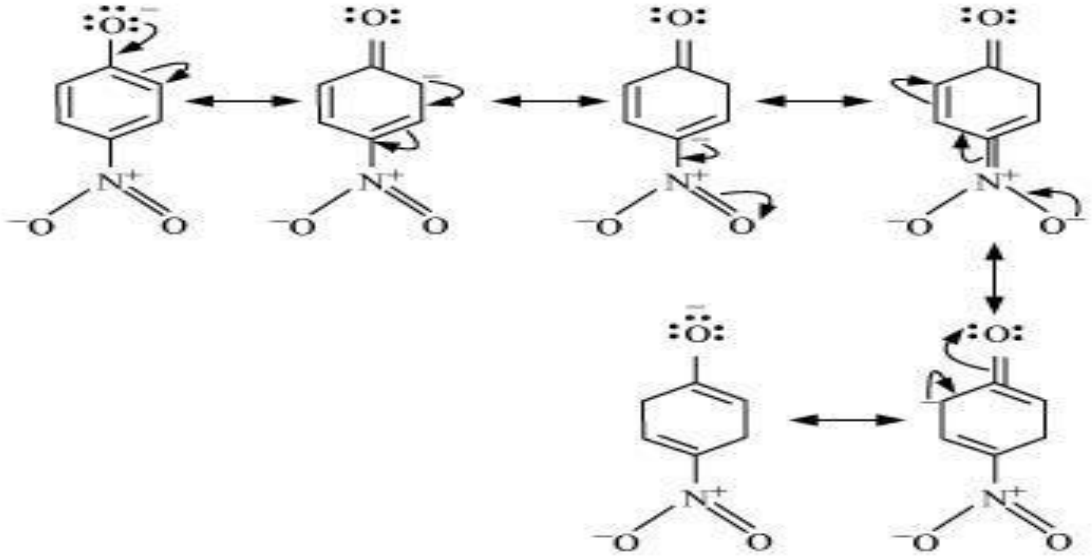
It enables the ring is to with draw more electrons from the phenoxy oxygen.

This stabilizes the phenoxide ion still further and result in a stronger acid.



Phenol is reacting with concentrated sulphuric acid and concentrated Nitric acid to form P-Nitro phenol and O-Nitro phenol.

Resonance forms of Phenoxide ion:

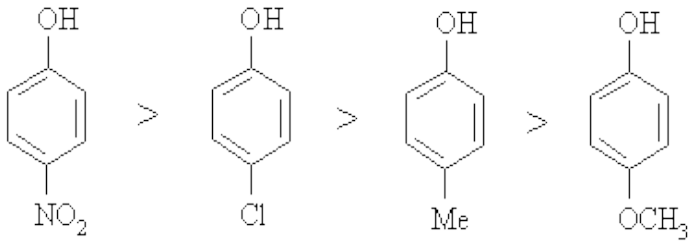


Effect of electron releasing substituent's:

An electron releasing groups (-CH_3, -OCH_3, -NH_2) on the aromatic ring is acid weakening.

It strengthens the negative charge on the phenoxy oxygen and inhibits the charge delocalization due to resonance.

This destabilizes the phenoxide ion and results in a weak acid.



P-Nitro Phenol P-Chloro Phenol P-methyl Phenol P-Methoxy Phenol.