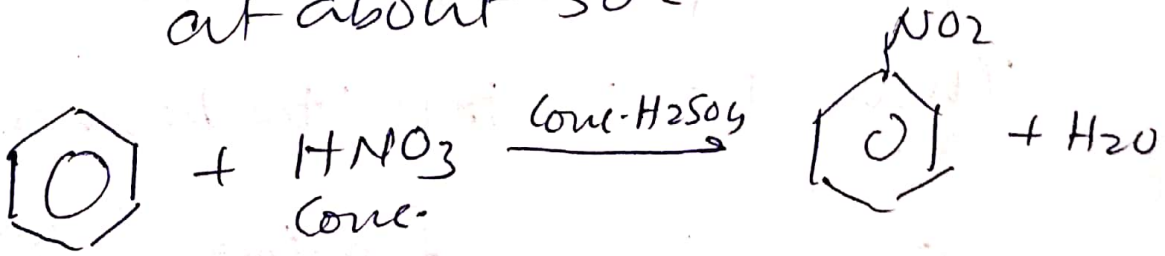
TOC-II (P-IV)
Aromatic

R.N. College

Nitration of Benzene

- When H-atom of benzene is substituted by $-NO_2$ group giving Nitrobenzene it is called Nitrobenzene.

- Nitration of benzene is carried out by treating benzene with Conc HNO_3 and Conc H_2SO_4 at about 50°C.

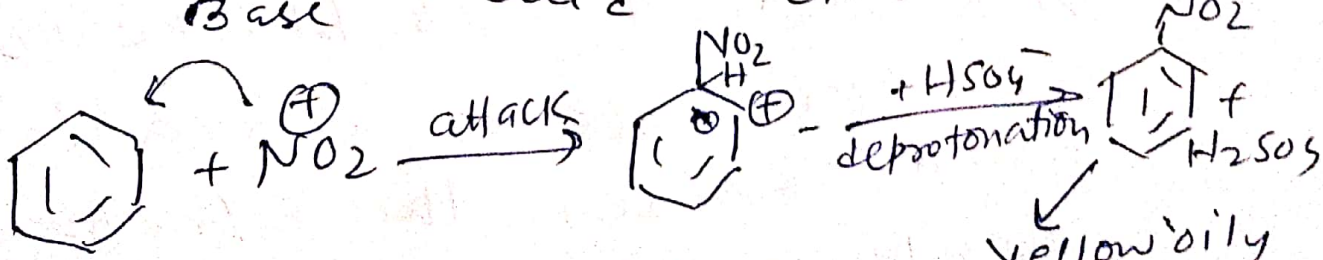


Mechanism of Nitration

First of all Nitrating mixture gives $NO_2^{\oplus}$ Electrophile

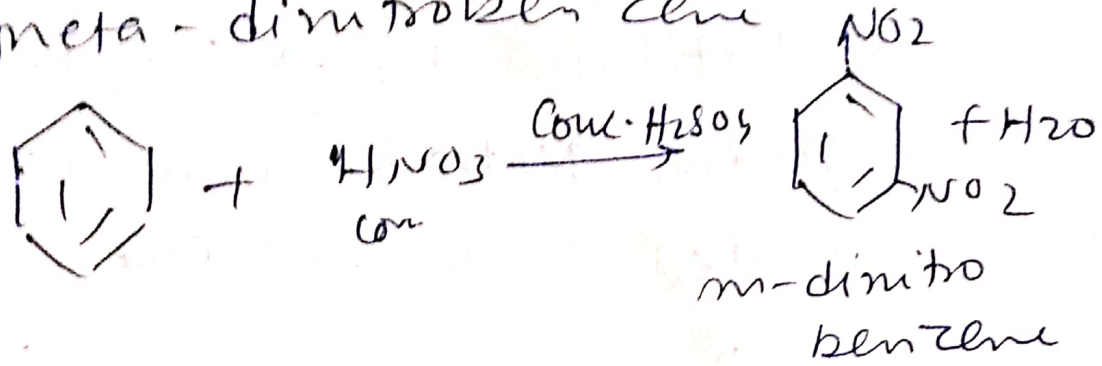
$$HNO_3 + 2H_2SO_4 \rightleftharpoons NO_2^{\oplus} + 2HSO_4^{-} + H_2O$$

Base — acid — Electrophile



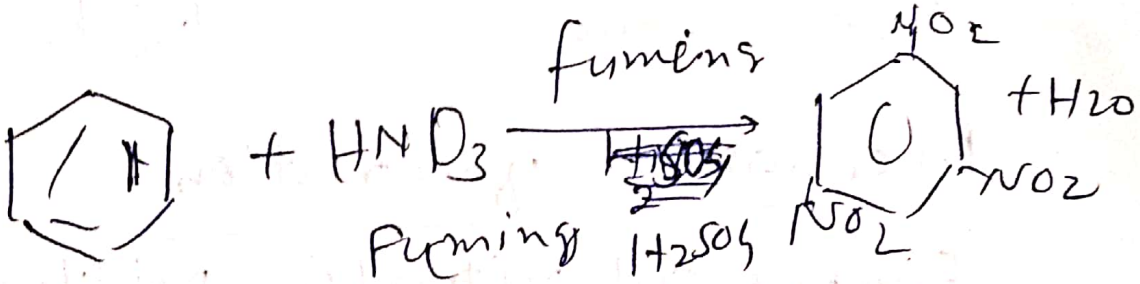
Yellow oily liquid.

Nitration of benzene at higher temperature gives meta-dinitrobenzene

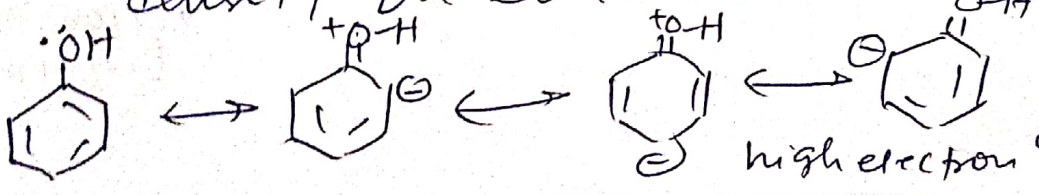


m-dinitro benzene

— When mixture of fuming ~~Conc~~ HNO3 & fuming H2SO4 is used Then 1,3,5-trinitro benzene



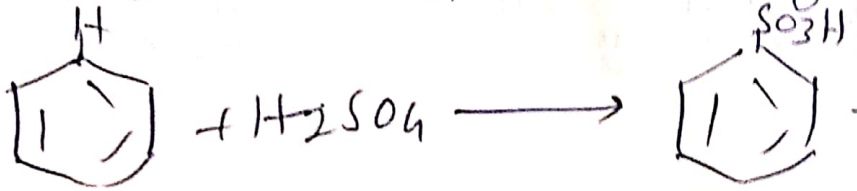
Toluene, Phenol, anisole are more reactive Than benzene towards nitration. Electrophilic Substitution reaction Because activating group increasing the Electron density on benzene ring



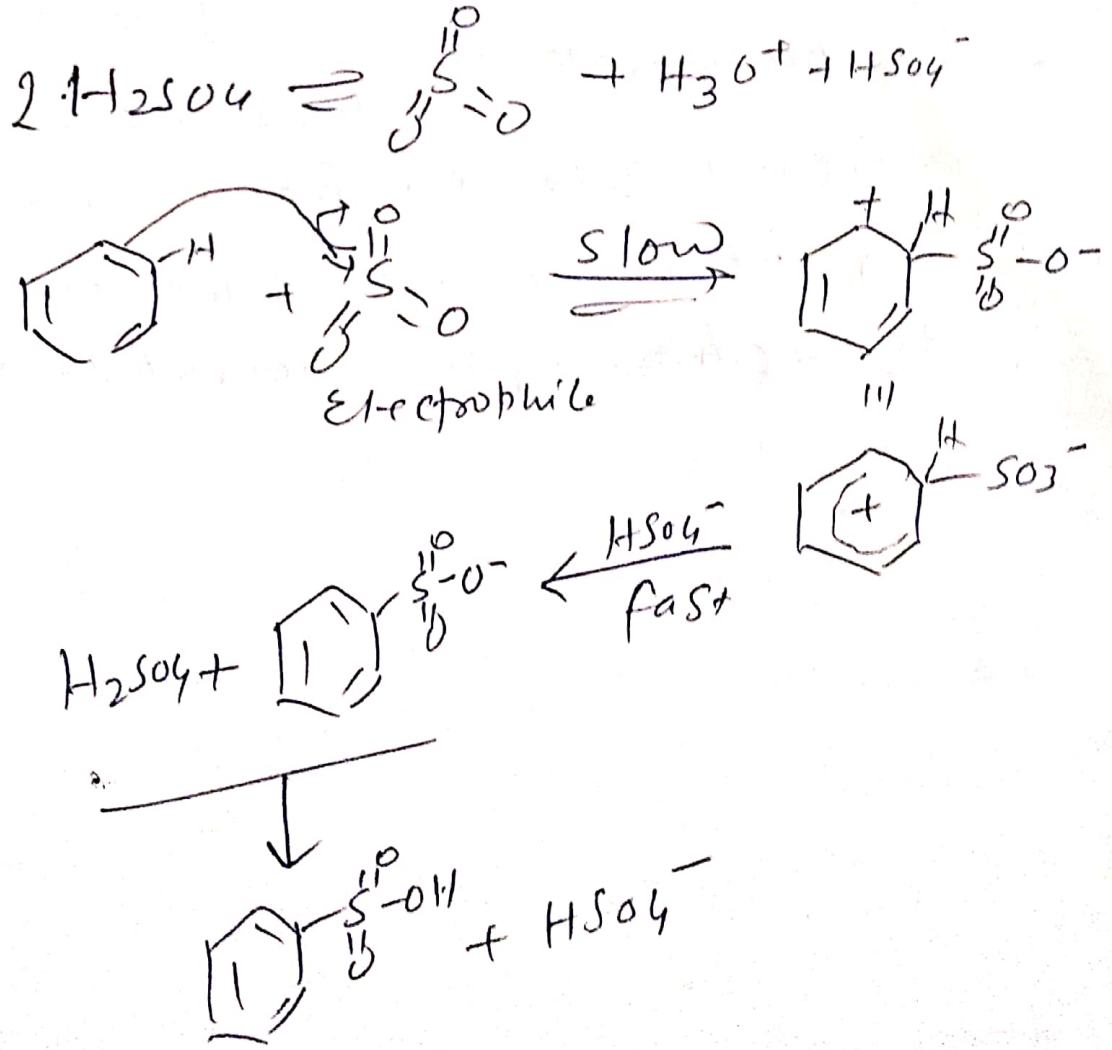
TOPIC-II (P-IV)
Aromatic

Sulphonation of Benzene

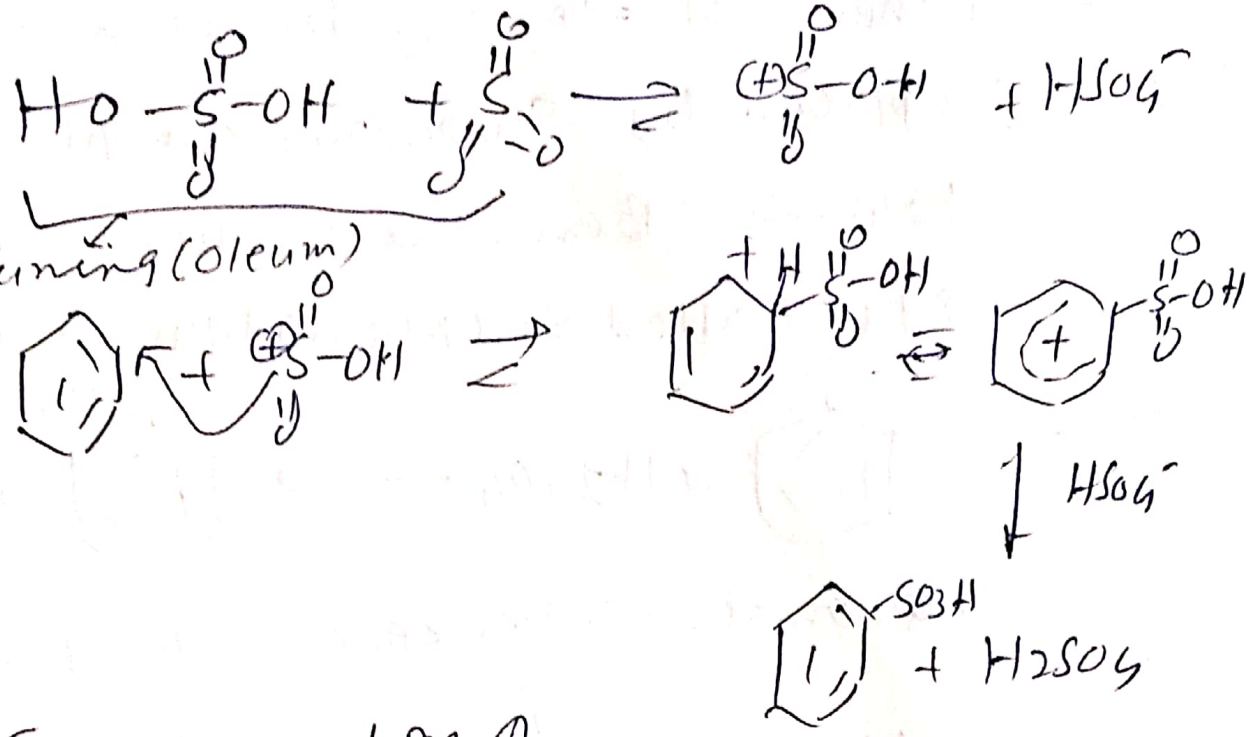
— When H atom of benzene is replaced by sulphonic group (–SO3H) to given Benzene sulphonic acid it is called sulphonation of Benzene



— Sulphonation of benzene involves Reversible steps



Use of SO_3 in H_2SO_4 increases the rate of sulphonation



- Sulphonation of benzene is a reversible reaction. The dilution of Benzene sulphonic acid reaction of sulphonation is reverse