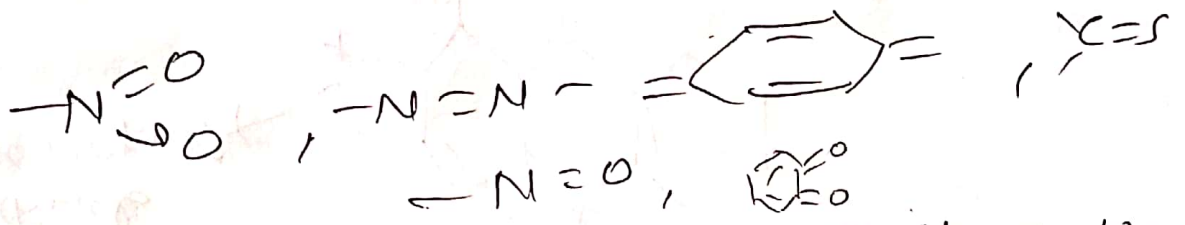


Organic Dye

- Q. Discuss geometrical isomerism in Indigo
- Q. Identification of chromophore, auxochrome and chromogen group in Dye.
- Q. Outline preparation & application of Dye like alizarin, Crystal violet etc.

Chromophore groups \Rightarrow The Unsaturated groups which gives

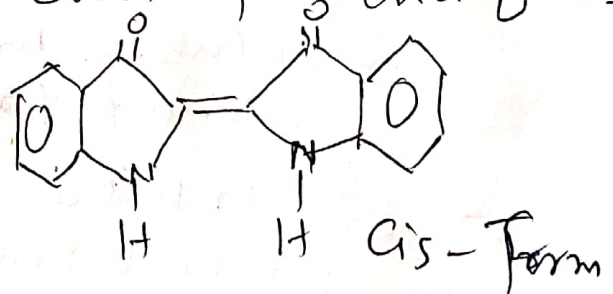
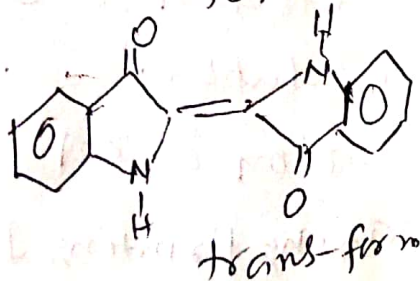
Colour to the organic compound are called chromophore (colour bearing) group.



Chromogens = Compounds with Chromophore groups are called Chromogens.

e.g. Indigo or Indigotin is Chromogen as it contains Chromophore groups.

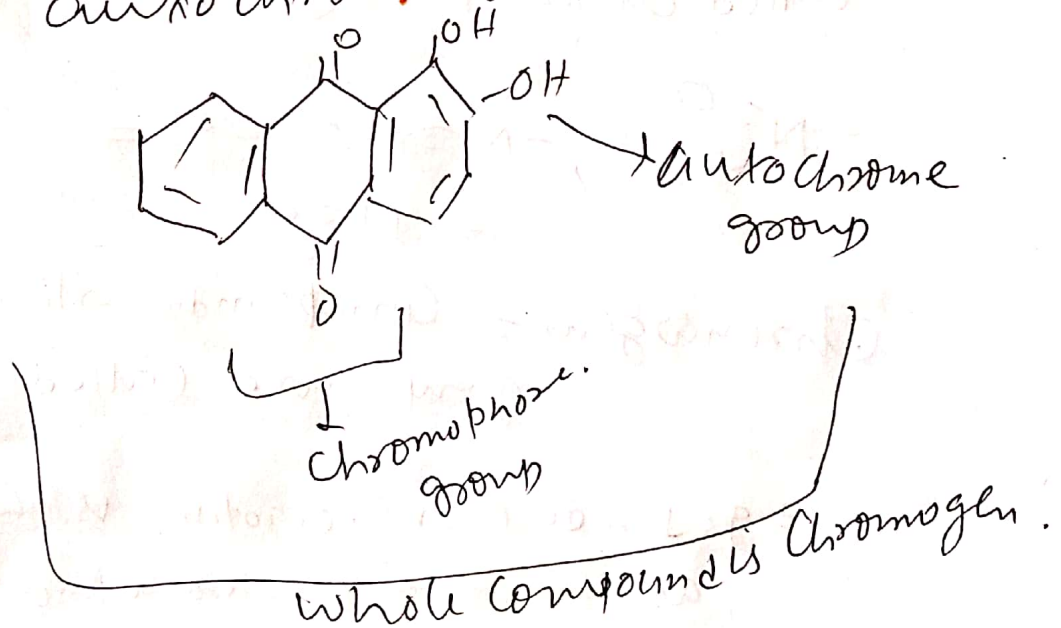
Indigo exists as cis & trans geometrical isomeric forms due to presence of C=C



Auxochrome group - The group which do not cause colouration to chromogen compound but deepen the colour of a chromogen. It is called auxochrome group. (To increase λ_{max} & Absorbance)

$-\text{NR}_2$, $\text{R}-\text{NH}-$, $-\text{NH}_2$, $-\text{OR}$, $-\text{OH}$, X are auxochrome groups.

e.g. Alizarin is chromogen. It contains chromophore as well as auxochrome group.



→ Alizarin is ruby red crystal (mp = 290°C) insoluble in water & ethanol, it dissolves in alkali to form purple solution.

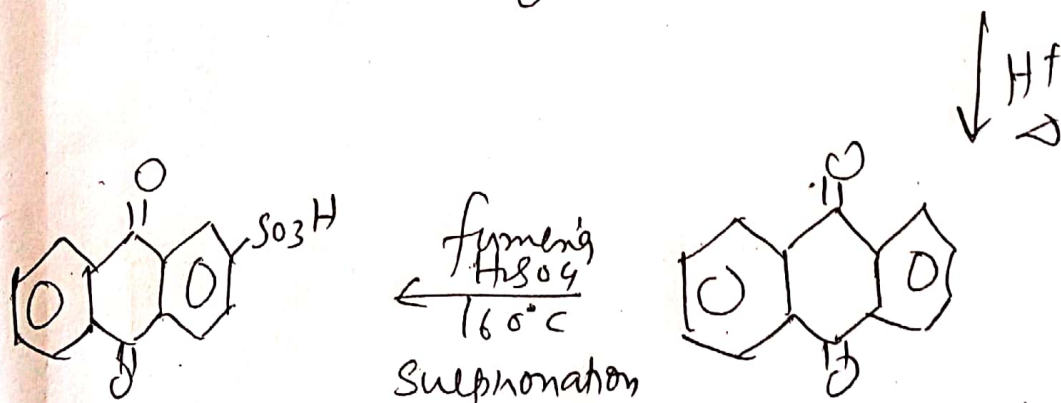
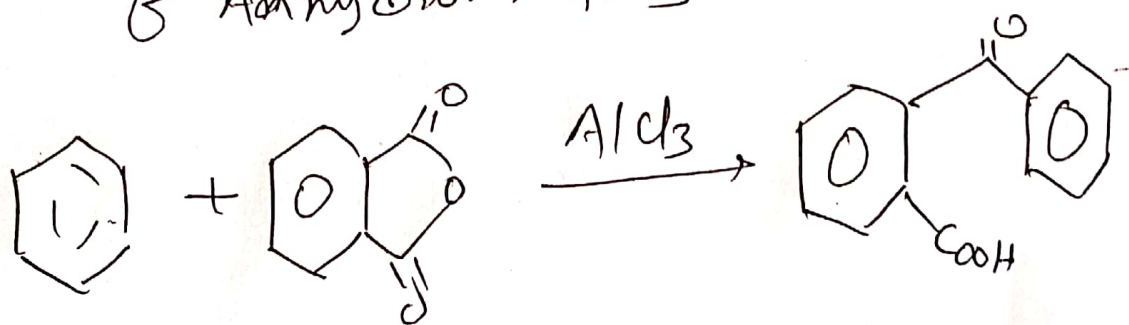
→ It is used to dye cotton & wool

→ It is used for making printing ink.

Alizarin is 1,2-dihydroxyanthraquinone
 It was obtained first from roots of
 madder plant (Fr. Alizari = madder)

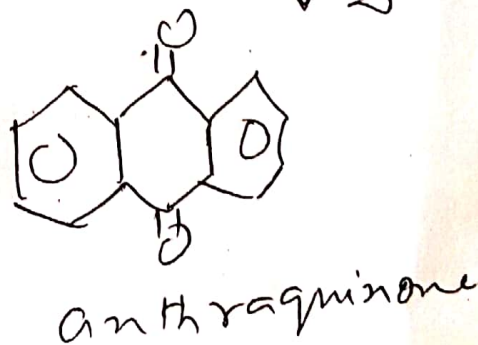
- Alizarin is prepared from Phthalic
 anhydride by following steps-

- First of all Benzene is subjected
 to Friedel Craft reaction with
 Phthalic anhydride in presence
 of Anhydrous $AlCl_3$



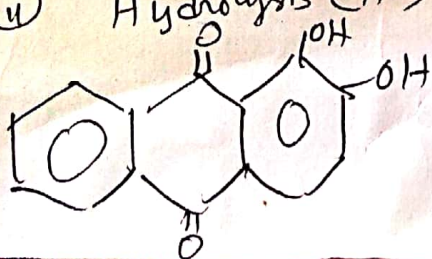
2-anthraquinone
 Sulphonic acid

Fuming
 H_2SO_4
 $165^\circ C$
 Sulphonation



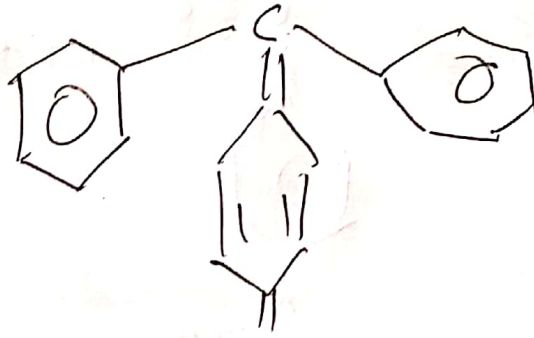
(1) $\downarrow NaOH$
 fused

(2) Hydrolysis (HF)



Crystal violet

It is an example of ~~Trip~~ triphenyl methane dye due to presence of triphenyl methane group



Central C-atom joined to two phenyl ring & one p-quinoid ring

Crystal Violet has greenish-brown metallic lusture. It gives deep blue colour in water.

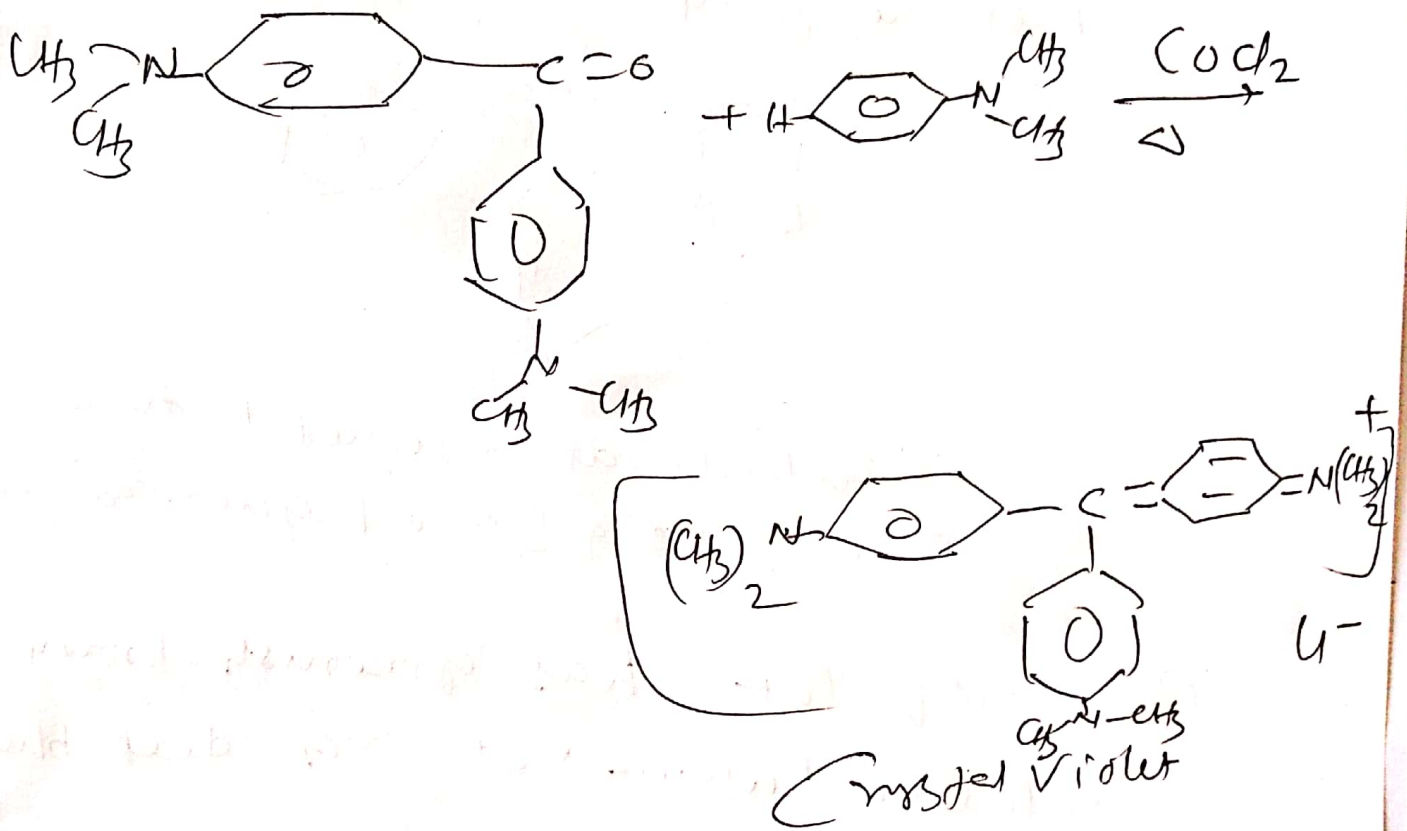
→ It is used in the manufacture of inks, stamping pads, type-writer ribbons.

— It is also used as an indicator for the determination of H^+ concentration in solutions.

— It has antibacterial, antifungal and anthelmintic properties

Preparation →

Crystal violet is obtained by condensing Michler's ketone with N,N-dimethylaniline in presence of POCl_3 or phosgene COCl_2



It is also obtained by condensation of $\text{H}_2\text{C}=\text{O}$ with dimethylaniline followed by oxidation by MnO_2

