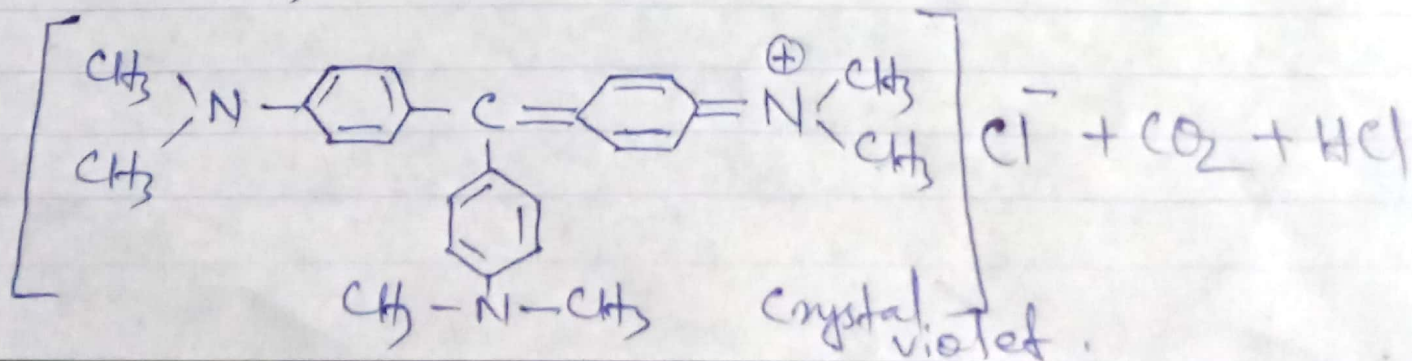
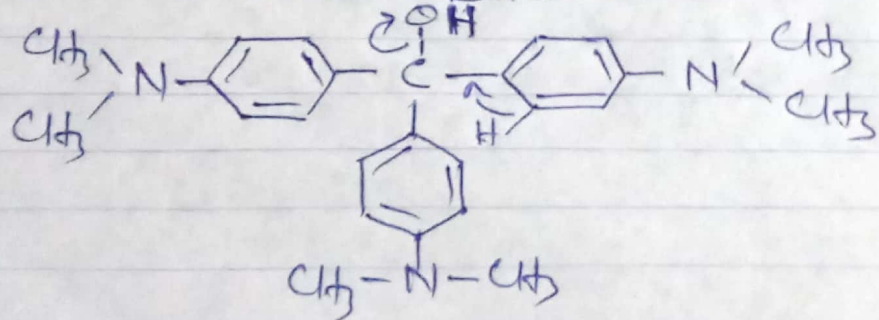
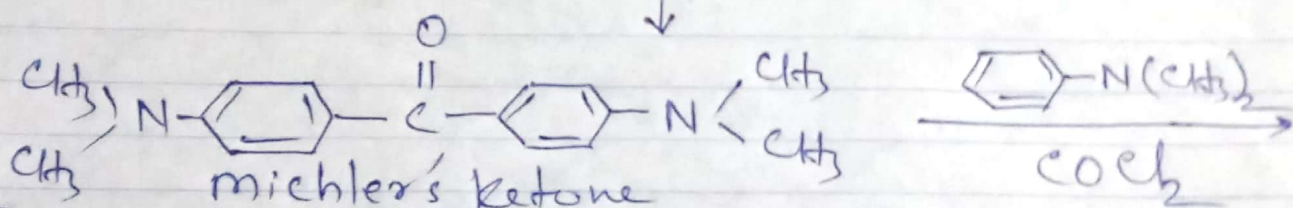
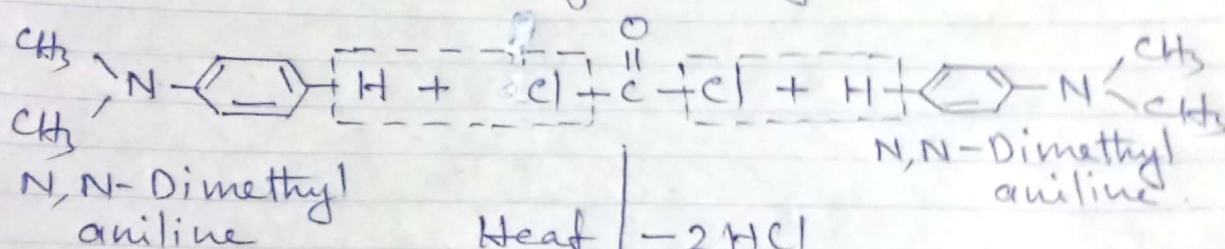


(4) Chemistry and synthesis of crystal violet dye
 [Hexamethyl pararosaniline hydrochloride dye]

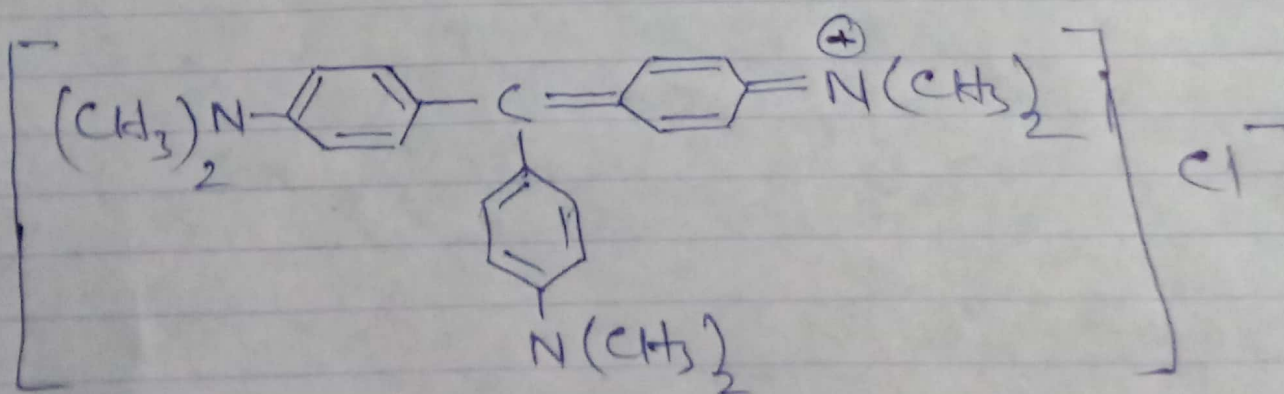
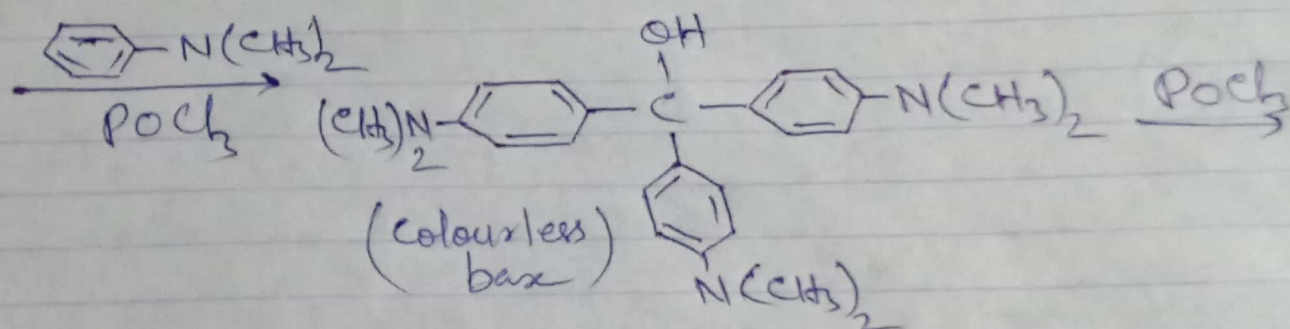
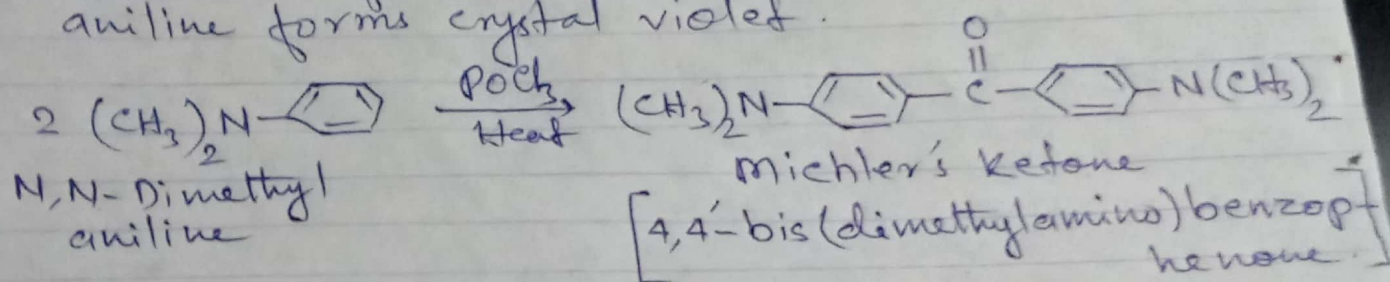
It is synthesised by following methods.

- i) By condensation of N,N-dimethylaniline in presence of carbonyl chloride (COCl₂).



(8)

(ii) It is synthesised from Michler's Ketone by heating with N,N-dimethylaniline in presence of phosphoryl chloride (POCl_3). In this process 1st Michler's Ketone is synthesised, which on further condensation with dimethylaniline forms crystal violet.



crystal violet.

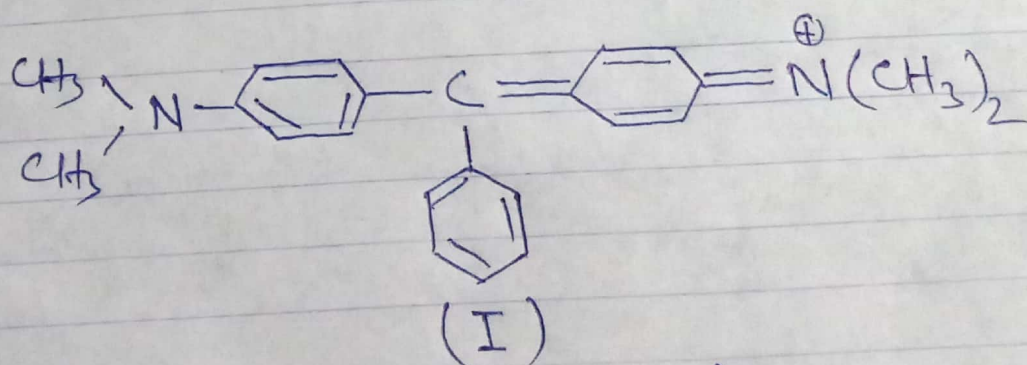
Uses -

- i) It gives bluish violet colour to mordanted cotton, but the colour is not fast to light
- ii) It is used in the manufacture of inks and stamping pads and typewriting ribbons.
- iii) It is used as indicator for determining hydrogen ion concentration in solutions.

Colour change with pH in crystal violet

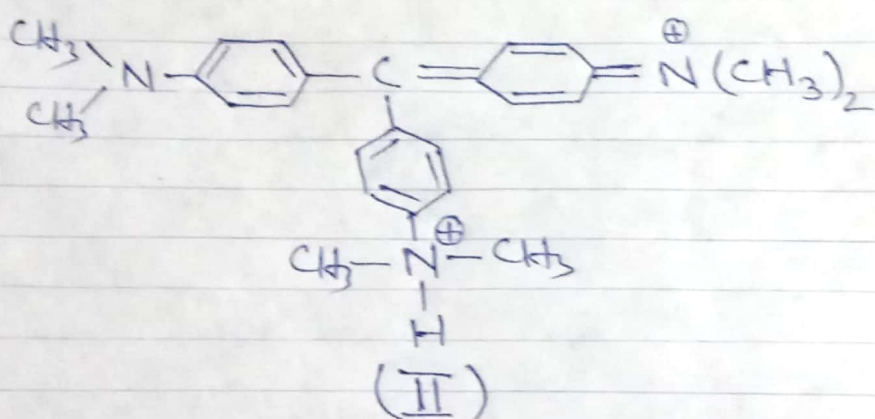
A weakly acidic solution of crystal violet is purple, a strongly acidic solution is green and still more acidic solution is yellow. These colour changes may be explained as follows:

- i) In weakly acidic solution the crystal violet exists as a singly charged ion (I). In this state two-third of the charge can oscillate in the horizontal direction.



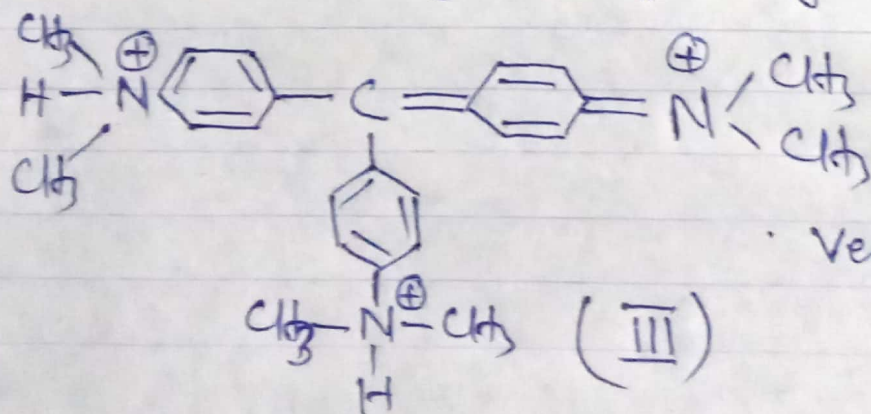
Weakly acidic solution
single charge ion
(Purple)

(ii) In strongly acidic solution crystal violet exists as doubly charged ion (II). In this state the whole unit of charge can oscillate in horizontal direction and hence the colour deepens from purple to green.



Strongly acidic solution
Double charge ion
(Green)

(iii) In highly strong acidic solution, another proton is added to form the triply charged ion (III). In this ion only little resonance is possible and hence the colour lightens from green to yellow.



Very strongly acidic solution
Triple charge ion
(Yellow)