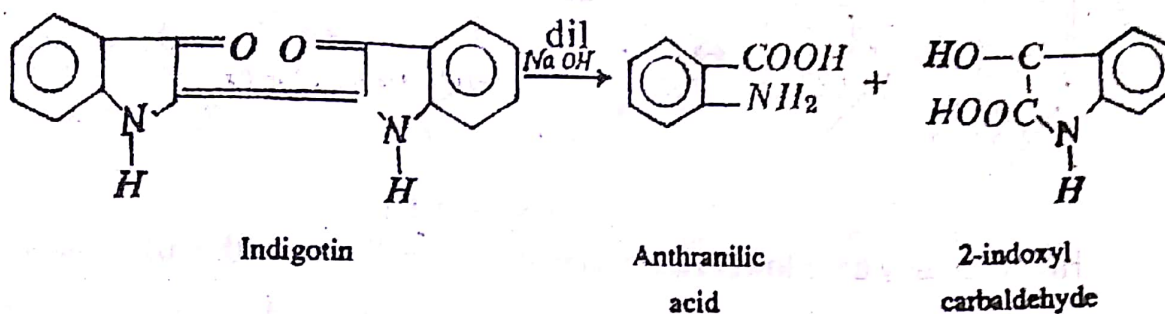
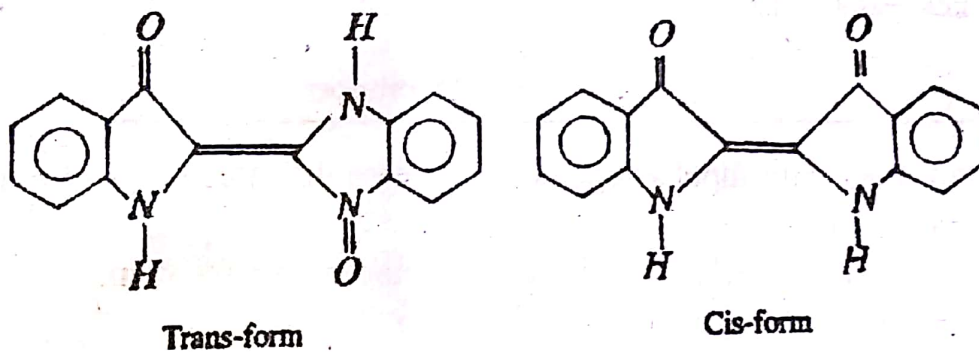


This shows the structure (A) is correct.

(6) The structure (A) is further confirmed by the fact that it gives anthranilic acid and 2-indoxylcarbaldehyde on hydrolysis by dil. alkali.

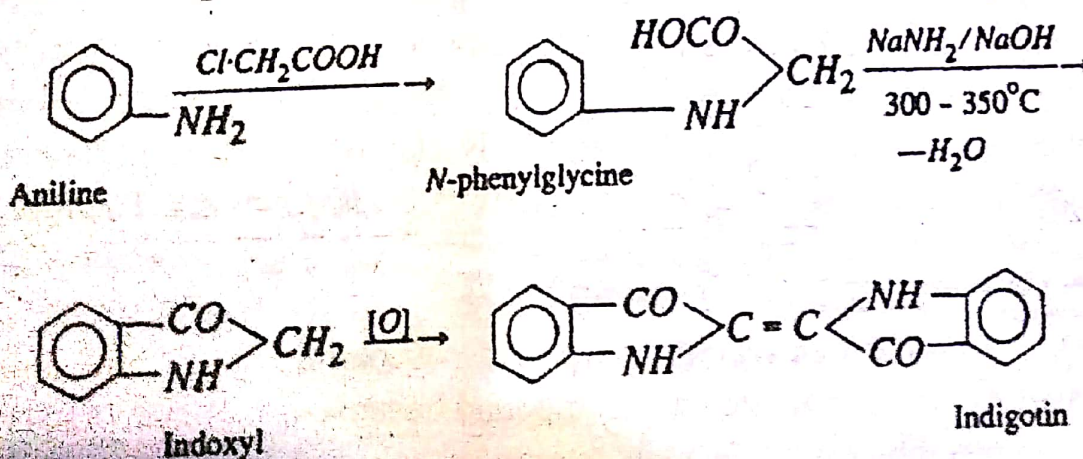


7. Due to the presence of C = C bond, it exists in cis and trans forms—out of which trans is more stable. The cis form is firstly formed during dyeing on the cloth which slowly changes to stable trans form—



Q.9. Sketch the synthesis of indigotin from aniline.

Ans. : Indigotin form aniline



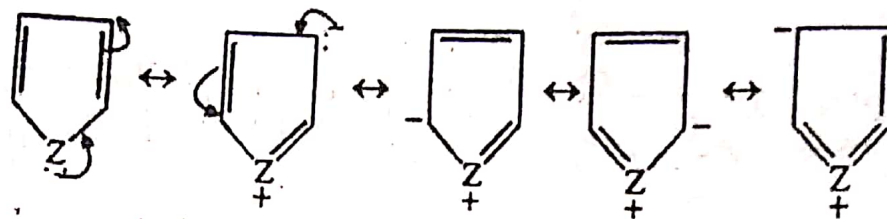
Q.10. Comment on the aromaticity of heterocyclic compounds.

Ans. : Aromaticity of heterocyclics : The 5 or 6-membered heterocyclics show aromaticity because—

(a) They resemble benzene in their properties.

(b) They have 6π -electrons two π -bonds give four π -electrons and two electrons on hetero atom in 5-membered ring while three π -bonds give 6π -electrons in 6-membered ring. Therefore they obey Huckel's $(4n + 2)$ π -electrons rule.

(c) They are resonance stabilised—



(Z = O, S or -NH)

However they have lower resonance energy (R. E.) than that of benzene

	Benzene	Pyridine	Thiophene	Pyrrole	Furan
RE in kcal/mole	39	23	28-31	21	16
				Decreases \rightarrow	

Unlike benzene, dipolar structures in heterocyclics are important contributing structures.

(d) They have π -electron cloud above and below the planar molecule i.e. their π -electrons are delocalised.

Q.11. Comment on the reactivity of furan, pyrrole, thiophene and benzene.

Ans. : Furan, pyrrole & thiophene are more reactive than benzene. Thiophene is more reactive than benzene, furan having still greater reactivity and pyrrole being most reactive. Furan is less reactive than pyrrole because O-atom can accommodate a positive charge less readily than N-atom. The +M effect of sulphur is weaker than that of oxygen because the overlap of $2p$ -orbital of carbon and $3p$ -orbital of sulphur is less than $2p$ -orbitals of C and O-atoms. Therefore, the order of reactivity is given as—

Pyrrole > Furan > Thiophene > Benzene

Q.12. Pyrrole is an aromatic compound—Explain.

Ans. : Pyrrole is an aromatic compound because—

(a) it resembles benzene in its properties.