Class - P.G. Sem. II
Subject - chemistry
Paper - C-C VIII
Unit - I
Dr. Rashmi Sinha, H.D.J.C. Hoq

Benzoin condensation :-

The reaction of aromatic aldehyde with aquous ethanolic KCN or HCN to form α-hydroxy Ketone is known as Benzoin-condensation. Thus Benzaldehyde gives Benzoin.

$$2\,C_6H_5CHO \xrightarrow{KCN} C_6H_5-\overset{O}{\overset{\|}{C}}-\overset{OH}{\overset{|}{\underset{H}{\underset{|}{C}}}}-C_6H_5$$

Benzoin

Mechanism :- Firstly the nucleophile cyanide ion adds to carbonyl carbon of first molecule of aldehyde. The cyanide ion - acidify H-atom of aldehyde (former) giving resonance stablised carbanion.

The carbanion thus generated attacks carbonyl carbon of second aldehyde molecule forming an unstable cyanohydrine of Benzoin which

immediatly breaks down into Benzoin and hydrogen cyanide.

Step I :-

Step II

Application :-

(i) Furfural with ethanolic KCN undergoes Benzoin condensation to give Furoin and this on oxidation gives Furil.