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Dept. of Chemistry

class : U.G. sem V

paper : MJC - 9(T)

Unit : 1

Topic : POLYNuclear Hydrocarbons

Naphthalene [continued - - - - -]

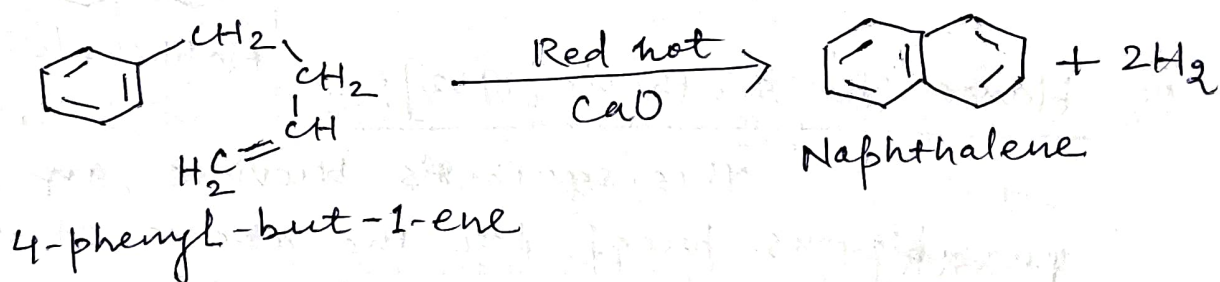
Synthesis of Naphthalene:

Synthesis involved in two types:—

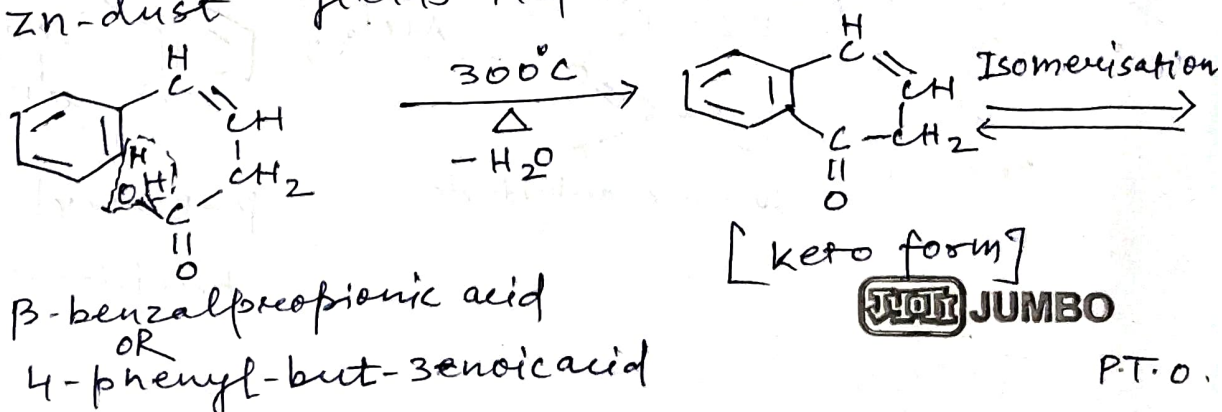
[A] Those which involves the ring closer all. Aromatic ring containing side open chain having at least 4-C atoms.

[B] Those in which O-substituted benzene ring is condensed with the aliphatic compound.

i] By passing 4-phenyl but-1-ene over red hot CaO.

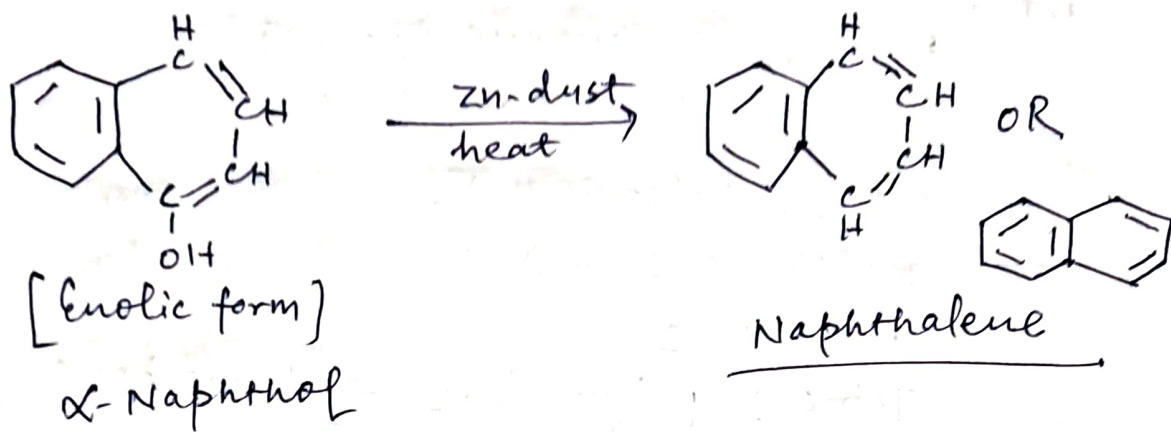


ii] Fittig's synthesis (1885):— β -Benzalpropionic acid on heating produces α -Naphthol which on distillation with Zn-dust yields Naphthalene.



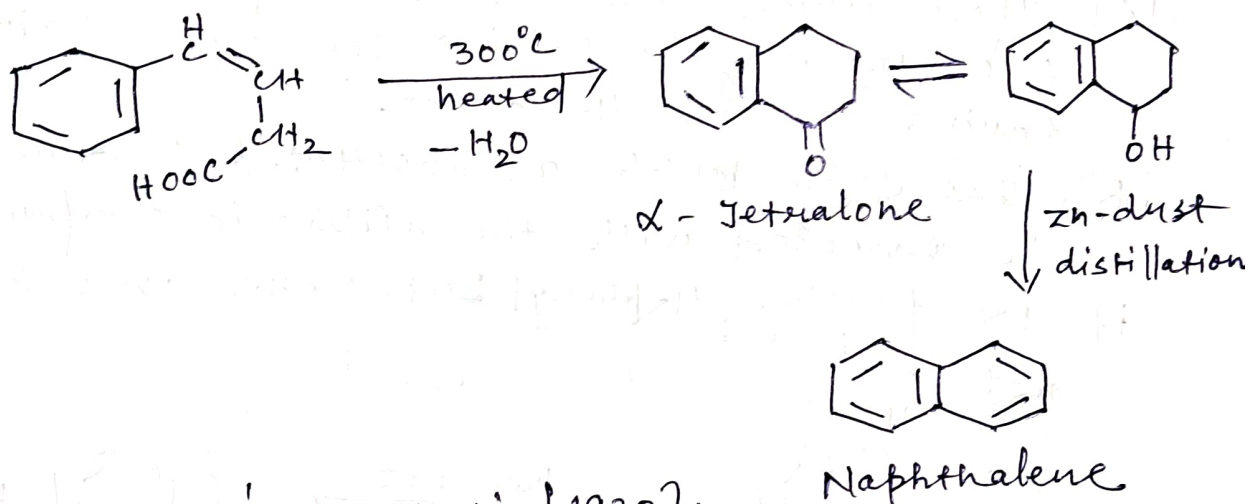
JUMBO

P.T.O.



OR

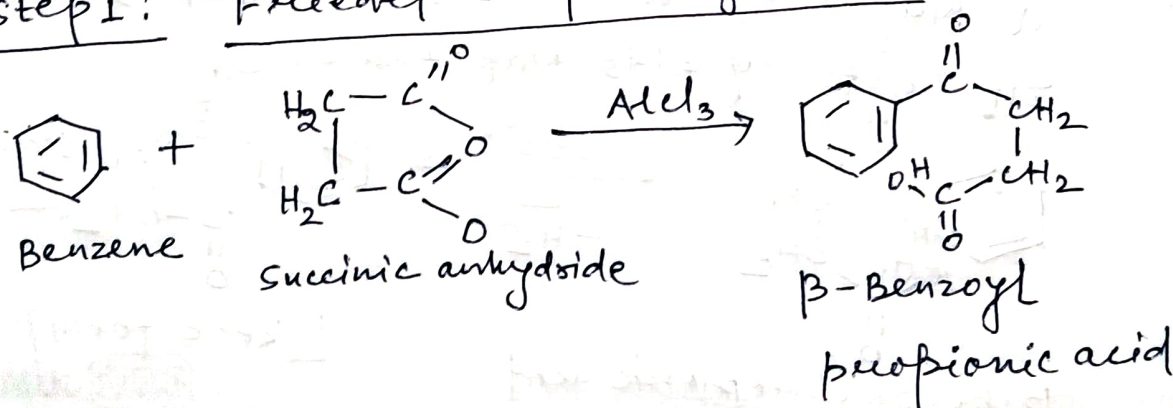
By heating 4-phenyl-but-3-enoic acid to 1-Naphthalene and distilling the latter with Zn-dust.



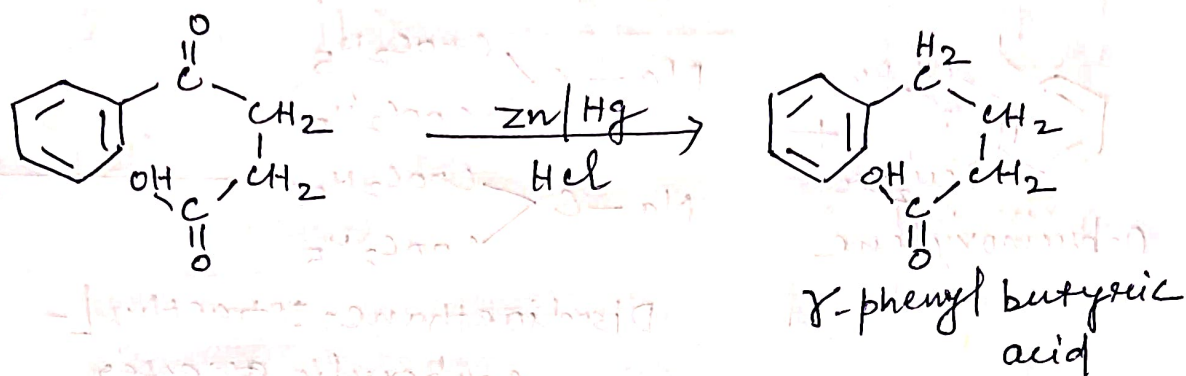
iii] Haworth's synthesis [1932]:-

This synthesis provides an unambiguous proof for the above structure of Naphthalene. This involves the following five steps:-

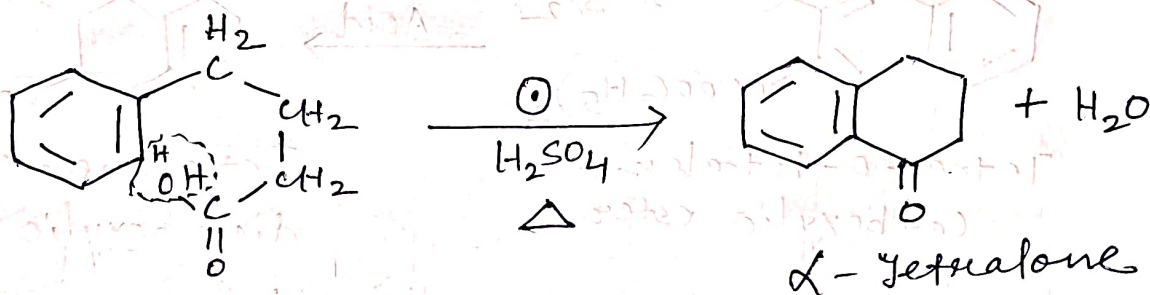
Step I: Friedel Crafts' Acylation:



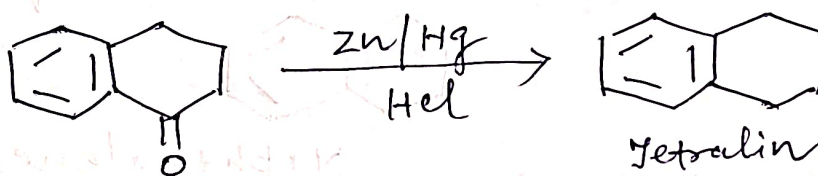
step II: Clemmensen Reduction: $\rightarrow$



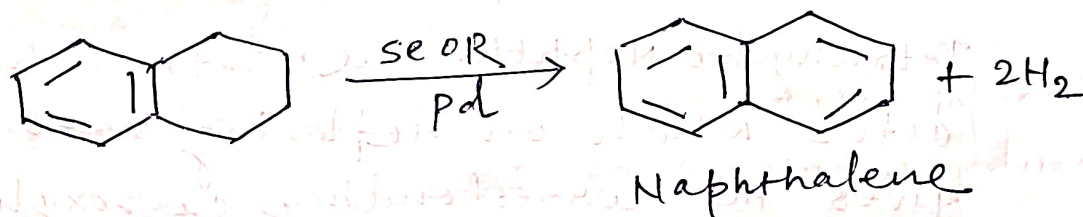
step III: Ring close Reaction: $\rightarrow$



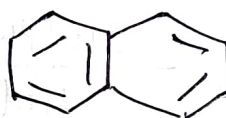
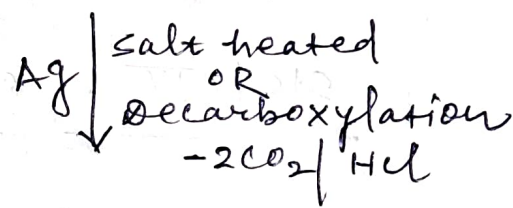
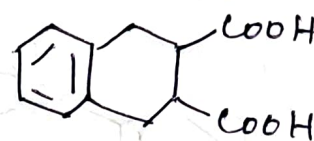
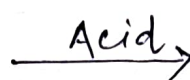
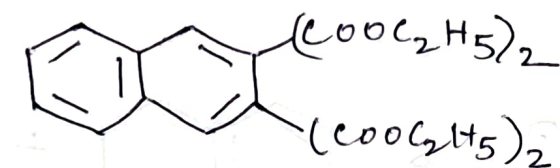
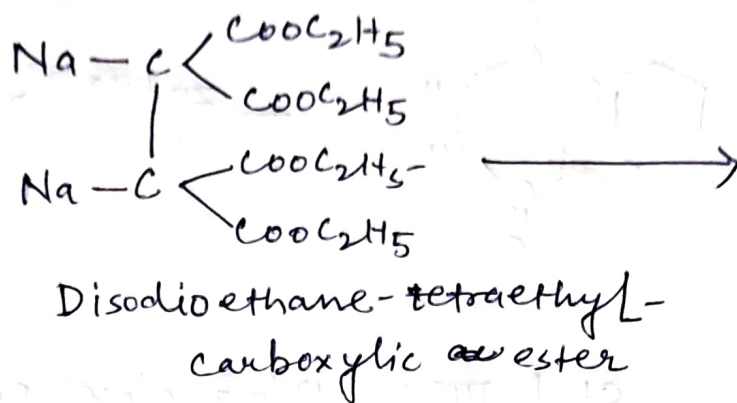
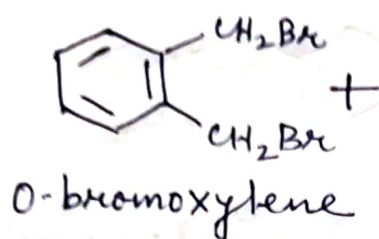
step IV: Clemmensen Reduction: $\rightarrow$



step V: Aromatization reaction: $\rightarrow$



iv.] Baeyer and Perkin synthesis: →



Naphthalene.

The o-bromoxylene is treated with disodioethane-tetraethyl carboxylic ester to yield Tetrahydro Naphthalene. Tetracarboxylic ester which on refluxing with acid gives the corresponding carboxylic acid. The Ag-salt of the latter compound on heating gives Naphthalene.