

23-04-2020

## ( LECTURE - 3 )

Deg-II (Hons.&amp;Sub.)

Chapter-6 Chapter-4

Paper-IV Group-'C'

Group-'B'

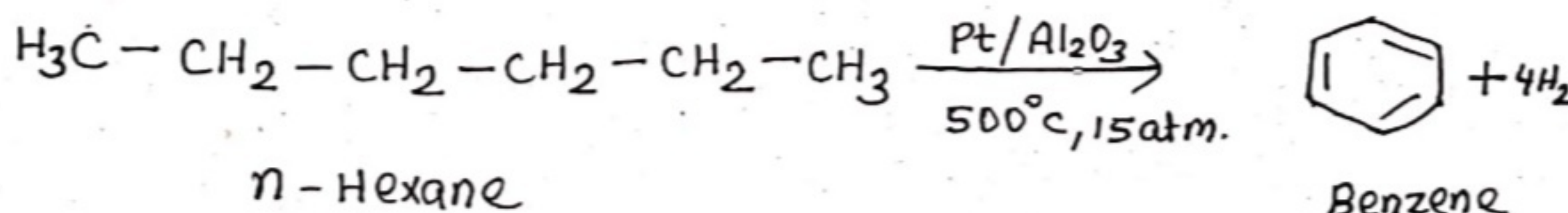
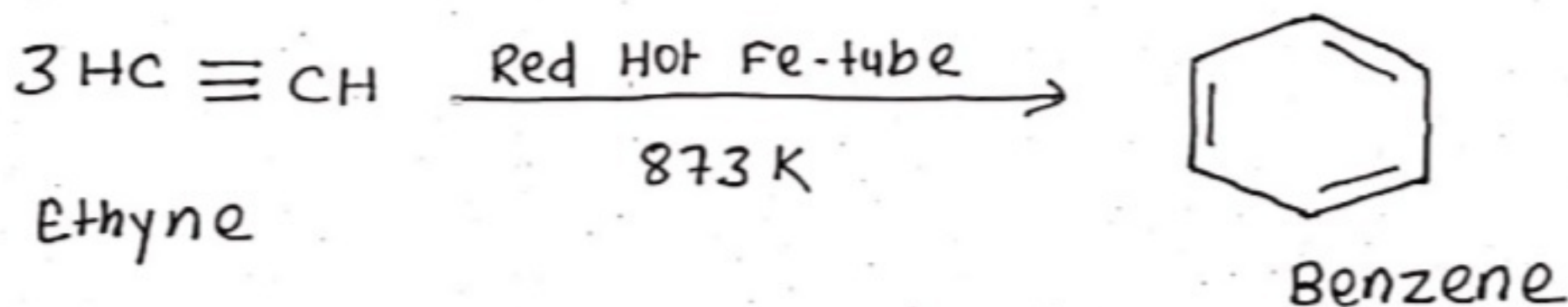
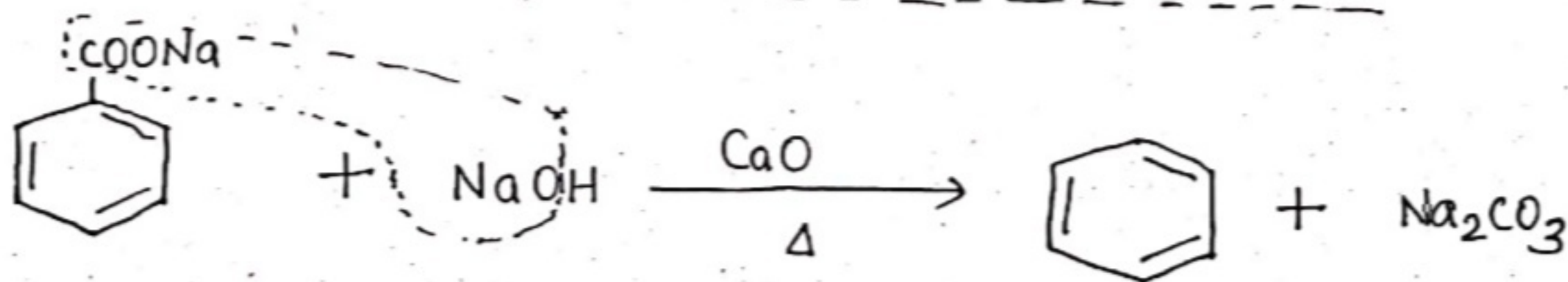
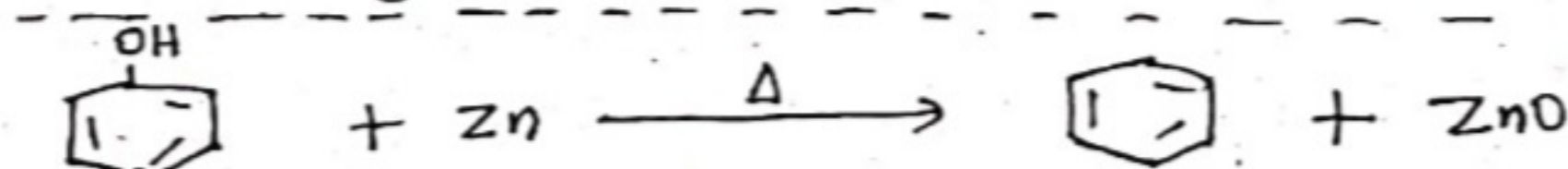
(Organic Portion)

Topic - " PREPARATION "

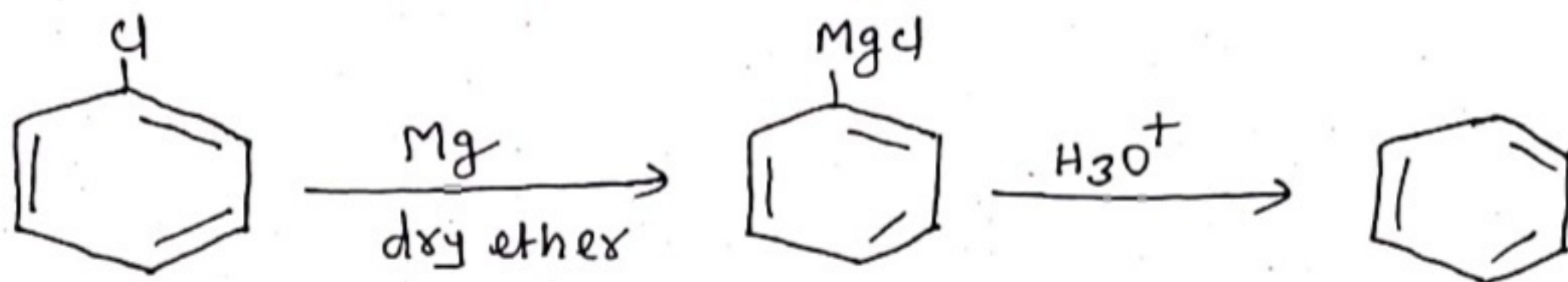
AND

" PROPERTIES OF BENZENE "

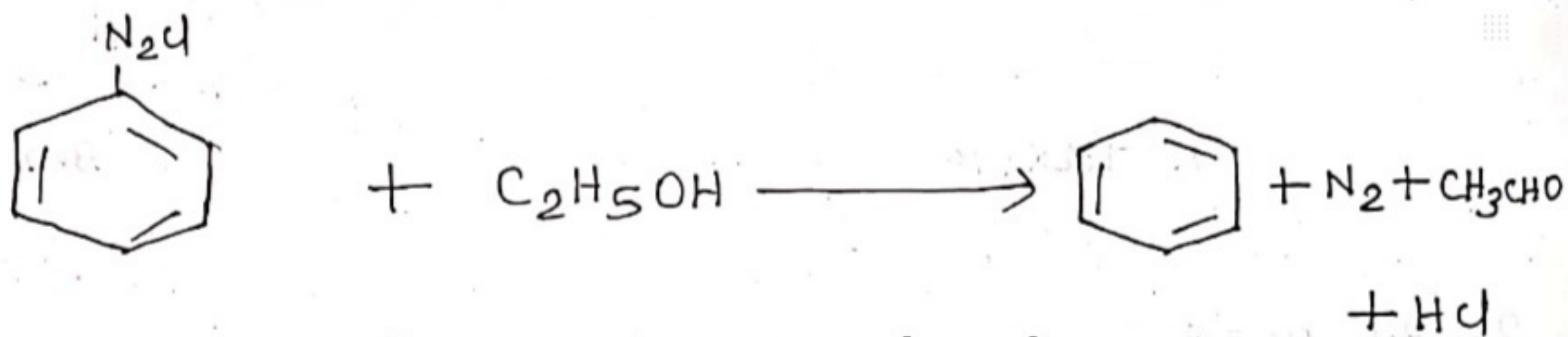
### Preparation Of Benzene

1. From n-Hexane :-2. By passing ethyne through red-hot Fe tube.3. By heating sodium benzoate with soda-lime.4. By heating phenol with zinc-dust:

5. By treating chlorobenzene with 'Mg' followed by treatment with dil. HCl



6. From Benzene diazonium chloride:



~~ Preparation completed.~~

## PHYSICAL PROPERTIES

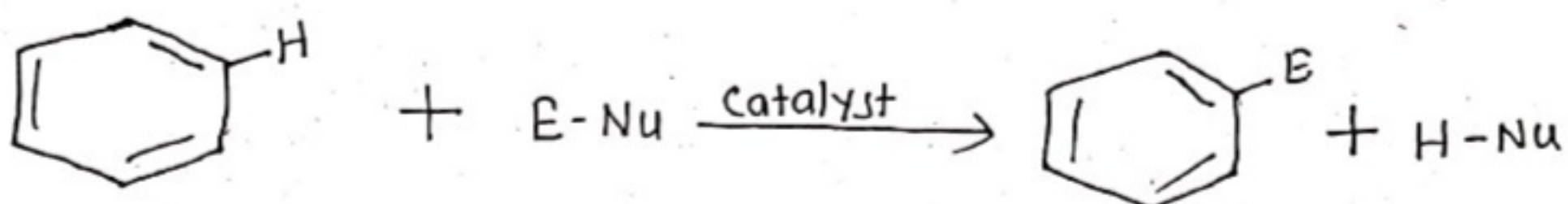
1. Benzene is a colourless liquid.  
b.p =  $80.1^\circ\text{C}$   
m.p =  $5.5^\circ\text{C}$
2. It is insoluble in water.
3. It is a good solvent for many non-polar substances.
4. It burns with a sooty flame.

# CHEMICAL REACTION OF BENZENE

The principal types of reactions are: - - -

1. Electrophilic Substitution Reactions.
2. Addition Reactions.
3. Oxidation Reactions.

## Electrophilic Substitution Reaction



Where  $\text{E}^+$  = Any Electrophile

$\text{Nu}^-$  = Any Nucleophile

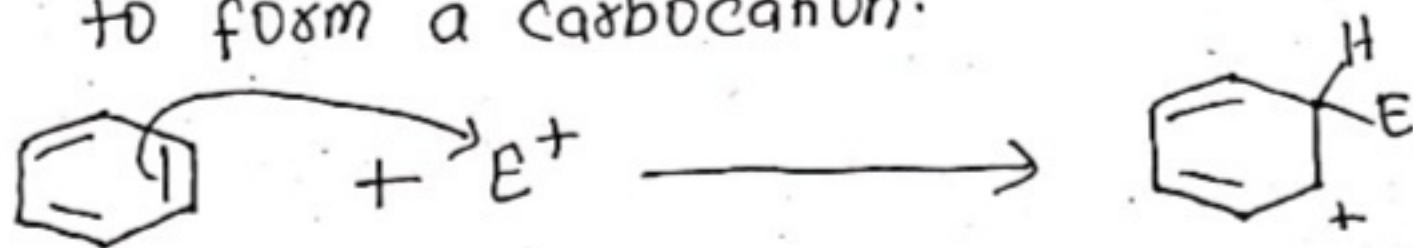
## General Mechanism

All electrophilic substitution reaction follow the same three step mechanism.

Step 1. Formation of an electrophile.



Step 2. The electrophile attacks the aromatic ring to form a carbocation.



The carbocation is resonance stabilised. It is a hybrid of the following three structures:

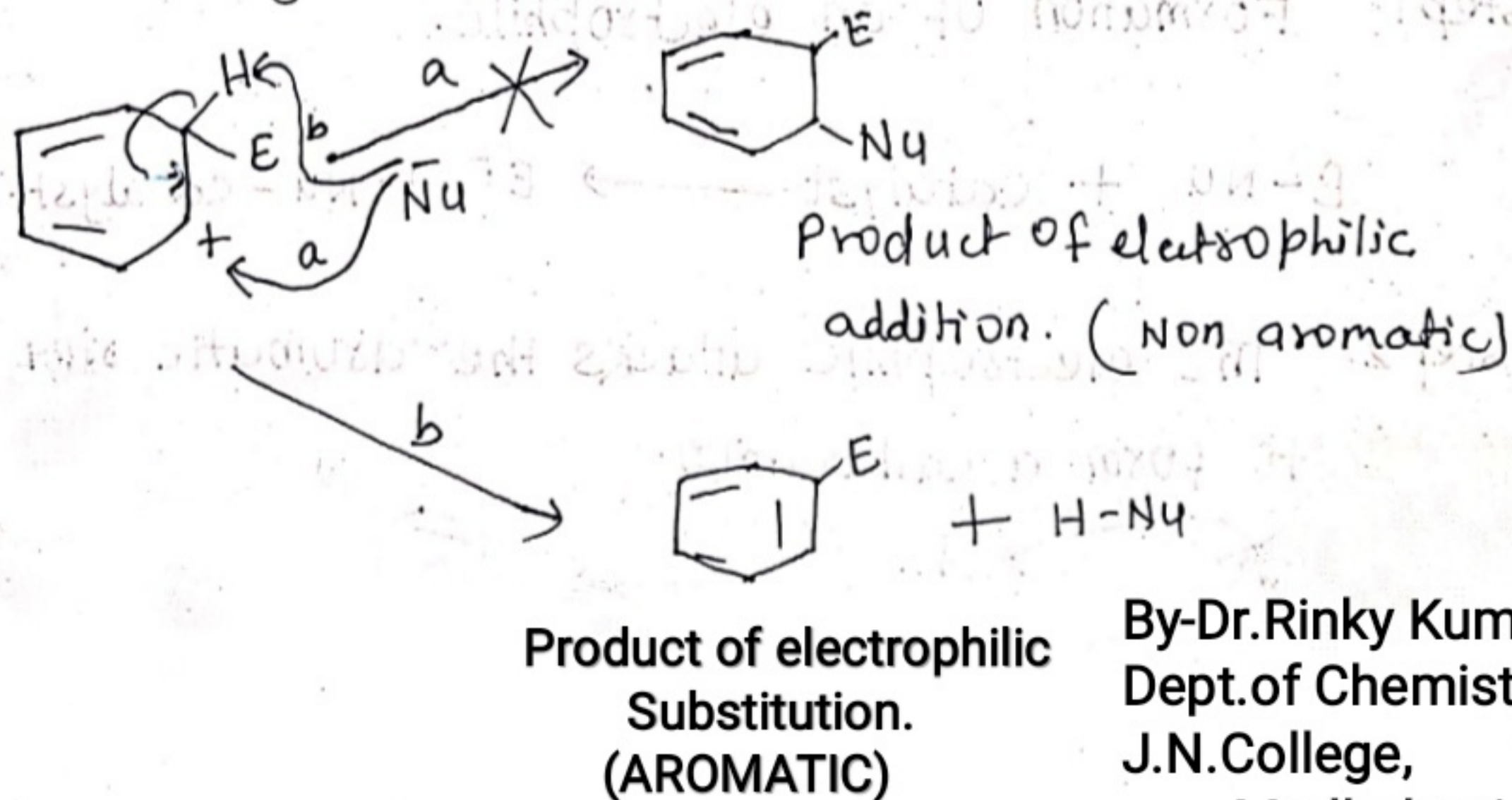


Step 3.

If the carbocation intermediate that is formed from the reaction of benzene with an electrophile were to react similarly with a nucleophile

(depicted as path 'a' in fig.) then the addition product would not be aromatic.

But if the carbocation instead were to lose a proton from the site of electrophilic addition and form a substitution product (depicted as path 'b' in fig.) then the aromaticity of the benzene ring would be restored.



By-Dr.Rinky Kumari.  
Dept.of Chemistry.  
J.N.College,  
Madhubani.