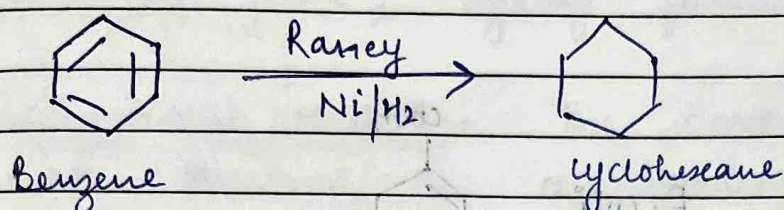
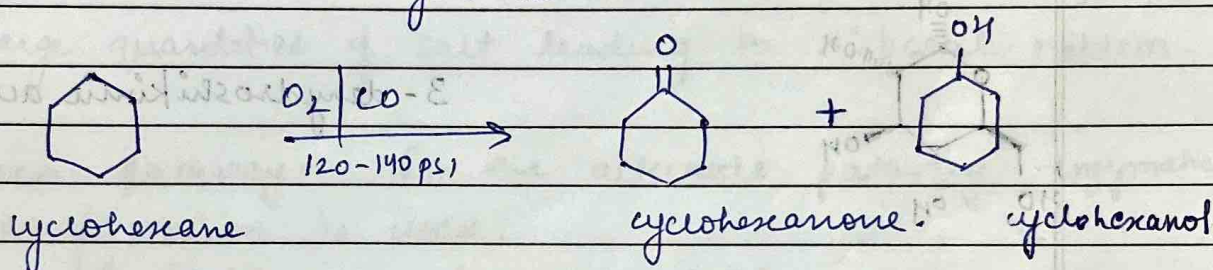


# SYNTHESIS OF BENZENE TO CYCLOHEXANE USING RANEY Ni & HYDROGEN.

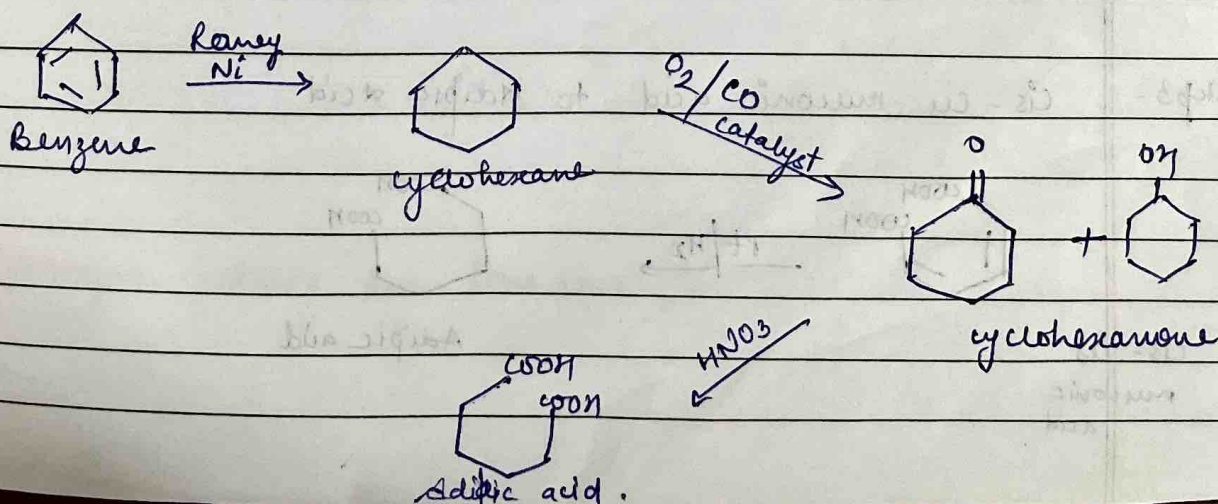
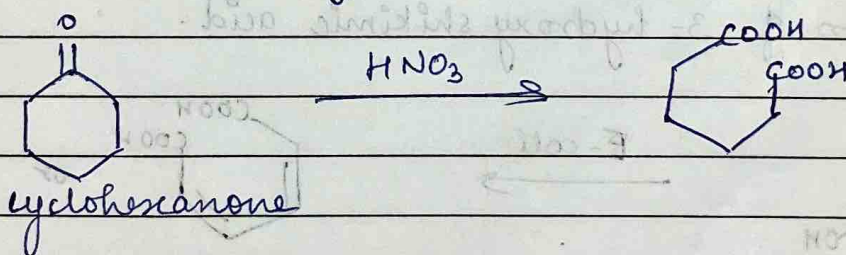
Step 1 → Reduction of Benzene to cyclohexane using Raney Ni & Hydrogen.



Step 2 → Oxidation of cyclohexane to cyclohexanone and cyclohexanol.



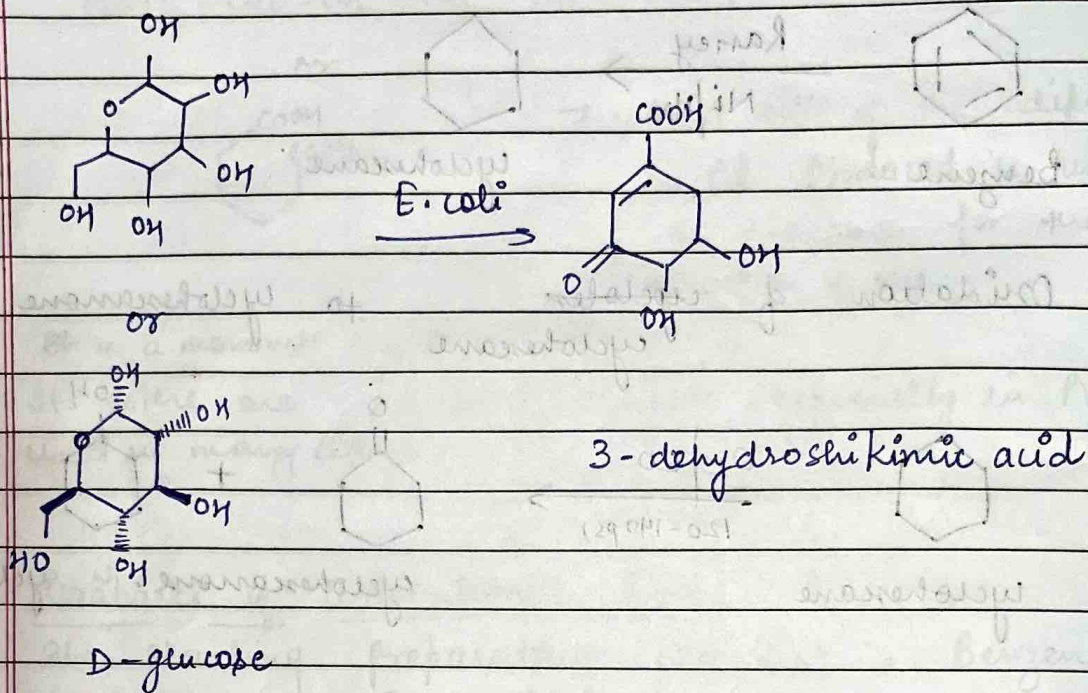
Step 3 → Oxidation of cyclohexanone to adipic acid.



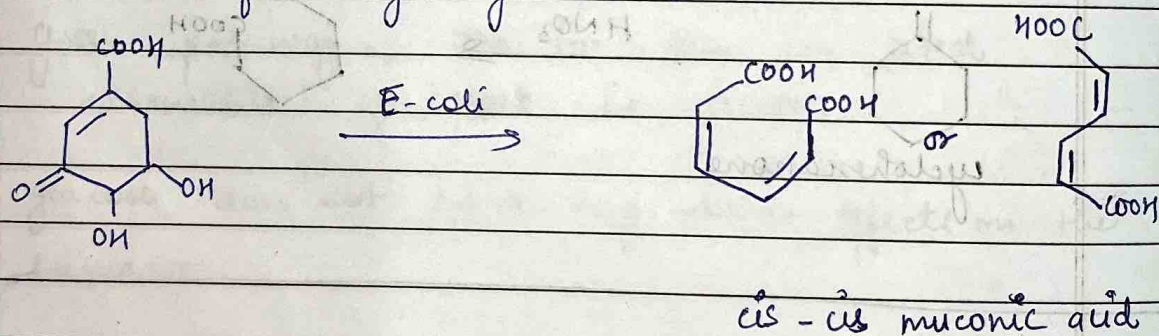


# SYNTHESIS OF ADIPIC ACID BY GREEN ROUTE +

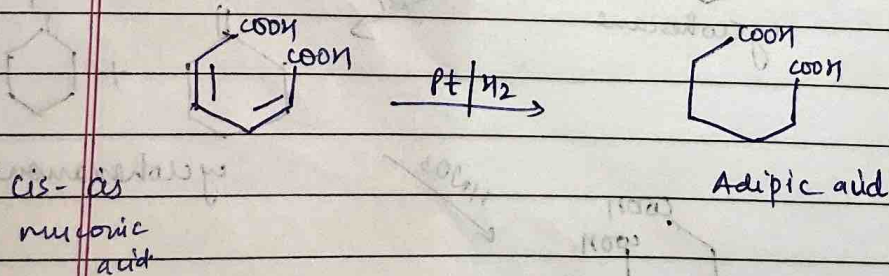
Step 1 Reduction of glucose by *Escherichia coli* (E-coli Bacteria)



Step 2. Reduction of 3-hydroxy shikimic acid.



Step 3 - cis - cis muconic acid to Adipic acid



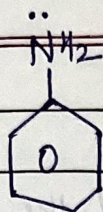


# SYNTHESIS OF INDIGO DYE BY CONVENTIONAL METHOD

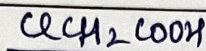
classmate

Date  
Page

METHOD

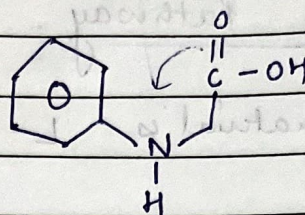


aniline



chloro  
acetic  
acid

-HCl

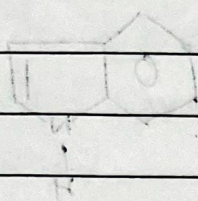


-NaOH

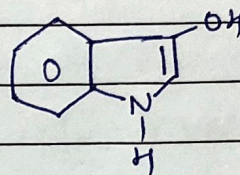
-NH<sub>2</sub>OH

NaNH<sub>2</sub> (sodium amide)

H-OH

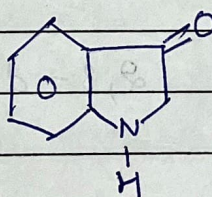
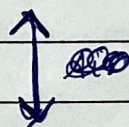
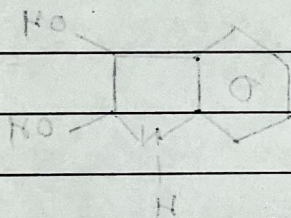


indole



+ NaOH + NH<sub>2</sub>OH

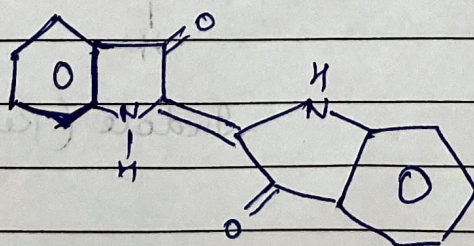
3-hydroxy Indole (enol form)



(keto form)

air (-H<sub>2</sub>O)

O<sub>2</sub> (80-90°C)

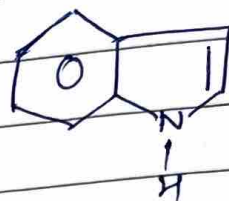
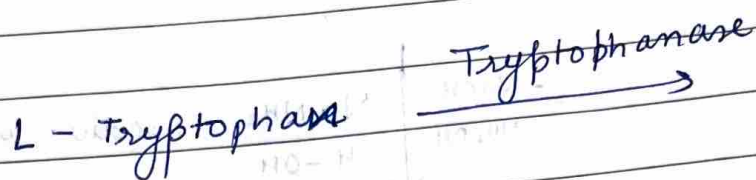


Indigo dye.

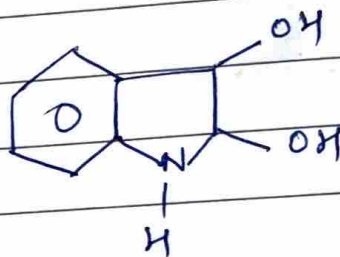
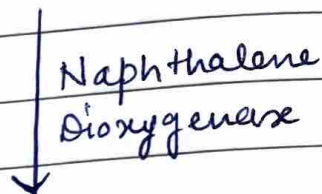


# greenes Pathway.

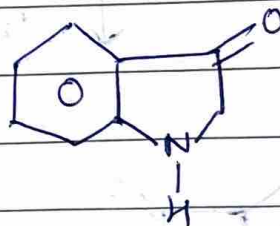
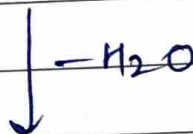
Starting material is L-tryptophan (one of the amino acid)



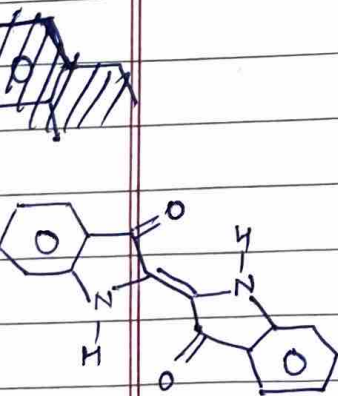
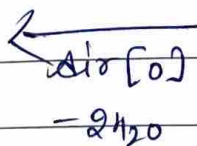
Indole



2,3-dihydroxy Indole



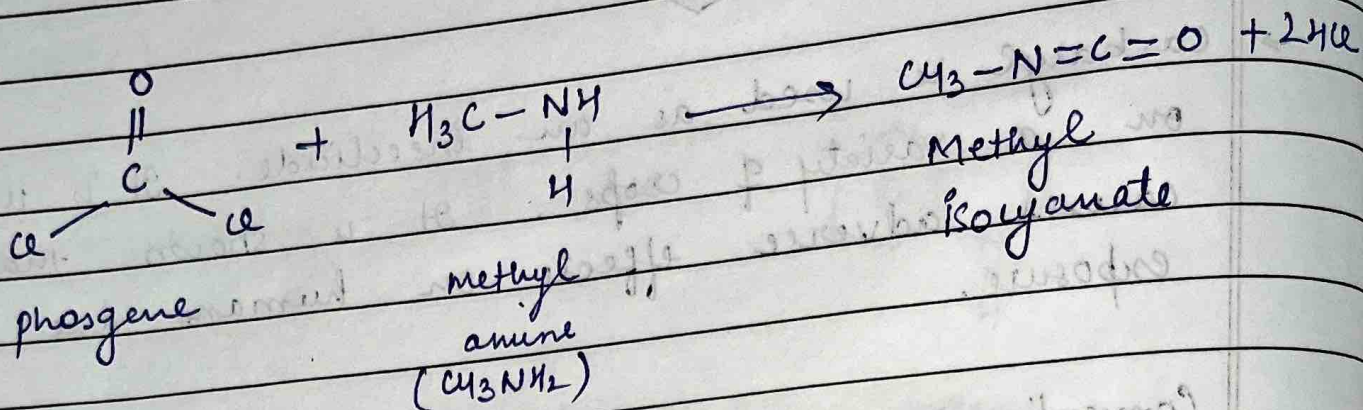
Indole (Keto form)



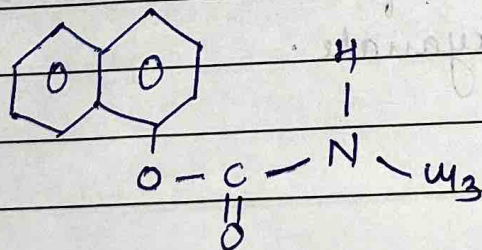
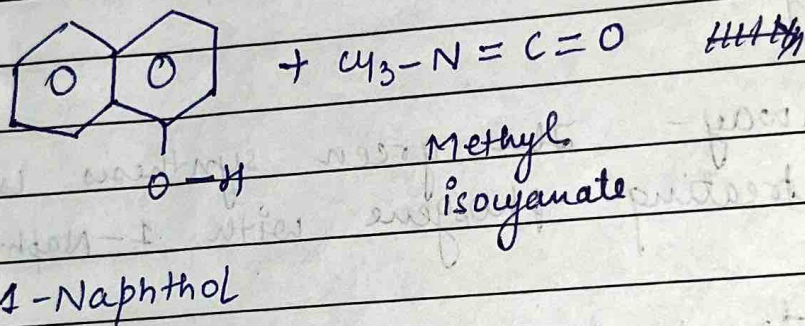
Indigo dye

# CONVENTIONAL ROUTE OF SYNTHESIS OF CARBARYL

Step 1



Step 2

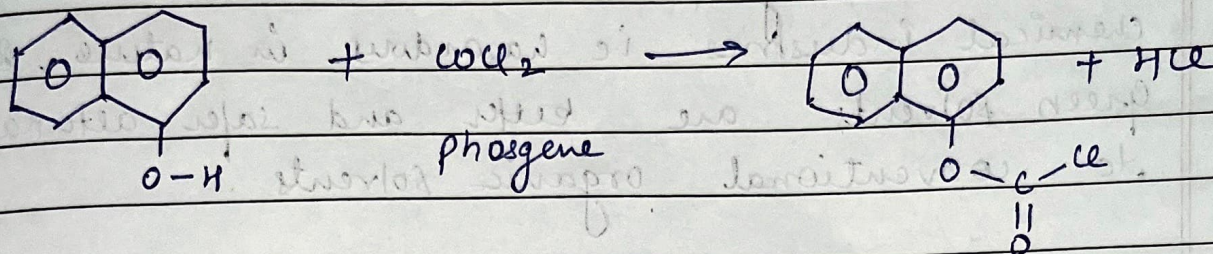


Carbaryl



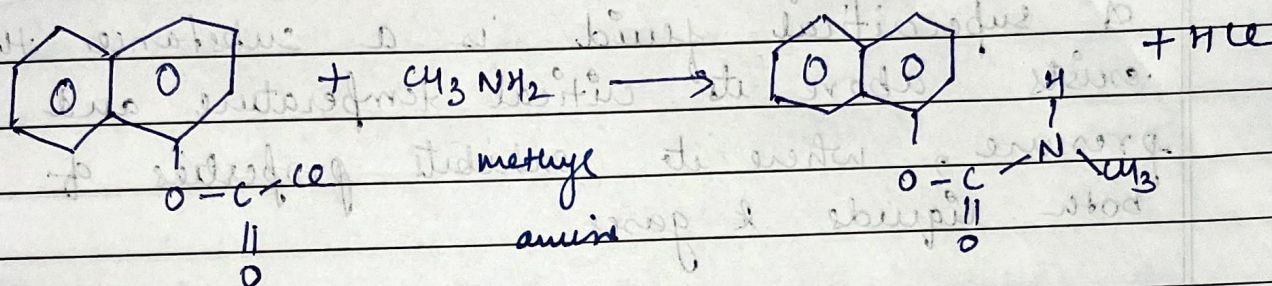
# GREENER ROUTE OF SYNTHESIS OF CARBARYL

step 1



1-Naphthalenyl chloroformate

step 2



Carbaryl

(1-Naphthalenyl Methyl carbamate)