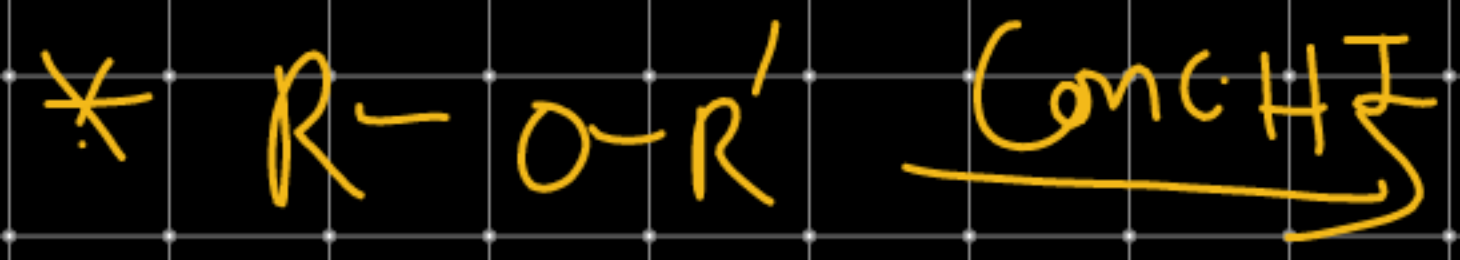
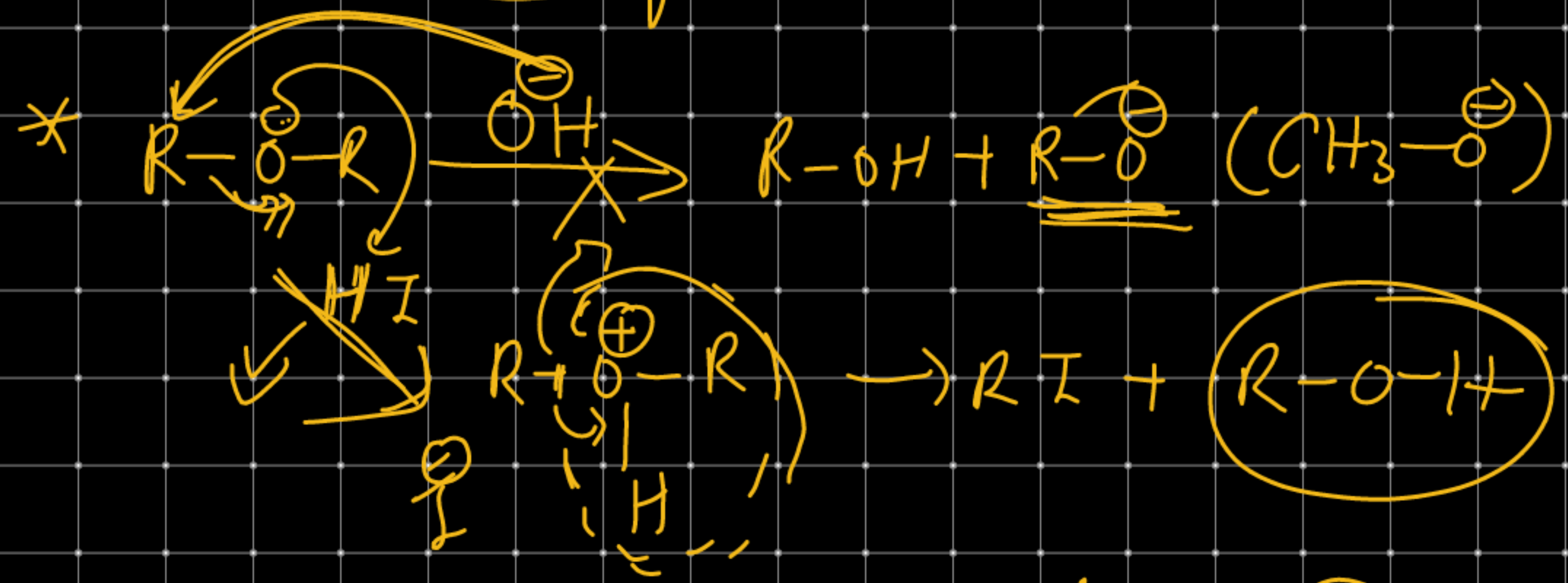
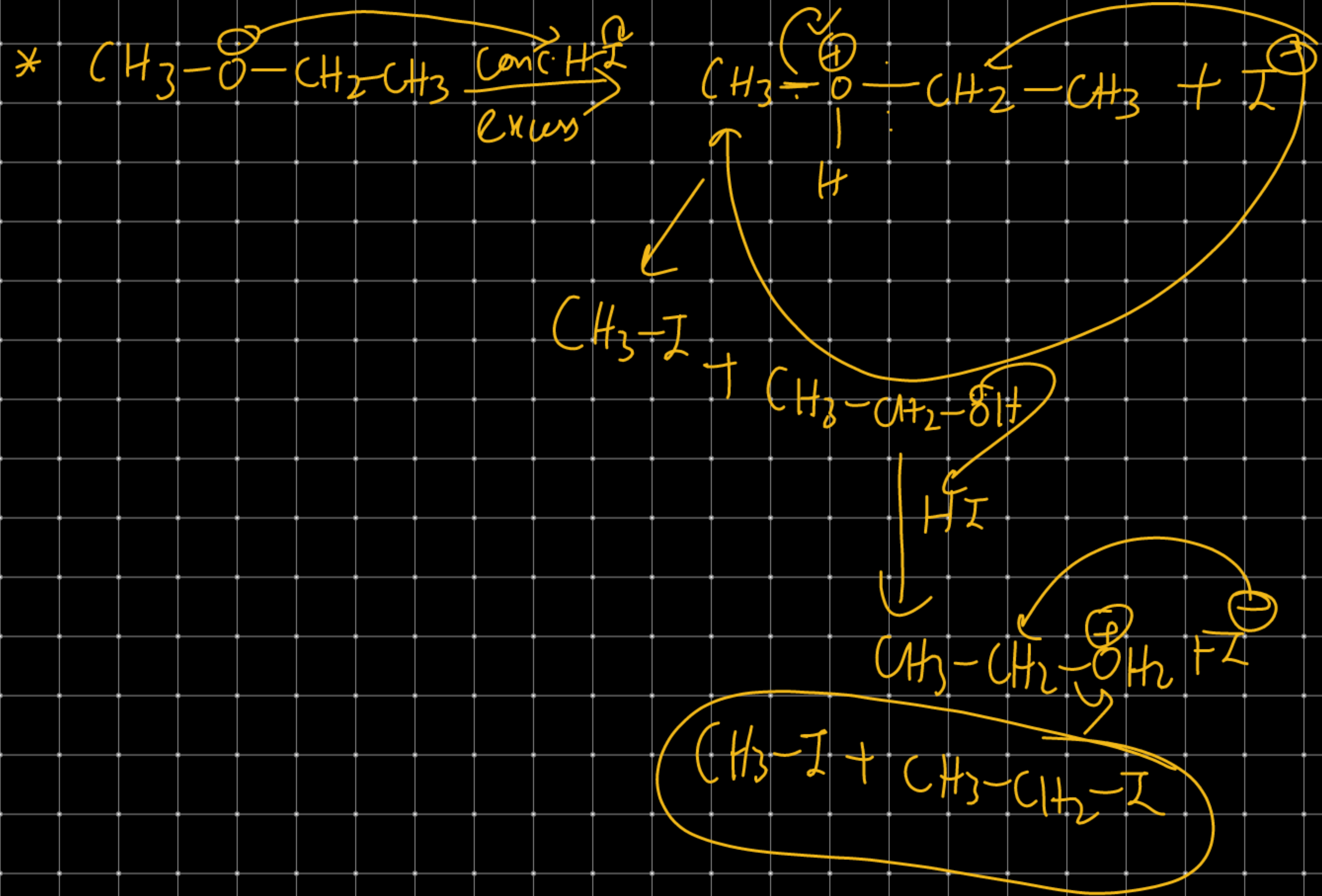


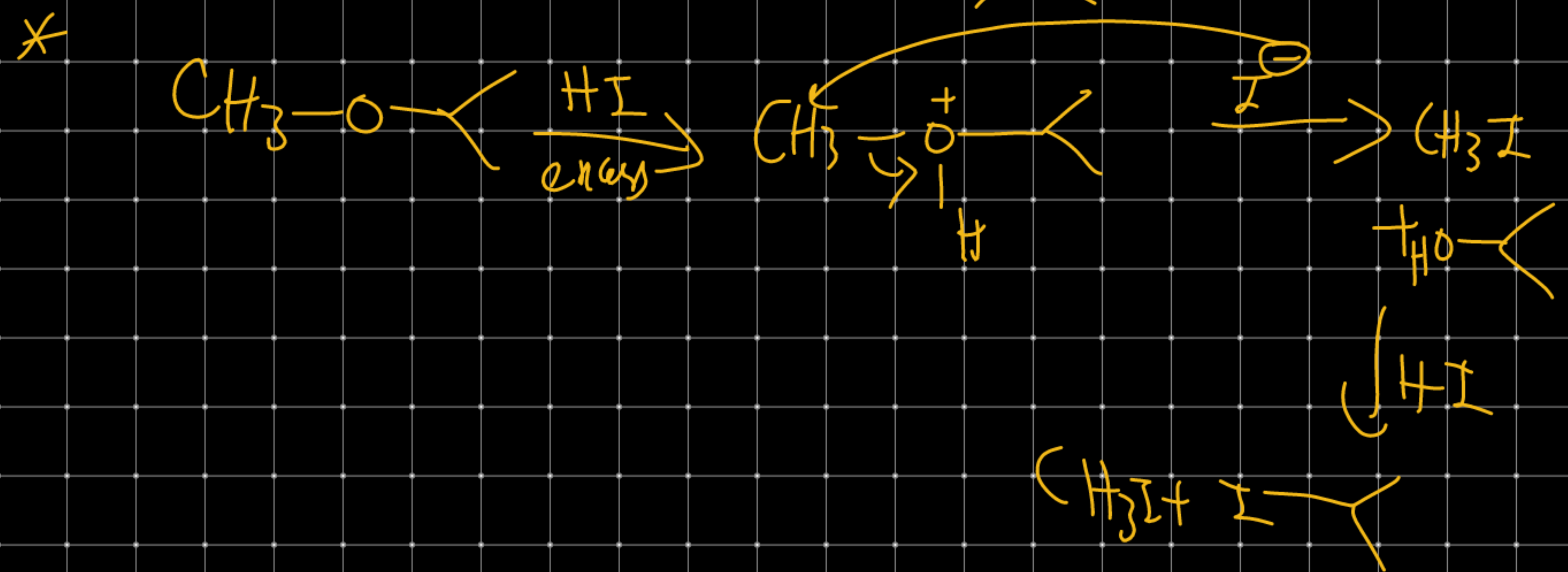
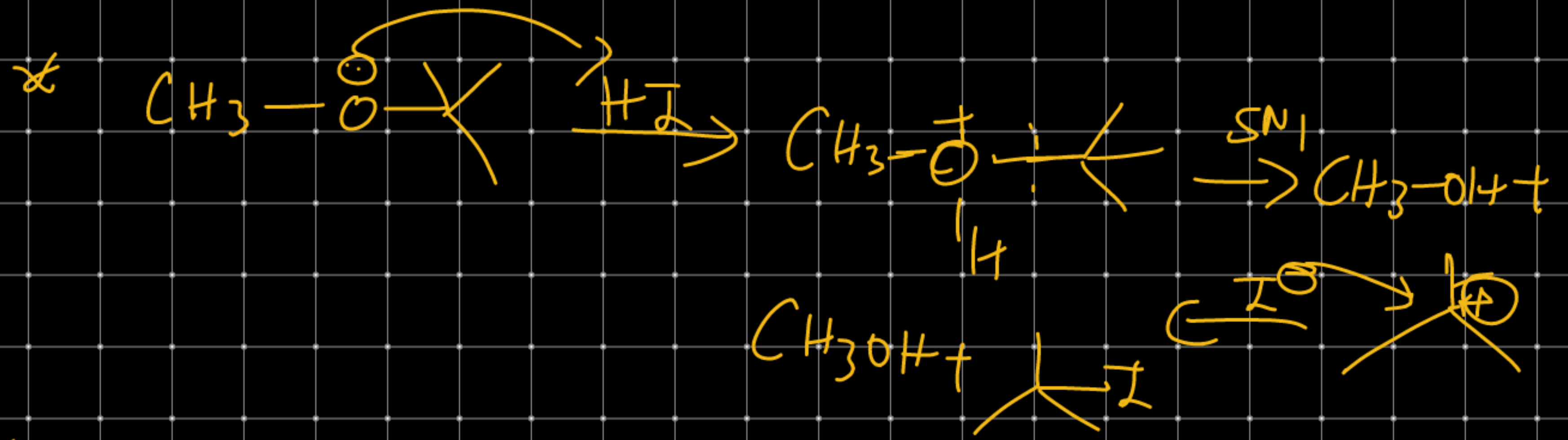
# Nucleophilic Substitution rxn of ether

## Rxn of ether with HI

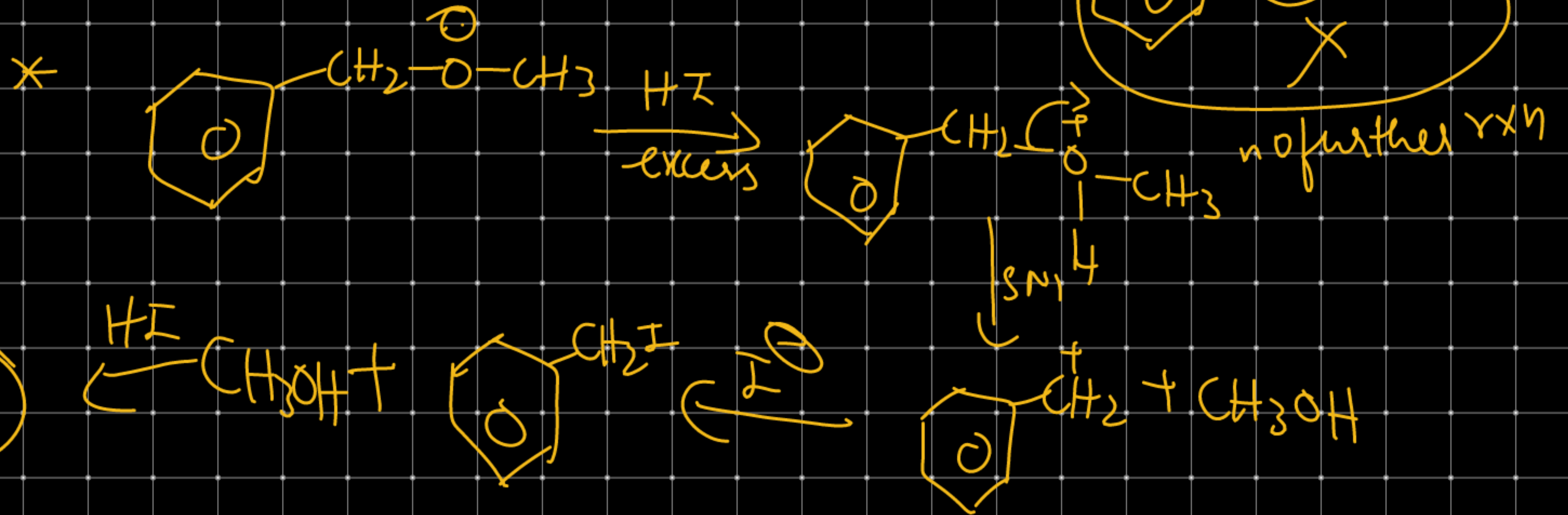
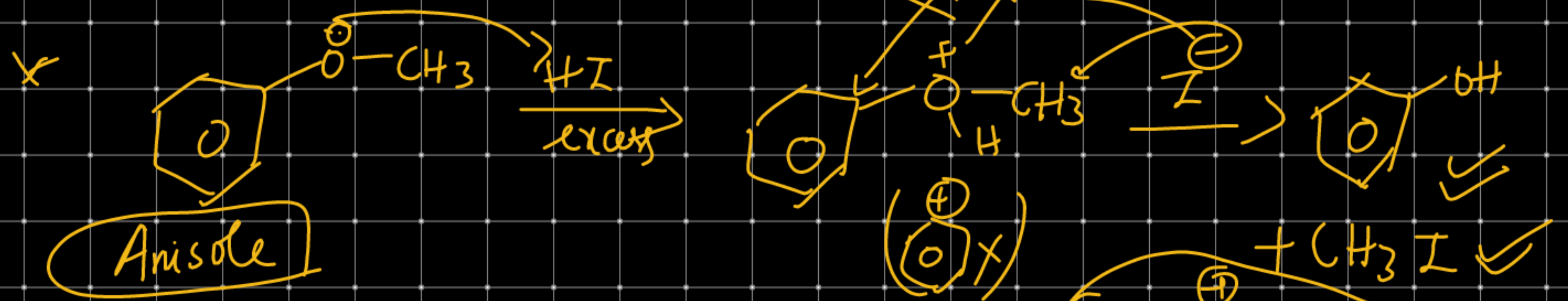


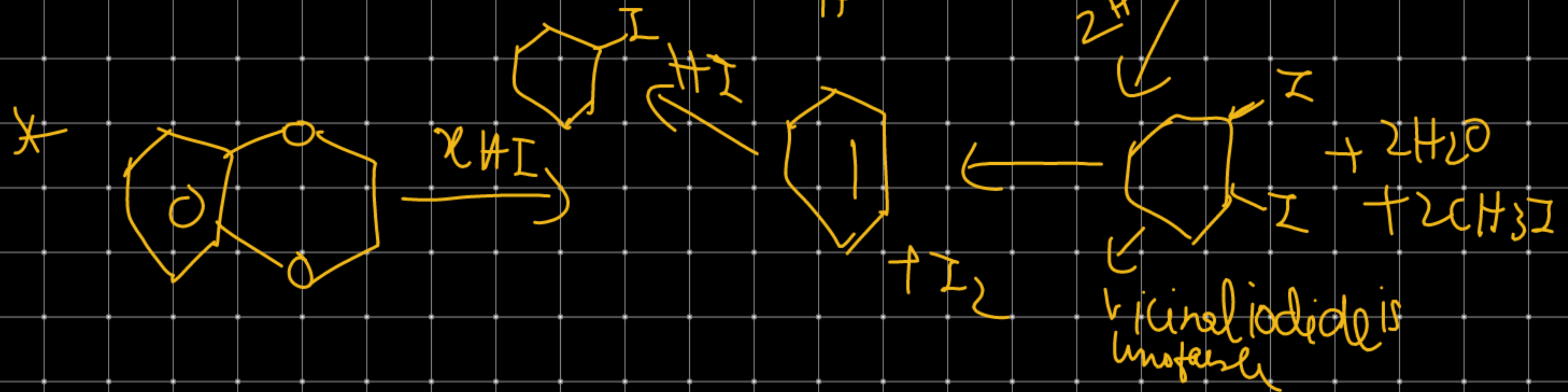
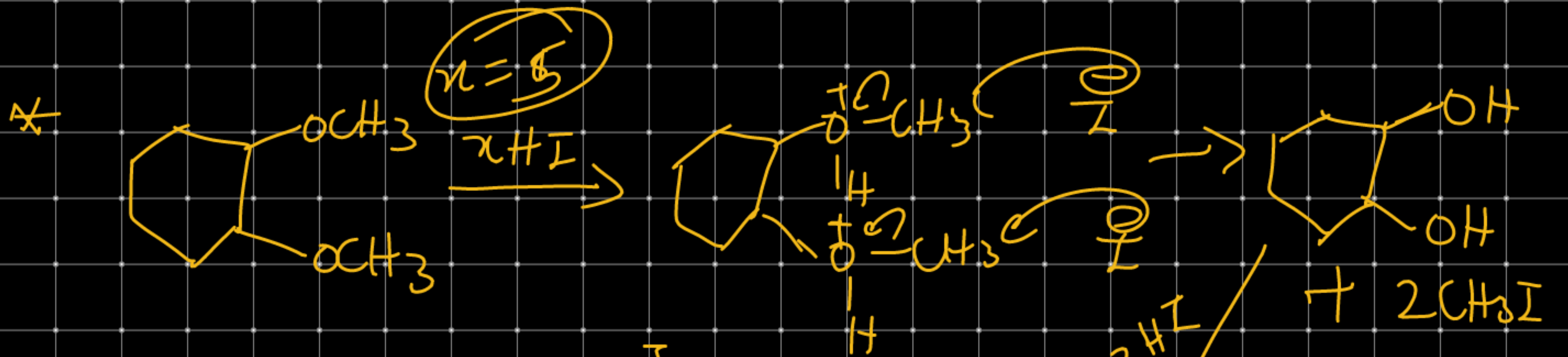
if any of  $R$  &  $R'$  is  $3^\circ$  alkyl group or form resonance stabilised carbocation  
 When  $LiCl$  is removed then rxn is by  $SN_1$  mechanism otherwise by  $SN_2$

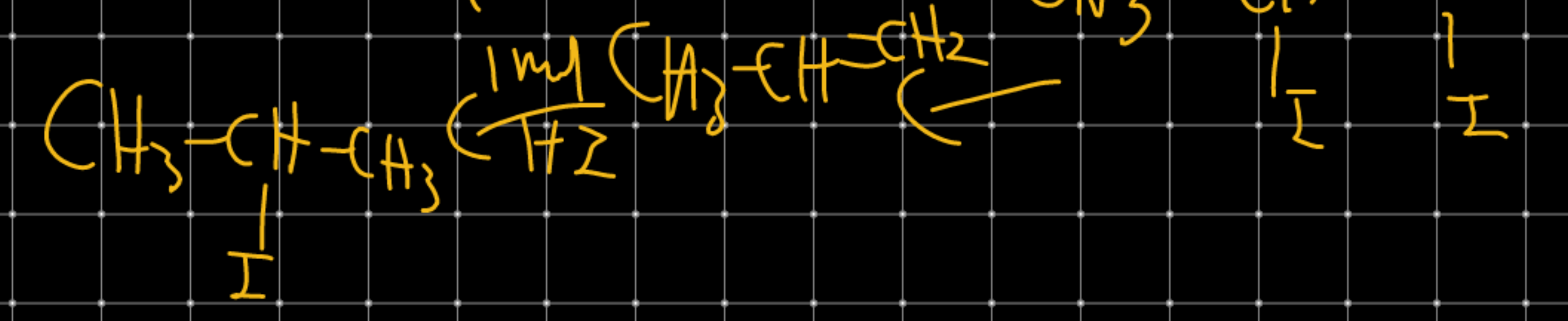
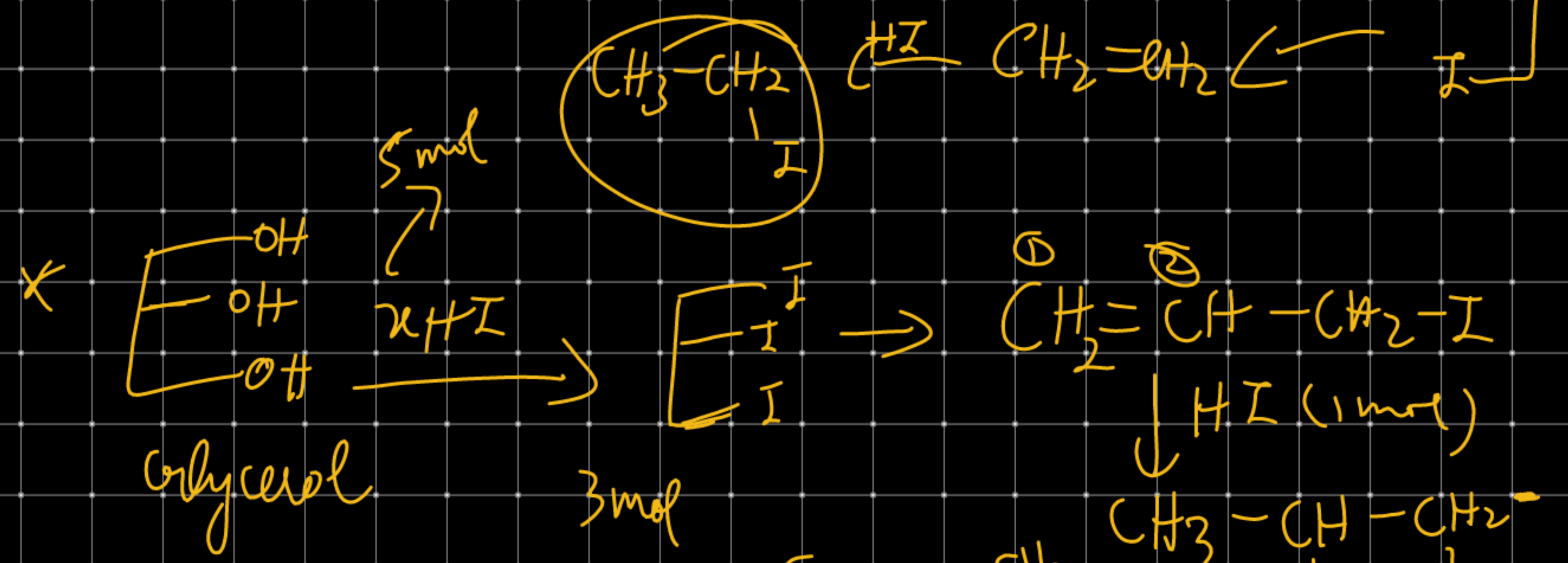
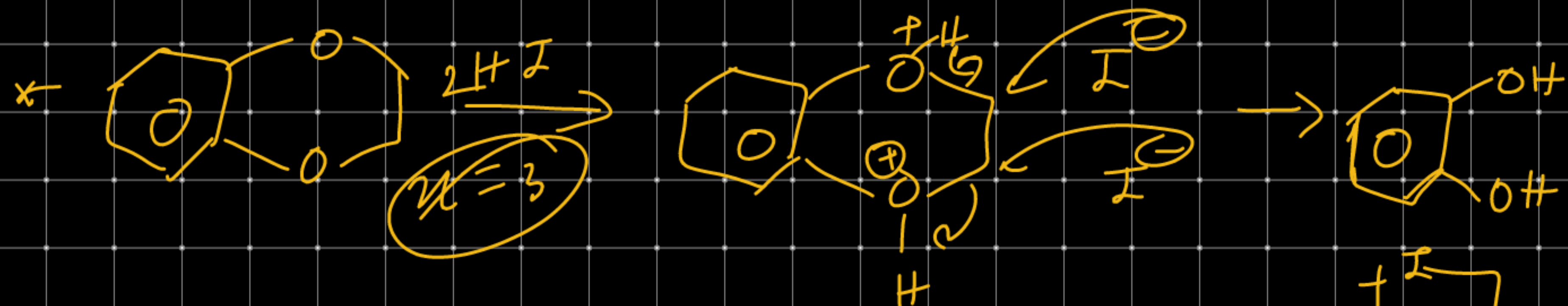






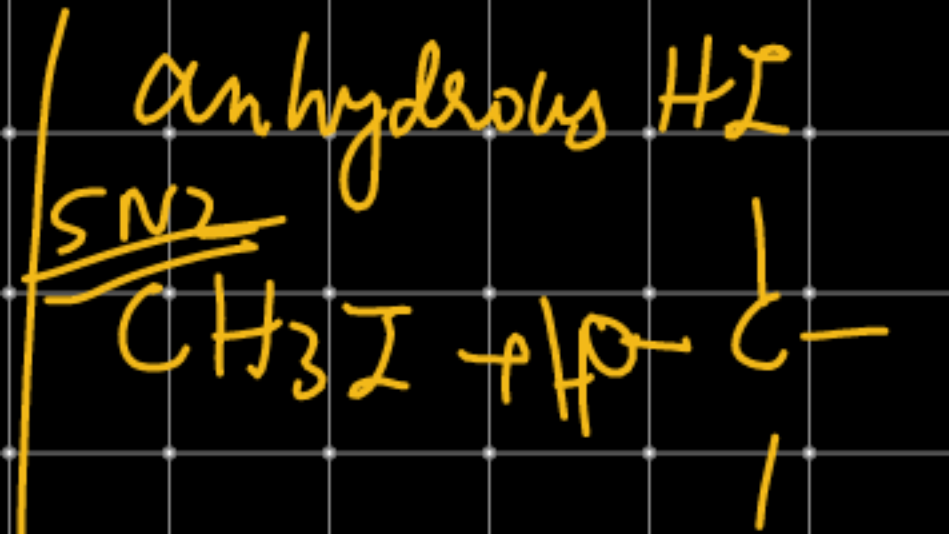
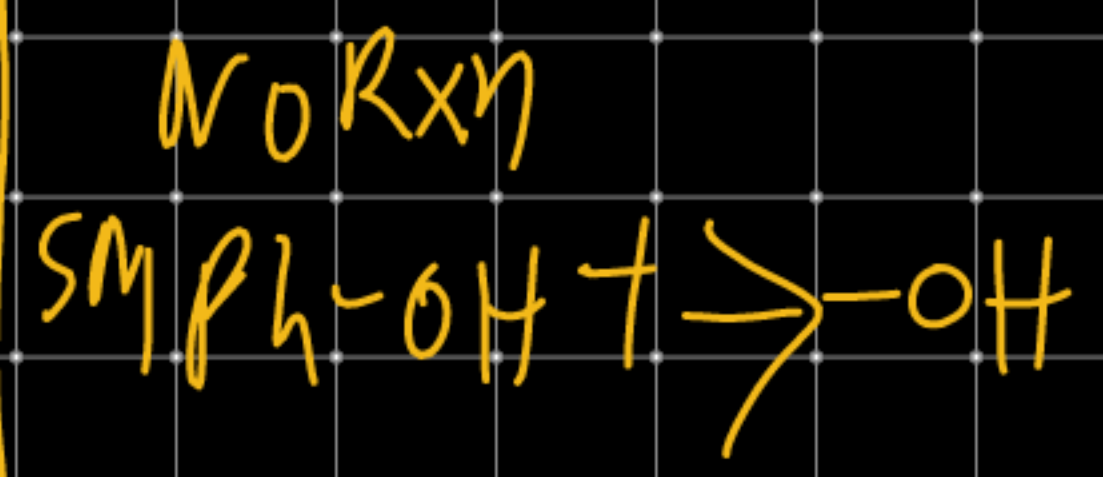
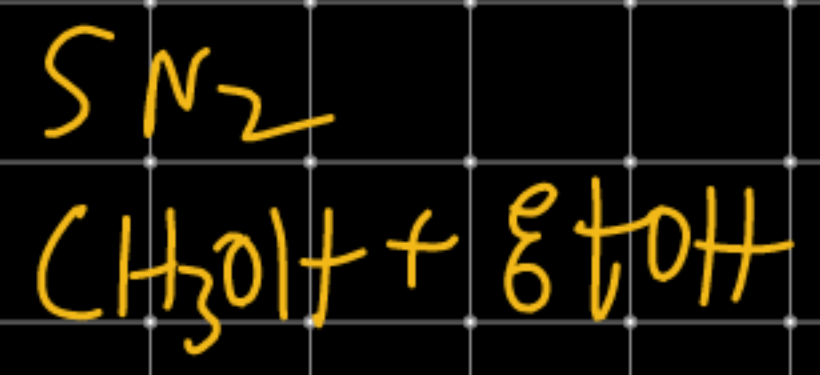
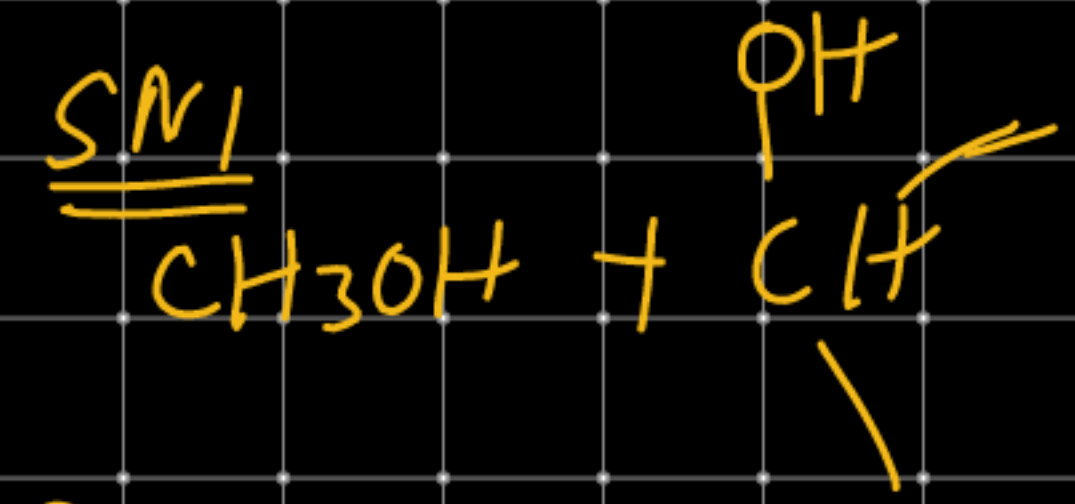
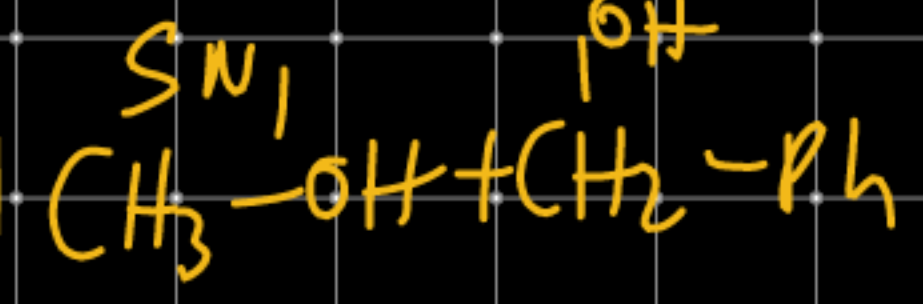
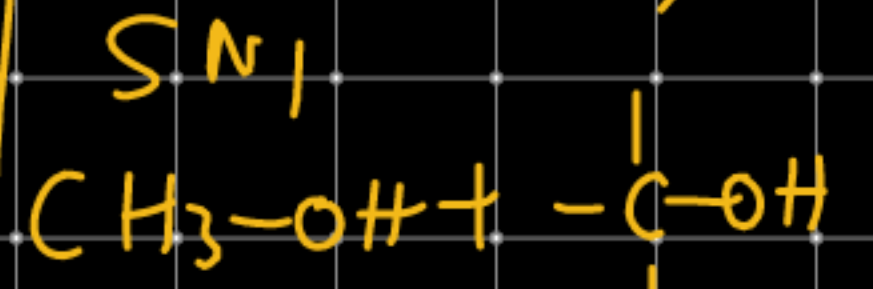
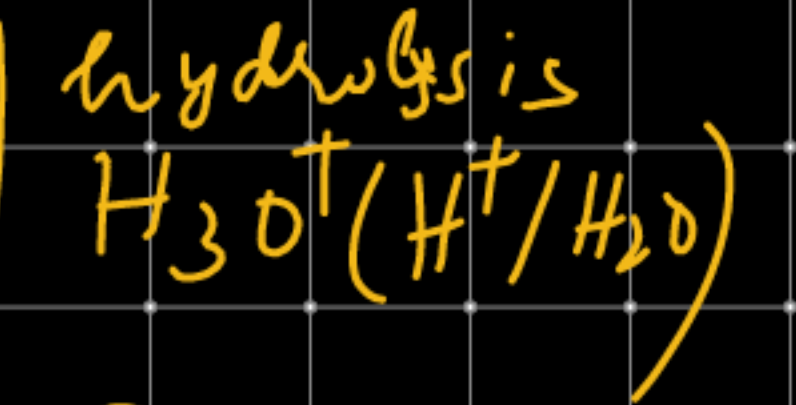
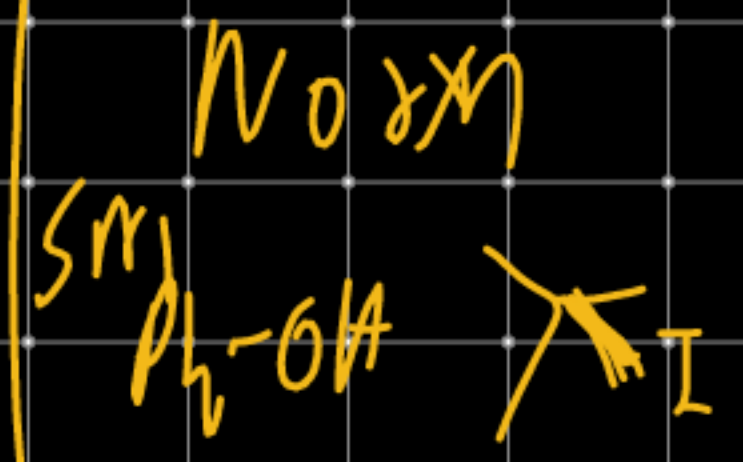
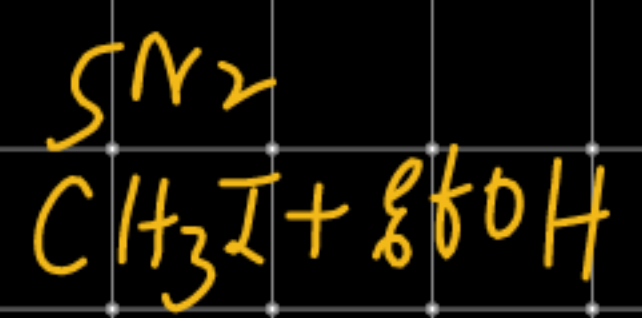
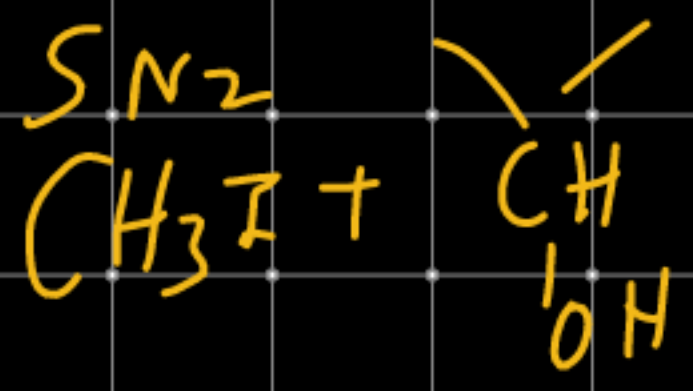
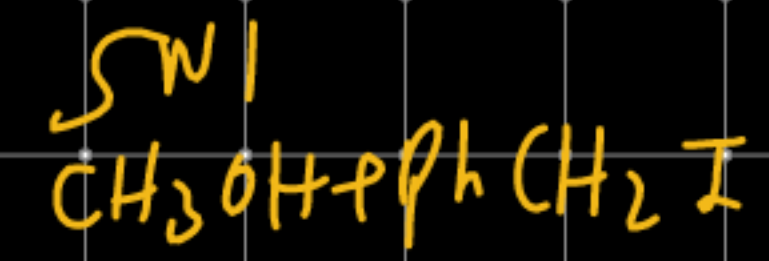
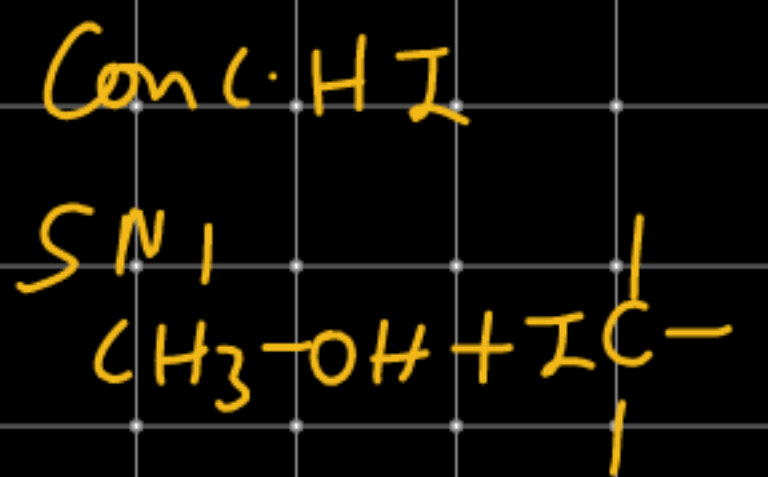
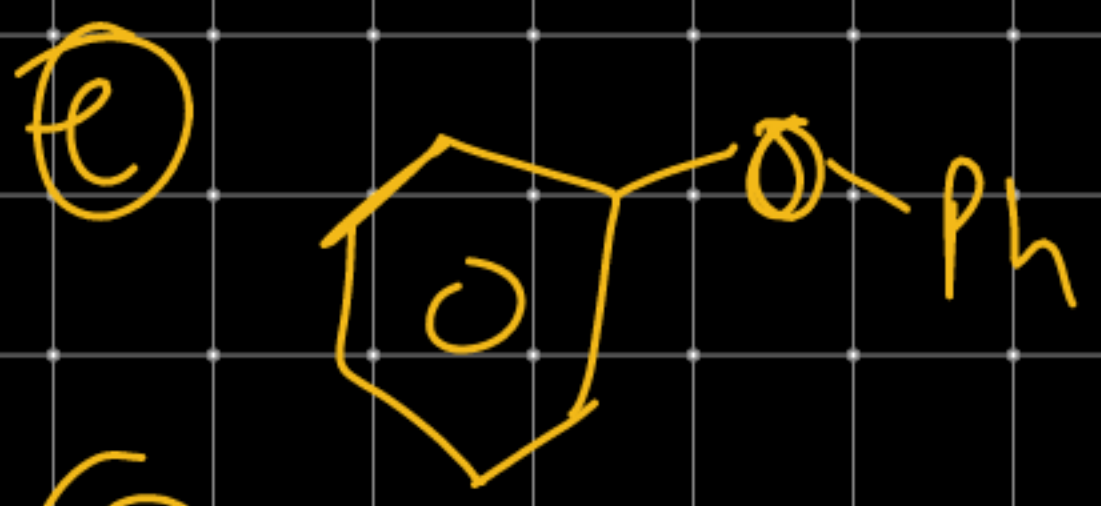
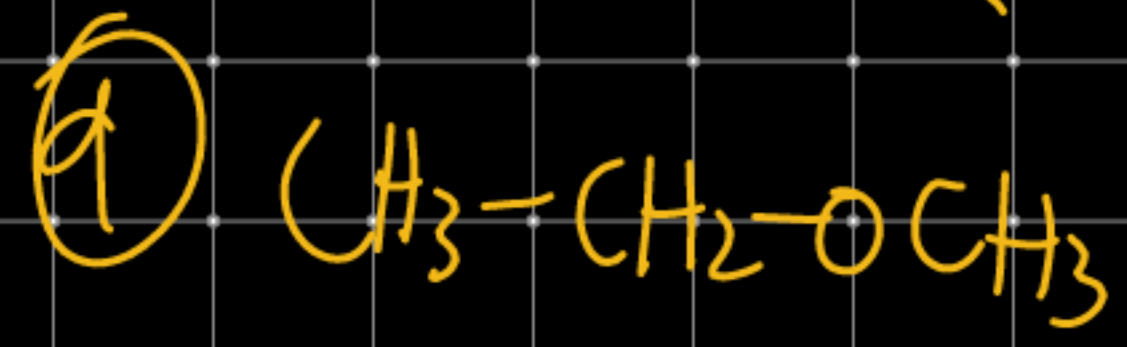
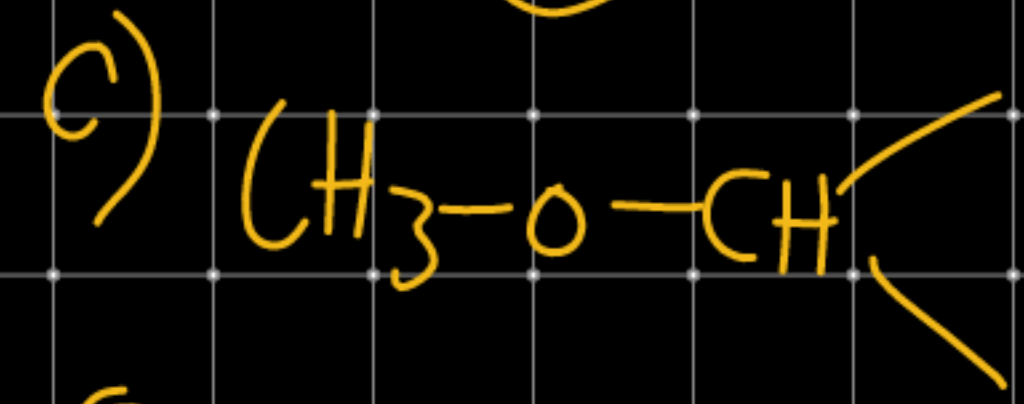
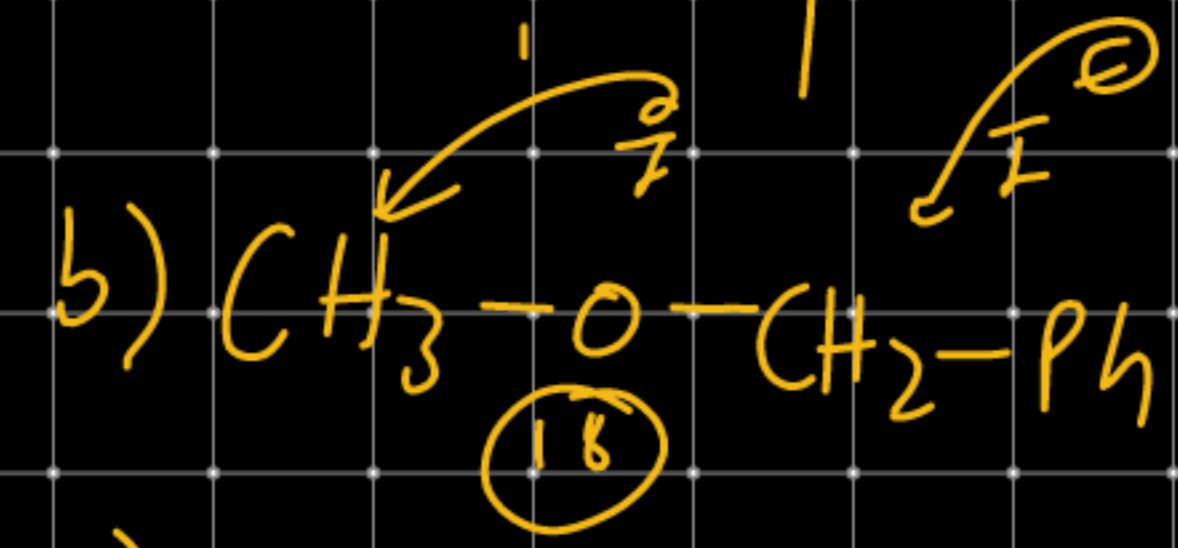
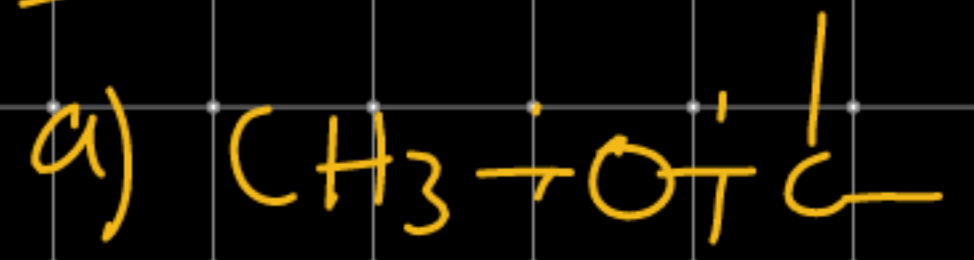








Ether



$\text{SN}_2$

$\text{SN}_2$   
 Same as 1

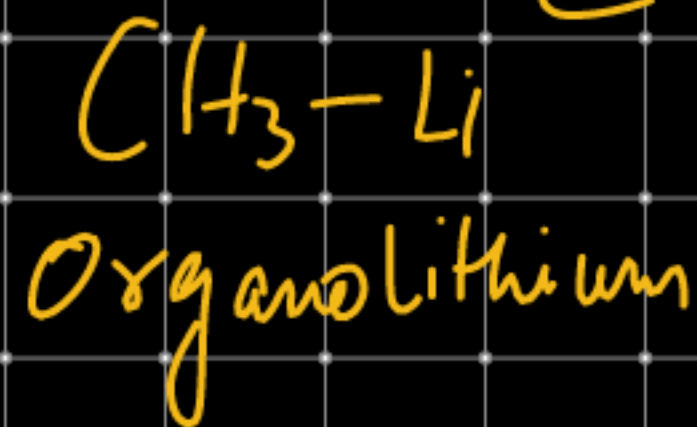
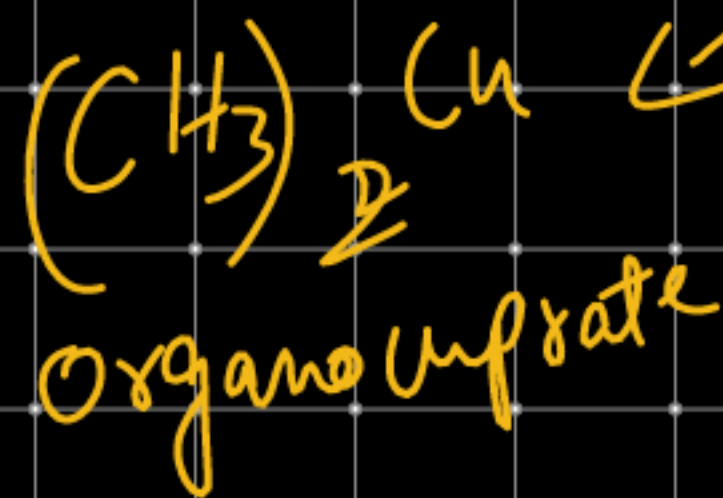
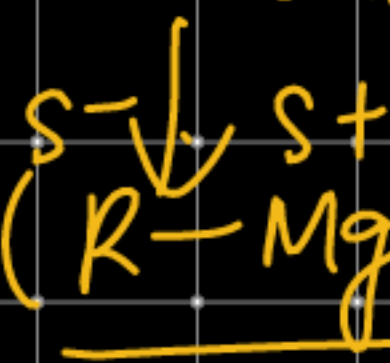
$\text{SN}_2$   
 Same as  $\text{SN}_1$

No rxn

No rxn

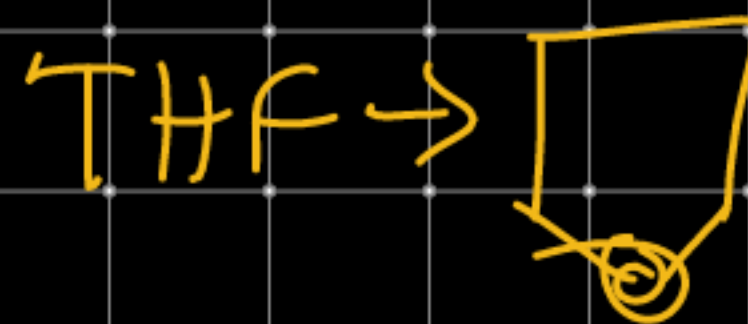
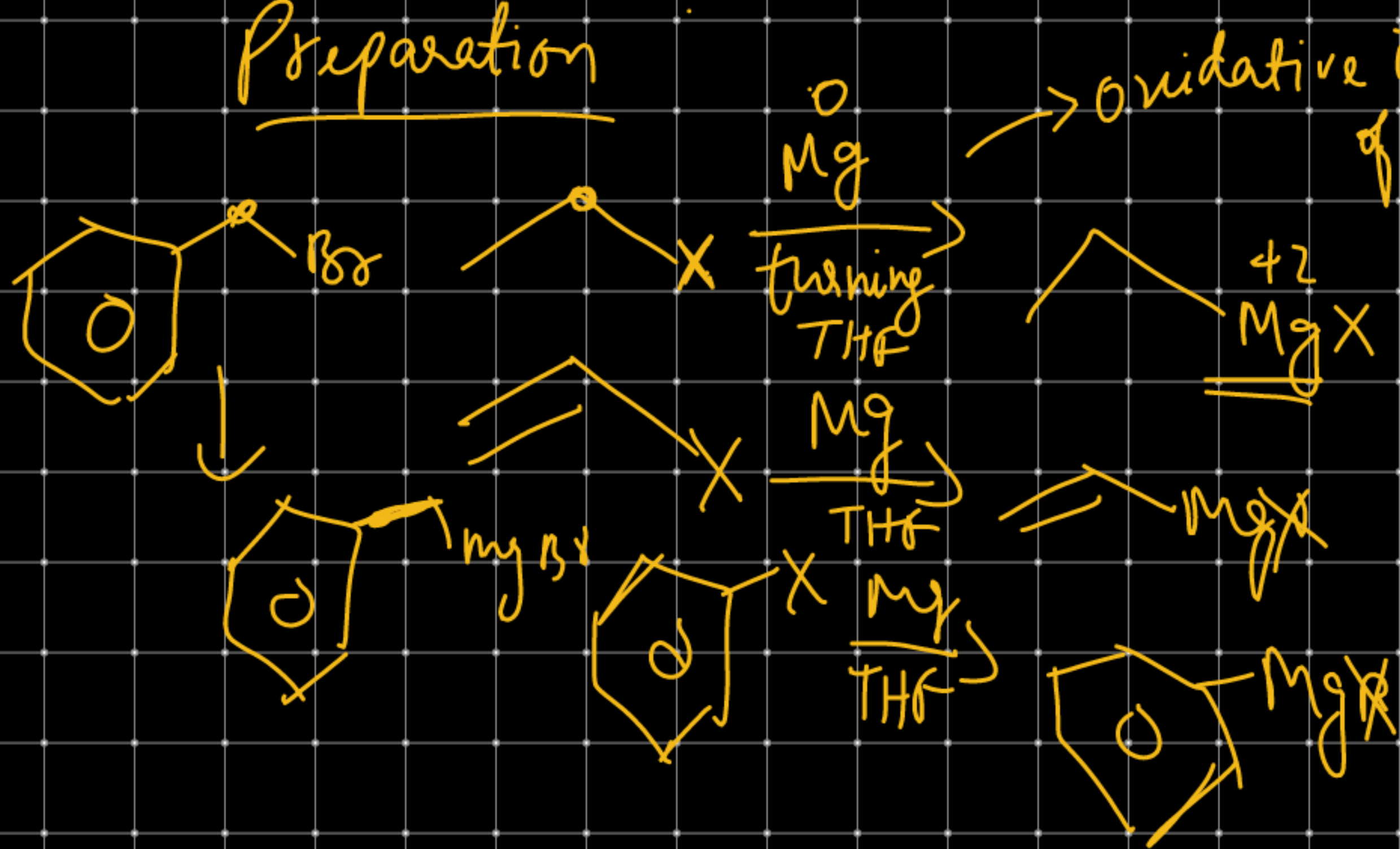
# Organometallic Compounds

covalent (high ionic character)



ionic bond  
Mg & X

## Preparation

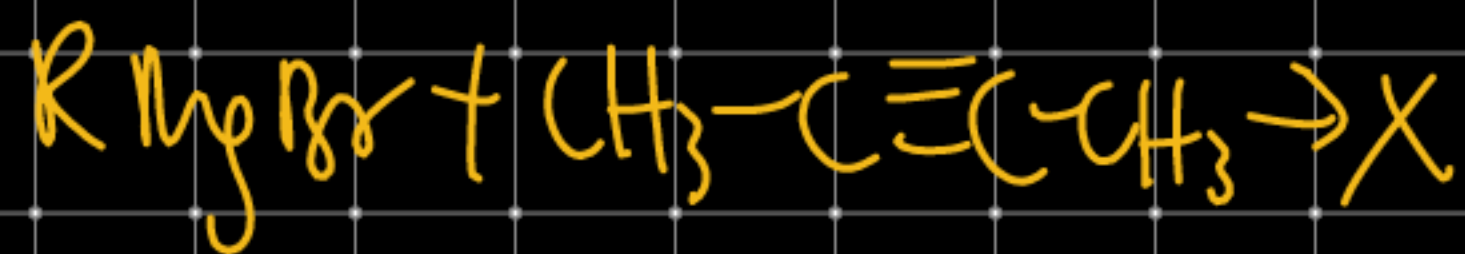
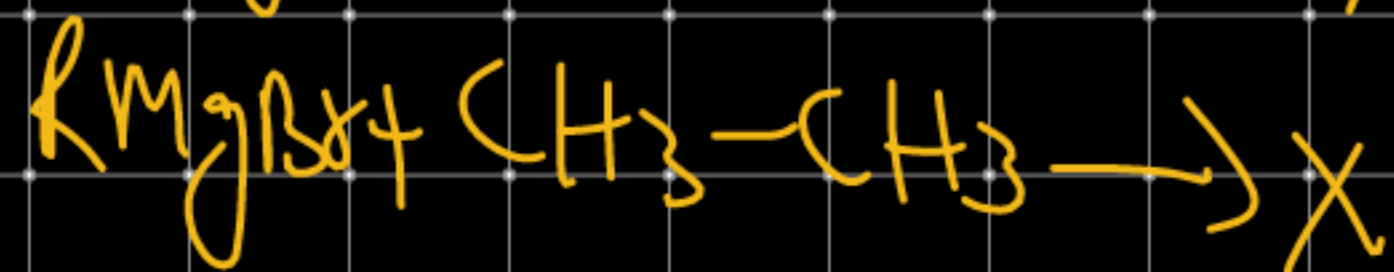
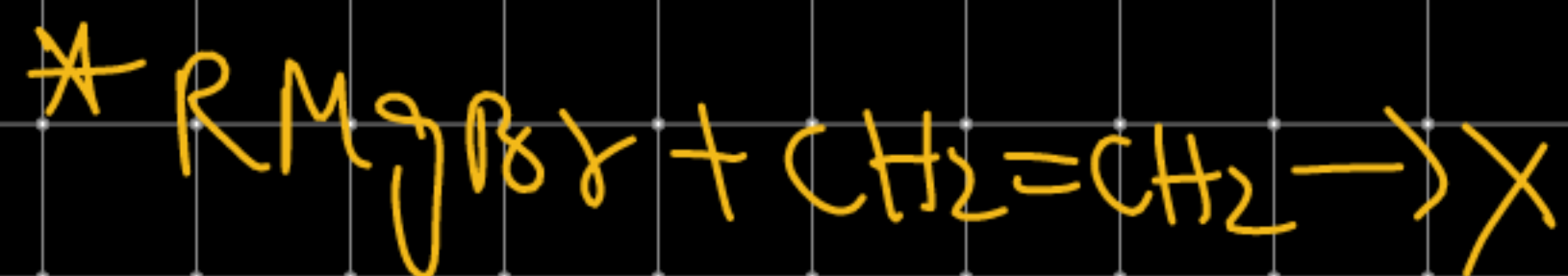
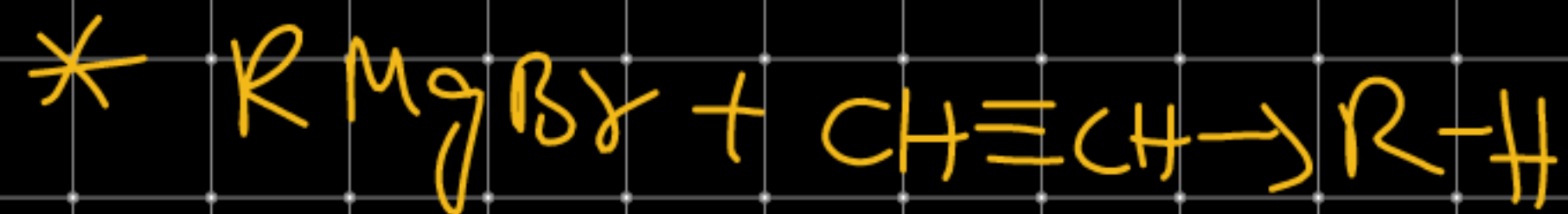
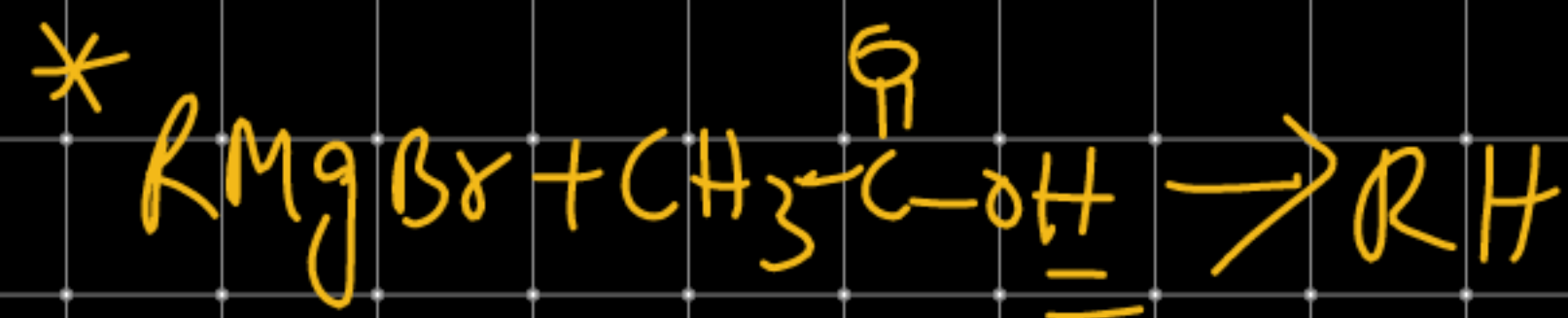
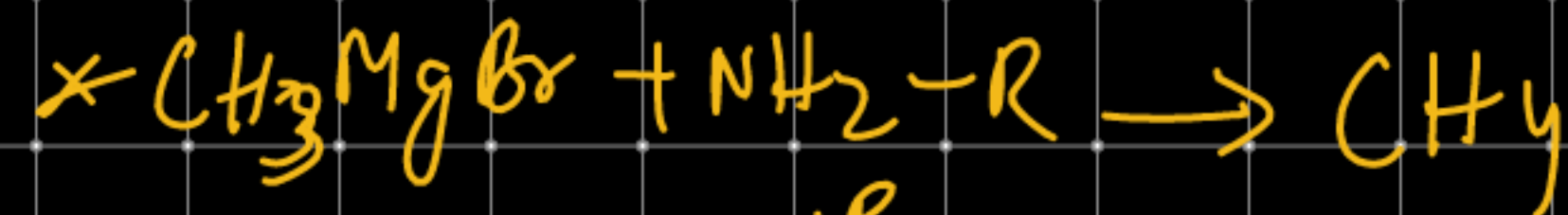
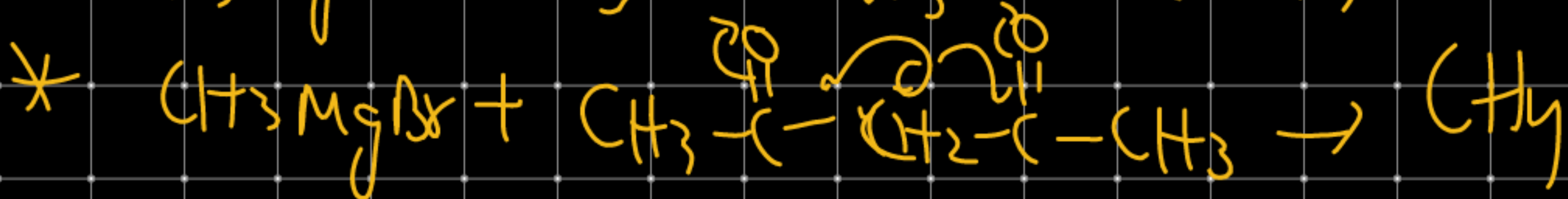
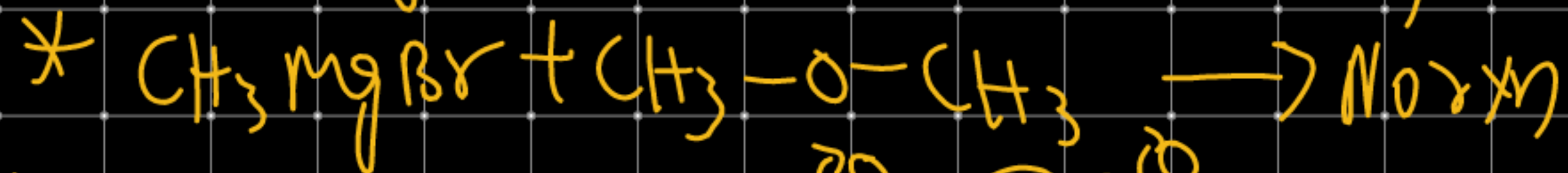
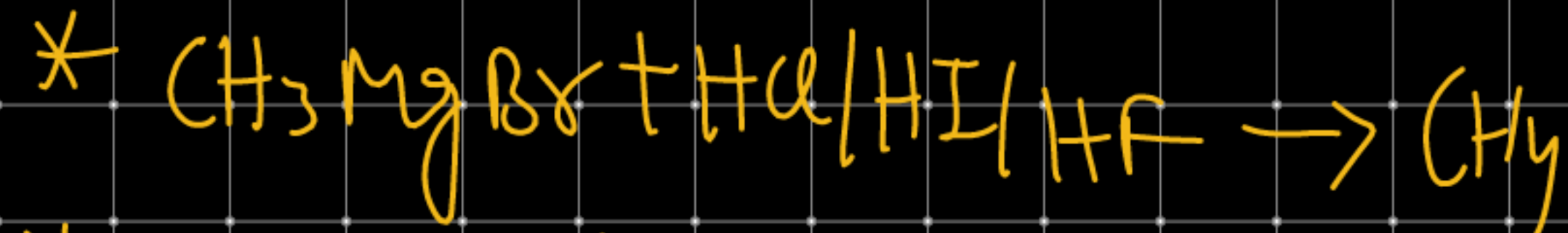
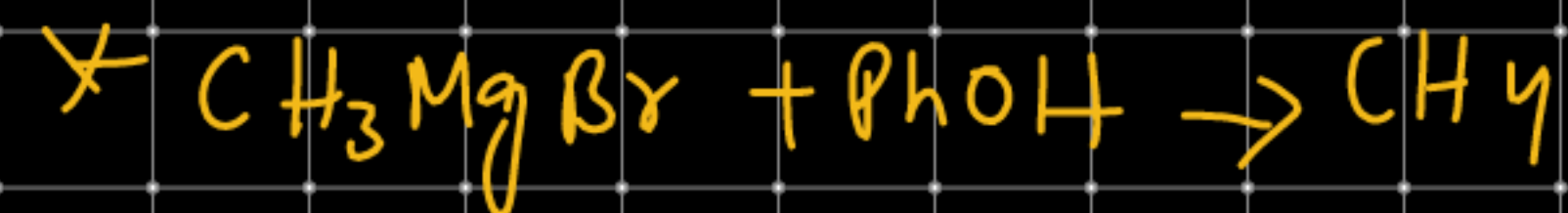
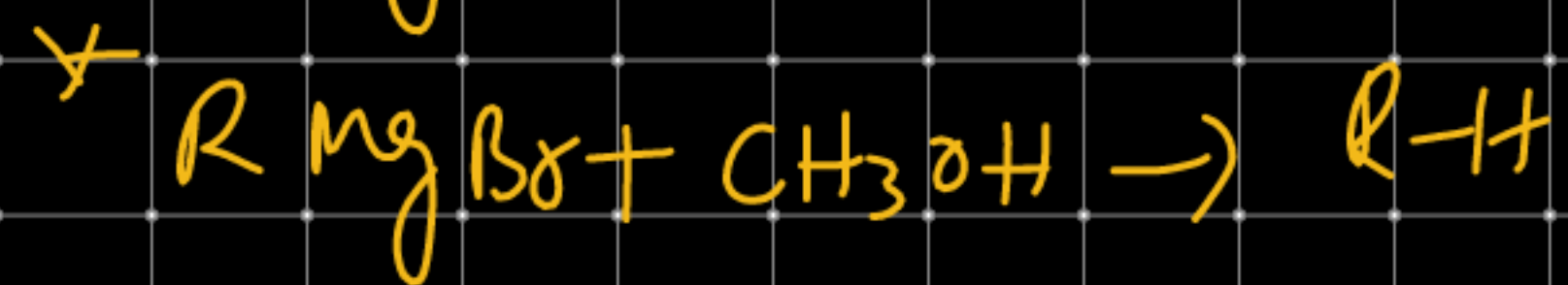
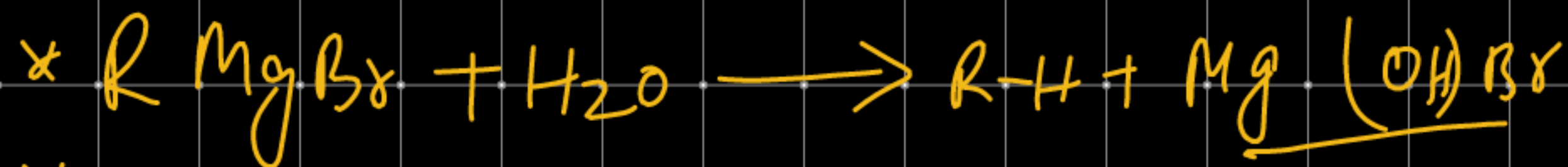


Rate of Grignard formation  
 $R-I > R-Br > R-Cl > R-F$

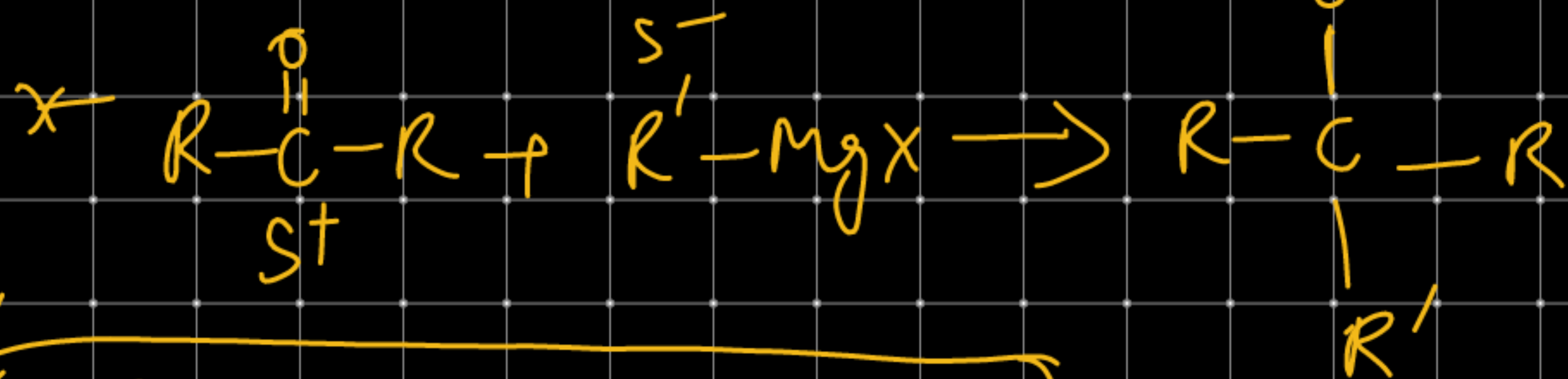
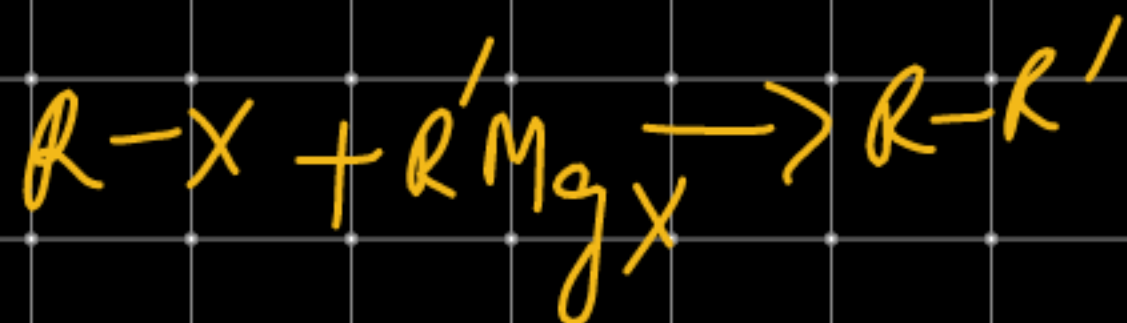
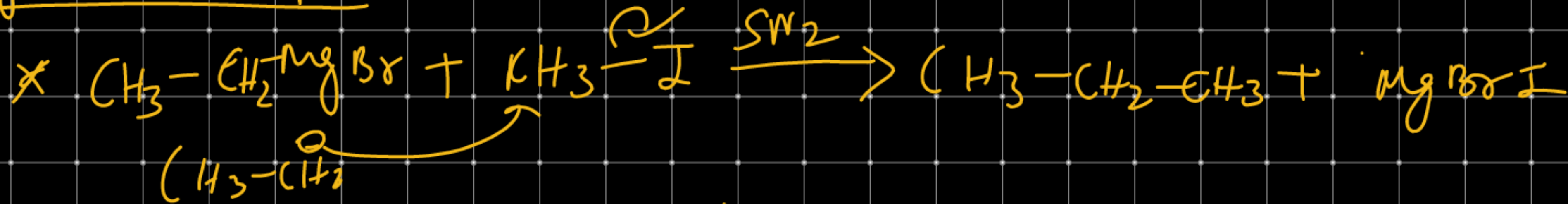
on the basis of C-X bond strength.



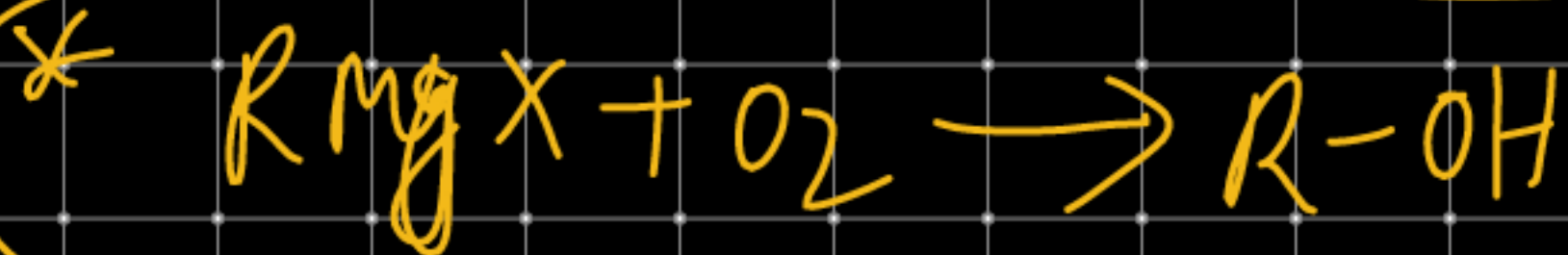
Grignard as Base  $\rightarrow$  will react with any acidic H (H attached - O, N, F)



## Grignard as a Nucleophile

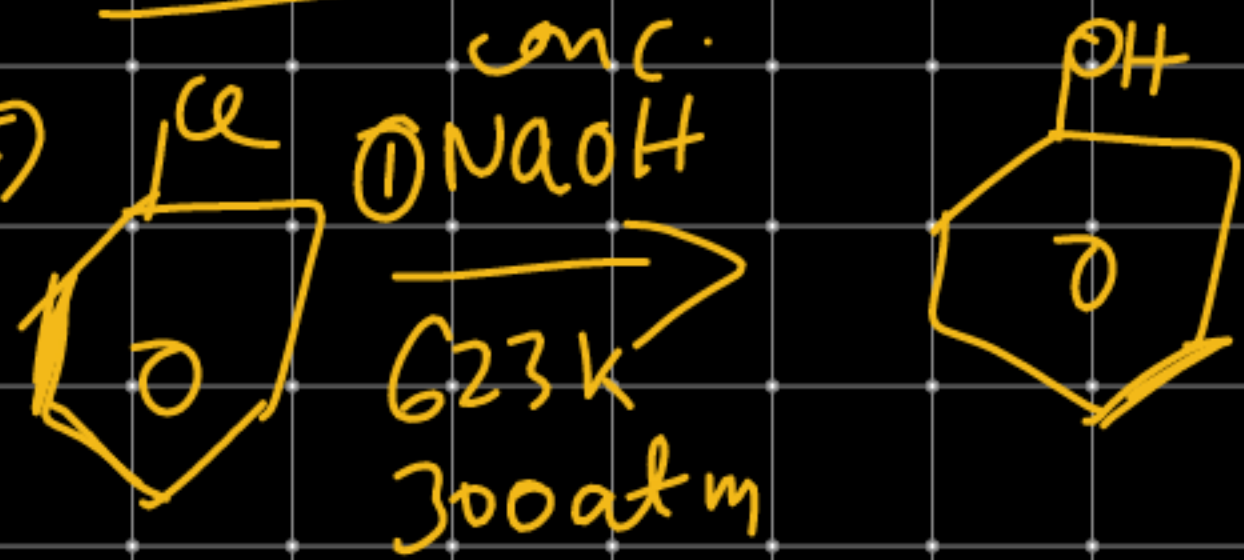


Remember



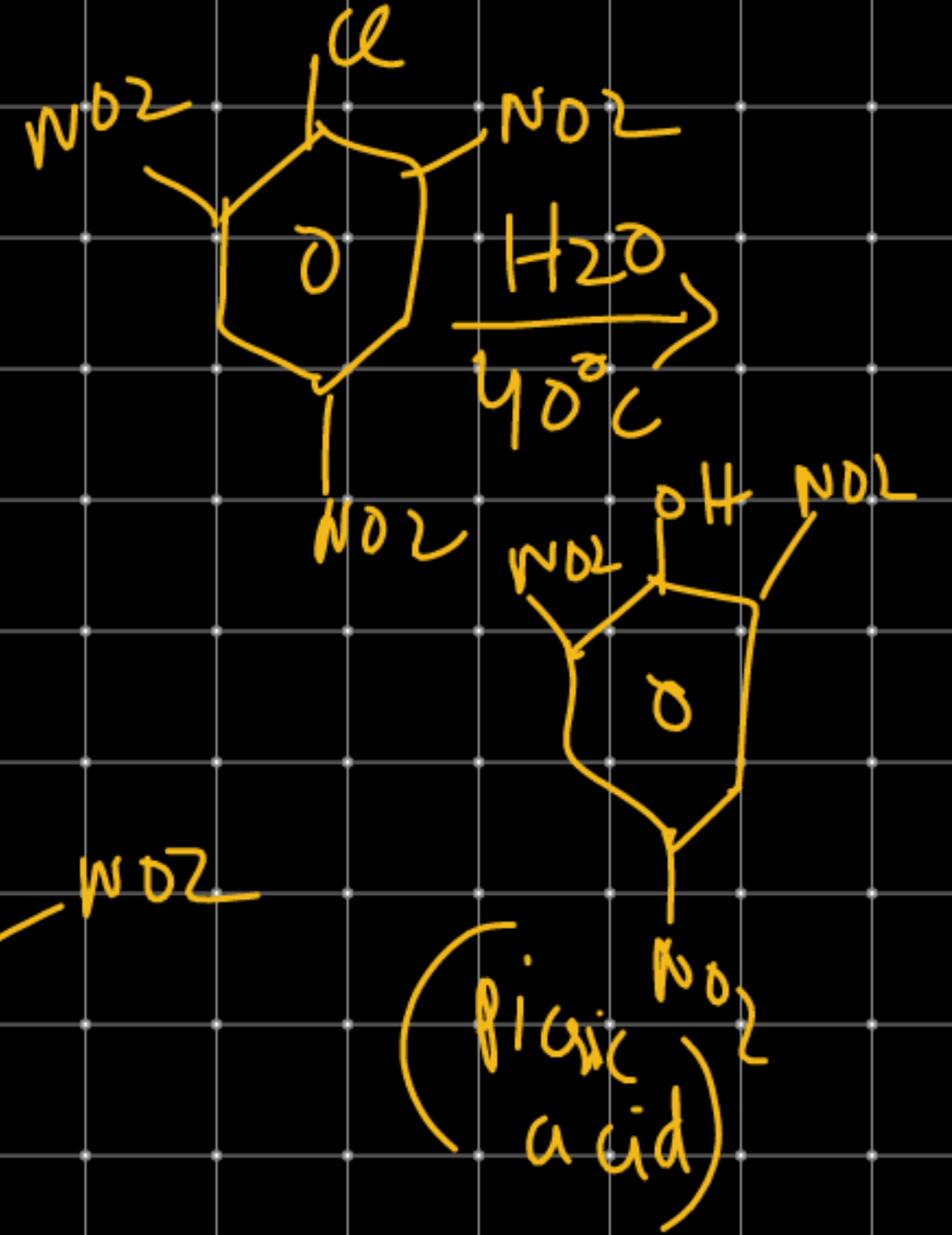
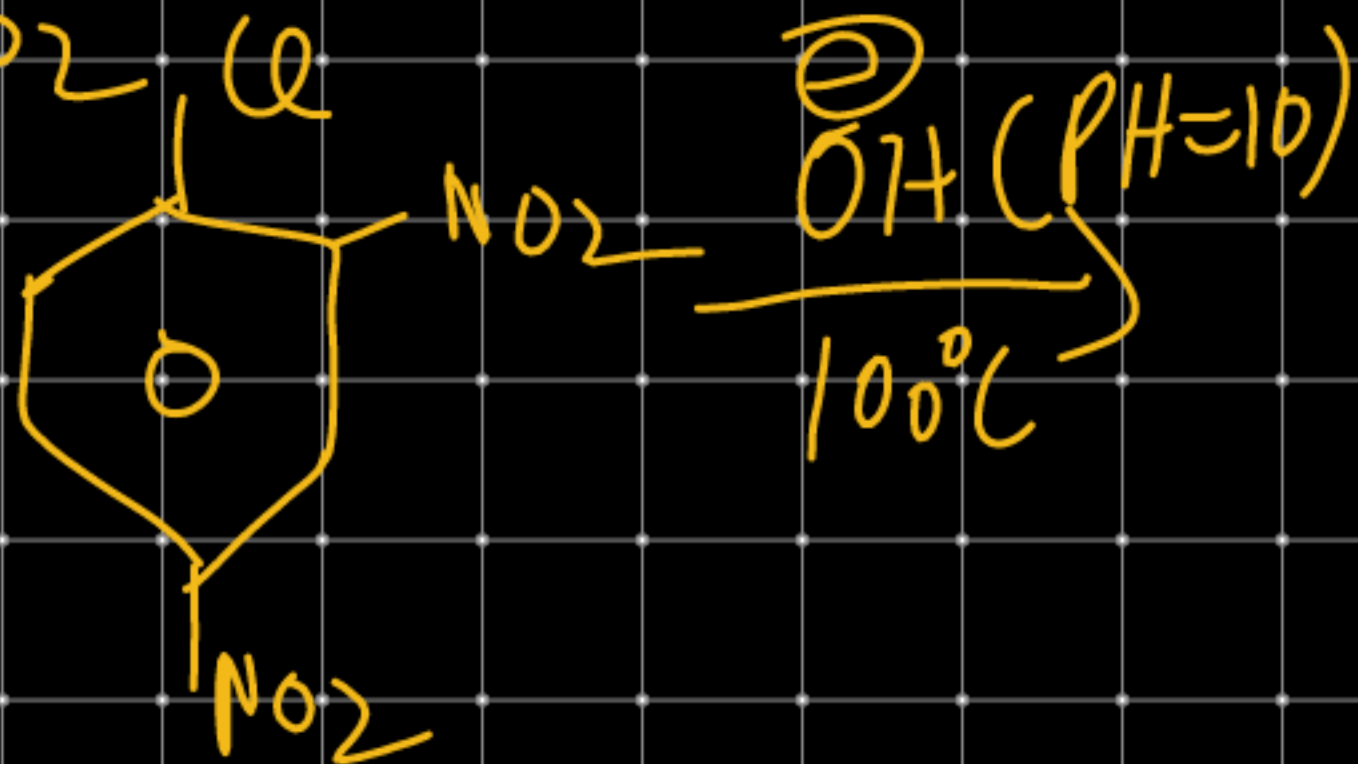
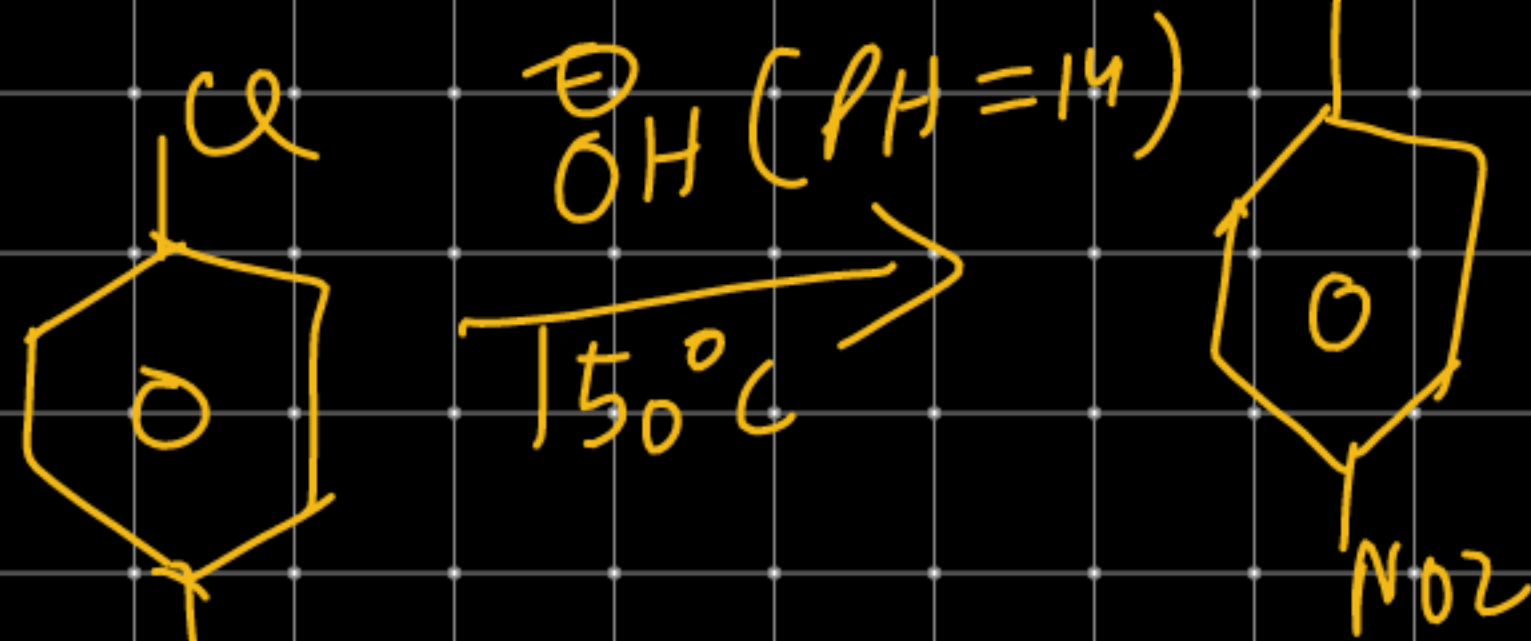
# Substitution Nucleophilic aromatic (S<sub>N</sub>Ar)

Dow's process



Substitution (Benzene) + NaCl

② H<sup>+</sup>

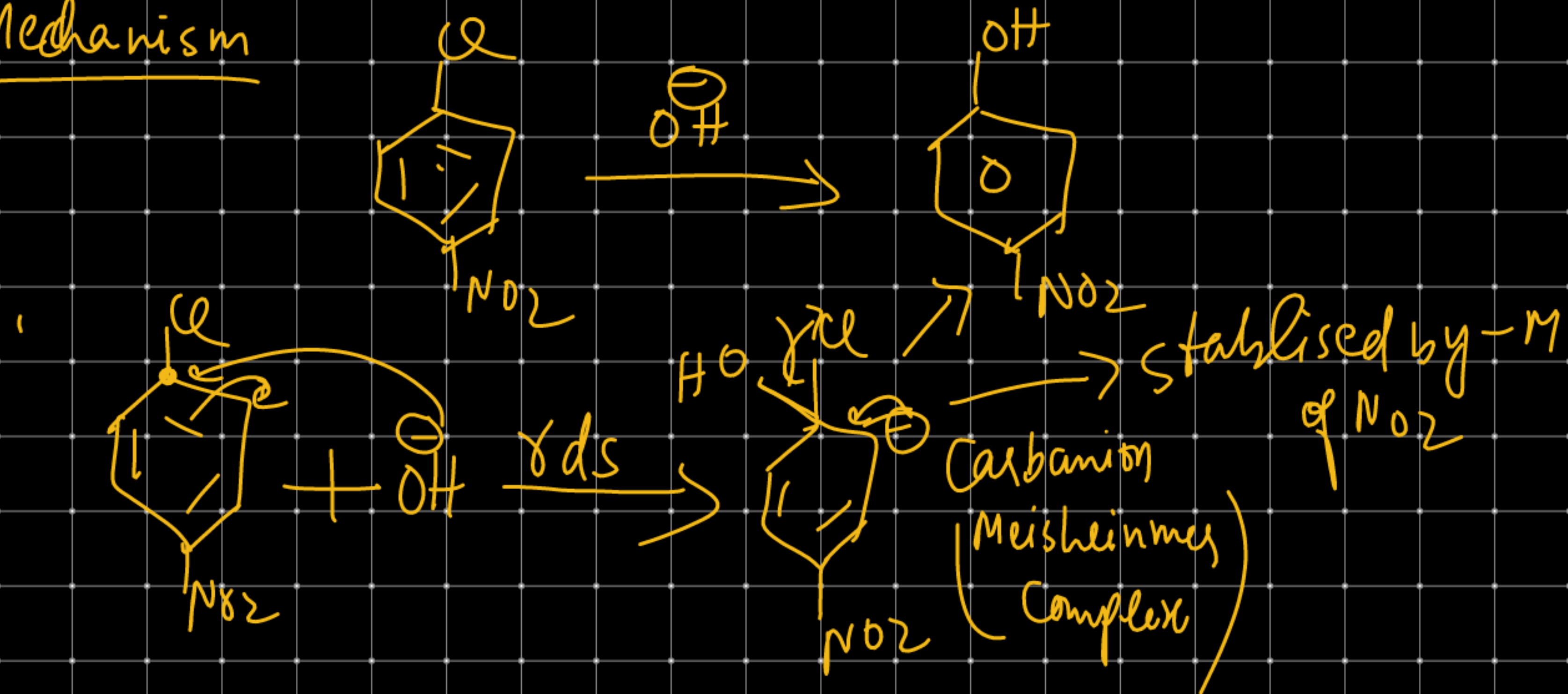




## Condition for S<sub>N</sub>A<sub>2</sub>

- ① Presence of Leaving group, EWG (NO<sub>2</sub>)
- ② L.G. & -NO<sub>2</sub> at o/p each other

## Mechanism



## Characteristics of Rxn

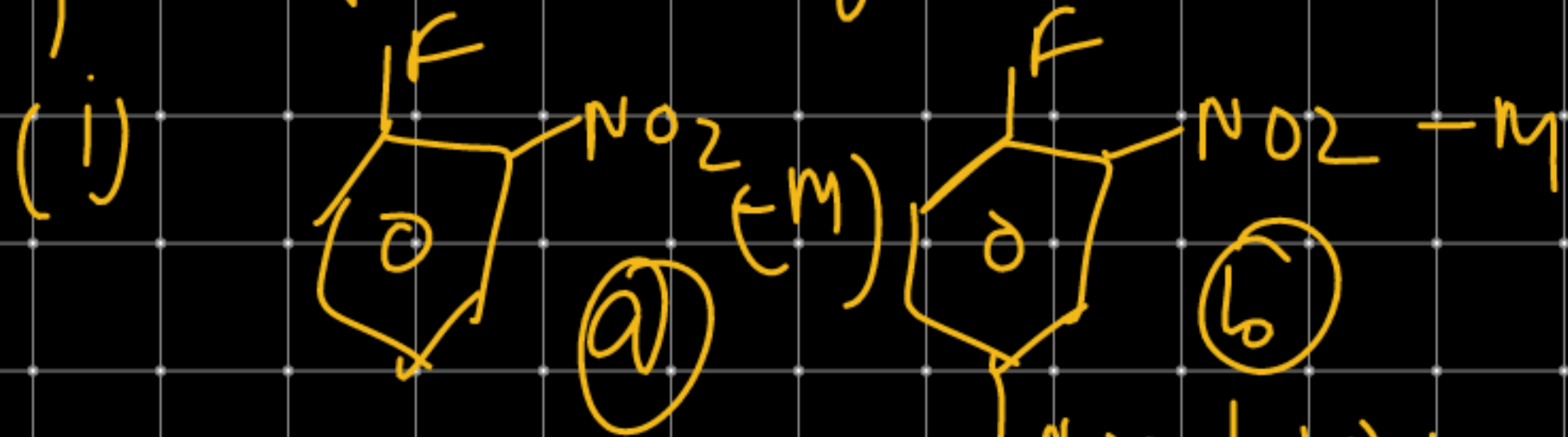
\* Rate  $\propto$  [Halide][Nu], order = 2

Miscellaneous  
complex

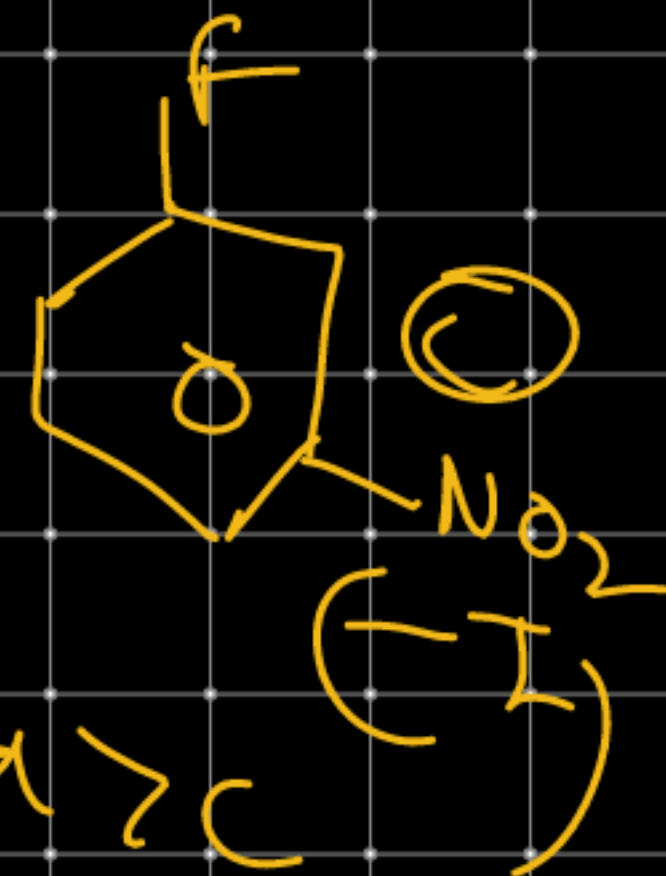
\* Carbanion is intermediate & formation of carbanion is rds.

More stable carbanion more rate.

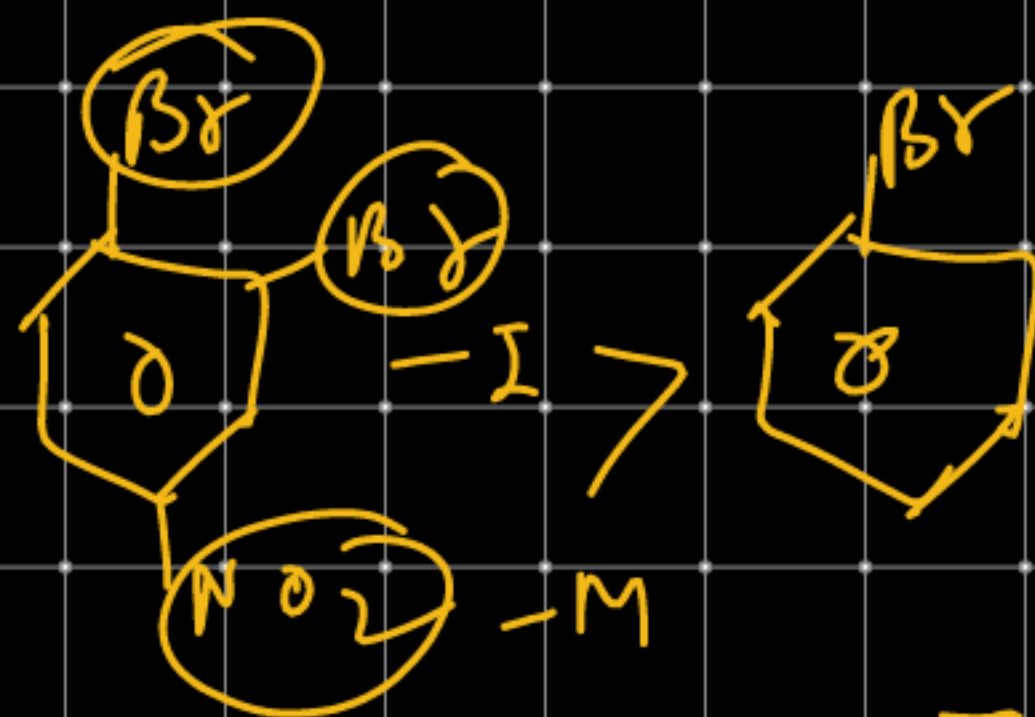
Q Compare Rate of  $S_NAr$  /  $S_NArE$



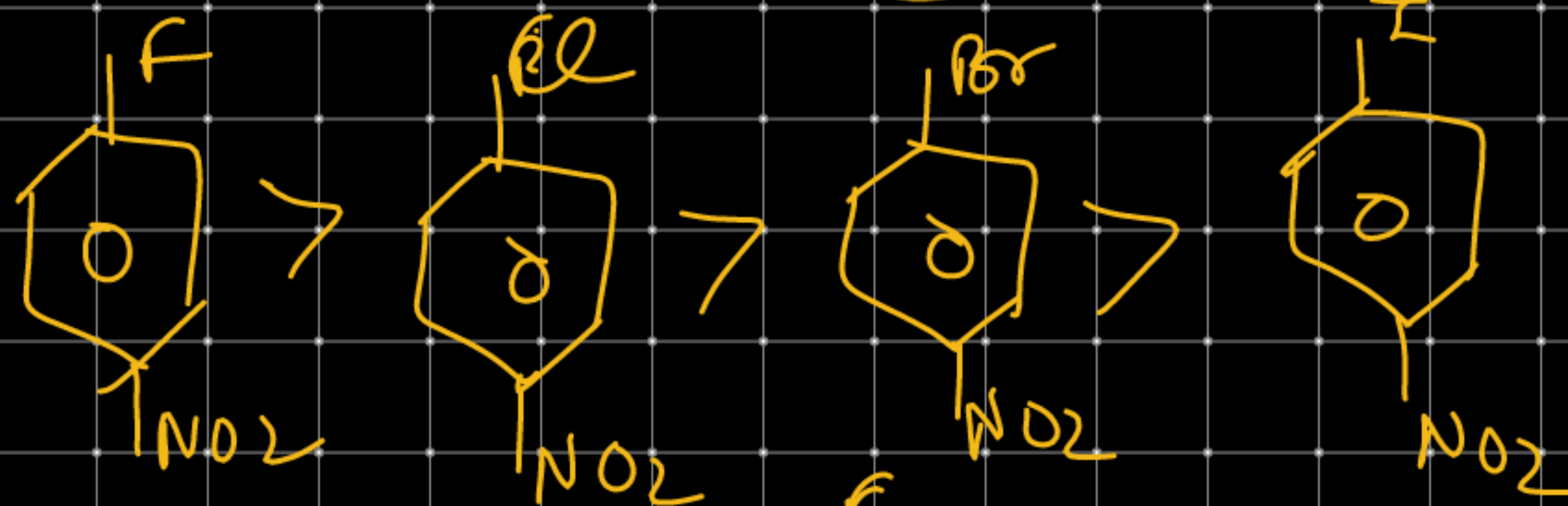
$b > d > a > c$



Rate of SNAr (2)



Rate of SNAr (3)  
v. imp



Rate of EAS

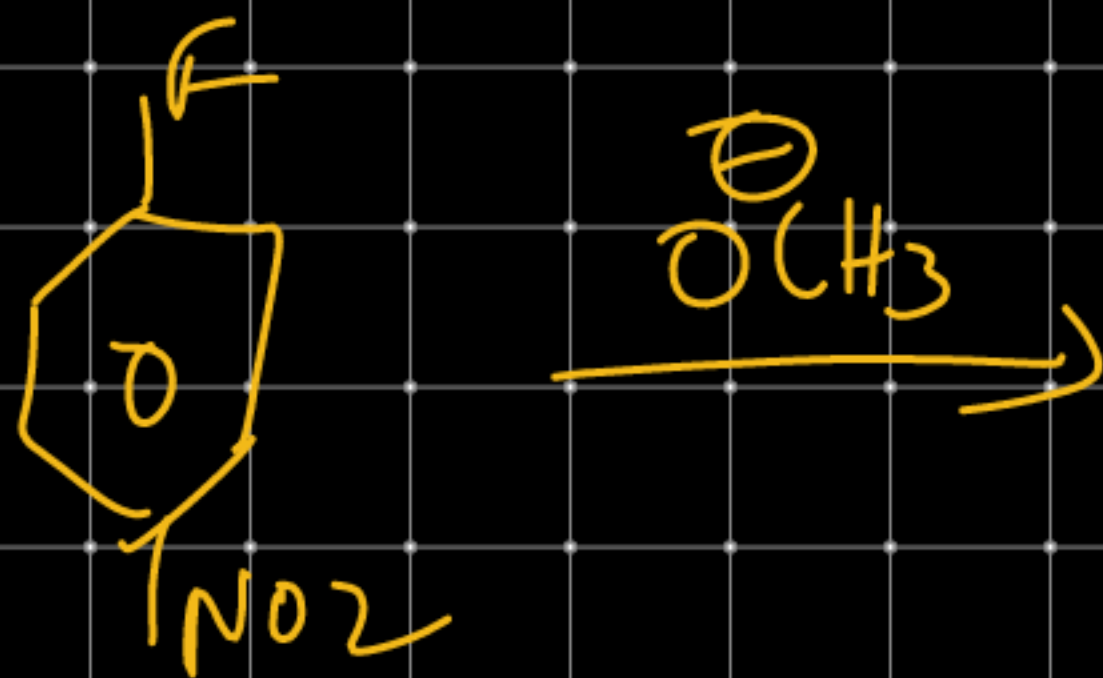


most stable intermediate  
-I of -F max

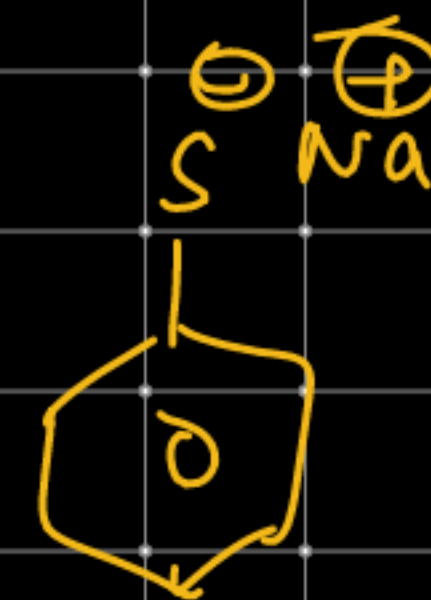
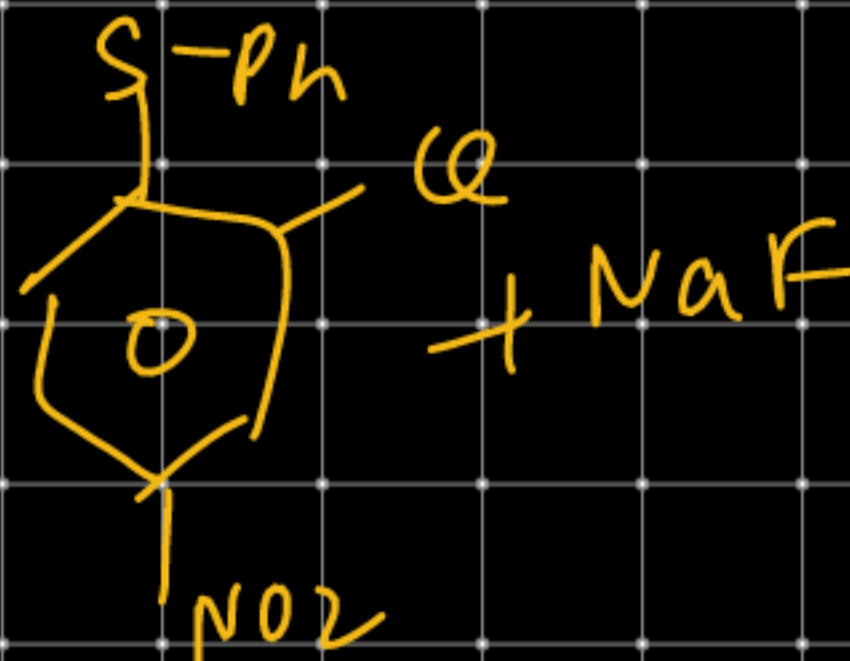
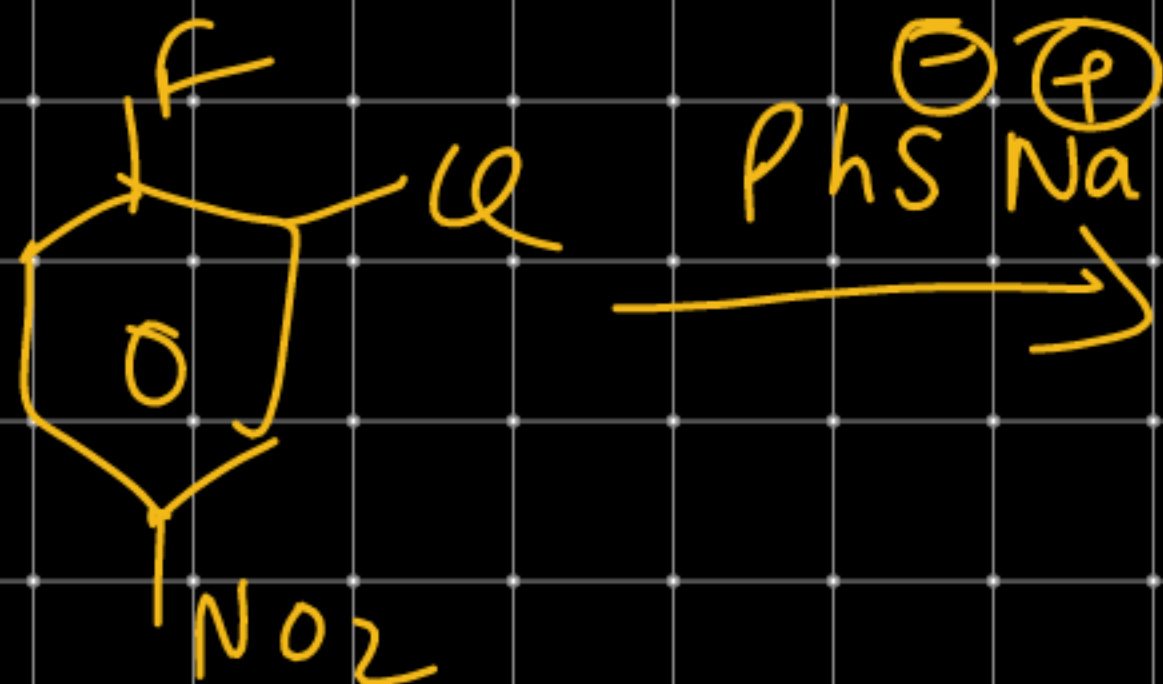


Draw products

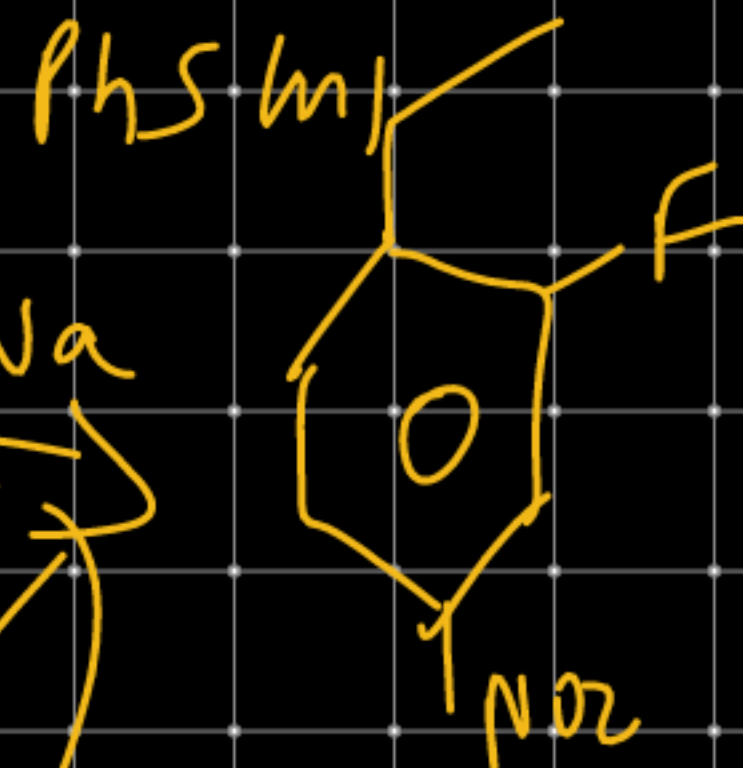
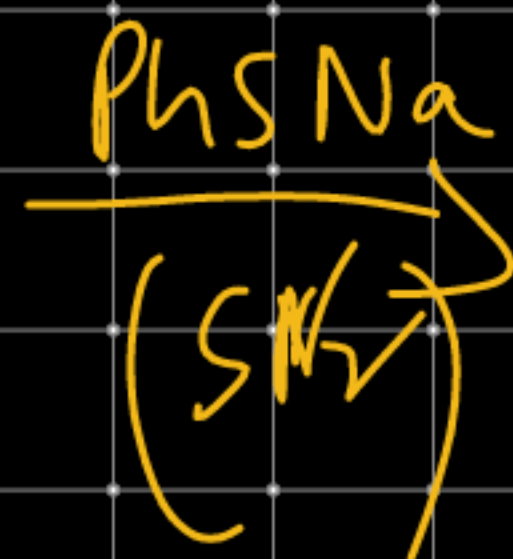
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\*



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IIT Mains  
2022