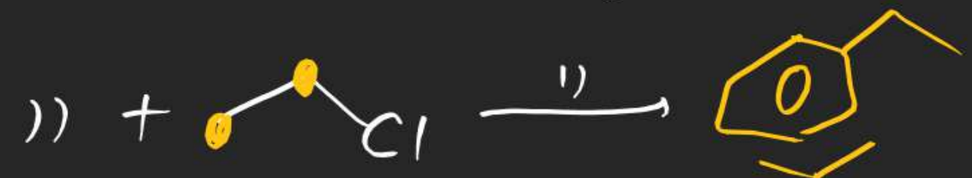
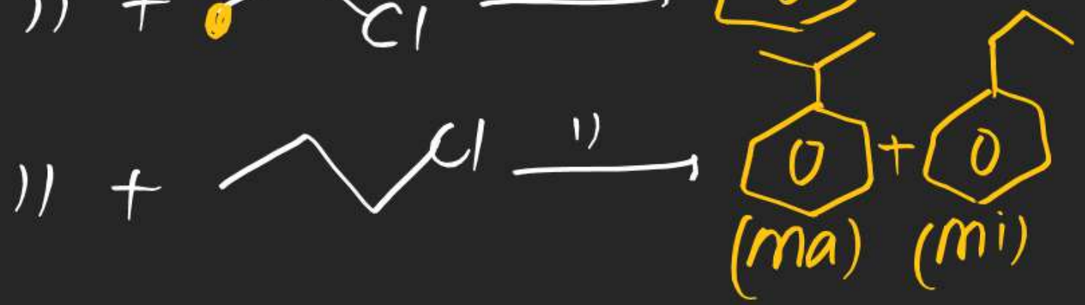
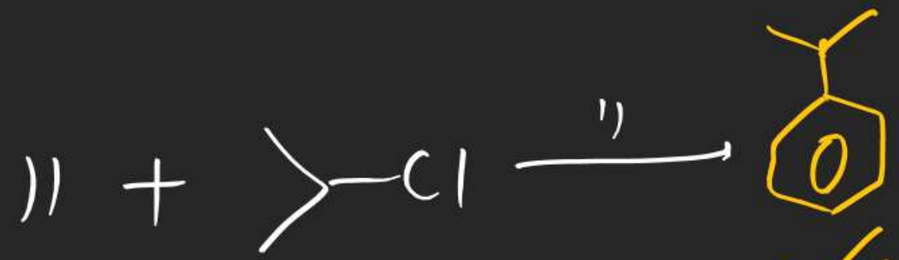
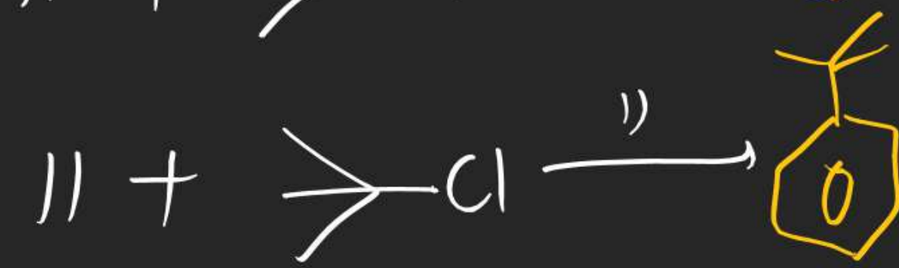
Nishant Jindal

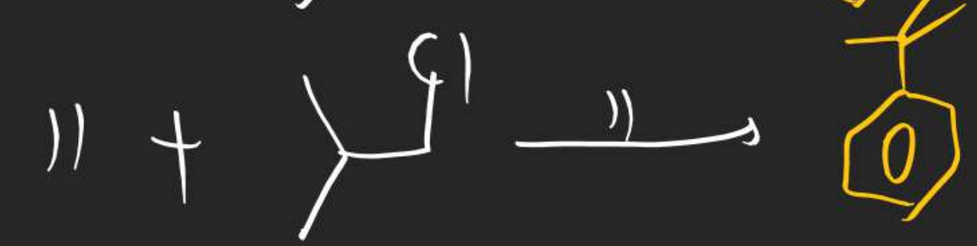
(2) 

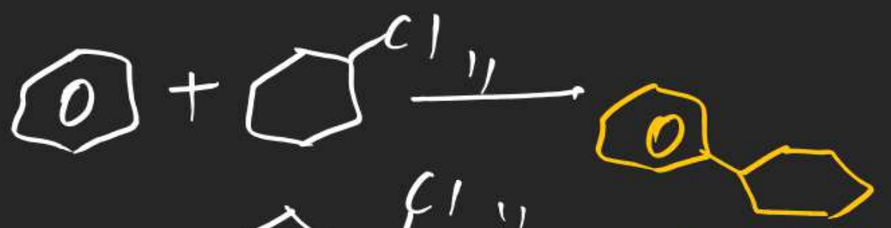
(3) 

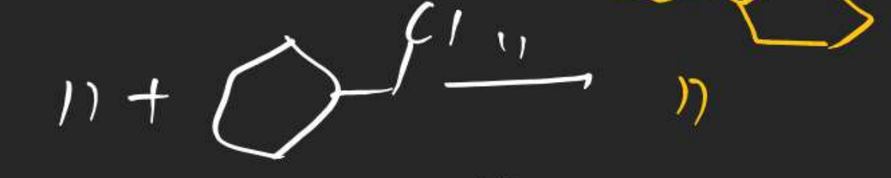
(4) 

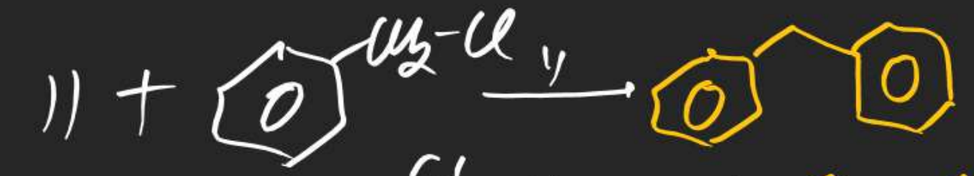
(5) 

(6) 

(7) 

(8) 

(9) 

(10) 

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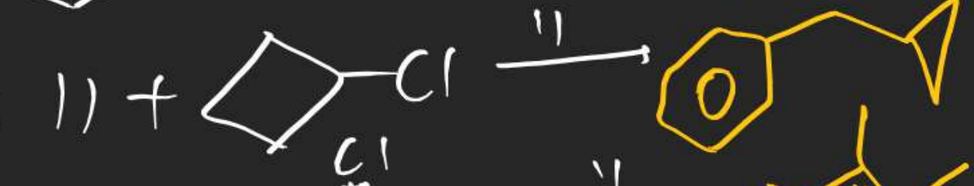
(12) 

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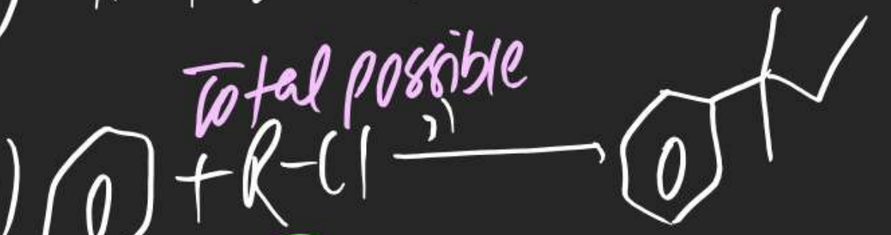
(14) 

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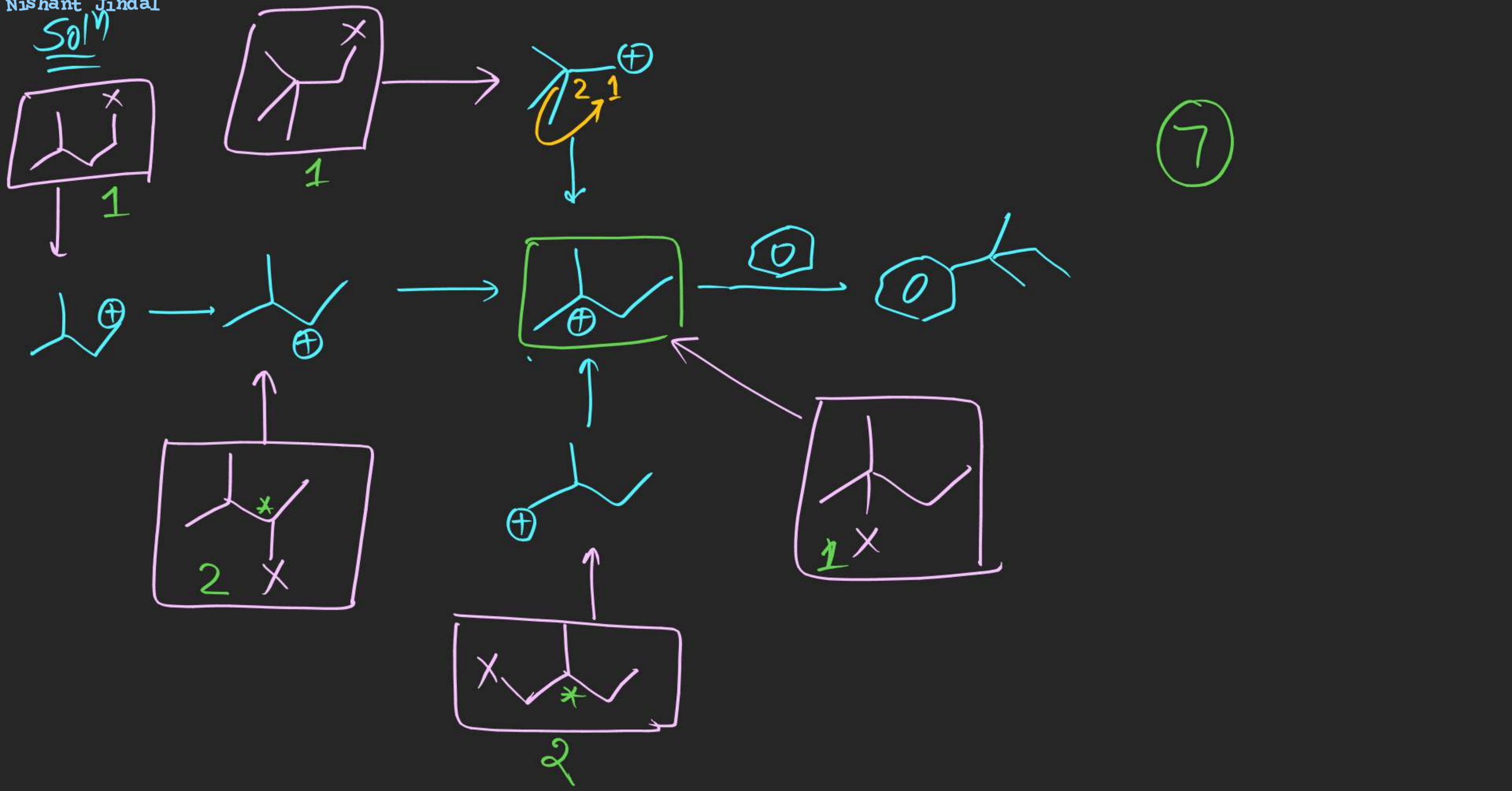
Soln



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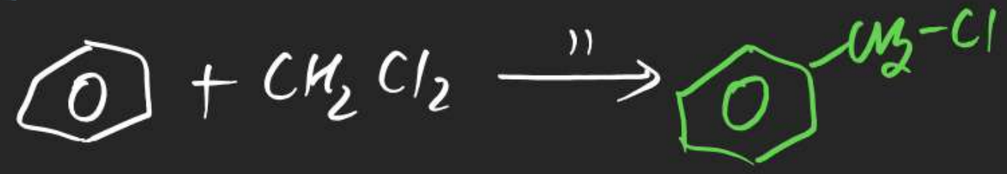
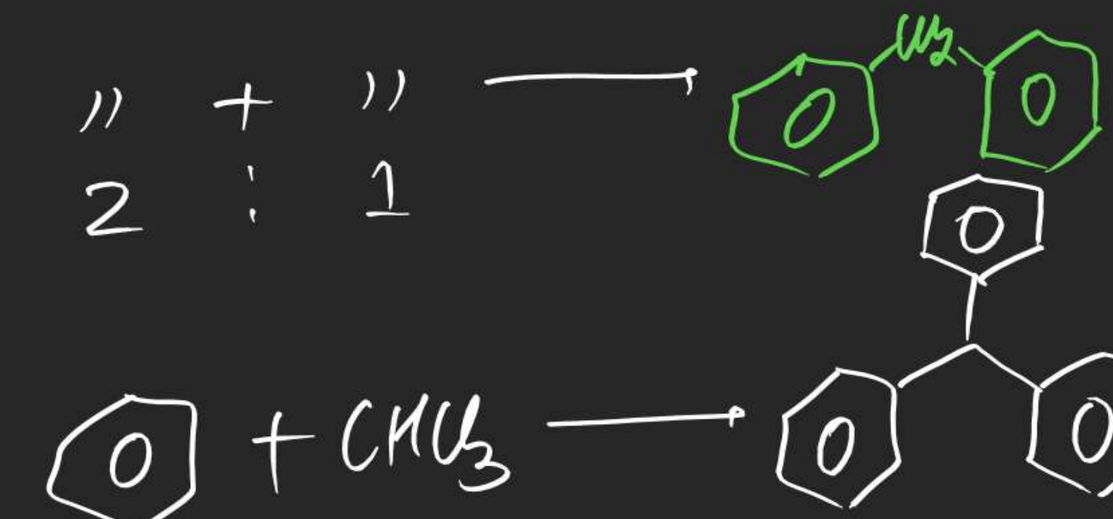
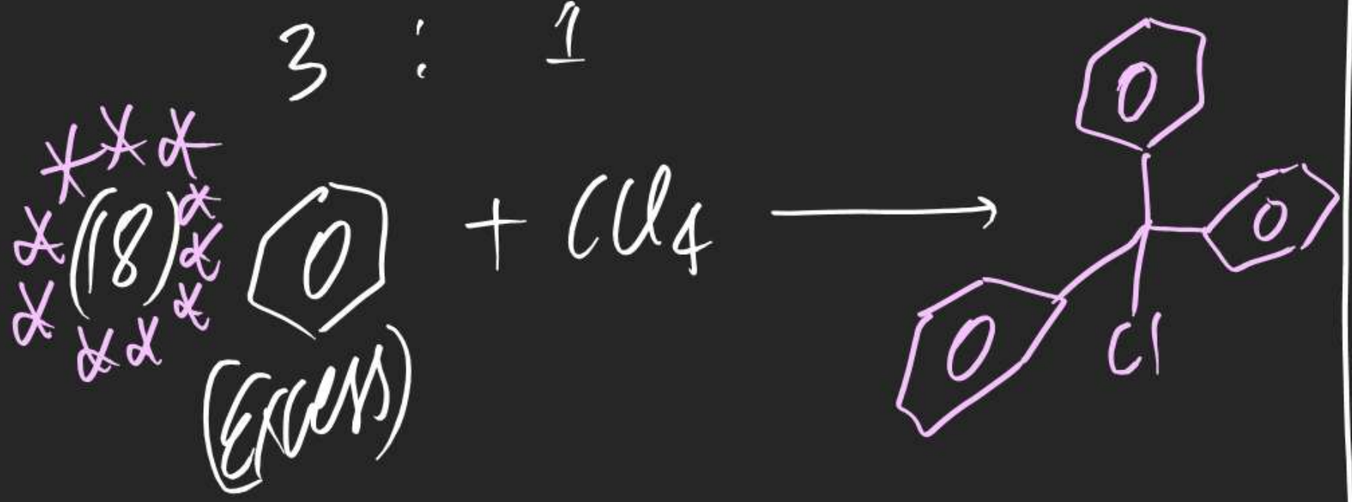
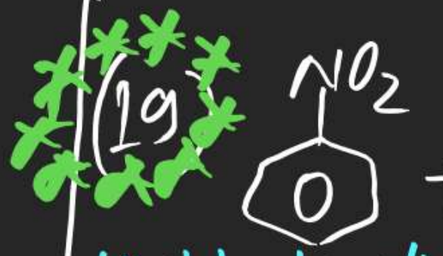
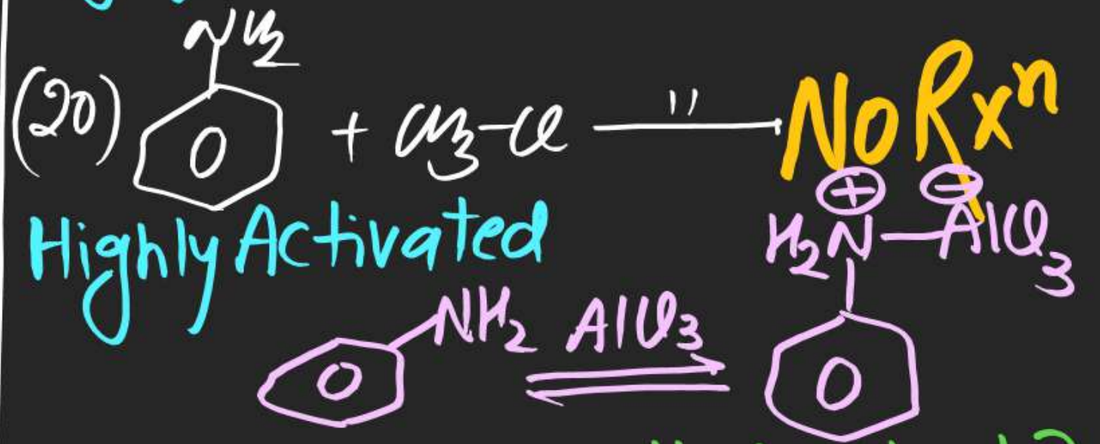
(15) 

(16) 
2 : 1

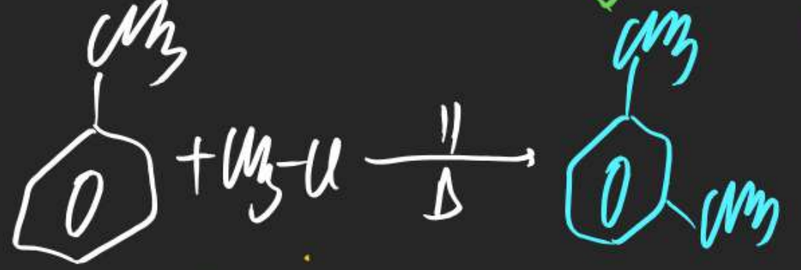
(17)
3 : 1

(18) 
(Excess)

(19) 
Highly deactivated

(20) 
Highly Activated

(21) 
highly deactivated

(22) 

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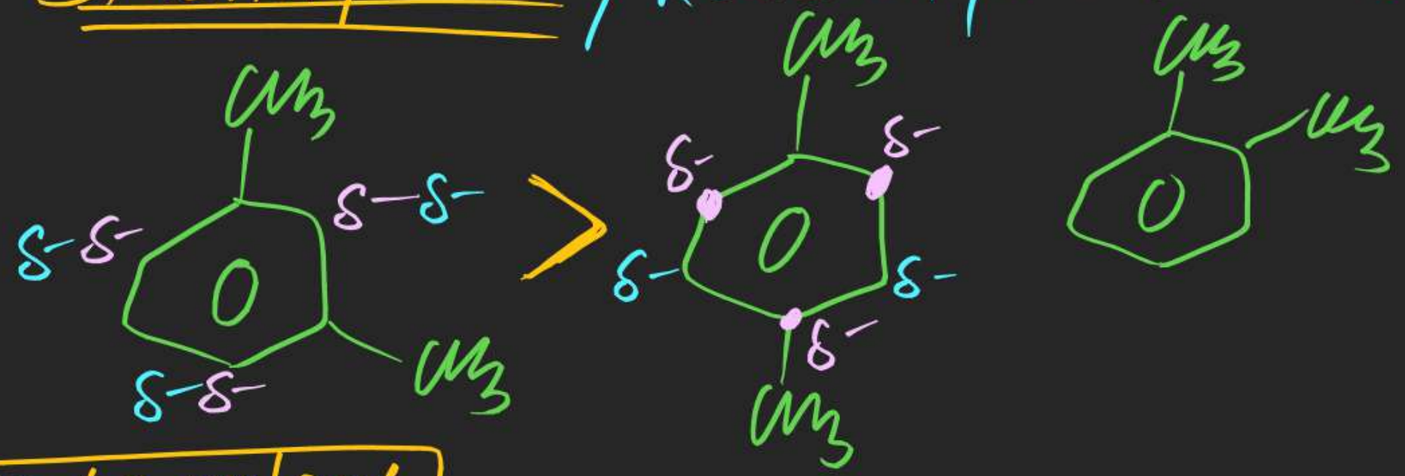
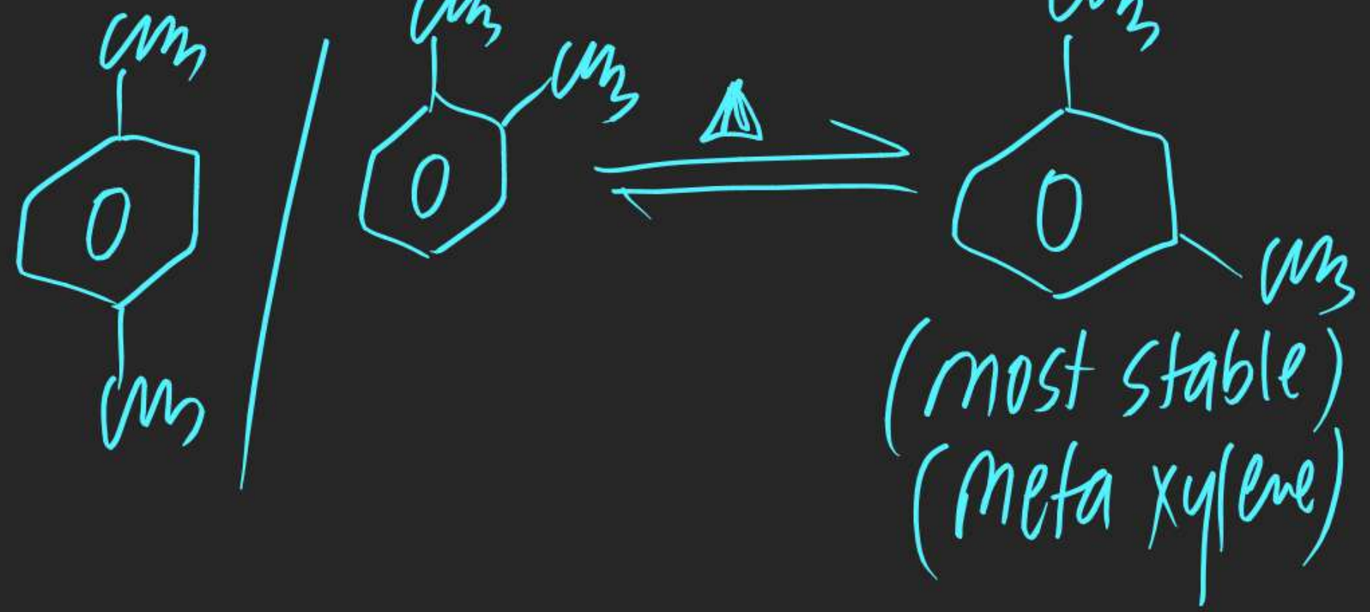
* Stability order / Reactivity order with Electrophile

SOM(22)



Meta xylene

(#)



(most stable)
(meta xylene)

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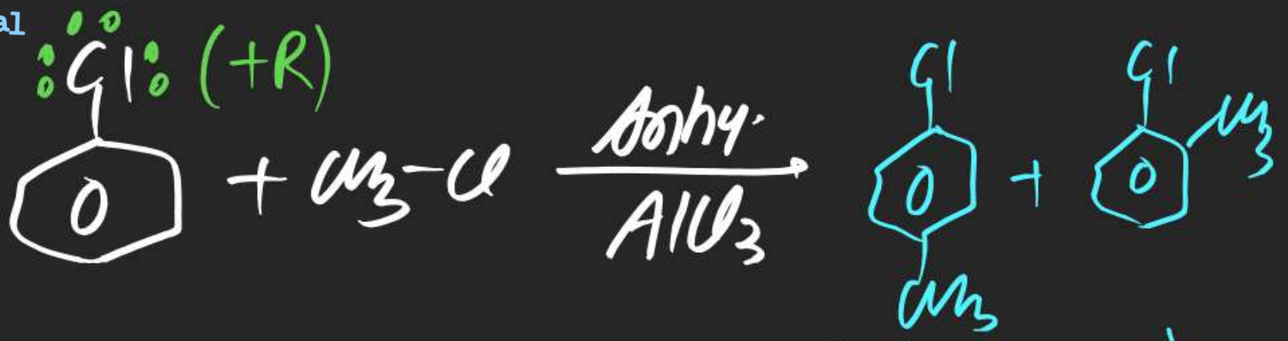
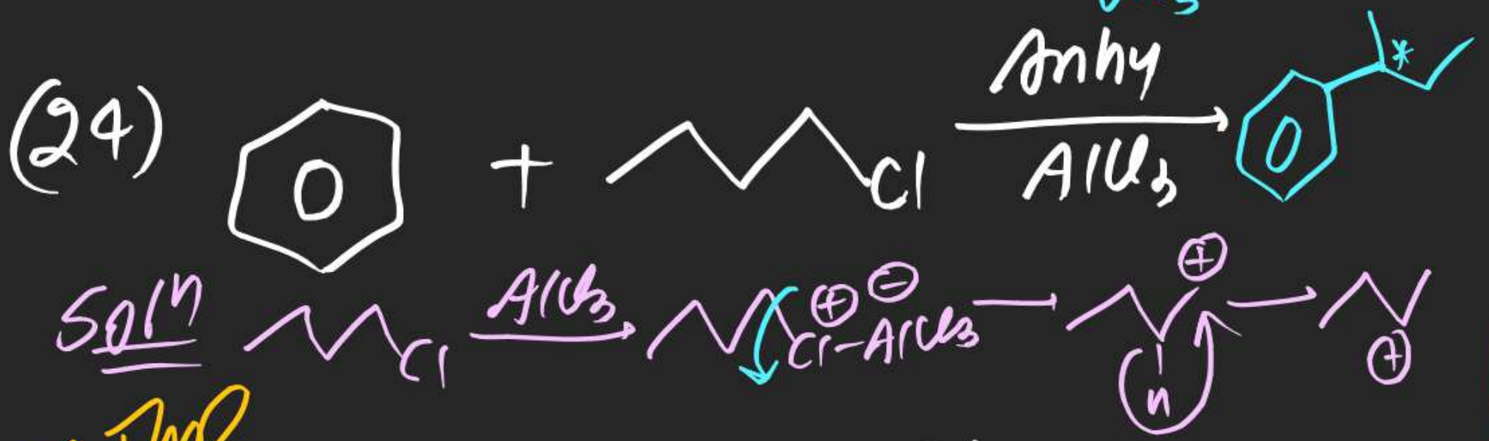
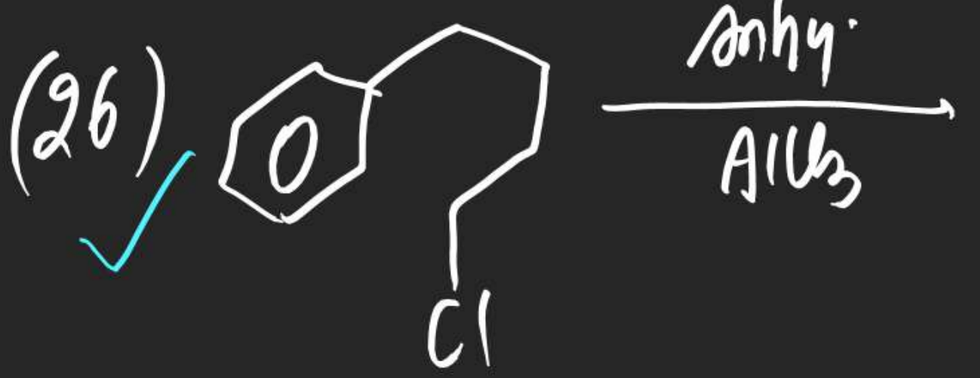
(23) 

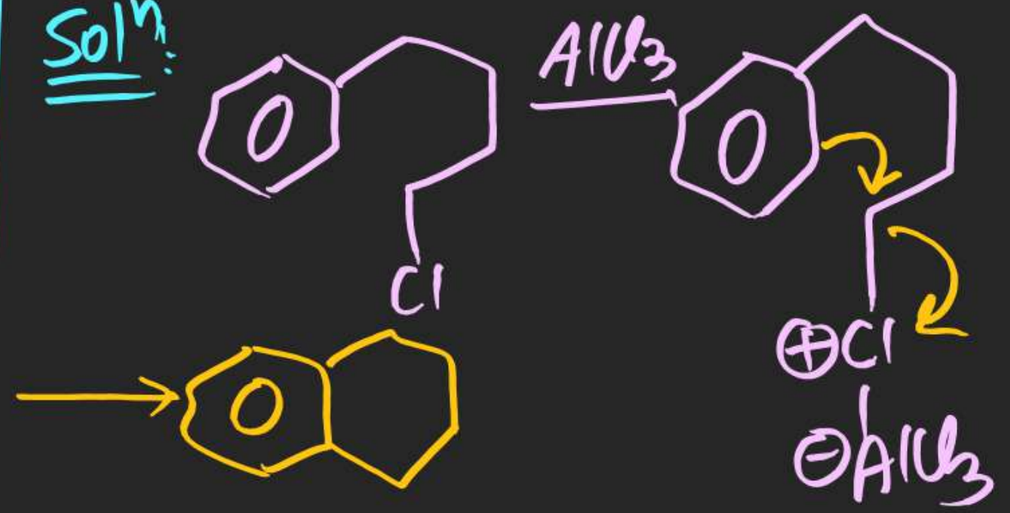
(24) 

M.I.P

(25) 

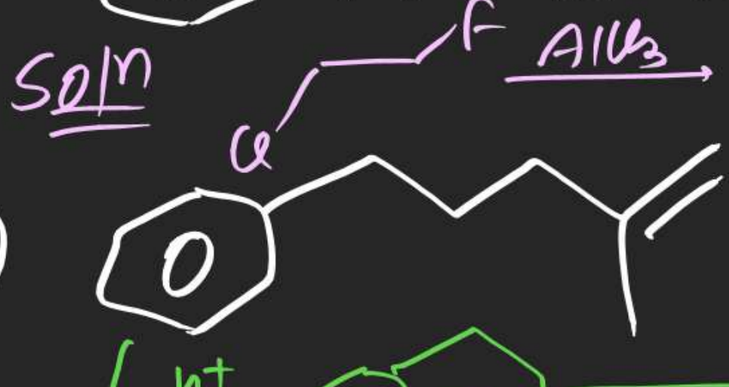
Soln 

(26) 

Soln: 

Nishant Jindal

(27) 

Soln 

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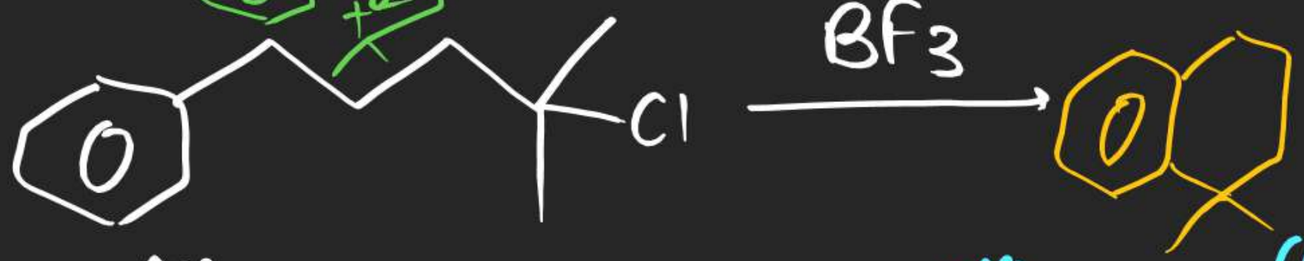
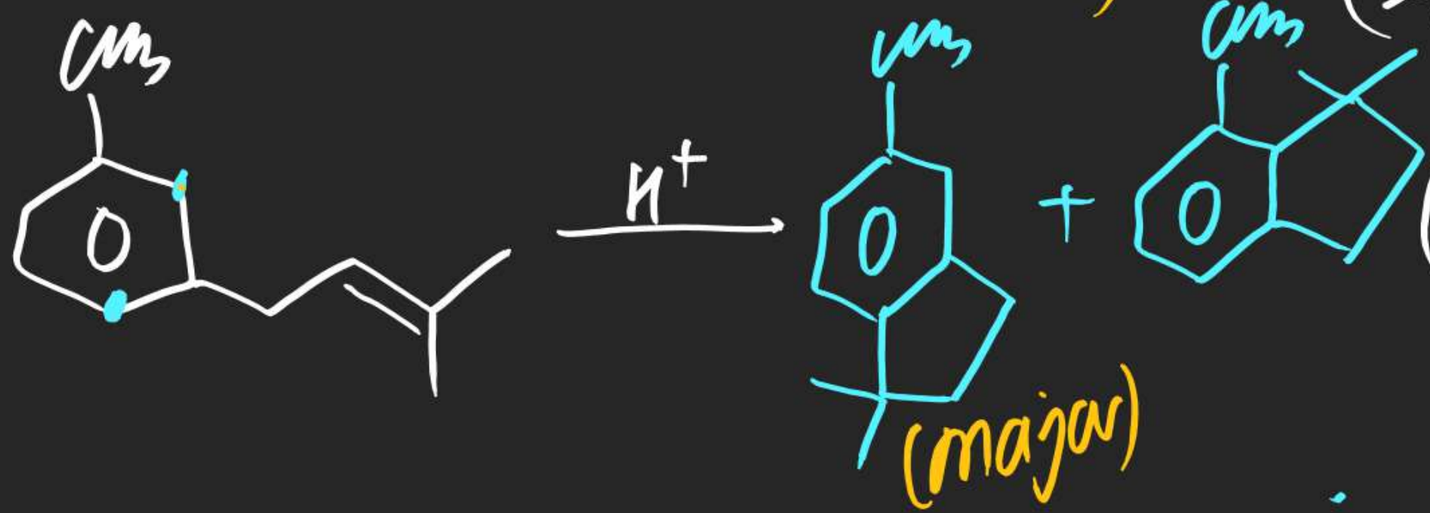
(29) 

IMP

(30) 

(major)

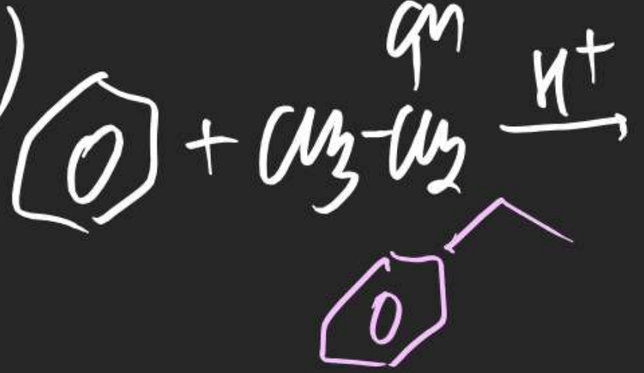
(31) 

(32) 

(33) 

(34) 

(35) 

(36) 

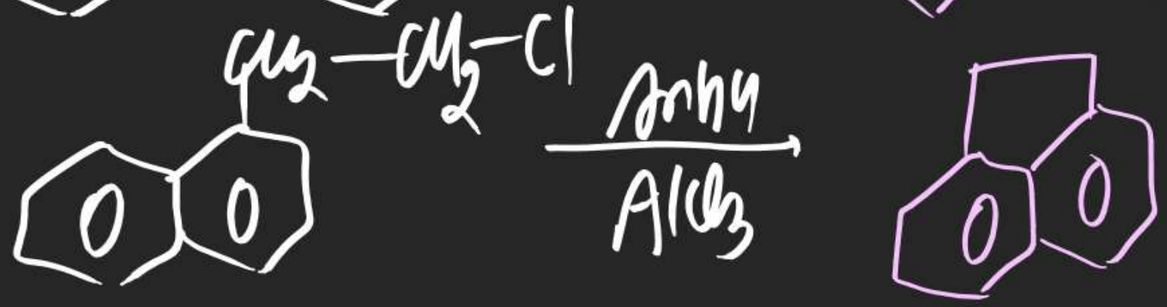
(37) 

(38) 

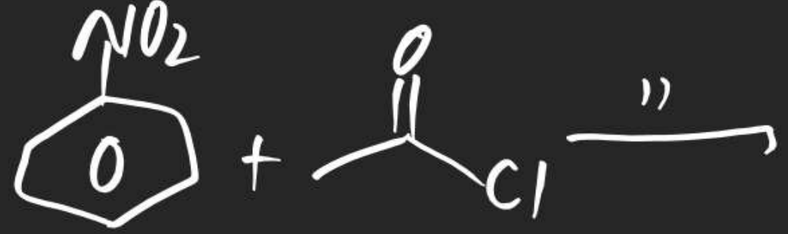
(39) 

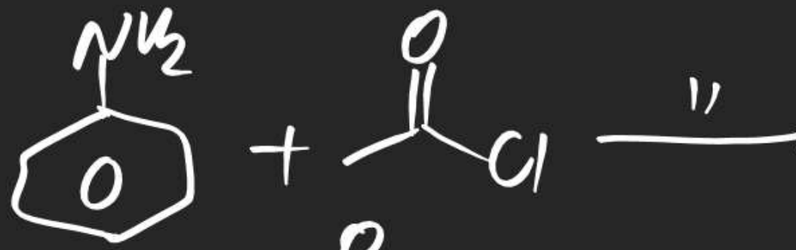
(40) 

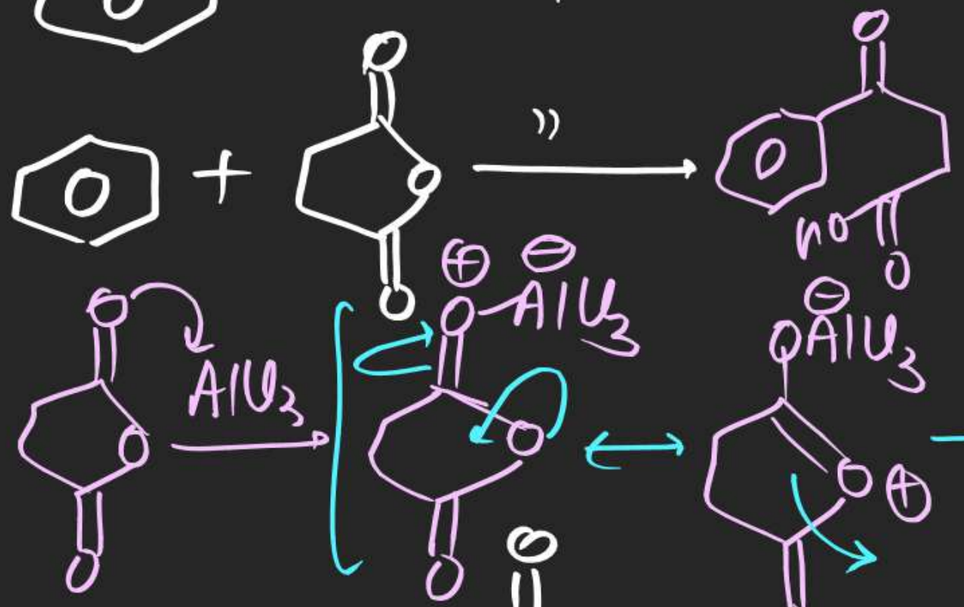
(41) 

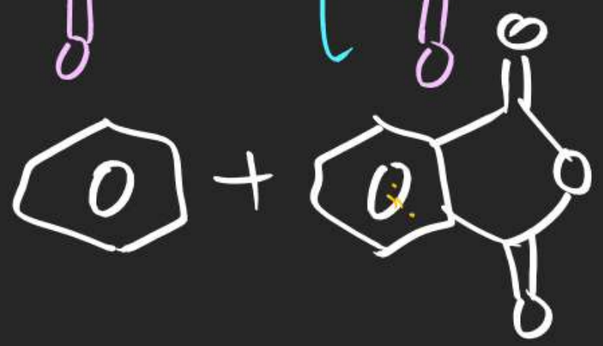
(42) 

Nishant Jindal

(11) 

(12) 

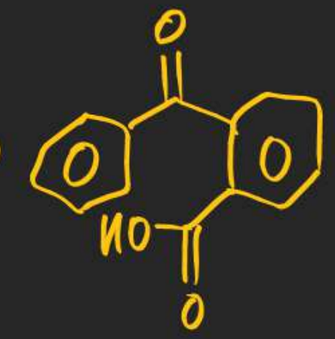
(13) 

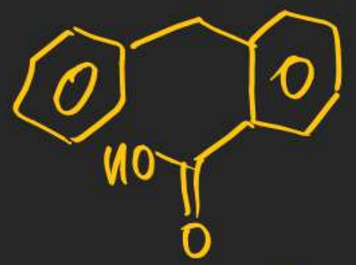
(14) 

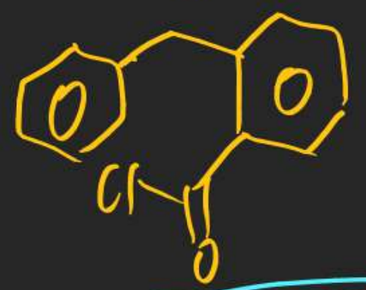
No Rxn

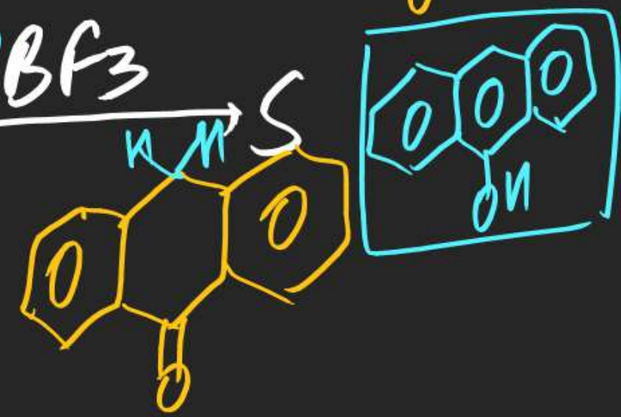
No Acylation of Benzene.

Soln:

P ⇒ 

Q ⇒ 

R ⇒ 



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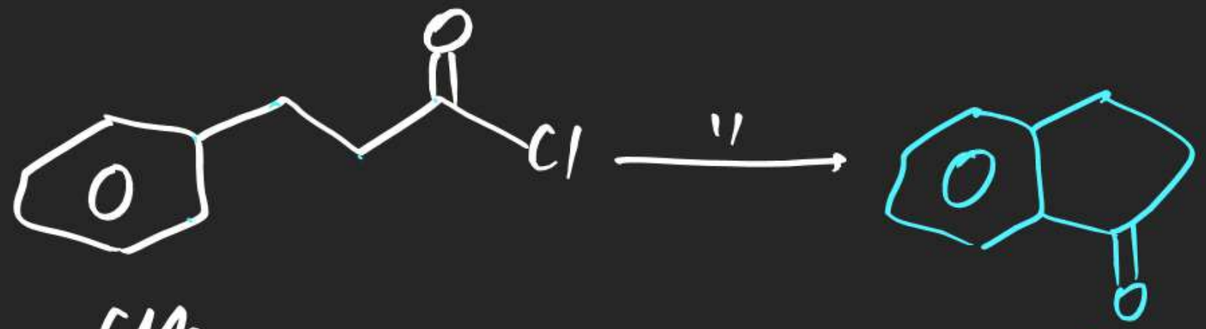
(15)



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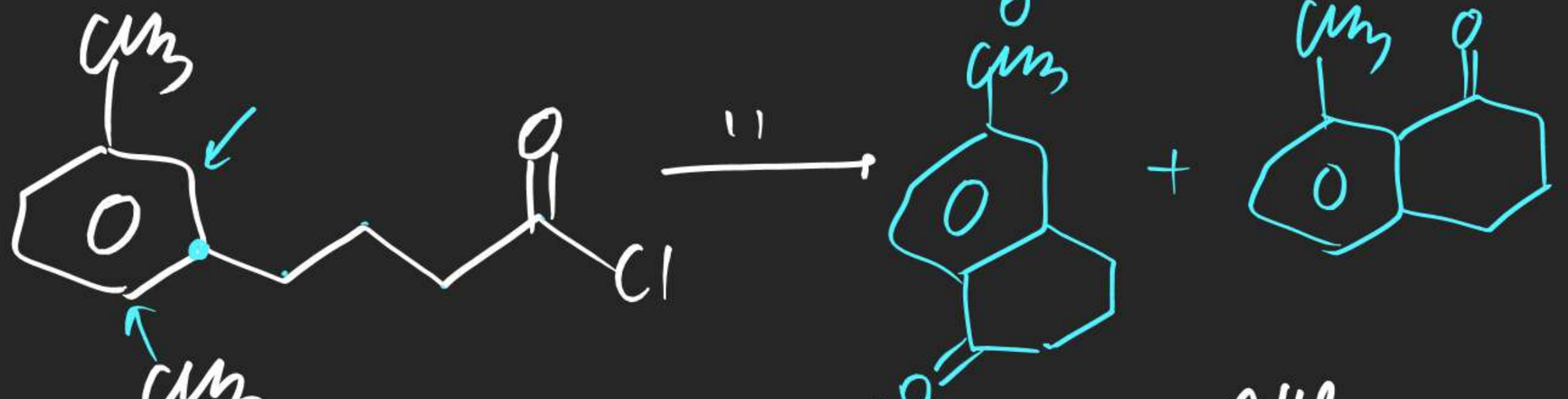
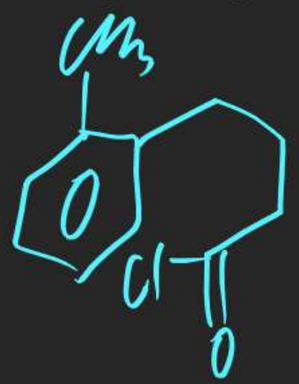
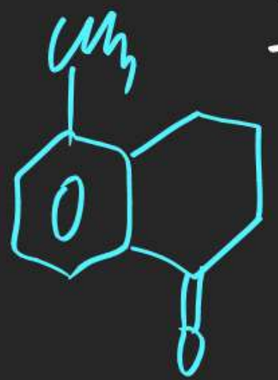


(17)

$\xrightarrow{PCl_5}$ P $\xrightarrow{AlCl_3}$ Q





Nishant Jindal

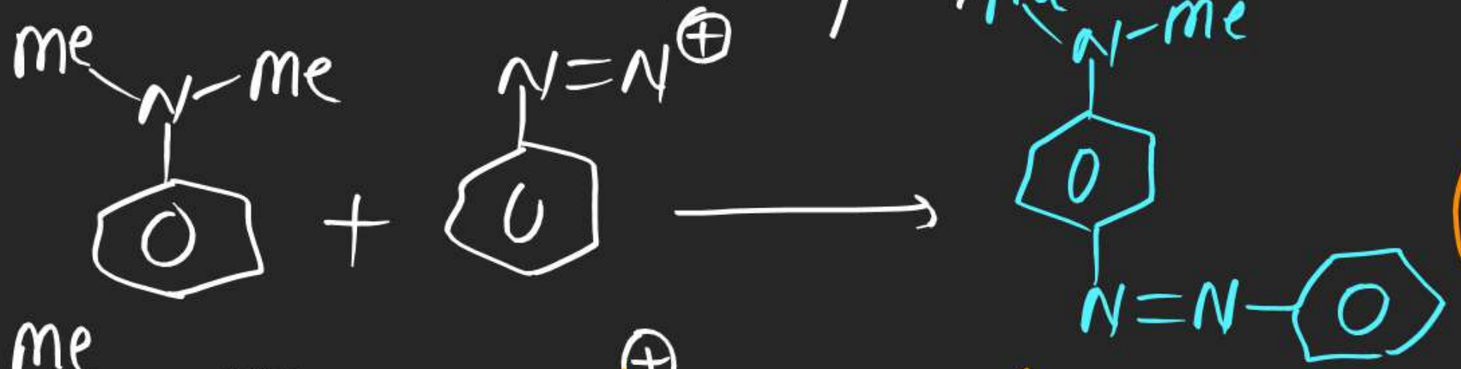
$\Rightarrow$ There are two type of Coupling

(i) C-Coupling :- when $Ph-N=N^{\oplus}$ attacks at Carbon of aromatic Ring

(ii) N-Coupling :- when ——— Nitrogen of Aromatic

primary & sec. Amine.

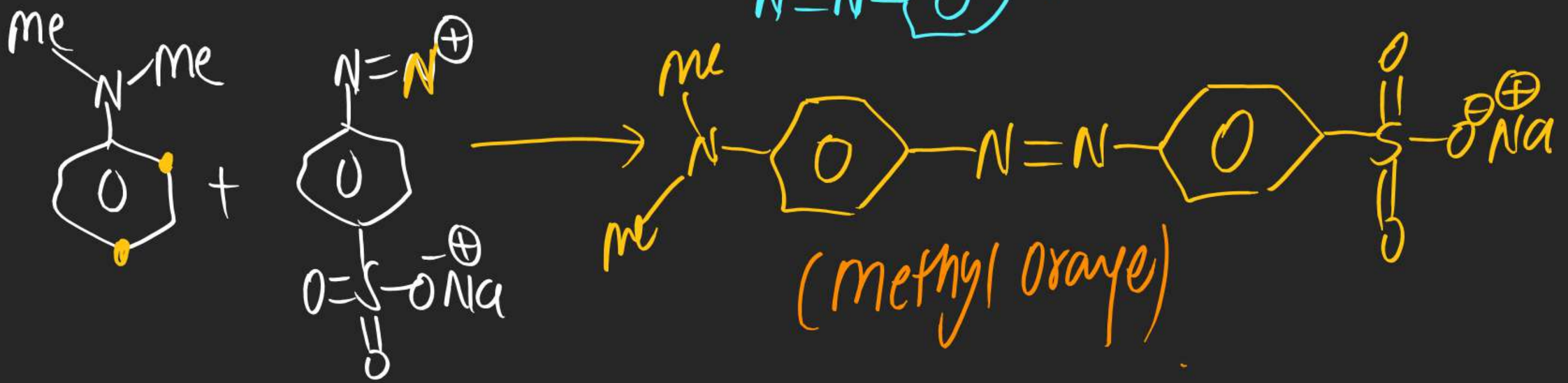
(1)



(yellow colour)

Imp

(2)



(Methyl Orange)

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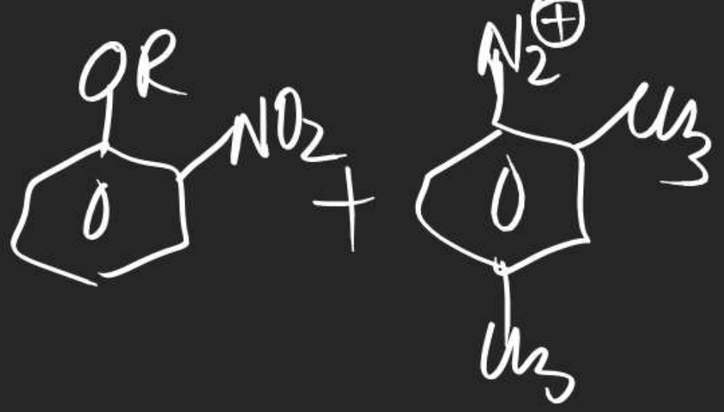
(3) 

p-hydroxy Azo Benzene

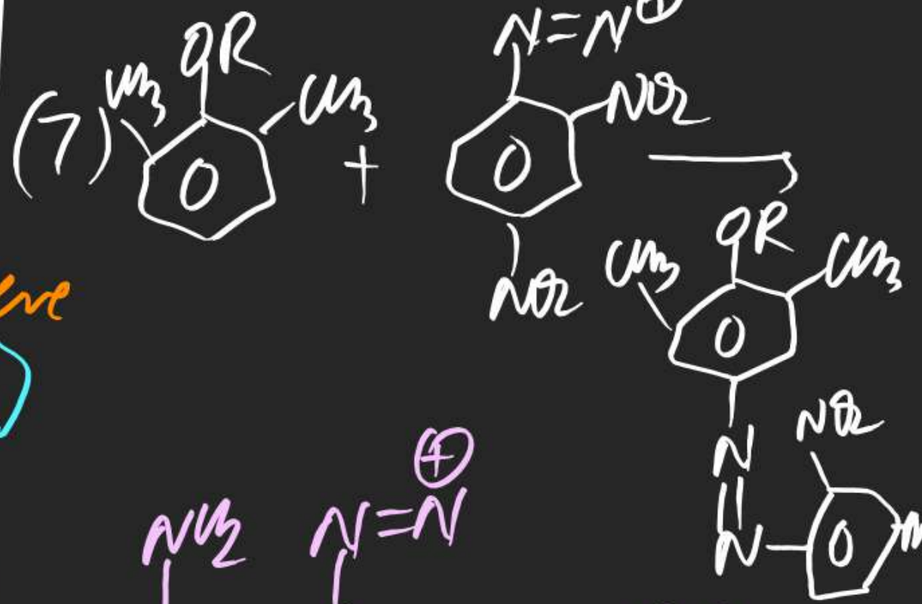
(4) 

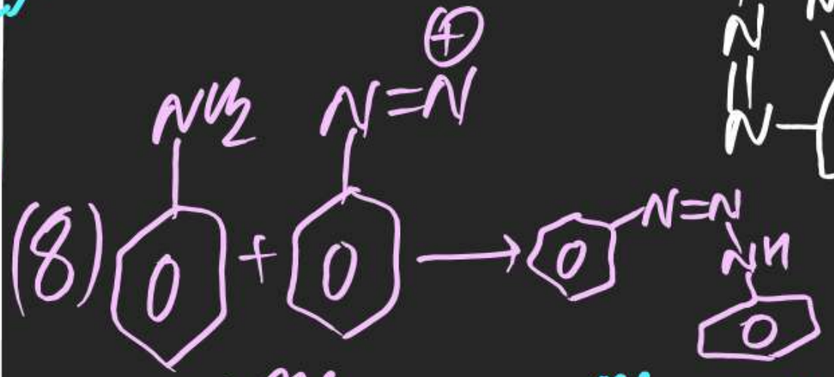
(5) 

(Red dye)

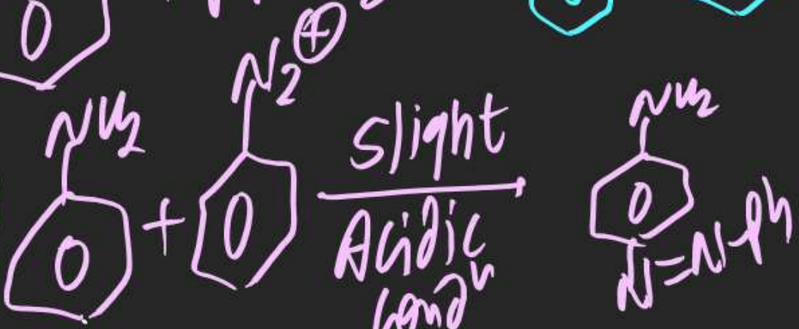
(6) 

No coupling

(7) 

(8) 

(9) 

(10) 

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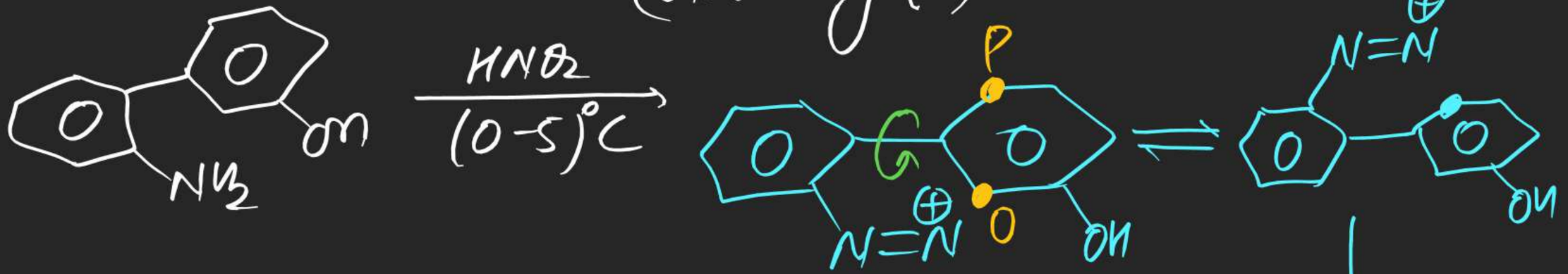
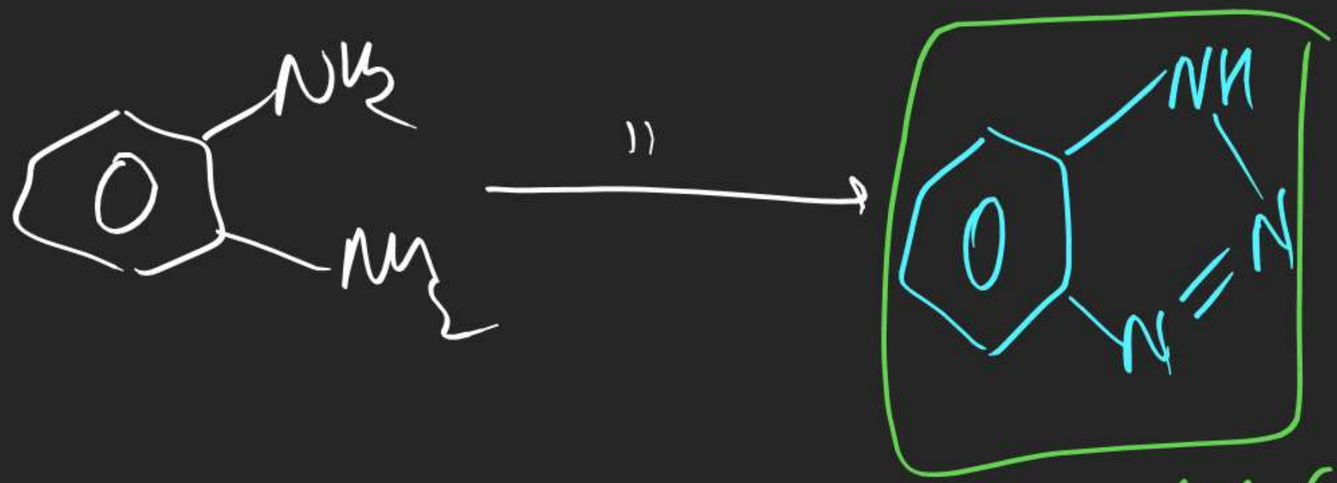
(11) 

(Goomberg Rxn)

(12) 

(13) 

(N-Coupling)

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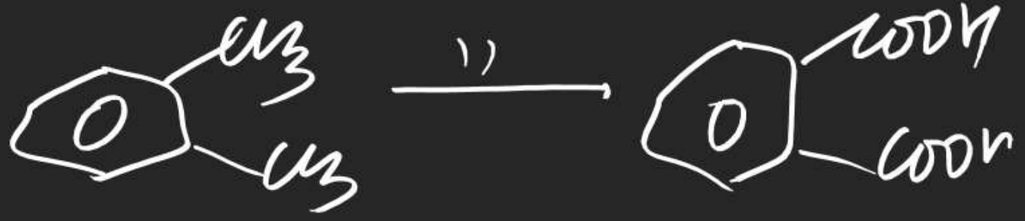
(24) 

(25) 

(26) 

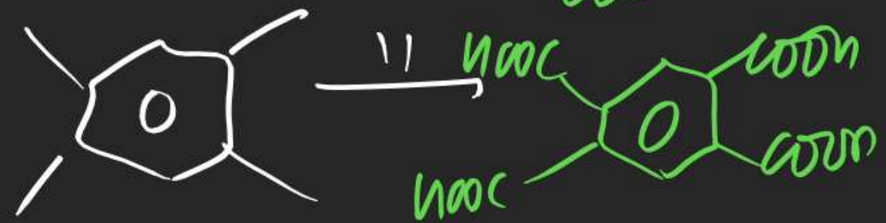
(27) 

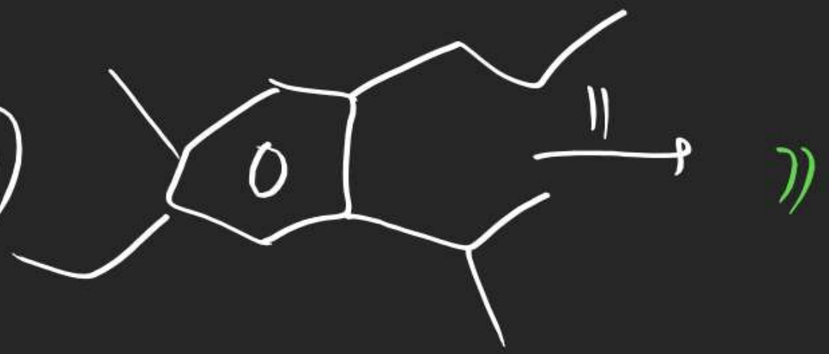
(28) 

(29) 

(30) 

(31) 

(32) 

(33) 

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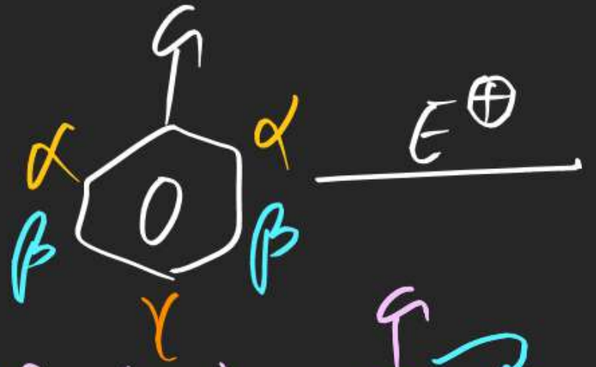
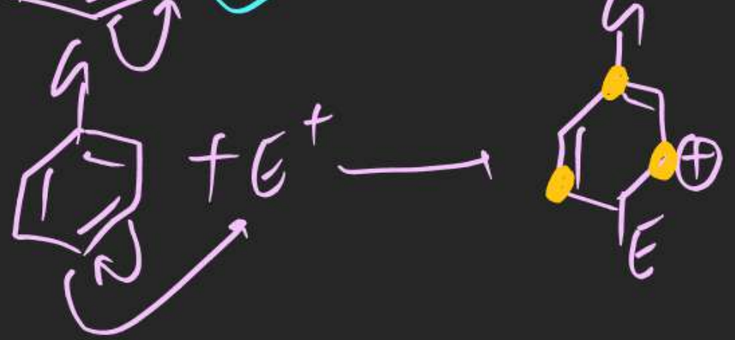
(#) Orientation of Incoming electrophile on Aromatic Compound

(1) 

(2) 

At α (ortho) 

At β (meta) 

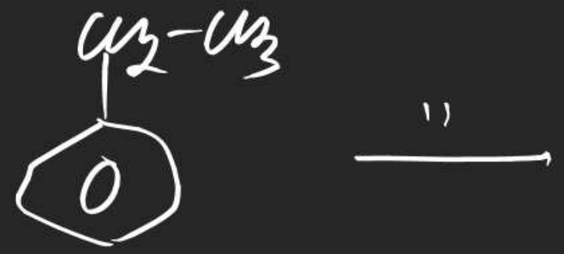
At γ (para) 

Note:

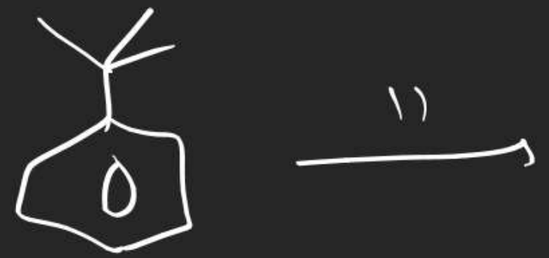
(*) if G is cation stabilising
⟹ ortho & para directing

(*) If G is cation destabilising
⟹ meta directing.

(3) 

(4) 

(5) 

(6) 

(7) 

(8) 

(9) 

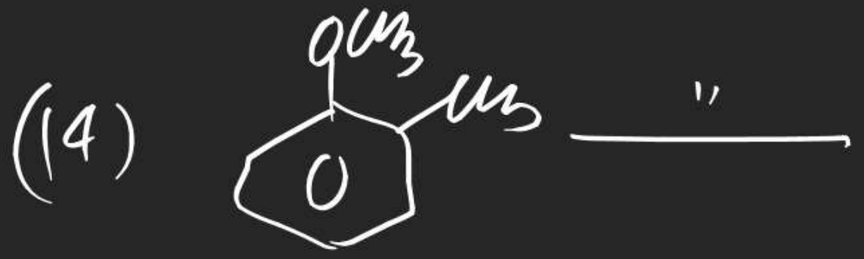
(10) 

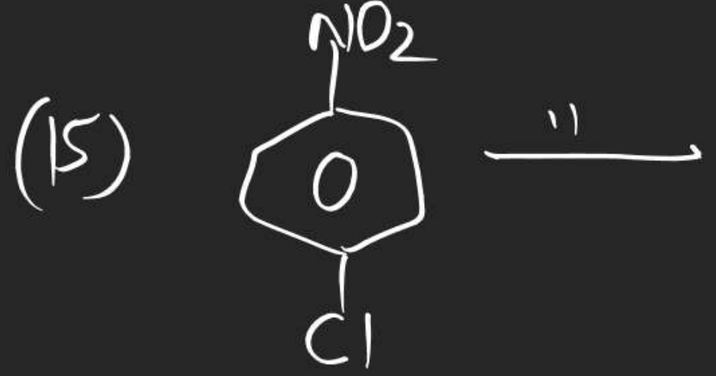
(11) 

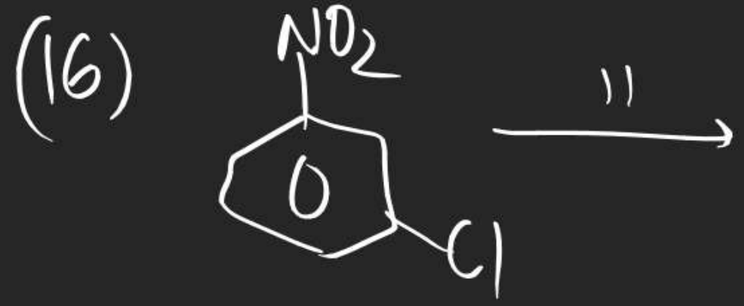
(12) 

Nishant Jindal

(13) 

(14) 

(15) 

(16) 

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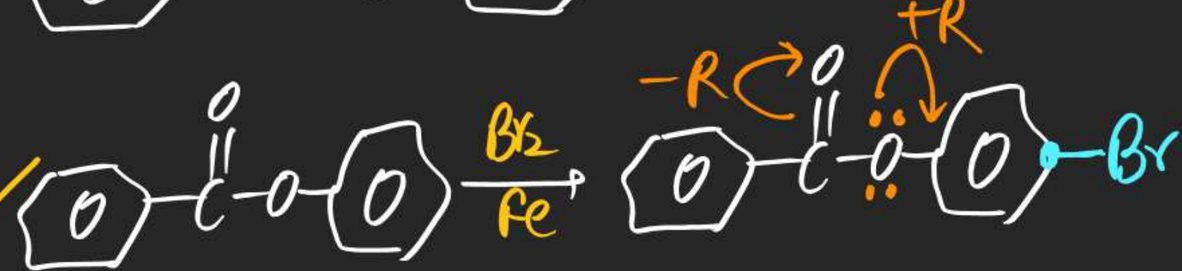
(20) 

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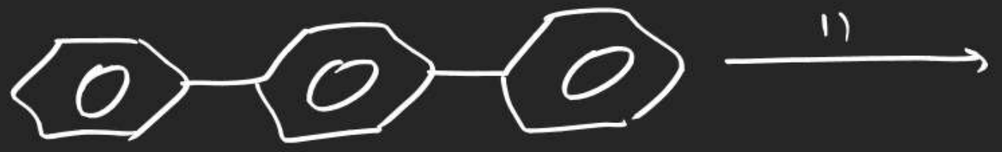
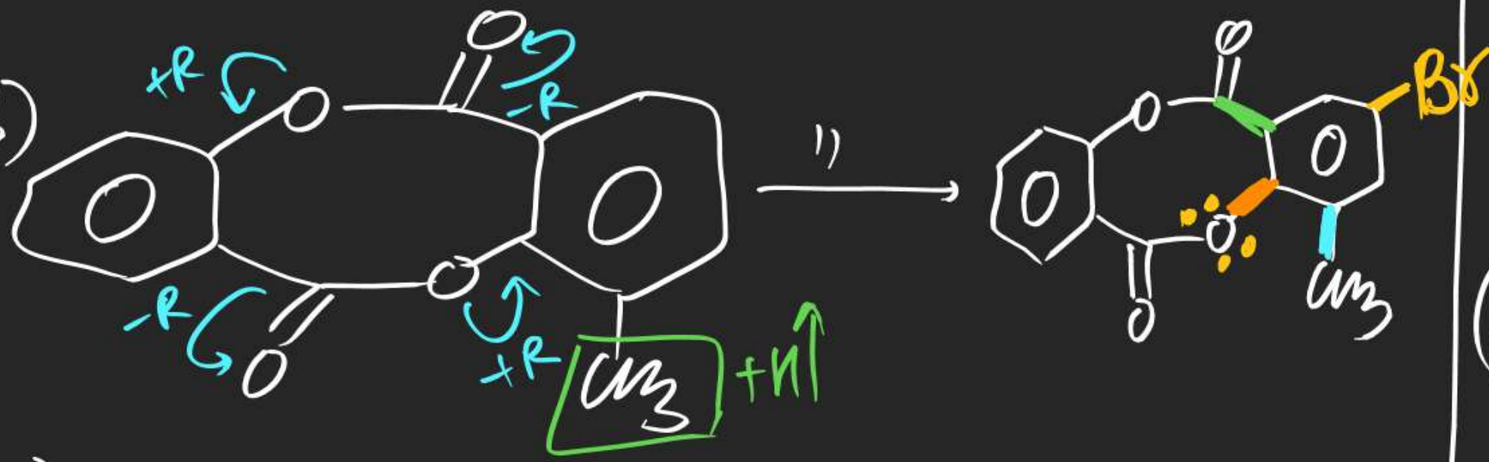
(22) 

(23) 

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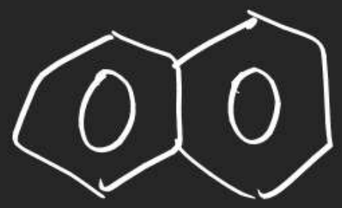
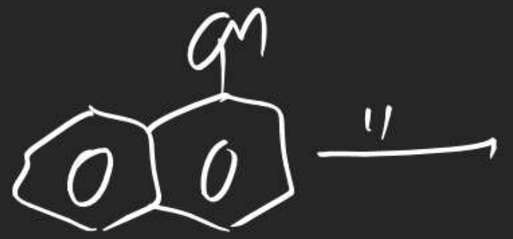
(25) 

(26) 

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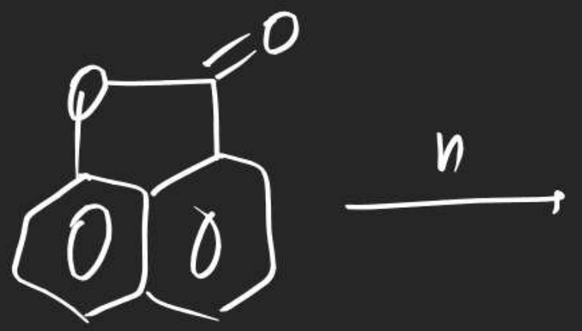
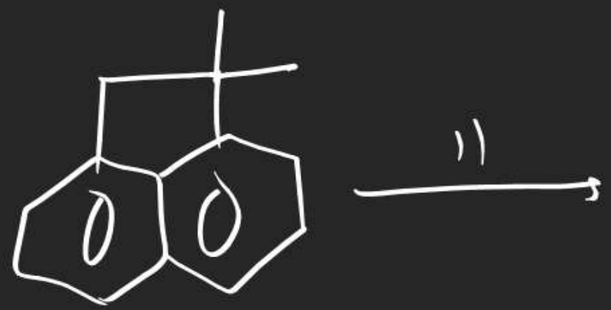
(28) 

(29) 

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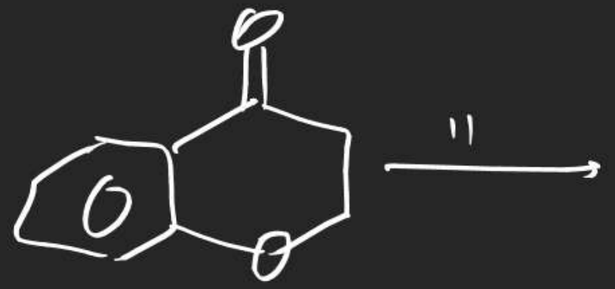
(30) 

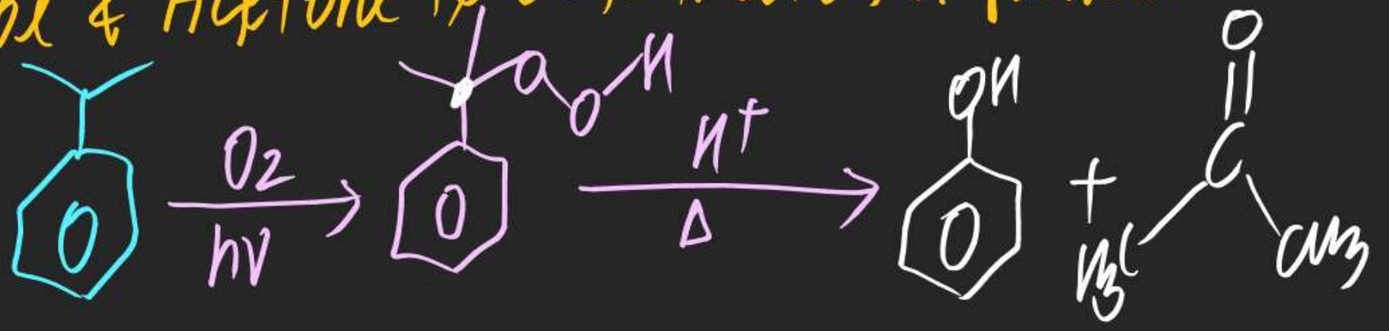
Reactions of phenol

(#) Preparation of phenol :

MJUP

(1) Cumene Hydroperoxide Rearrangement :

⇒ In this Rearrangement Cumene Hydroperoxide is treated with H_2SO_4/Δ so that phenol & Acetone is obtained as a product.



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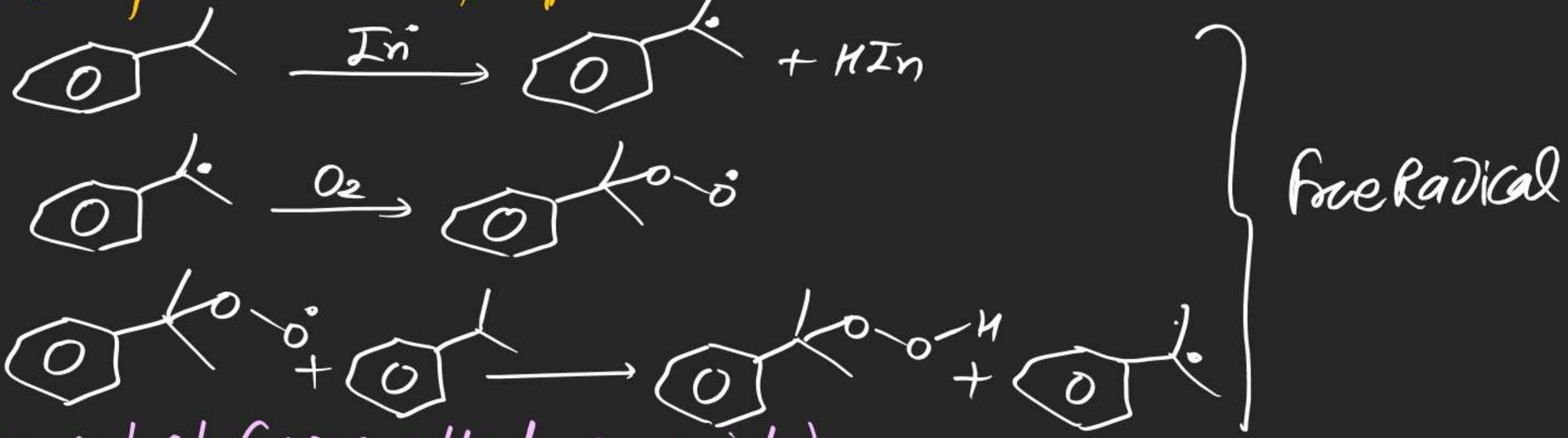
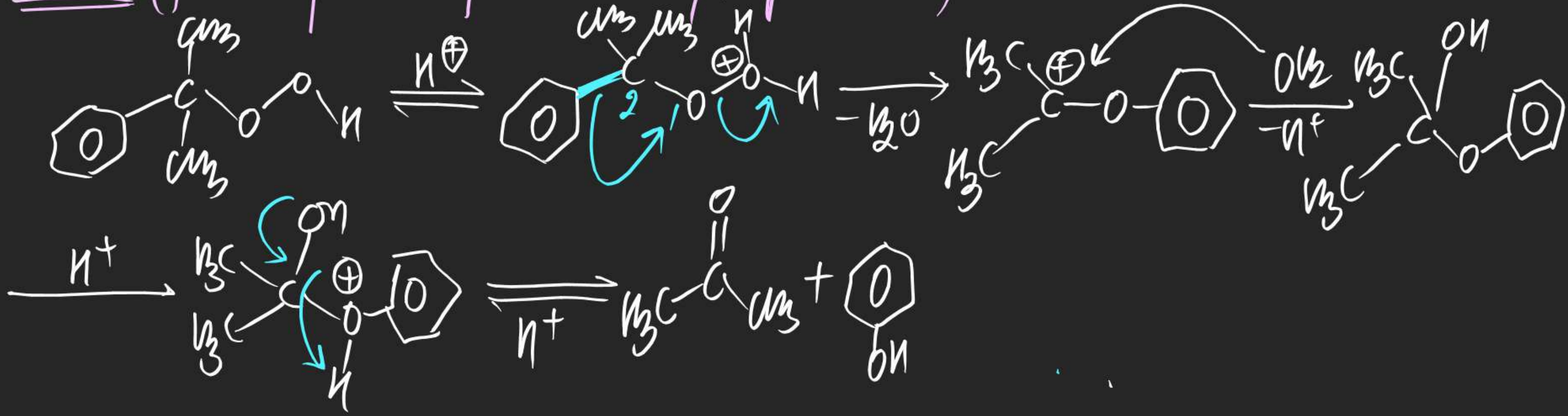
Mechⁿ (Formation of Cumene Hydroperoxide)



Mechⁿ (for Rearrangement of Cumene Hydroperoxide)



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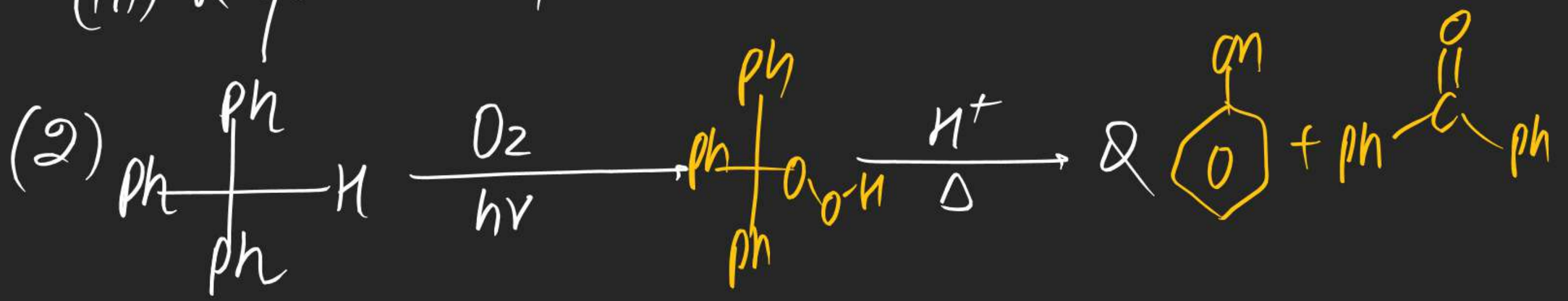
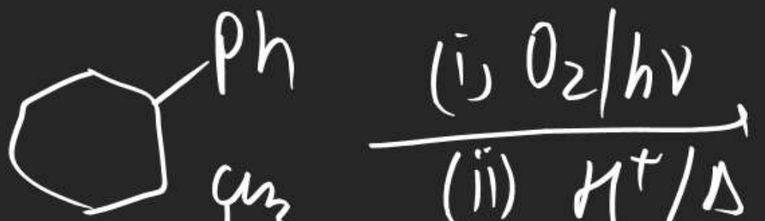
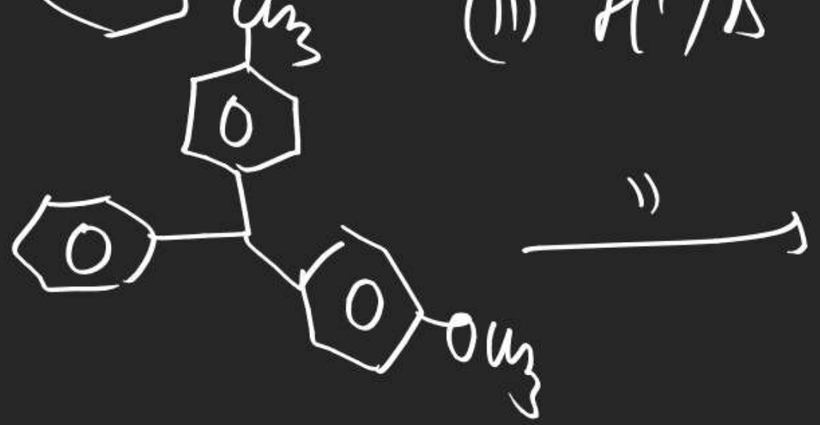
Note (i) Free Radical is formed duiy formation of Cumene Hydroperoxide

(ii) Duiy Reagent of Cumene Hydroperoxide Carbocation intermidiate

(iii) Rearrangement step is 1,2-shift

(2) 

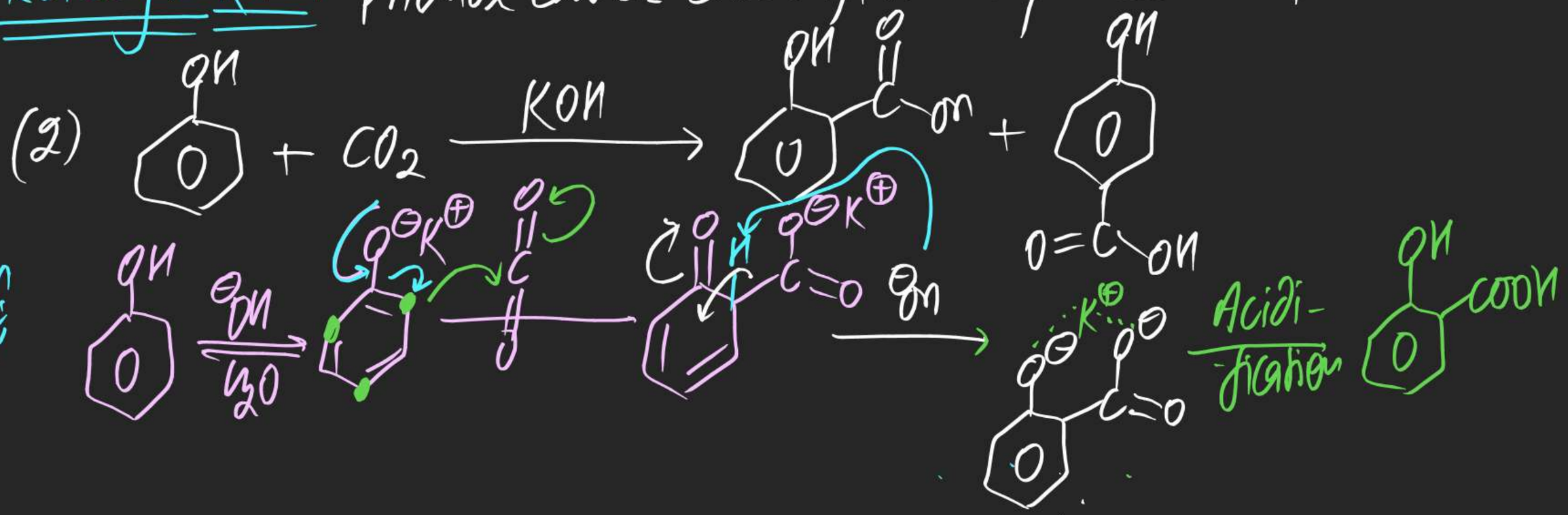
(3) 

(4) 

(#) Reactions of Phenol :-

(1) Reaction with Zn-Dust :

(2) Kolbe's Rxn :- Phenol can be Carboxylated By CO_2 in alkaline condn



Note (i) For KOH

$T < 60^\circ C$ — para > ortho [To avoid steric factors]

$60^\circ C \leq T < 160^\circ C$ — ortho > para [due to chelate formation]

$T \geq 160^\circ C$ — para > ortho [chelation destroy]

(ii) **At $T = 50^\circ C$**

LiOH — para > ortho (Universally large size of $Li^{\oplus}$ hydrated)

NaOH — ortho > para (chelate formation)

KOH — para > ortho

(3) 

(4) 

Nishant Jindal

(#) Reimer Tiemann's Rxn: