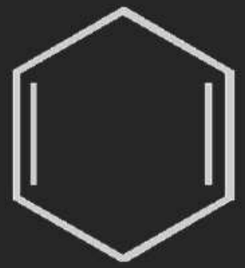
Nishant Jindal

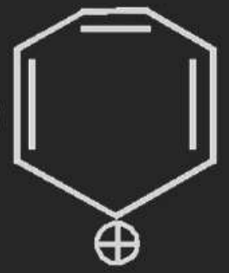
AROMATIC COMPOUNDS

EXERCISE -I

1. Which of the following is not an aromatic compound:

(A) 

(B) 

(C) 

(D) 

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2. Which of the following group is divalent:

(A) Benzoyl (B) Benzyl (C) Benzal (D) p-Tolyl

AROMATIC COMPOUNDS

Scientist (R-S)

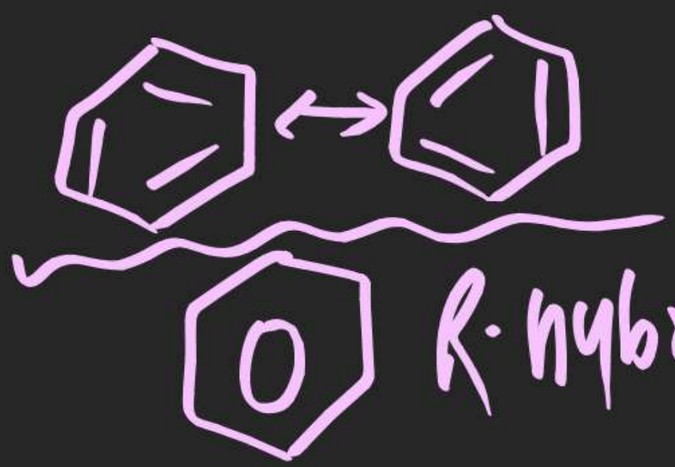
3. Benzene is a resonance hybrid mainly of two Kekule structures. Hence:

(A) Half of the molecules correspond to one structure, and half of the second structure

(B) At low temperatures benzene can be separated into two structures

(C) Two structures make equal contribution to resonance hybrid ✓

(D) An individual benzene molecule changes back and forth between two structures



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4. How many π electron are there in the following species:

(A) 2 (B) 4 (C) 6 (D) 8

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5. The number of benzylic hydrogen atoms in ethylbenzene is:

(A) 3 (B) 5 (C) 2 (D) 7

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6. Which one of the following is the most basic compound in water :

(A) $C_6H_5-NH_2$ (B) $C_6H_5-NHCH_3$ (C) $C_6H_5-N(CH_3)_2$ (D) $C_6H_5\,N(C_2H_5)_2$

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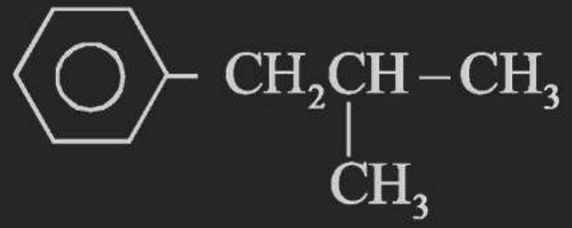
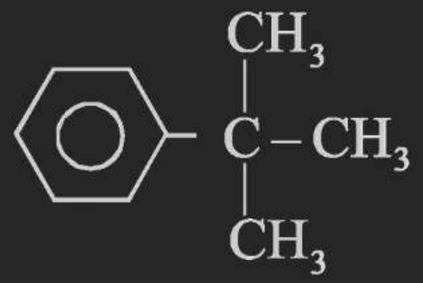
AROMATIC COMPOUNDS

7.  + $CH_3CH_2CH_2CH_2Cl \xrightarrow{AlCl_3}$ hydrocarbon (X) major product X is:

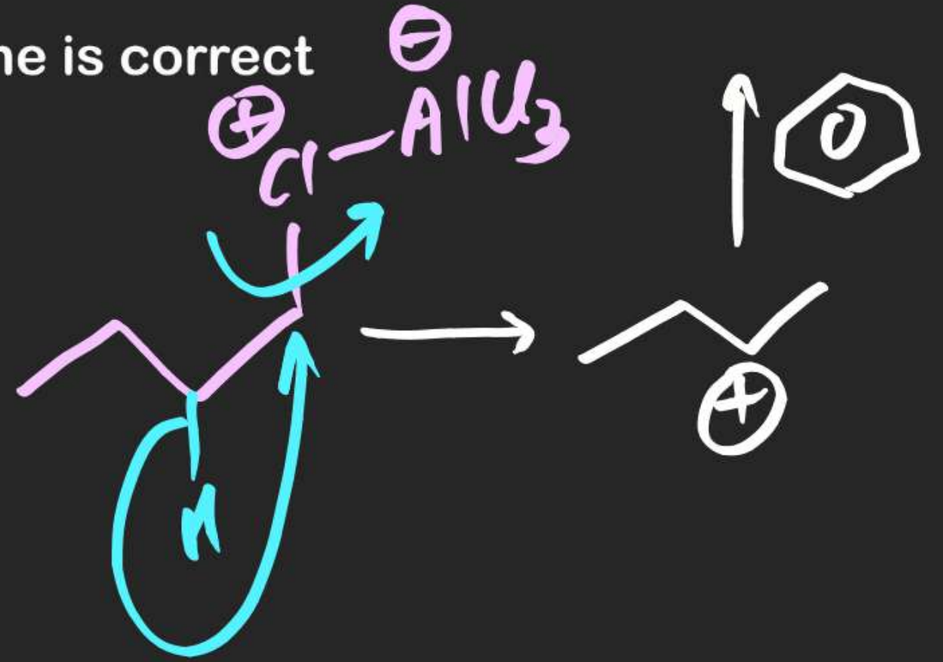
(A) 

(B) 

(C) 

(D) None is correct

Soln:



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AROMATIC COMPOUNDS

8. In the sulphonation, acetylation and formylation of benzene the group of effective electrophiles would be :

(A) $SO_3^+, CH_3C \equiv \overset{+}{O}, \overset{+}{H}O$

(B) $SO_3, CH_3 - C \equiv \overset{+}{O}, \overset{+}{H}O$

(C) $SO_3, CH_3CHO, CO + HCl$

(D) HSO_3, CH_3CO, HCO

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AROMATIC COMPOUNDS

9. o/p ratio in highest for nitration of which of the following compound?

(A) Ethyl benzene

(B) Toluene

(C) Isopropyl benzene

(D) Tertiarybutyl benzene

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AROMATIC COMPOUNDS

10. Which can be used to generate NO_2^+ in nitration of benzene ring

(A) $HNO_3 + H_2SO_4$ (B) $HNO_3 + HClO_4$ (C) N_2O_5 (D) All

WA SA WA SA

HNO_3

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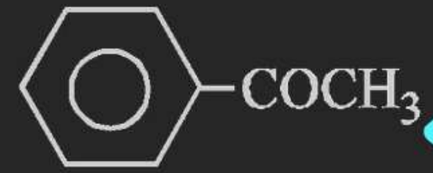
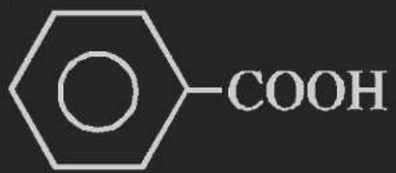
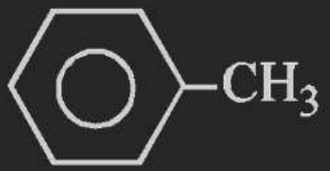
AROMATIC COMPOUNDS

11. Product obtained when benzoyl acetic acid is heated with soda-lime is:

(A) 

(B) 

(C) 

(D) 

AROMATIC COMPOUNDS

12. For the electrophilic substitution reaction involving nitration, which of the following sequence regarding the rate of reaction is true?

(A) $k_{C_6H_6} > k_{C_6D_6} > k_{C_6T_6}$

(B) $k_{C_6H_6} < k_{C_6D_6} < k_{C_6T_6}$

(C) $k_{C_6H_6} = k_{C_6D_6} = k_{C_6T_6}$

(D) $k_{C_6H_6} > k_{C_6D_6} < k_{C_6T_6}$

AROMATIC COMPOUNDS

13. For the electrophilic substitution reaction involving sulphonation, which of the following sequence regarding the rate of reaction is true?

(A) $k_{C_6H_6} > k_{C_6D_6} > k_{C_6T_6}$

(B) $k_{C_6H_6} < k_{C_6D_6} < k_{C_6T_6}$

(C) $k_{C_6H_6} = k_{C_6D_6} = k_{C_6T_6}$

(D) $k_{C_6H_6} > k_{C_6D_6} < k_{C_6T_6}$

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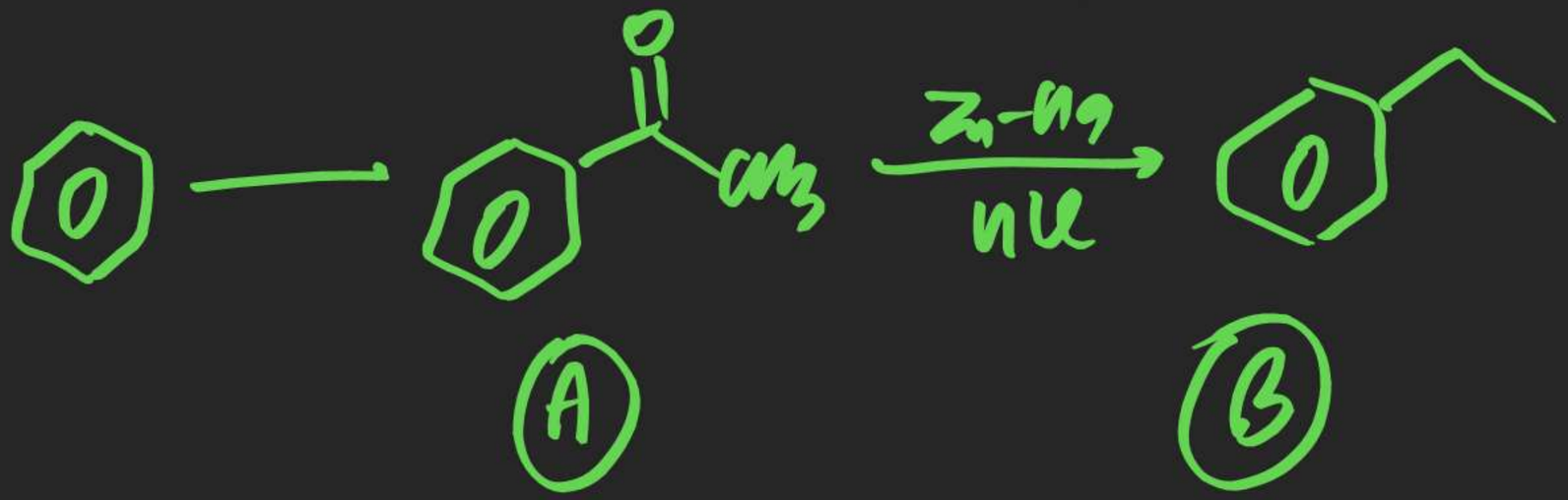
AROMATIC COMPOUNDS

14. $C_6H_6 \xrightarrow[AlCl_3]{CH_3COCl} A \xrightarrow[HCl]{Zn-Hg} B$

The end product in the above sequence is:

(A) Toluene **(B) Ethyl benzene** **(C) Both the above** **(D) None**



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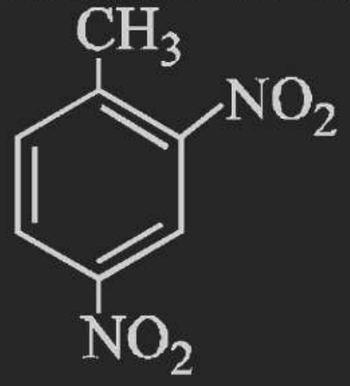
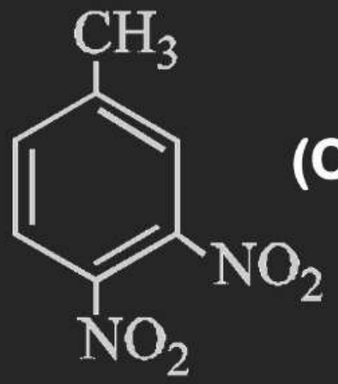
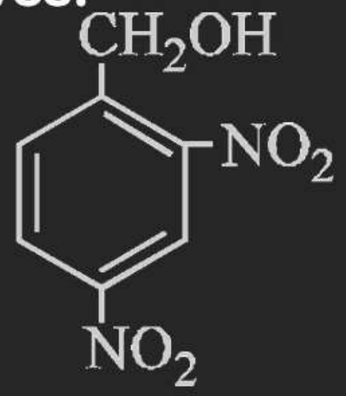
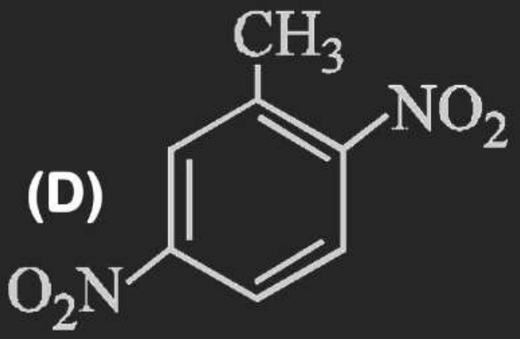
AROMATIC COMPOUNDS

15. p-Nitrotoluene on further nitration gives:

(A) 

(B) 

(C) 

(D) 

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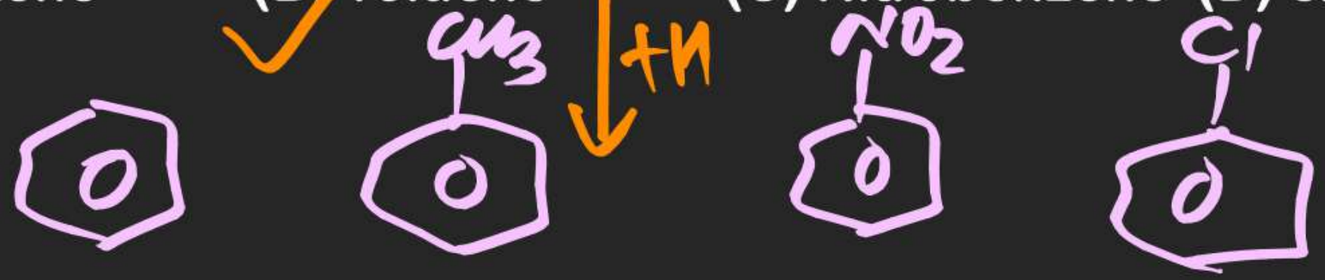
AROMATIC COMPOUNDS

Electrophile

16. Reaction of SO_3 is easier in:

most Nucleophilic

(A) Benzene (B) Toluene (C) Nitrobenzene (D) chlorobenzene



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AROMATIC COMPOUNDS

17. Which order is correct for the decreasing reactivity to ring monobromination of the following compounds:

(I) $C_6H_5CH_3$ (II) C_6H_5COOH (III) C_6H_6 (IV) $C_6H_5NO_2$

(A) I > II > III > IV (B) I > III > II > IV (C) II > III > IV > I (D) III > I > II > IV

AROMATIC COMPOUNDS

18. The highest yield of m-product is possible by the electrophilic substitution of the following:

(A) $C_6H_5CH_3$

(B) $C_6H_5CH_2COOC_2H_5$

(C) $C_6H_5CH(COOC_2H_5)_2$

(D) $C_6H_5C(COOC_2H_5)_3$

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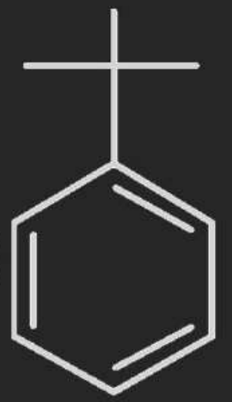
AROMATIC COMPOUNDS

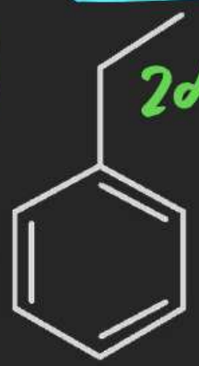
Electrophile

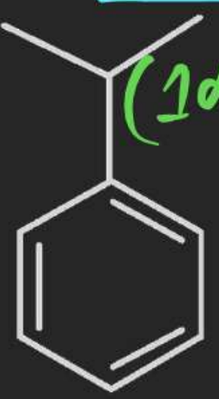
19. Which of the following will undergo sulphonation at fastest rate?

(A) 

(B) 

most Nucleophilic

(C) 

(D) 

most Nucleophilic

AROMATIC COMPOUNDS

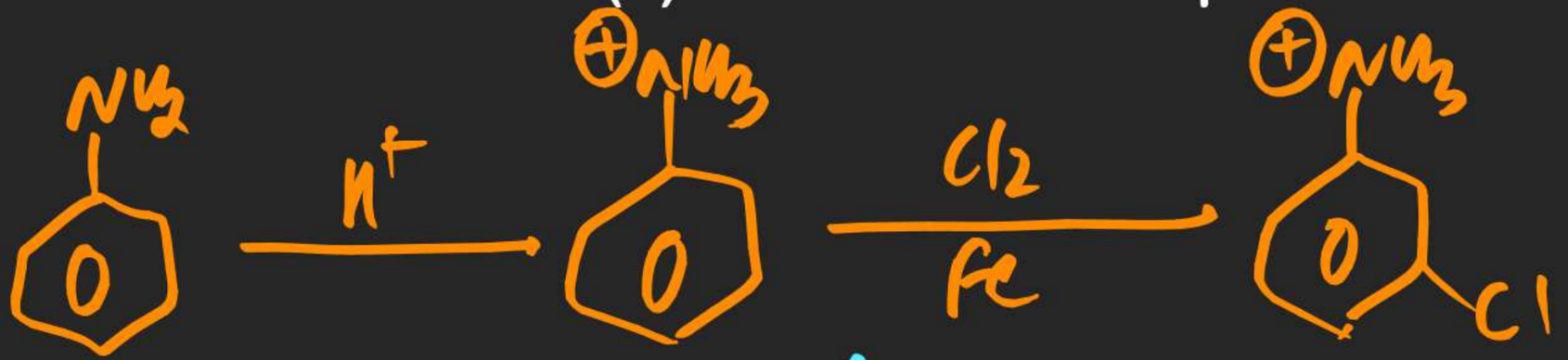
20. Aniline under acidic medium, when chlorinated, produces:

(A) o-Chloro aniline

(B) m-Chloro aniline

(C) p-Chloro aniline

(D) Mixture of ortho and para-chloro aniline



deactivated & (meta directing)

AROMATIC COMPOUNDS

21. When sulphonilic acid ($p - H_2NC_6H_4SO_3H$) is treated with excess of bromine water, the product is:

(A) Tribromo product

(B) Dibromo product

(C) Monobromo product

(D) Tetrebromo product

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AROMATIC COMPOUNDS

22. In a reaction of C_6H_5Y, the major product $(> 60\%)$ is m-isomer, so the group Y is:

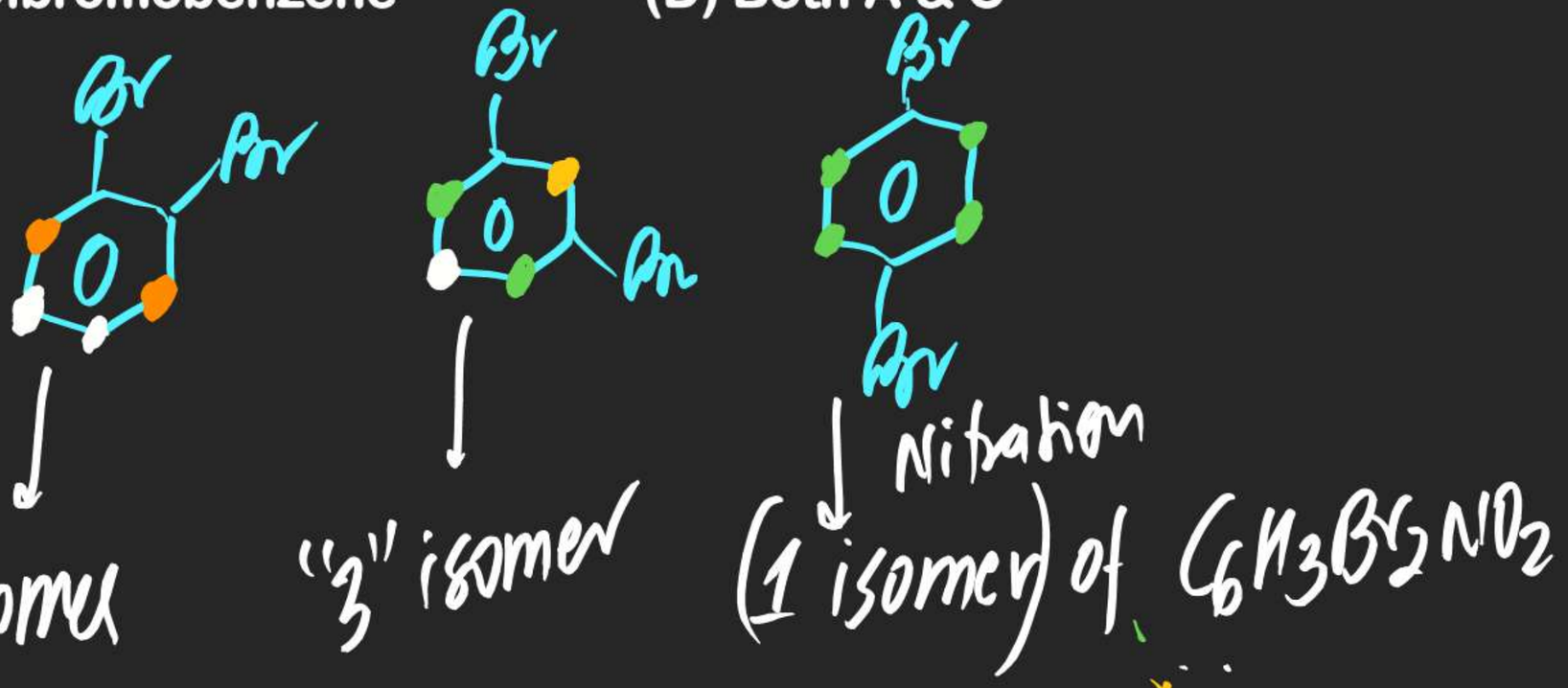
(A) $-COOH$ (B) $-Cl$ (C) $-OH$ (D) $-NH_2$

AROMATIC COMPOUNDS

23. An aromatic compound of molecular formula $C_6H_4Br_2$ was nitrated then three isomers of formula $C_6H_3Br_2NO_2$ were obtained. The original compound is:

(A) o-Dibromobenzene (B) m-Dibromobenzene

(C) p-Dibromobenzene (D) Both A & C



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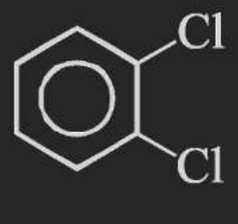
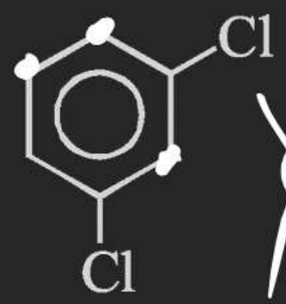
AROMATIC COMPOUNDS

24. Which of the following substituted benzene derivatives would furnish only three isomers in significant amount when one more substituent is introduced:

(A) 

(B) 

(C) 

(D) 

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AROMATIC COMPOUNDS

25. Which of the following is most reactive towards sulphonation?

(A) m-Xylene (B) o-Xylene (C) Toluene (D) p-Xylene

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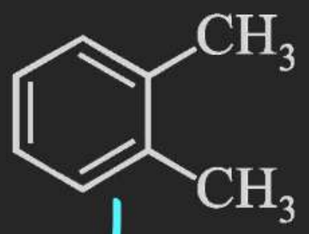
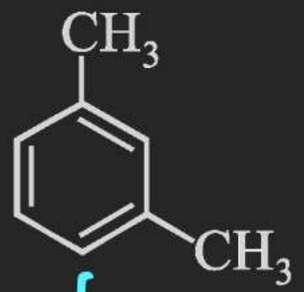
AROMATIC COMPOUNDS

26. Ring nitration of dimethyl benzene results in the formation of only one nitro dimethyl benzene. The dimethyl benzene is:

(A) 

(B) 

(C) 

(D) None of these

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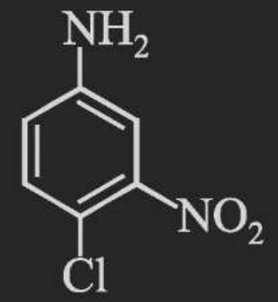
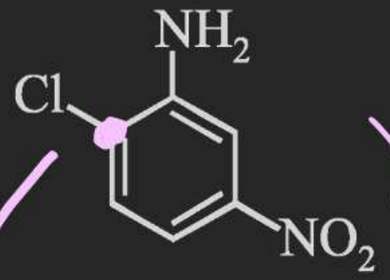
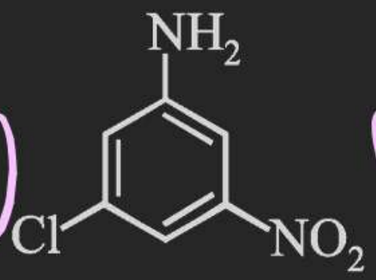
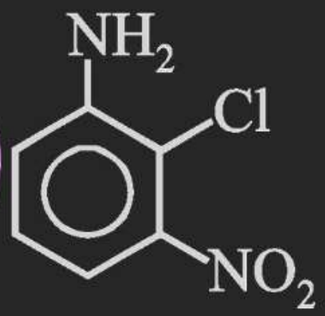
AROMATIC COMPOUNDS

27. If meta-nitroaniline is chlorinated, the major product is:

(A) 

(B) 

(C) 

(D) 

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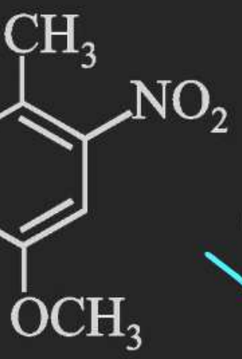
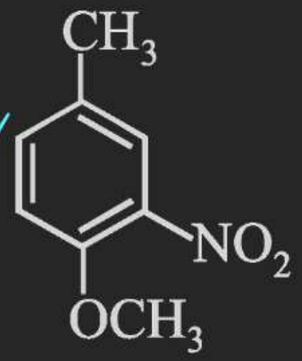
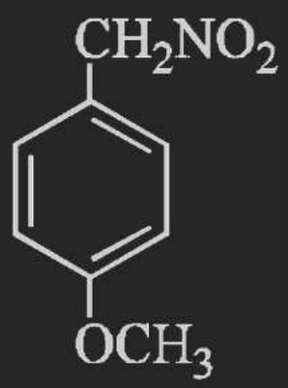
AROMATIC COMPOUNDS

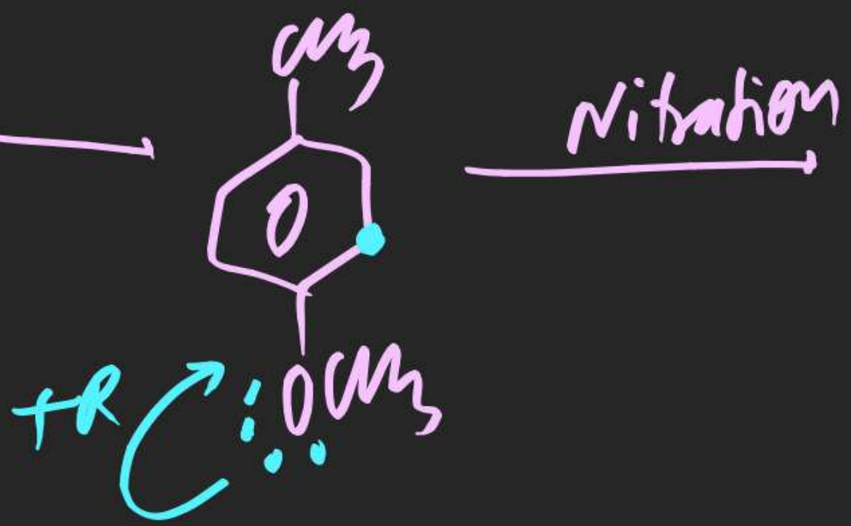
28. If p-methoxy toluene is nitrated, the major product is:

(A) 

(B) 

(C) 

(D) No reaction



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AROMATIC COMPOUNDS

29. $C_6H_5CH_3 \xrightarrow{CrO_2} A \xrightarrow{H_2O} B$

The functional group present in B and name of the reaction would be

(A) - CHO, Gattermann aldehyde synthesis

(B) - CHO, Etard reaction

(C) $-COCH_3$, Friedel Crafts reaction

(D) -CHO, Oxo reaction

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AROMATIC COMPOUNDS

30. Etard reaction in the following is:

(A) Oxidation of toluene to benzaldehyde by chromylchloride

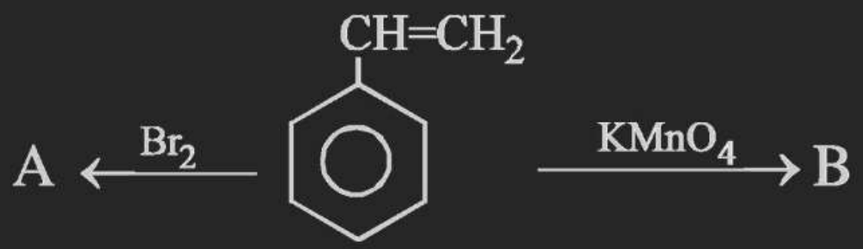
(B) Oxidation of toluene to benzaldehyde by alkaline $KMnO_4$

(C) Dry distillation of calcium benzoate

(D) Reaction of benzene with Cl_2 in the presence of UV light

AROMATIC COMPOUNDS

31.



Compound A and B respectively are:

(A) o-Bromostyrene, benzoic acid

(B) p-Bromostyrene, benzaldehyde

(C) m-Bromostyrene, benzaldehyde

(D) Styrene dibromide, benzoic acid

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AROMATIC COMPOUNDS

32. If the mixture of the following four aromatic compounds on oxidation by strong oxidising agent gives:

Incomple.

(A) Mixture of $C_6H_5CH_2OH + C_6H_5COOH$

(B) Mixture of $C_6H_5CHO + C_6H_5COOH$

Ans (C) Only C_6H_5COOH

(D) None of the above

AROMATIC COMPOUNDS

33. Methyl group attached to benzene can be oxidised to carboxyl group by reacting with:

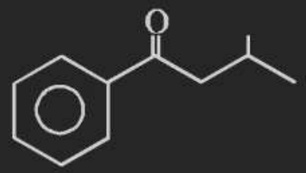
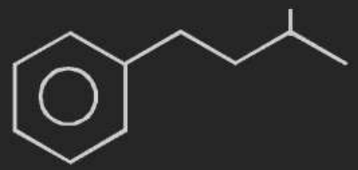
(A) Fe_2O_3 (B) $AgNO_3$ (C) $KMnO_4$ (D) CrO_3

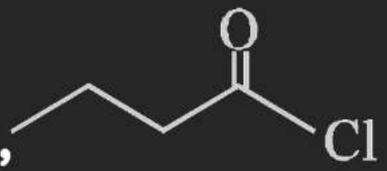
AROMATIC COMPOUNDS

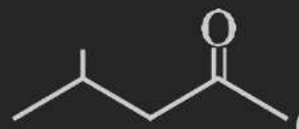
34. Which of the following is/are produced when a mixture of benzene vapour and oxygen is passed over V_2O_5 catalyst at $775\ K$?

(A) Oxalic acid (B) Glyoxal (C) Fumaric acid (D) Maleic anhydride

AROMATIC COMPOUNDS

35. Benzene on reaction with 'A' forms  which on reaction with 'B' forms  'A' and 'B' are:

(A) $Zn(Hg)$ + conc. HCl, 

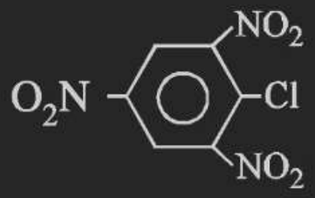
(B)  Cl, $LiAlH_4$

(C)  Cl, $NaBH_4$

(D)  Cl, $Zn(Hg)$ + conc. HCl

AROMATIC COMPOUNDS

36. Which chloroderivative of benzene among the following would undergo-hydrolysis most readily with aq. $NaOH$ to furnish the corresponding hydroxy derivative.

(A) 

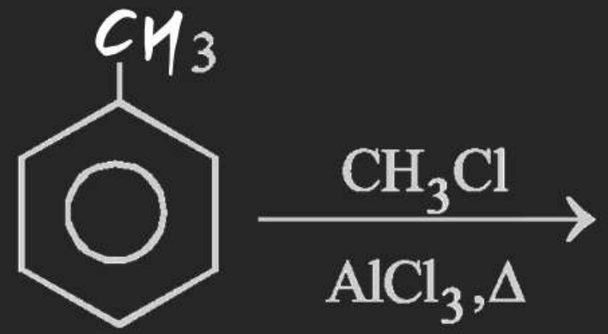
(B) 

(C) 

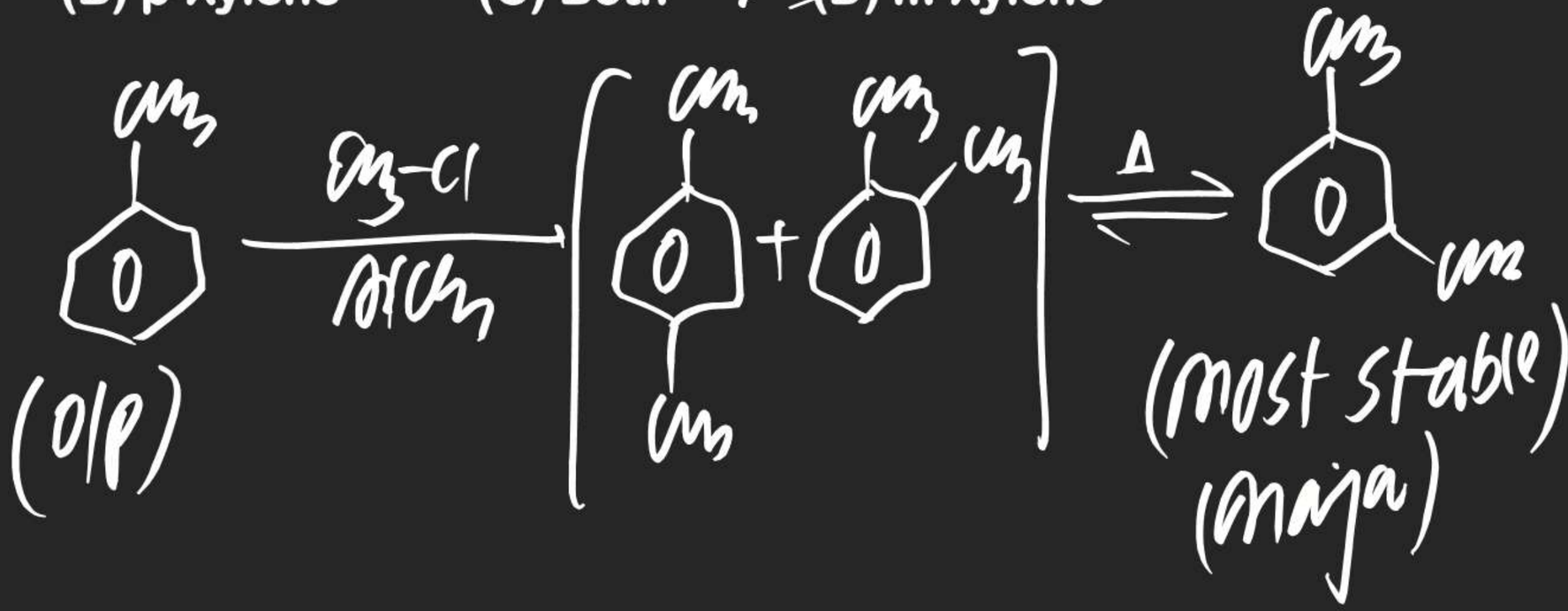
(D) 

AROMATIC COMPOUNDS

37. Major product of this reaction will be :



(A) o-Xylene (B) p-Xylene (C) Both ~~(D) m-Xylene~~



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AROMATIC COMPOUNDS

38. For preparing monoalkyl benzene, acylation process is preferred than direct alkylation because

(A) In alkylation, a poisonous gas is evolved

(B) In alkylation, large amount of heat is evolved

(C) In alkylation, polyalkylated product is formed

(D) Alkylation is very costly

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AROMATIC COMPOUNDS

39. Phenol and ethanol are distinguished by the reaction with

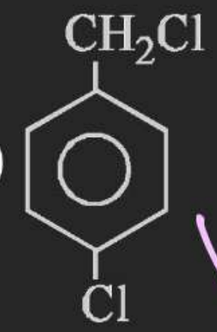
(A) Red litmus (B) $NaHCO_3$ (C) $FeCl_3$ (D) Na

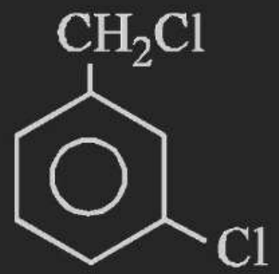
phenol & stable enol

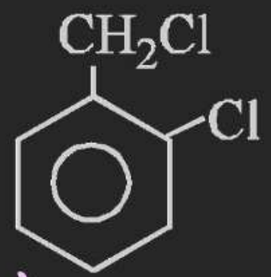
Neutral $FeCl_3$ ⟶ (violet color)

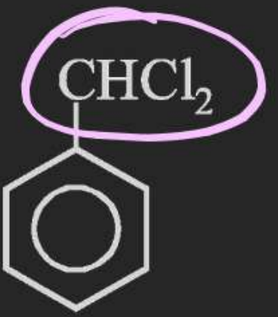
AROMATIC COMPOUNDS

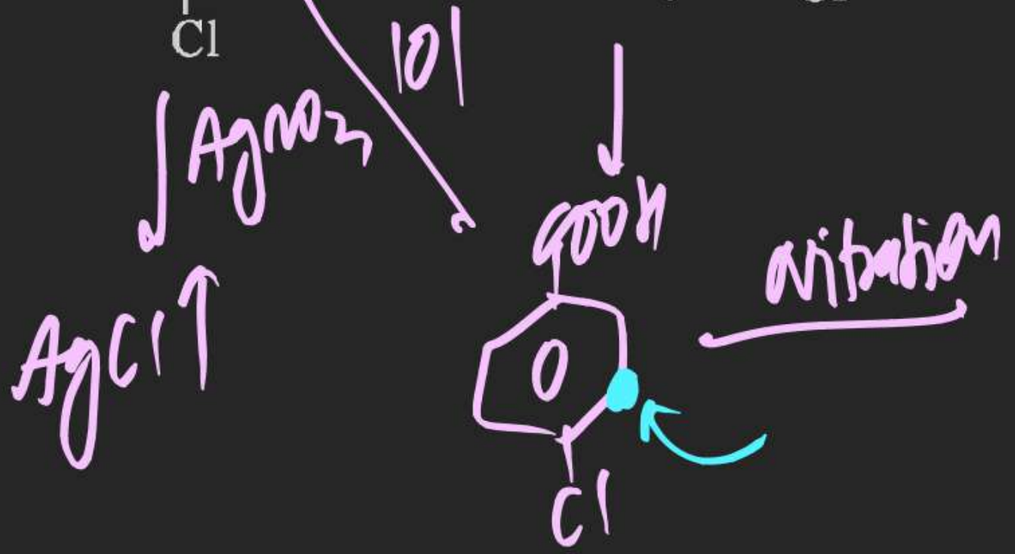
40. An aromatic compound ' $A' C_7H_6Cl_2$, gives $AgCl$ on bonding with alcoholic $AgNO_3$ solution, and yields C_7H_7OCl on treatment with sodium hydroxide. 'A' on oxidation gives a mono chlorobenzoic acid which affords only one mononitro derivative. The compound A is:

(A) 

(B) 

(C) 

(D) 



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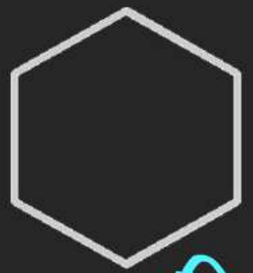
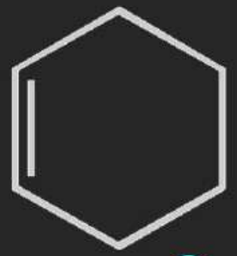
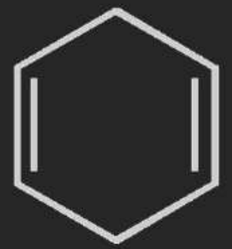
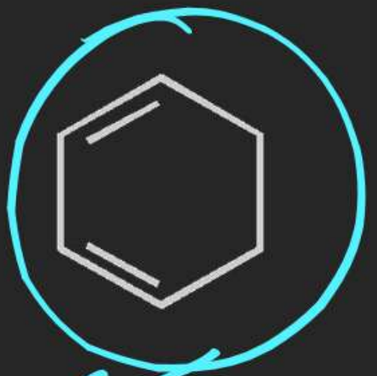
AROMATIC COMPOUNDS

41.  $+ H_2 \xrightarrow[\text{High pressure}]{\text{Ni, high temp.}}$ (A). Which of the following can be isolated as the product of this

(A) 

(B) 

(C) 

(D) 

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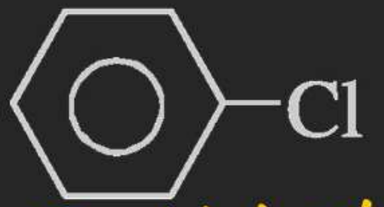
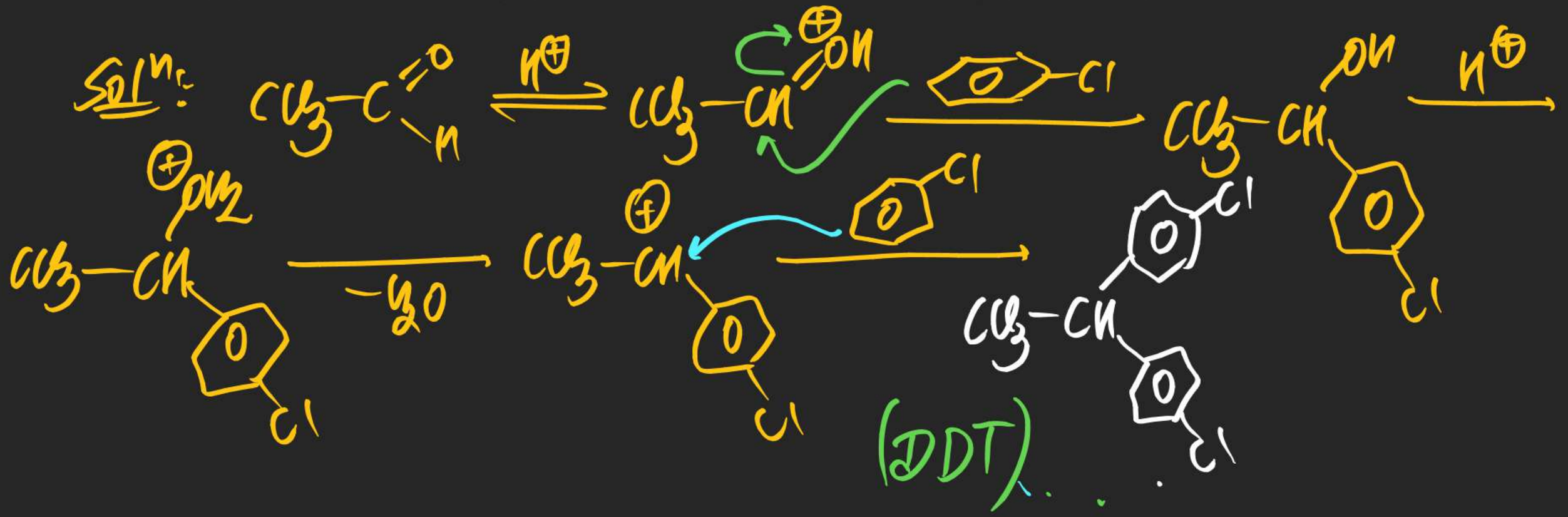
AROMATIC COMPOUNDS

42. Chloral +  $\xrightarrow{\text{Conc.}H_2SO_4}$ product. The product is:

Don't touch

(A) Lindane (B) DDT (C) Teflon (D) Ethaneperchlorate

Soln:



(DDT)

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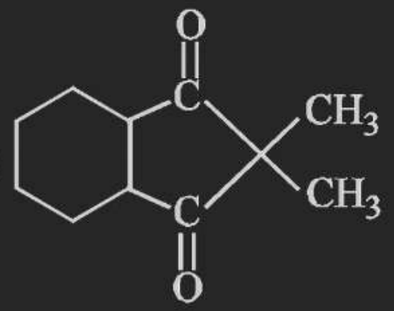
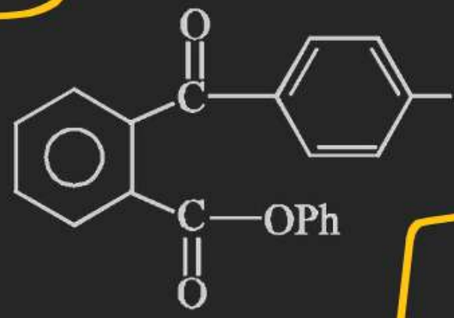
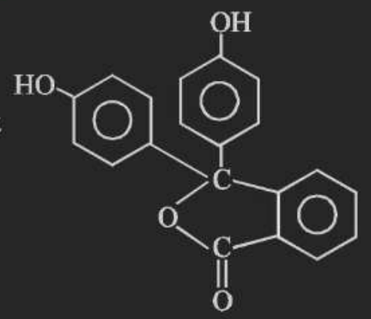
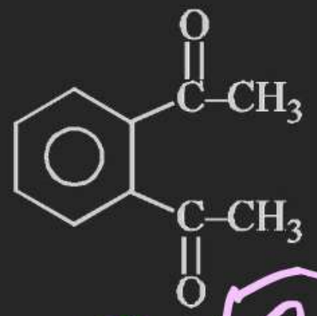
AROMATIC COMPOUNDS

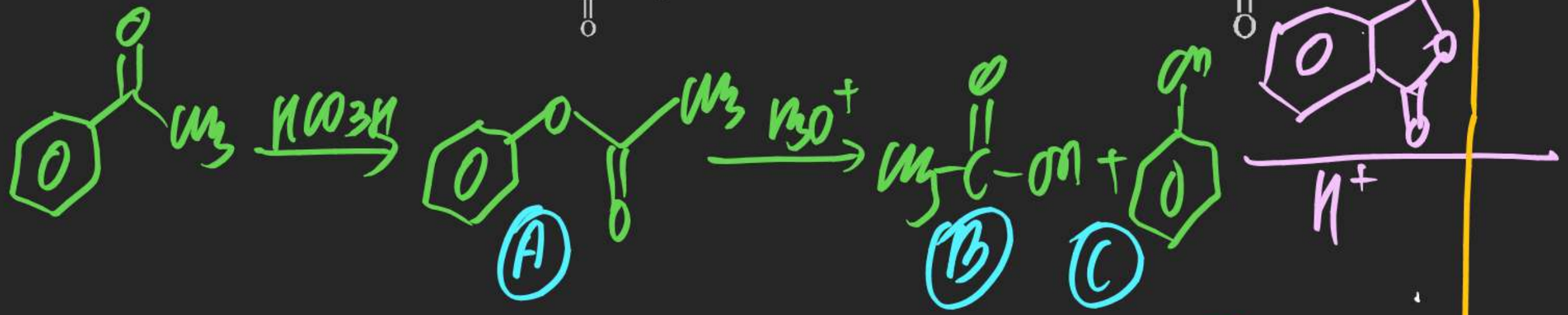
43. Acetophenone $\xrightarrow{HCO_3H}$ A $\xrightarrow{H_3O^+}$ B + C $\xrightarrow[H^+]{\text{Pthalic Anhydride}}$ Indicator (D) ; **C & D are**

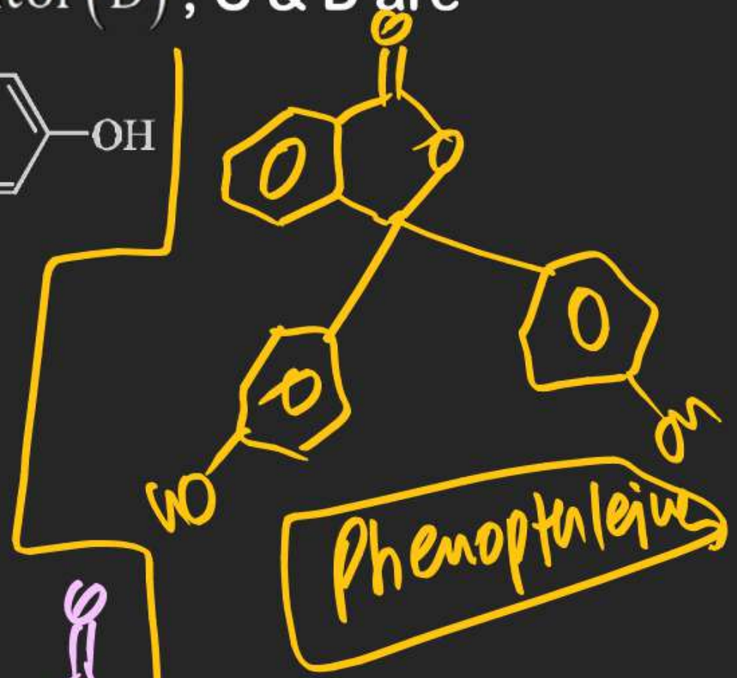
(A) CH_3OH & 

(B) PhOH & 

(C) PhOH & 

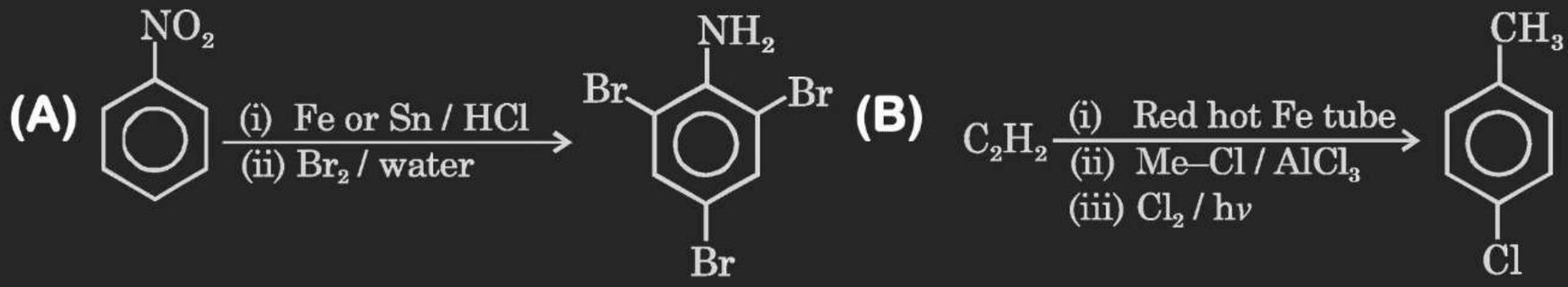
(D) CH_3OH & 

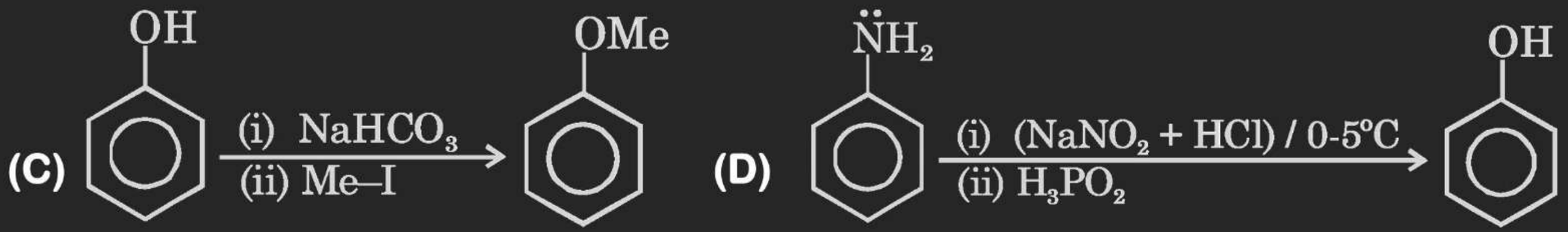




AROMATIC COMPOUNDS

44. Select the reaction giving correct major product:





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AROMATIC COMPOUNDS

45. $\text{Phenol} \xrightarrow[(ii)\text{Me–I}]{(i)\cancel{NaHCO_3}} A \xrightarrow{H^+/H_2O} B \xrightarrow[CH_3COOH,\Delta]{Al_2O_3} C$

Na_2CO_3

CO_2, KOH

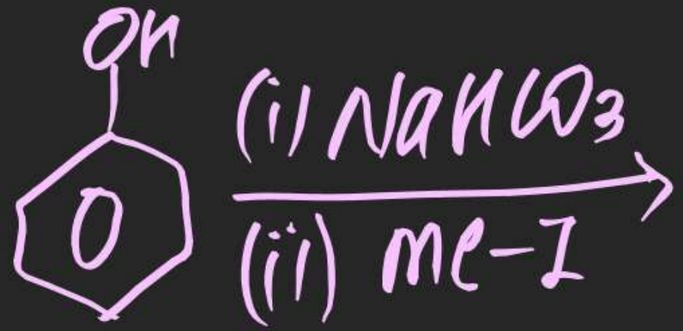
Ans (C)

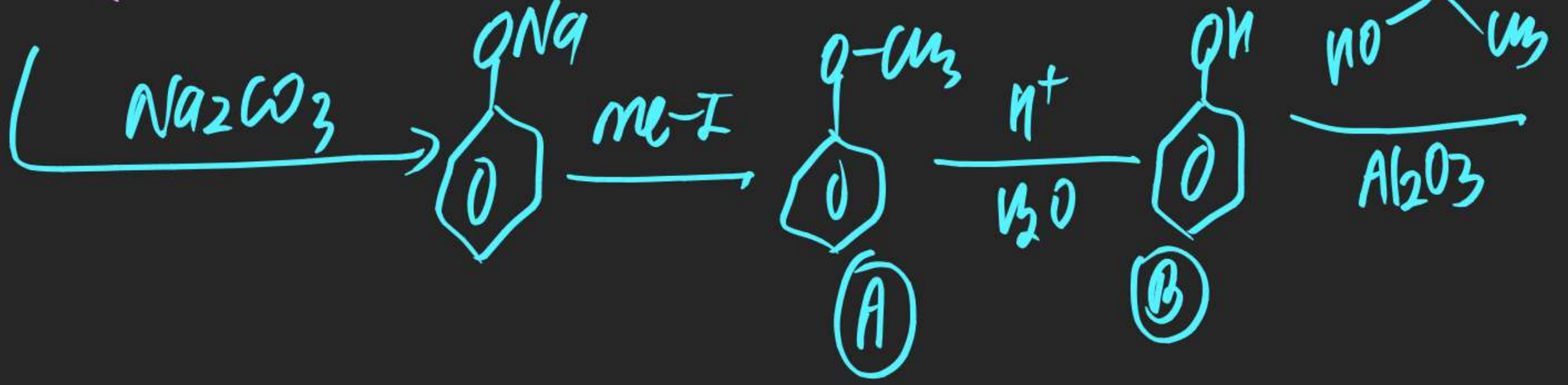
Ans (D)

In this reaction, the end product C is:

(A) Salicylaldehyde (B) Salicylic acid (C) Phenyl acetate (D) Aspirin

Soln:





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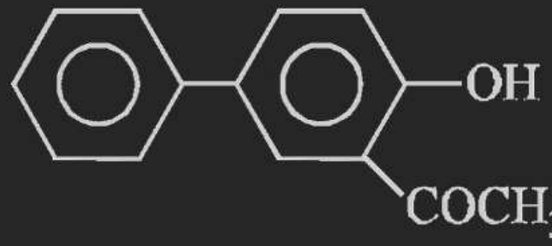
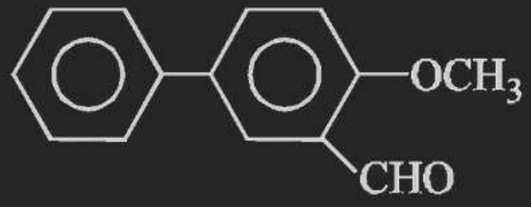
AROMATIC COMPOUNDS

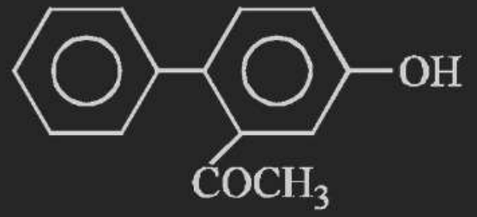
46. 

Major Product is:

(A) 

(B) 

(C) 

(D) 

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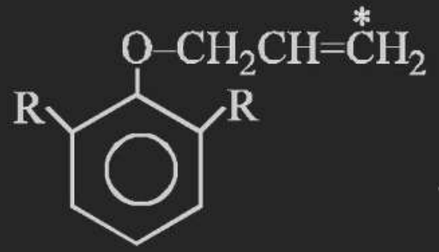
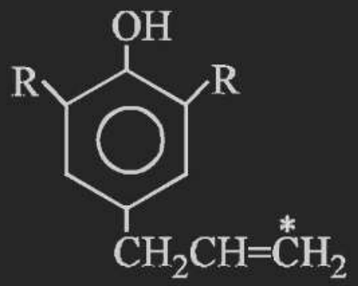
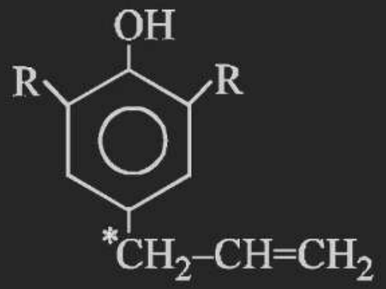
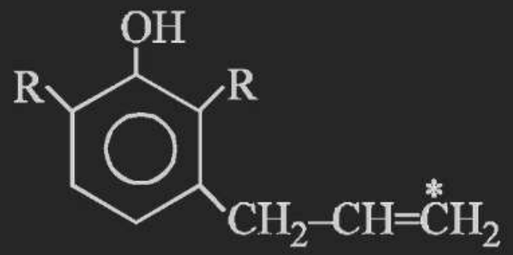
AROMATIC COMPOUNDS

47. 

$\xrightarrow{\Delta}$? Product is:

(A) 

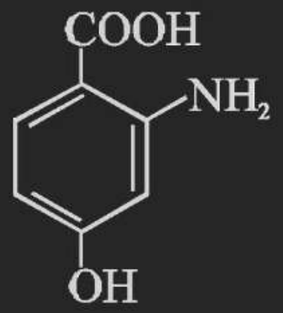
(B) 

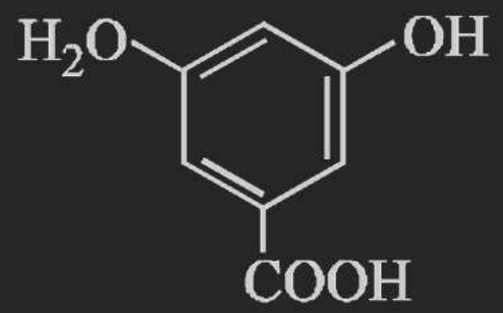
(C) 

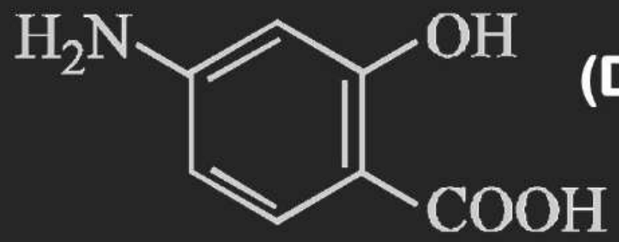
(D) No reaction

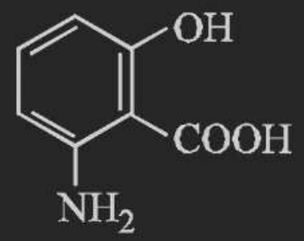
AROMATIC COMPOUNDS

48. m-Aminophenol on treatment with $NaOH$ and CO_2 gives which of the following as major product?

(A) 

(B) 

(C) 

(D) 

AROMATIC COMPOUNDS

49. Stability order of following singlet halocarbene is

(A) $CF_2 > CCl_2 > CBr_2 > CI_2$

(B) $CI_2 > CBr_2 > CCl_2 > CF_2$

(C) $CCl_2 > CF_2 > CBr_2 > CI_2$

(D) $CF_2 > CI_2 > CCl_2 > CBr_2$

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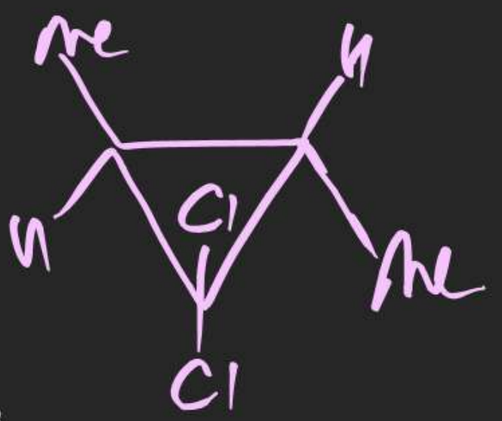
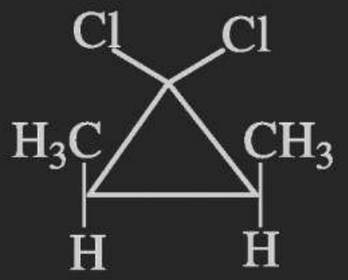
AROMATIC COMPOUNDS

CCl_2 (DCC) Singlet $\overset{1r}{CCl_2}$

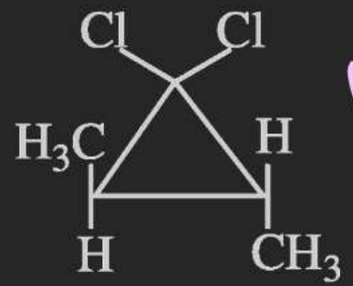
50. **Trans-Butene-** 2 $\xrightarrow[\text{Solvent}]{CHCl_3/KOH}$ Product



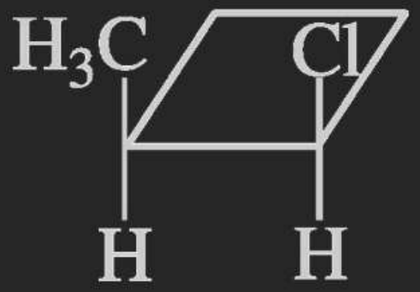
(A)



(B)



(C)



(D) Both (A) & (B)

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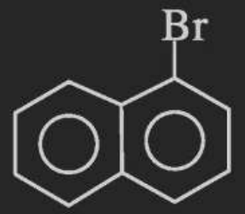
AROMATIC COMPOUNDS

51.  $\xrightarrow[KOH]{CHCl_2Br}$ Product ; Product is :

(A) 

(B) 

(C) 

(D)