



CHEMISTRY

BOOKS - CBSE COMPLEMENTARY MATERIAL CHEMISTRY (HINGLISH)

ALCOHOLS, PHENOLS AND ETHERS

Multiple Choice Questions

1. Arrange the following compounds in increasing order of boiling point :

Propan-1-ol, butan-1-ol, butan-2-ol, pentan-1-ol

A. a) i gt iii gt ii gt iv

B. i gt ii gt iii gt iv

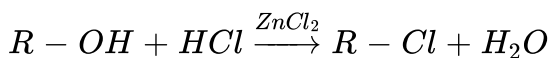
C. iv gt iii gt ii gt i

D. iv gt ii gt iii gt i

Answer: D

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2. What is the correct order of reactivity of alcohols in the following reaction ?



A. 1° gt 2° gt 3°

B. 1° lt 2° gt 3°

C. 3° gt 2° gt 1°

D. 3° gt 1° gt 2°

Answer: C

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3. IUPAC name of the compound $CH_3 - \overset{CH_3}{\underset{|}{CH}} - O - CH_3$ is:

A. 1-methoxy-1-methyl ethane

B. 2-methoxy-2-methyl ethane

C. 2-methoxy propane

D. isopropylmethyl ether

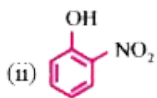
Answer: C

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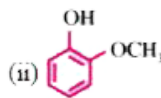
4. The correct order of decreasing acid strength of the following compound is:



(a) $i > ii > iii$



(b) $iii > ii > i$



A. $i > ii > iii$

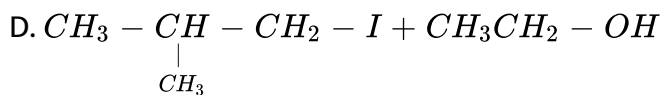
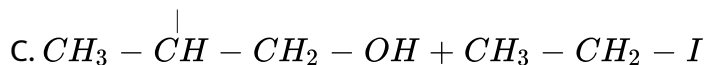
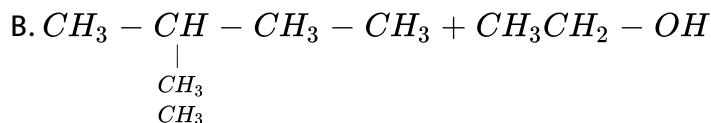
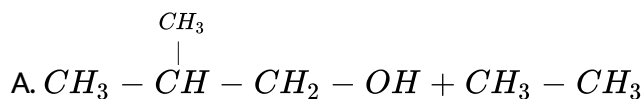
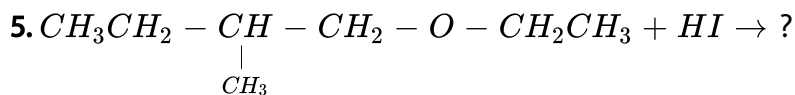
B. $iii > ii > i$

C. $ii > i > iii$

D. $ii > iii > i$

Answer: C

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Answer: C

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6. Benzene $\xrightarrow[\text{anhydrous } AlCl_3]{CH_3Cl}$ X $\xrightarrow{\text{alkaline } KMnO_4}$ Y $\xrightarrow{\text{alkaline } KMnO_4}$ Z, The product Z is

- A. Benzaldehyde
- B. Benzoic acid
- C. Benzene
- D. Toluene

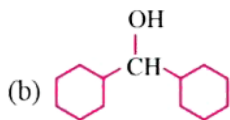
Answer: B

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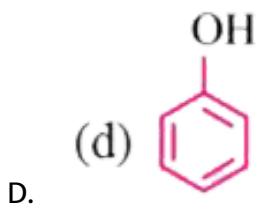
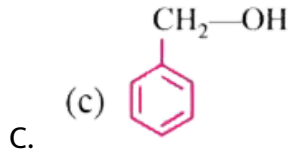
7. Which is most acidic



A.



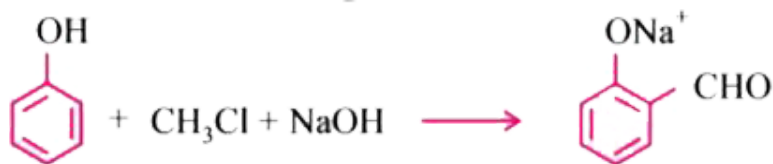
B.



Answer: D

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8. The electrophile involved in the given reaction is:



A. CCl_2

B. CCl_3^-

C. CHO^+

D. $CHCl_2^+$

Answer: A

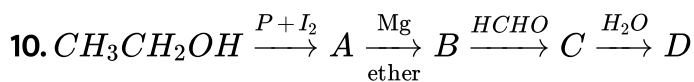
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9. The major product obtained on interaction of phenol with NaOH and CO_2 is

- A. Benzoic acid
- B. Salicylaldehyde
- C. Salicylic acid
- D. Phthalic acid

Answer: C

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The product 'D' is-

A. n-butylalcohol

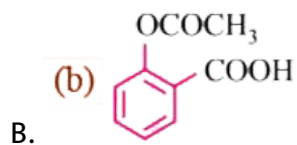
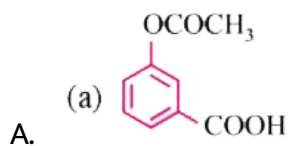
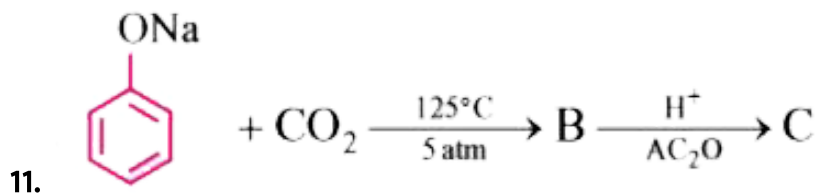
B. n-propylalcohol

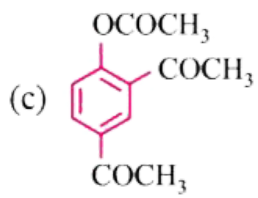
C. propanal

D. butanal

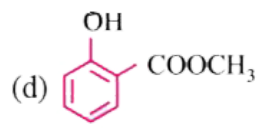
Answer: B

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C.



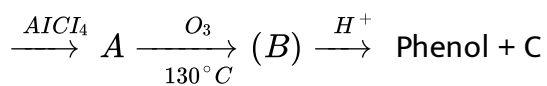
D.

Answer: B

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12.



Identify 'C' in the following is:

- A. Water
- B. Ethanol
- C. Cumenehydroperoxide
- D. acetone

Answer: D

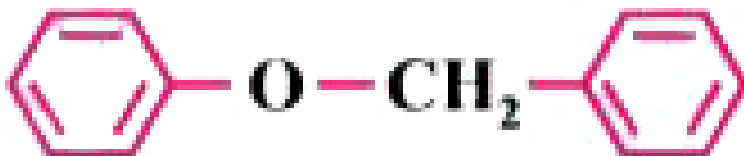


13. Iodoform can be prepared from all except

- A. butan-2-one
- B. acetophenone
- C. propan-2-ol
- D. propan-1-ol

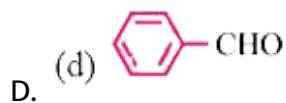
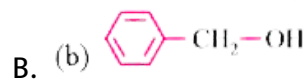
Answer: D

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14. The ether

when treated with HI produce



Answer: A

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15.  $\xrightarrow{\text{HBr}}$ the products are:

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16. Which of the following alcohol on dehydration with conc H_2SO_4 gives but-2-ene?

A. 2-methylpropan-2-ol

B. Butan-1-ol

C. 2-methyl propan-1-ol

D. Butan-2-ol

Answer: B::D



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17. Which of the following alcohol give iodoform test?

A. Butan-1-ol

B. Propan-1-ol

C. Propan-2-ol

D. Ethanol

Answer: C::D



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18. Which of the following is a weaker acid than phenol?

A. 4-Methoxy phenol

B. 3, 5-dinitrophenol

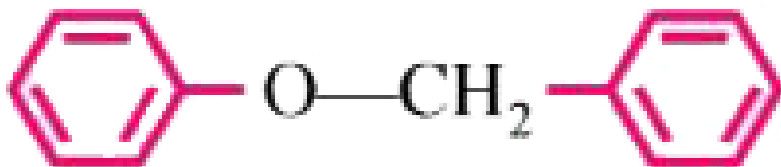
C. 4-Methyl phenol

D. 4-Nitrophenol

Answer: A::C



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19. The ether
when treated with HI produces.

- A. (a) c1ccccc1CI
- B. (b) c1ccccc1CO
- C. (c) c1ccccc1I
- D. (d) c1ccccc1O

Answer: A:D

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20. Correct statements in case of n-butanol and t-butanol are:

- A. both are having equal solubility in water
- B. t-butanol is more soluble in water than n-butanol
- C. boiling point of t-butanol is lower than n-butanol
- D. boiling point of n-butanol is lower than t-butanol

Answer: B::C

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21. Give reason for the following:

The boiling point of alcohol is higher than those of hydrocarbons of comparable molecular mass.

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22. Assertion: O and p-nitrophenols can be separated by steam distillation

Reason: O-isomer is steam volatile due to chelation and p-isomer is not steam volatile due to intermolecular hydrogen bonding

- A. If both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion
- B. If both assertion and reason are CORRECT, but reason is NOT the CORRECT explanation of the assertion
- C. If assertion is CORRECT but reason is INCORRECT
- D. If assertion is INCORRECT but reason is CORRECT

Answer: A



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23. Match the column

- | | |
|--|--------------------|
| A. Methanol and ethanol | P. Lucas reagent |
| B. Phenol and cyclohexanol | Q. Sodium metal |
| C. <i>n</i> - propyl alcohol and tertbutyl alcohol | R. Iodoform test |
| D. Methanol and diethyl ether | S. Ferric chloride |

A. A-Q, B-S, C-P, D-R

B. A-S, B-P, C-Q, D-R

C. A-P, B-Q, C-R, D-S

D. A-R, B-S, C-P, D-Q

Answer: D



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24. Match the column

A. Willionsan synthesis

B. Conversion of 2° alcohol to ketone

C. Reimer Tiemann reaction

D. Kolbc's reaction

P. Conversion of phenol to salicylic

Q. Conversion of phenol to salicalde

R. Heated with Cu-573k

S. reaction of alkyl halide with sodi

A. A-S, B-R, C-Q, D-P

B. A-R, B-S, C-Q, D-P

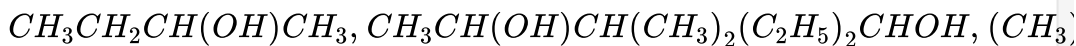
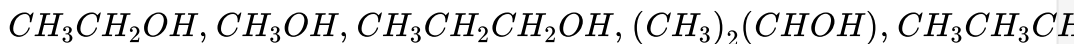
C. A-R, B-Q, C-P, D-S

D. A-Q, B-P, C-R, D-S

Answer: A

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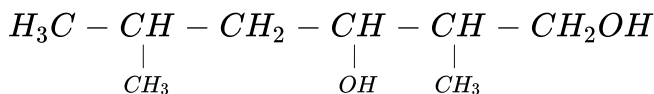
25. The number of alcohols giving iodoform test among the following is:



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Very Short Answer Type Questions 1 Mark

1. Q. 1. Write IUPAC name of the following compound :



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2. How is phenol obtained from aniline ?

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3. How will you explain that phenols are acidic in nature ?

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4. Arrange the following in decreasing order of their acidic character :



(i)

(ii)



$\text{C}_6\text{H}_5\text{OH}$ (iii)

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5. Among HI, HBr and HCl, HI is most reactive towards alcohols. Why ?

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6. Name a substance which can be used as an antiseptic as well as disinfectant.

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7. Nitrating mixture is

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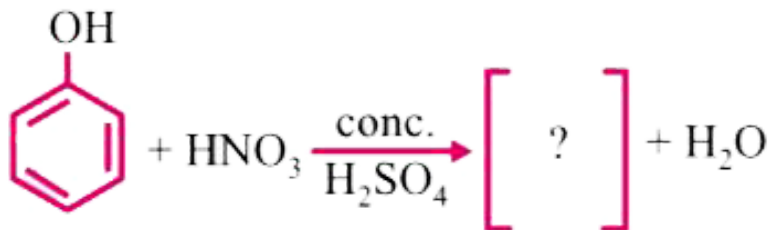
8. Lower alcohols are soluble in water, higher alcohols are not. Why ?

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9. What happens when CH_3CH_2OH heated with red P and HI ?

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10. Complete the following reaction :



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11. Ethanol has higher boiling point than methoxy methane. Give reason.

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12. How will you convert ethanol to ethene? Write chemical equation

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13. Explain Kolbe's reaction with example.

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14. Which of the following isomers is more volatile : o-nitrophenol or p-nitrophenol

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Short Answer I Type Questions 2 Marks

1. Write the equations involved in the following reactions :

(i) Reimer-Tiemann reaction

(ii) Williamson's ether synthesis

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2. Account for the following :

(i) Phenol has a smaller dipole moment than methanol.

(ii) Phenol goes electrophilic substitution reactions.



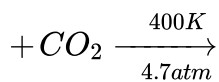
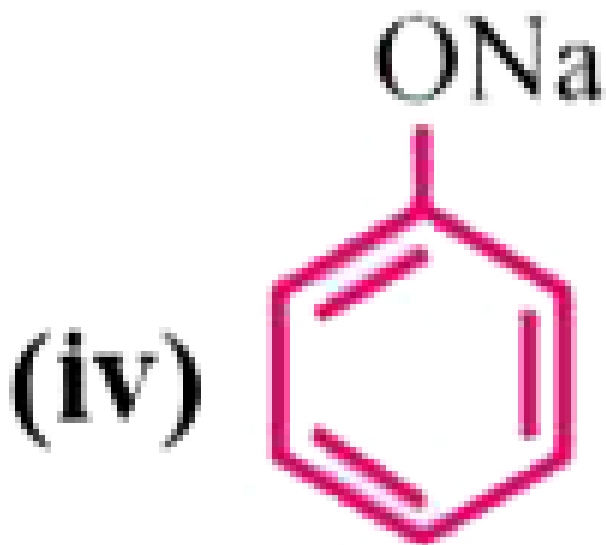
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3. Complete the following equations and name the products :

(i) Phenol + $FeCl_3 \rightarrow$

(ii) $C_6H_5OH + CHCl_3 + NaOH \xrightarrow{340K}$

(iii) $C_6H_5OH + Br_2(aq) \rightarrow$



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4. Write :

(i) Friedel-Crafts reaction

(ii) Coupling reaction

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5. Give one reaction of alcohol involving cleavage of :

(i) C – O bond

(ii) O – H bond

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6. Etherial solution of an organic compound 'X' when heated with Mg gave 'Y'. 'Y' on treatment with CH_3CHO followed by acid hydrolysis gave 2-propanol. Identify the compound 'X'. What is 'Y' known as ?

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7. While separating a mixture of ortho- and para-nitrophenols steam distillation, name the isomer which will be steam volatile. Give reason.

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8. Account for the following :

- (i) Phenol has a smaller dipole moment than CH_3OH .
- (ii) Phenol do not give protonation reactions readily.

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9. Write the reactions and conditions involved in the conversion of :

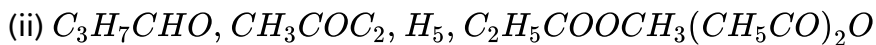
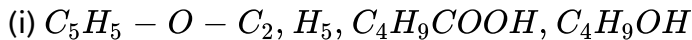
- (i) Propene to propan-2-ol.
- (ii) Phenol to salicylic acid.

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10. Write the mechanism of the reaction of HI with methoxymethane.

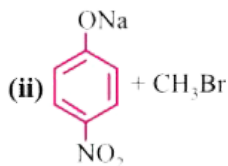
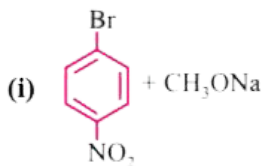
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11. Arrange in order of boiling points :



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12. Which of the following is an appropriate set of reactants for the preparation of 1-methoxy-4-nitrobenzene and why ?



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13. Ethers are relatively inert. Justify.

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14. How will you distinguish between CH_3OH and C_2H_5OH ?

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Short Answer II Type Questions 3 Marks

1. Name the reagents which can be used for the following conversions :

- (a) A primary alcohol to an aldehyde
- (b) Butan-2-one to butan-2-ol
- (c) Phenol to picric acid.

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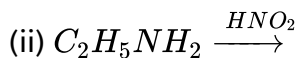
2. Write the structures of the major products expected from the following reactions:

- (a) Mononitration of 3-methylphenol
- (b) Dinitration of 3-methylphenol
- (c) Mononitration of phenyl methanoate.



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3. Complete the following reactions :



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4. Give equations of the following reactions :

(i) Oxidation of propan-1-ol with alkaline $KMnO_4$ solution.

(ii) Bromine in CS_2 with phenol.

(iii) Treating phenol with chloroform in presence of aqueous NaOH.



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5. Describe the following reactions with examples :

(i) Reimer-Teimann reaction

(ii) Kolbe's reaction

(iii) Friedel Crafts acylation of anisole

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6. Dehydration of alcohol to form an alkene is always carried out with concentrated H_2SO_4 and not with concentrated HCl or HNO_3 . Explain.

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7. How will you convert :

(i) Phenol to cyclohexanol

(ii) Benzyl chloride to benzyl alcohol

iii) Anisole to phenol

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Long Answer Type Questions 5 Marks

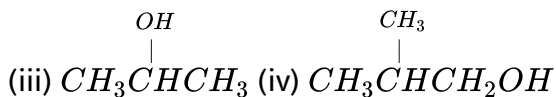
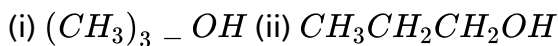
1. An alcohol [A] with molecules formula ($C_4H_{10}O$) o oxidation with acidified potassium dichromate gives acid [B] ($C_4H_8O_2$). Compound [A] when dehydrated with conc. H_2SO_4 at $443K$ gives compound [C]. Treatment of [C] with aqueous H_2SO_4 gives compound [D] ($C_4H_{10}O$) which is an isomer of [A]. compound [D] is resistant to oxidation but compound [A] can be easily oxidised. Identify [A], [B], [C] and [D]. Name the type of isomerism exhibited by [A] and [D].

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2. An ether 'A' ($C_5H_{12}O$) when heated with excess of hot concentrated HI produced two alkyl halides which on hydrolysis form compounds B and C. Oxidation of B gives an acid D whereas oxidation of C gave a ketone E. Deduce the structures of A, B, C, D and E.

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3. Which of the following compounds gives fastest reaction with HBr and why?



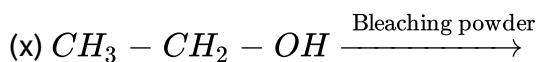
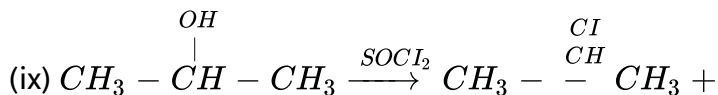
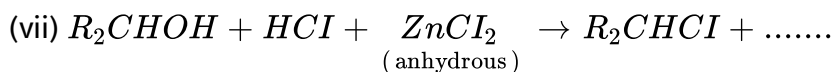
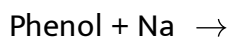
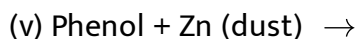
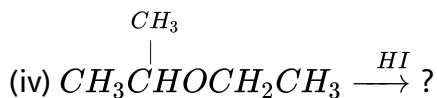
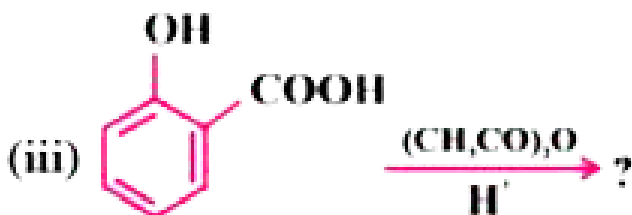
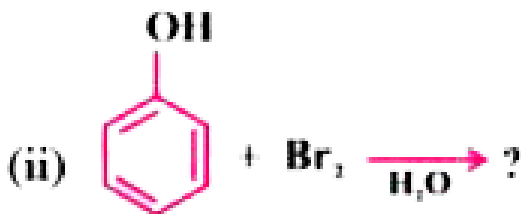
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4. Phenol, C_6H_5OH when it first reacts with concentrated sulphuric acid, forms Y. The compound, Y is reacted with concentrated nitric acid to form Z. Identify Y and Z and explain why phenol is not converted commercially to Z by reacting it with conc. HNO_3 .

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5. Fill in the blanks :





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