Previous years Questions (2015-25)

Ch 7- Alcohols Phenols and Ethers.

2025

1. The conversion of phenol to salicylic acid can be accomplished by CBSE-25

(A) Reimer-Tiemann reaction (B) Friedel-Crafts reaction

(C) Kolbe reaction (D) Coupling reaction

2. What will be formed after oxidation reaction of secondary alcohol with chromic anhydride (CrO_3) ? CBSE - 2025

(A) Aldehyde (B) Ketone

(C) Carboxylic acid (D) Ester

3 (A) An organic compound 'A', molecular formula C_2H_6O oxidises with CrO_3 to form a compound 'B'. Compound 'B' on warming with iodine and aqueous solution of NaOH gives a yellow precipitate of compound 'C'. When compound 'A' is heated with conc. H_2SO_4 at 413 K gives a compound 'D', which on reaction with excess HI gives compound 'E'. Identify compounds 'A', 'B', 'C', 'D' and 'E' and write chemical equations involved. CBSE - 2025 5

OR

4. (B) (a) Write chemical equations of the following reactions : 3 + 1 + 1 = 5

(i) Phenol is treated with conc. HNO_3 (nitration)

(ii) Propene is treated with B_2H_6 followed by oxidation by H_2O_2/OH^-.

(iii) Sodium t-butoxide is treated with CH_3Cl.

(b) Give a simple chemical test to distinguish between butan–1–ol and butan–2–ol.

(c) Arrange the following in increasing order of acid strength : phenol, ethanol, water CBSE-2025

5. **Which is the correct order of acid strength from the following?** CBSE-2025

(A) $C_6H_5OH > H_2O > ROH$

(B) $C_6H_5OH > ROH > H_2O$

(C) $ROH > C_6H_5OH > H_2O$

(D) $H_2O > C_6H_5OH > ROH$

6. **Assertion (A): The boiling point of ethanol is higher than that of methoxymethane.**
Reason (R): There is intramolecular hydrogen bonding in ethanol. CBSE-2025

7. **Would you expect benzaldehyde to be more reactive or less reactive in nucleophilic addition reactions than propanal? Justify your answer.** CBSE-2025

Complete :- CBSE-2025

8. $C_6H_5NH_2 \xrightarrow{NaNO_2/HCl} A \xrightarrow{C_6H_5NH_2} B$

C

9. **Phenols undergo electrophilic substitution reactions readily due to the strong activating effect of the OH group attached to the benzene ring. Since the OH group increases the electron density more to the ortho- and para- positions, one of the examples of the aldehyde group being introduced on the aromatic ring of phenol, ortho to the hydroxyl group. This is a general method used for the ortho-formylation of phenols.**

Answer the following questions:

(a)What happens when phenol reacts with:

(i) Br_2/CS_2

(ii) Conc. HNO_3

(b) Why phenol does not undergo Protonation easily

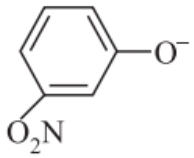
(c) which is acidic phenol or cresol? Explain

(c) Write IUPAC name of the product formed in Riemer Tiemann reaction.
or

10. **(B) An organic compound (A) (molecular formula $C_8H_{16}O_2$) was hydrolyzed with dilute sulphuric acid to get a carboxylic acid (B) and an alcohol (C). Oxidation of (C) with chromic acid produced (B). On dehydration, (C) gives But-1-ene. Identify (A), (B), and (C) and write chemical equations for the reactions involved.** CBSE-2025

2024

1. Which of the following species can act as the strongest base? CBSE-2024

(a) OH^-
(b) $C_6H_5O^-$
(c) RO^-
(d) 

2. Give the structure of the major product expected from the following reactions:
(a) Reaction of Ethanal with methyl-magnesium bromide followed by hydrolysis.
(b) Hydration of But-1-ene in the presence of dilute sulphuric acid.
(c) Reaction of phenol with bromine water. CBSE-2024

3. Which one of the following compounds has the lowest pK_a value ? CBSE-2024

(A) *p*-Cresol
(B) *p*-Nitrophenol
(C) *m*-Nitrophenol
(D) 2,4,6-Trinitrophenol

4. $(CH_3)_2CH - O - CH_3$ when treated with HI gives :

CBSE-2024

(A) $(CH_3)_2CH - I + CH_3OH$

(B) $(CH_3)_2CH - OH + CH_3 - I$

(C) $(CH_3)_2CH - I + CH_3 - I$

(D) $(CH_3)_2CH - OH + CH_3OH$

5. *Assertion (A) :* The boiling point of ethanol is higher than that of dimethyl ether. CBSE-2024

Reason (R) : Ethanol molecules are associated through hydrogen bonding whereas in dimethyl ether, it is not possible.

6. (a) Write the equations of the reactions involved in the following :

(i) Reimer-Tiemann reaction CBSE-2024

(ii) Kolbe's reaction

(b) Name the reagent used in the bromination of phenol to form 2,4,6-Tribromophenol. *2+1=3*

2023

1. Which of the following reactions are feasible?

(*a*) $CH_3CH_2Br + Na^+O^-C(CH_3)_3 \longrightarrow CH_3CH_2—O—C(CH_3)_3$

(*b*) $(CH_3)_3C—Cl + Na^+O^-CH_2CH_3 \longrightarrow CH_3CH_2—O—C(CH_3)_3$

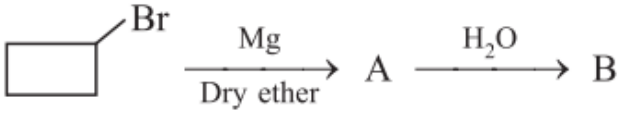
(*c*) Both (*a*) and (*b*) CBSE-2023

(*d*) Neither (*a*) nor (*b*)

2. Write the chemical equation involved in the following: CBSE-2023

(*a*) Kolbe's reaction (*b*) Williamson synthesis

3. Identify A and B in the following: CBSE-2023



4. (*a*) (*i*) Write the mechanism of the following reaction: CBSE-2023

$$2CH_3CH_2OH \xrightarrow[413\ K]{H^+} CH_3—CH_2—O—CH_2—CH_3 + H_2O$$

(*ii*) Why *ortho*-nitrophenol is steam volatile while *para*-nitrophenol is not?

OR

4. (*b*) What happens when CBSE- 2023

(*i*) Anisole is treated with CH_3Cl/anhydrous $AlCl_3$?

(*ii*) Phenol is oxidised with $Na_2Cr_2O_7/H^+$?

(*iii*) $(CH_3)_3C$—OH is heated with Cu/573 K?

Write chemical equation in support of your answer.

5. In the reaction $R - OH + HCl \xrightarrow{ZnCl_2} RCl + H_2O$, what is the correct order of reactivity of alcohol ? CBSE- 2023

(a) $1^\circ < 2^\circ < 3^\circ$ (b) $1^\circ > 3^\circ > 2^\circ$

(c) $1^\circ > 2^\circ > 3^\circ$ (d) $3^\circ > 1^\circ > 2^\circ$

6. (a) Account for the following : CBSE- 2023 *1+1=2*

(i) Phenol is a stronger acid than an alcohol.

(ii) The boiling point of alcohols decreases with increase in branching of alkyl chain.

6. (b) (i) Write the mechanism of the following reaction : CBSE- 2023

$$CH_3CH_2OH \xrightarrow[443\ K]{H^+} CH_2 = CH_2 + H_2O$$

(ii) Write the equation involved in Reimer-Tiemann reaction.

7. How do you convert the following : (Any ***three***) CBSE- 2023

(a) Phenol to picric acid

(b) Propanone to 2-Methylpropan-2-ol

(c) Phenol to anisole

(d) Propene to Propan-1-ol

2021

1. he compound which reacts fastest with Lucas reagent at room temperature is:

(a) Butan-1-ol

(b) Butan-2-ol

(c) 2-Methylpropan-1-ol

(d) 2-Methylpropan-2-ol

2. Dehydration of ethanol in the presence of concentrated sulphuric acid produces:

(a) Ethanal
(b) Ethene
(c) Ethane
(d) Diethyl ether

3. The IUPAC name of the compound $CH_3–O–C_2H_5$ is:
(a) Methoxyethane
(b) Ethoxyethane
(c) Methylethoxide
(d) Ethylmethoxide

4. Acid strength of alcohols, phenols, and carboxylic acids is of the order:
(a) Alcohols < phenols < carboxylic acids
(b) Phenols < alcohols < carboxylic acids
(c) Carboxylic acids < phenols < alcohols
(d) None of these

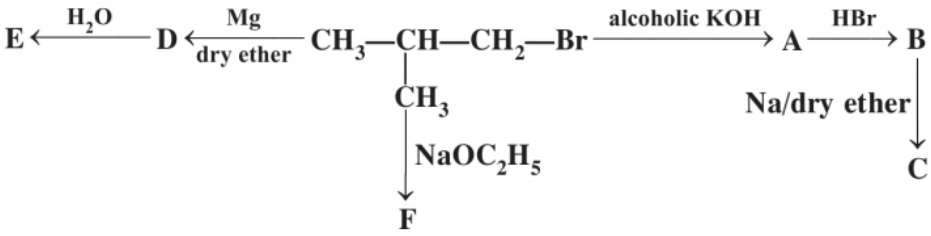
Remaining questions asked with aldehyde ketones and carboxylic acids, these questions are mentioned there.

2020

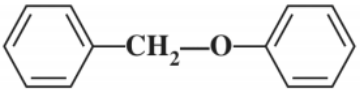
1. **The conversion of an alkyl halide into an alcohol by aqueous NaOH is classified as** CBSE-2020
   (a) a dehydrohalogenation reaction
   (b) a substitution reaction
   (c) an addition reaction
   (d) a dehydration reaction

2. **Assertion (A): The C—O—C bond angle in ethers is slightly less than tetrahedral angle.**
   Reason (R): Due to the repulsive interaction between the two alkyl groups in ethers. CBSE-2020

3. **Identify A, B, C, D, E and F in the following:** CBSE-2020



6×½=3

4. **Give the structures of final products expected from the following reactions:**
   (i) **Hydroboration of propene followed by oxidation with H_2O_2 in alkaline medium.**
   (ii) **Dehydration of $(CH_3)_3C—OH$ by heating it with 20% H_3PO_4 at 358 K.**
   (iii) **Heating of**  **with HI.**

CBSE-2020
3×1=3

5. How can you convert the following? CBSE-2020

(*i*) Phenol to *o*-hydroxybenzaldehyde

(*ii*) Methanal to ethanol

(*iii*) Phenol to phenyl ethanoate

2019

1. (*a*) How do you convert the following: CBSE-2019

(*i*) Phenol to Anisole

(*ii*) Ethanol to Propan-2-ol

(*b*) Write the mechanism of the following reaction:

$$C_2H_5CH_2OH \xrightarrow[443\ K]{H_2SO_4} CH_2{=}CH_2 + H_2O$$

(*c*) Why phenol undergoes electrophilic substitution more easily than benzene?

2. (*a*) Account for the following: CBSE-2019

(*i*) *o*-nitrophenol is more steam volatile than *p*-nitrophenol.

(*ii*) *t*-butyl chloride on heating with sodium methoxide gives 2-methylpropene instead of *t*-butylmethylether.

2. (*b*) Write the reaction involved in the following: CBSE-2019

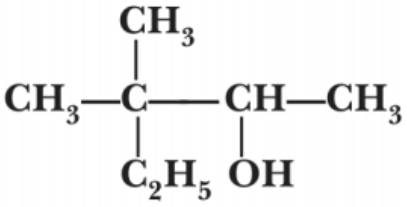
(*i*) Reimer-Tiemann reaction

(*ii*) Friedal-Crafts Alkylation of Phenol.

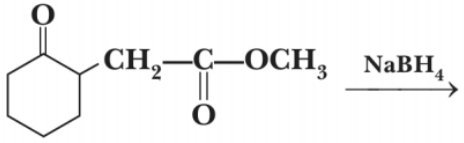
(*c*) Give simple chemical test to distinguish between Ethanol and Phenol.

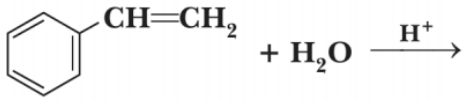
2018

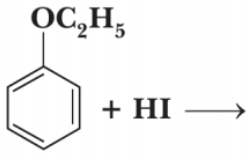
1. Write the IUPAC name of the following: CBSE-2018



2. Write the structures of the main products in the following reactions: CBSE-2018

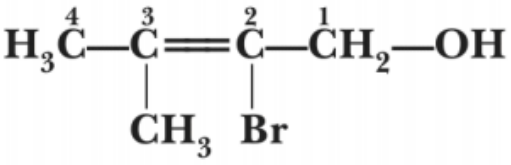
(*a*) 

(*b*) 

(*c*) 

2017

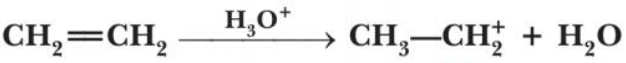
1. **Write the IUPAC name of the following compound:** CBSE - 2017



2. **(a) Arrange the following compounds in the increasing order of their acid strength:** CBSE - 2017

p-cresol, *p*-nitrophenol, phenol

(b) Write the mechanism (using curved arrow notation) of the following reaction:

 [2]

Or

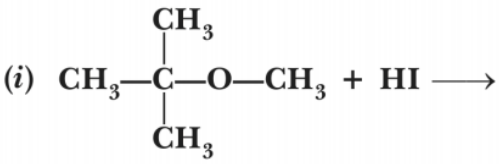
Write the structures of the products when Butan-2-ol reacts with the following:

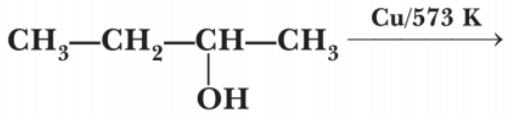
(a) CrO_3

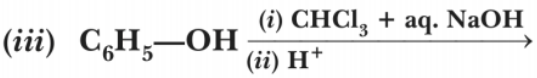
(b) $SOCl_2$

2016

1. **(a) Write the major product(s) in each of the following reactions:** CBSE - 2016

(i) 

(ii) 

(iii) 

1. **(b) Write the chemical reaction involved in the following reactions:** CBSE - 2016

(i) **Kolbe's reaction**

(ii) **Friedel–Crafts acetylation of anisole**

2. **(a) What happens when** CBSE - 2016

(i) **phenol reacts with Bromine water?**

(ii) **ethanol reacts with CH_3COCl/pyridine?**

(iii) **anisole reacts with HI?**

Write the chemical equations involved in the above reactions.

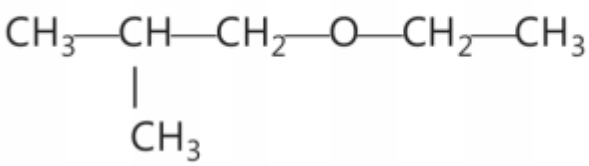
2 **(b) Distinguish between:** CBSE - 2016

(i) **Ethanol and phenol**

(ii) **Propan-2-ol and 2-methylpropan-2-ol**

2015

1. Write the IUPAC name of the given compound: CBSE - 2015



2. Give reasons for the following: CBSE - 2015

(*i*) Phenol is more acidic than methanol.

(*ii*) The C—O—H bond angle in alcohols is slightly less than the tetrahedral angle (109°28′).

(*iii*) $(CH_3)_3C—O—CH_3$ on reaction with HI gives $(CH_3)_3C—I$ and $CH_3—OH$ as the main products and not $(CH_3)_3C—OH$ and $CH_3—I$. 3