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CBSE Class 12 · Chemistry

Alcohols, Phenols and Ethers

10 most probable questions for Boards 2027

Q1. 1 mark · Multiple choice

Alcohols are classified as monohydric, dihydric, trihydric or polyhydric according to the:
(A) Number of carbon atoms
(B) Number of hydroxyl groups
(C) Hybridisation of the carbon atom
(D) Position of the hydroxyl group

Answer

(B) Number of hydroxyl groups — alcohols are classified as mono-, di-, tri- or polyhydric according to whether they contain one, two, three or many hydroxyl groups.

Q2. 1.5 marks · Short answer

Why are phenols more acidic than alcohols? Include the role of the phenoxide ion in your explanation.

Answer

Phenols are more acidic because the phenoxide ion formed after proton donation is resonance-stabilised, with its negative charge delocalised into the benzene ring. In alkoxide ions, the negative charge remains localised on oxygen.

Q3. 2 marks · Multiple choice

Which is the common name of CH_3OH?
(A) Ethyl alcohol
(B) Methyl alcohol
(C) Methanal
(D) Methoxy methane

Answer

(B) Methyl alcohol — CH_3OH is methyl alcohol.

Q4. 3 marks · Medium answer

State the IUPAC naming rules for (a) monohydric alcohols, including how the parent chain is numbered, and (b) polyhydric alcohols, including how the number and positions of hydroxyl groups are shown.

Answer

1. For monohydric alcohols, replace ‘e’ of the alkane name with suffix ‘ol’. Number the longest carbon chain from the end nearest –OH; give the positions of –OH and substituents by locants.
2. For polyhydric alcohols, retain ‘e’ and add ‘ol’; show the number of –OH groups with prefixes di, tri, etc., and their positions with locants.

Q5. 5 marks · Long answer

For the cleavage of diethyl ether with excess concentrated HI on heating: (a) state the order of reactivity of HI, HBr and HCl (1 mark); (b) write the equations showing the products formed, including the further reaction of the alcohol with excess HI (2 marks); and (c) explain how protonation of the ether is followed by iodide attack at the less substituted carbon by an SN2 mechanism (2 marks).

Answer

$(C_2H_5)_2O(l) + HI(aq) \rightarrow$ (concentrated HI) $[(C_2H_5)_2OH]^+(aq) + I^-(aq)$

$[(C_2H_5)_2OH]^+(aq) + I^-(aq) \rightarrow$ (heat) $C_2H_5OH(l) + C_2H_5I(l)$

$C_2H_5OH(l) + HI(aq) \rightarrow$ (excess concentrated HI, heat) $C_2H_5I(l) + H_2O(l)$

The reactivity order is HI > HBr > HCl. HI and HBr are sufficiently acidic reagents for ether cleavage, and iodide is a good nucleophile. Cleavage is a nucleophilic substitution reaction. Ether oxygen is protonated first to form an oxonium ion, which makes the C–O bond susceptible to cleavage. Iodide attacks the less substituted ethyl carbon of the oxonium ion and displaces ethanol by the SN2 mechanism. The first cleavage therefore forms ethanol and ethyl iodide. With excess HI at high temperature, ethanol reacts with another HI molecule and is converted into ethyl iodide; the overall products are two molecules of ethyl iodide and water.

Q6. 1 mark · Multiple choice

Which statement about allylic and benzylic alcohols is correct?

(A) They are always primary alcohols.

(B) They are always secondary alcohols.

(C) They may be primary, secondary or tertiary alcohols.

(D) They are not classified as alcohols.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/chemistry/alcohols-phenols-and-ethers

Q7. 2 marks · Short answer

Describe the C–O bond in an alcohol in terms of the orbitals forming it. Explain why the bond angle in an alcohol is slightly less than the tetrahedral angle.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/chemistry/alcohols-phenols-and-ethers

Q8. 3 marks · Medium answer

(a) State the type of alcohol obtained when a Grignard reagent is added to methanal, another aldehyde or a ketone, followed by hydrolysis. (b) Give the conditions for converting chlorobenzene to phenol and state the subsequent step needed to obtain phenol from the reaction mixture.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/chemistry/alcohols-phenols-and-ethers

Q9. 5 marks · Long answer

Explain how an ether is formed by dehydration of an alcohol, identifying the species attacked and the reaction mechanism. Also state the effects of moderate and higher concentrations of ethanol on the central nervous system and respiration.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/chemistry/alcohols-phenols-and-ethers

Q10. 1 mark · Very short answer

State the C–O bond length in phenol and give the two factors that make it shorter than the C–O bond in methanol.

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