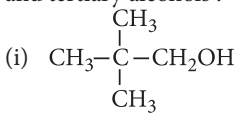
Previous Years' CBSE Board Questions

11.1 Classification

SA II (3 marks)

1. Classify the following as primary, secondary and tertiary alcohols :



(i) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-CH_2OH$

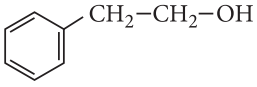
(ii) $H_2C=CH-CH_2OH$

(iii) $CH_3-CH_2-CH_2-OH$ *(AI 2009)*

11.2 Nomenclature

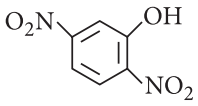
VSA (1 mark)

2. Write the IUPAC name of the given compound.



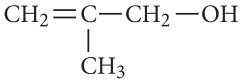
(AI 2016)

3. Write the IUPAC name of the given compound :



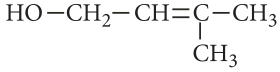
(Delhi 2015)

4. Write the IUPAC name of the given compound :



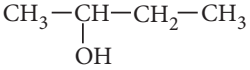
(AI 2015)

5. Write the IUPAC name of the given compound:



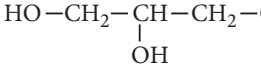
(Foreign 2015)

6. Name the following according to IUPAC system :



(1/2, Delhi 2015C)

7. Write IUPAC name of the following compound :

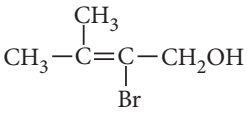


(Foreign 2014)

8. Draw the structural formula of 2-Methylpropan-2-ol molecule. *(Delhi 2012)*

9. Draw the structure of hex-1-en-3-ol compound. *(Delhi 2012)*

10. Write the IUPAC name of the following :

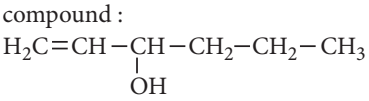


(AI 2012C)

11. Give the structure and IUPAC name of the product formed when propanone is reacted with methylmagnesium bromide followed by hydrolysis. *(AI 2012C)*

12. Write the structure of the molecule of compound whose IUPAC name is 1-Phenylpropan-2-o1 *(AI 2010)*

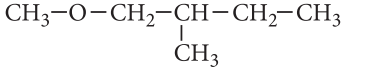
13. Give the IUPAC name of the following compound :



(AI 2009)

14. Write the structure of the following compound : 2-Methyl-2-ethoxypentane. *(Delhi 2009C)*

15. Write the IUPAC name of the following compound :



(AI 2008)

11.3 Structures of Functional Groups

VSA (1 mark)

16. The C—O bond is much shorter in phenol than in ethanol. Give reason. *(Delhi 2012C)*

11.4 Alcohols and Phenols

VSA (1 mark)

17. Write the equation involved in the acetylation of Salicylic acid. *(Delhi 2015)*

18. Give reason for the following :
Phenol is more acidic than ethanol. *(1/3, AI 2015)*

19. Which of the following isomers is more volatile : *o*-nitrophenol or *p*-nitrophenol? *(Delhi 2014)*

20. Write the equation involved in the following reaction :
Reimer –Tiemann reaction *(1/2, AI 2014, 2013)*

21. Write the equation involved in the following reaction :
Kolbe's reaction *(1/2, Delhi 2014C, 2013C)*

22. How is toluene obtained from phenol?
(1/3, Delhi 2013C)

23. Give a chemical test to distinguish between 2-Pentanol and 3-Pentanol. *(1/2, Delhi 2013C)*

24. Of the two hydroxy organic compounds *R*OH and *R*′OH, the first one is basic and other is acidic in behaviour. How is *R* different from *R*′? *(Delhi 2013C)*

25. How would you obtain ethane-1, 2-diol from ethanol ? *(AI 2013C)*

26. How would you obtain acetophenone from phenol? *(AI 2013C)*

27. *Ortho*-nitrophenol has lower boiling point than *p*-nitrophenol. Why? *(Delhi 2012C)*

28. Give a chemical test to distinguish between Benzoic acid and Phenol. *(Delhi 2012C)*

29. Illustrate the following name reaction
Reimer-Tiemann Reaction. *(Delhi 2012C)*

30. Give a chemical test to distinguish between 2-propanol and 2-methyl-2-propanol.
(Delhi 2012C)

31. *Ortho*-nitrophenol is more acidic than *ortho*-methoxyphenol. Why? (*1/2, Delhi 2012C)*

32. Explain the following giving one example :
Reimer-Tiemann reaction.
(1/3, Delhi 2011, 2010, AI 2009C)

33. How would you convert ethanol to ethene?
(AI 2011)

34. Illustrate the following reaction giving a chemical equation :
Kolbe's reaction *(Delhi 2010)*

35. Give one chemical test to distinguish between the following pairs of compounds.
1-Propanol and 2-Propanol. *(1/2, Delhi 2009C)*

36. Describe the following with an example :
Kolbe's reaction *(AI 2009C)*

37. Give reasons for the following :
Propanol has higher boiling point than that of the hydrocarbon butane. *(AI 2009C)*

38. Why do phenols not give the protonation reaction readily? *(1/3, AI 2008)*

39. How would you account for the following :
Phenols are much more acidic than alcohols.
(1/2, Delhi 2007)

SA I (2 marks)

40. Write the main product(s) in each of the following reactions :

(i) $CH_3-CH=CH_2 \xrightarrow[(ii)\ 3H_2O_2/OH^-]{(i)\ B_2H_6}$

(ii) $C_6H_5-OH \xrightarrow[(ii)\ CO_2,\ H^+]{(i)\ \text{aq. NaOH}}$ *(Delhi 2016)*

41. Write the final product(s) in each of the following reactions :

(i) $CH_3CH_2-\underset{\underset{OH}{|}}{CH}-CH_3 \xrightarrow{Cu/573\ K}$

(ii) $C_6H_5-OH \xrightarrow[(ii)\ H^+]{(i)\ CHCl_3 + \text{aq. NaOH}}$
(Delhi 2016)

42. Explain the mechanism of dehydration steps of ethanol :

$CH_3CH_2OH \xrightarrow[443\ K]{H^+} CH_2=CH_2+H_2O$
(Delhi 2015C)

43. How are the following conversions carried out?
(i) Propene to propane-2-ol
(ii) Benzyl chloride to Benzyl alcohol
(2/3, Delhi 2015C)

44. Write the mechanism of acid dehydration of ethanol to yield ethene. *(AI 2015C)*

45. Write the mechanism of the following reaction :

$CH_3CH_2OH \xrightarrow{HBr} CH_3CH_2Br + H_2O$
(AI 2014, 2/3 Foreign 2014)

46. Name the reagents used in the following reactions :
(i) Bromination of phenol to 2, 4, 6-tribromophenol
(ii) Butan-2-one to Butan-2-o1
(iii) Friedel–Crafts alkylation of anisole
(iv) Oxidation of primary alcohol to carboxylic acid *(Foreign 2014)*

47. Name the different reagents needed to perform the following reactions :
(i) Phenol to Benzene
(ii) Dehydration of propan-2-ol to propene

(iii) Friedel-Crafts alkylation of anisole
(iv) Dehydrogenation of ethanol to ethanal *(Foreign 2014)*

48. How are the following conversions carried out?
(i) Propene to Propan-2-ol
(ii) Ethyl chloride to Ethanal *(Delhi 2014C)*

49. Explain the following with an example for each :
(i) Kolbe's reaction
(ii) Reimer-Tiemann reaction *(2/3, AI 2014C)*

50. How will you convert :
(i) Propene to propan-2-ol?
(ii) Phenol to 2,4,6-trinitrophenol? *(Delhi 2013)*

51. How will you convert the following :
(i) Propan-2-ol to propanone.
(ii) Phenol to 2,4,6-tribromophenol. *(Delhi 2013)*

52. Explain the mechanism of the following reaction :

$$CH_3—CH_2—OH \xrightarrow[443\ K]{H^+} CH_2=CH_2 + H_2O$$

(AI 2013)

53. Explain the mechanism of acid catalysed hydration of an alkene to form corresponding alcohol. *(AI 2012)*

54. Explain the following behaviours :
(i) Alcohols are more soluble in water than the hydrocarbons of comparable molecular masses.
(ii) *Ortho*-nitrophenol is more acidic than *ortho*-methoxyphenol. *(AI 2012)*

55. Give a separate chemical test to distinguish between the following pairs of compounds :
(i) Ethanol and Phenol
(ii) 2-Pentanol and 3-Pentanol *(Delhi 2012C)*

56. How would you obtain the following :
(i) 2-methylpentan-2-ol from 2-methyl-1-pentene
(ii) Acetophenone from phenol *(2/3, AI 2012C)*

57. How would you obtain
(i) Picric acid (2, 4, 6-trinitrophenol) from phenol.
(ii) 2-Methylpropene from 2-methylpropanol? *(Delhi 2011)*

58. How would you obtain the following :
(i) Benzoquinone from phenol
(ii) 2-Methylpropan-2-ol from methyl magnesium bromide
(iii) Propan-2-ol from propene? *(AI 2011)*

59. Give the names of the reagents of bringing about the following transformations :
(i) Hexan-1-ol to hexanal
(ii) But-2-ene to ethanol *(Delhi 2011C)*

60. Account for the following :
(i) Propanol has higher boiling point than butane.
(ii) *Ortho*-nitrophenol is more acidic than *ortho*-methoxyphenol. *(2/3, Delhi 2011C)*

61. Account for the following :
(i) The boiling point of ethanol is higher than that of methanol.
(ii) Phenol is a stronger acid than an alcohol. *(Delhi 2011C)*

62. Write Reimer–Tiemann reaction giving an example. *(AI 2011C)*

63. How are the following conversions carried out?
(i) Benzyl chloride to benzyl alcohol.
(ii) Methyl magnesium bromide to 2-methyl-propan-2-ol. *(Delhi 2010)*

64. Describe the mechanism of hydration of ethene to yield ethanol. *(AI 2010C)*

65. Describe a chemical test each to distinguish between the following pairs :
(i) Ethanol and Phenol
(ii) 1-Propanol and 2-Propanol *(Delhi 2008C, AI 2008)*

SA II (3 marks)

66. How do you convert the following?
(i) Phenol to anisole
(ii) Propan-2-ol to 2-methylpropan-2-ol
(iii) Aniline to phenol *(Delhi 2015)*

67. Predict the products of the following reactions :
(i) $CH_3—CH=CH_2 \xrightarrow[(ii)\ 3H_2O_2/OH^-]{(i)\ B_2H_6} ?$
(ii) $C_6H_5OH \xrightarrow{Br_2(aq)} ?$
(iii) $CH_3CH_2OH \xrightarrow{Cu/573\ K} ?$ *(Foreign 2015)*

68. How are the following conversions carried out?
(i) Benzyl chloride to benzyl alcohol
(ii) Ethyl magnesium chloride to Propan-1-ol
(iii) Propene to Propan-2-ol.
(AI 2015C, 2014C)

69. (a) Write the mechanism of the following reaction :

$$CH_3CH_2OH \xrightarrow{HBr} CH_3CH_2Br + H_2O$$

(b) Write the equation involved in Reimer–Tiemann reaction. *(Delhi 2014)*

70. (a) Give chemical tests to distinguish between the following pairs of compounds :
(i) Pentan-2-ol and Pentan-3-ol
(ii) Methanol and Phenol
(b) *o*-nitro phenol is more acidic than *o*-methoxy phenol. Explain why.
(AI 2013C)

71. Draw the structure and name of the product formed if the following alcohols are oxidized. Assume that an excess of oxidising agent is used.
(i) $CH_3CH_2CH_2CH_2OH$
(ii) 2-butenol
(iii) 2-methyl-1-propanol *(Delhi 2012)*

72. (a) Describe the mechanism of hydration of ethene to yield ethanol.
(b) Write Kolbe's reaction with an example.
(AI 2011C)

73. Acid catalysed dehydration of *t*-butanol is faster than that of *n*-butanol. Explain. *(AI 2011C)*

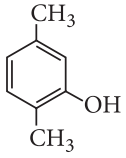
74. How would you convert the following :
(i) Phenol to benzoquinone
(ii) Propanone to 2-methylpropan-2-ol
(iii) Propene to propan-2-o1. *(AI 2010)*

75. (i) Describe the mechanism of acid dehydration of ethanol to yield ethene.
(ii) Describe a chemical test to distinguish between ethanol and phenol.
(Delhi 2010C)

76. Explain the mechanism of the following reactions :
(i) Addition of Grignard's reagent to the carbonyl group of a compound forming an adduct followed by hydrolysis.
(ii) Acid catalysed dehydration of an alcohol forming an alkene.
(iii) Acid catalysed hydration of an alkene forming an alcohol. *(Delhi 2009)*

77. Name the reagents which are used in the following conversions :
(i) A primary alcohol to an aldehyde
(ii) Butan-2-one to butan-2-ol
(iii) Phenol to 2, 4, 6-tribromophenol
(Delhi 2008)

78. (a) Write the IUPAC name of the following :



(b) Give reasons for the following :
(i) Phenol is a stronger acid than alcohol.
(ii) Alcohols are comparatively more soluble in water than the corresponding hydrocarbons. *(AI 2008C)*

11.5 Some Commercially Important Alcohols

VSA (1 mark)

79. Name a substance that can be used as an antiseptic as well as a disinfectant.
(Delhi 2008)

11.6 Ethers

VSA (1 mark)

80. Write the main product(s) in the following reaction :

$$CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-O-CH_3 + HI \longrightarrow$$

(1/3, Delhi 2016, 1/2, AI 2016)

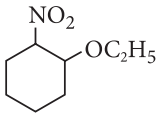
81. How is the following conversion carried out?
Anisole to *p*-bromoanisole *(1/3, Delhi 2015C)*

82. Write the equations involved in the following reaction :
Williamson synthesis
(1/2, AI 2014, 2013, 1/2, Delhi 2014C)

83. Explain the following with an example :
Williamson ether synthesis.
(1/3, AI 2014C, 2009C)

84. Illustrate the following name reaction :
Williamson Synthesis
(1/3, Delhi 2012C, 1/2 Delhi 2010)

85. Write IUPAC name of the following :



(1/3, AI 2012C)

86. Explain the following giving one example :
Friedel Craft's acetylation of anisole.
(1/3, Delhi 2011)

87. Account for the following :
Preparation of ethers by acid dehydration of secondary or tertiary alcohols is not a suitable method. *(1/3, Delhi 2011C, 1/2, Delhi 2008)*

88. Account for the following :
The boiling points of ethers are lower than isomeric alcohols. *(1/3, AI 2011C)*

89. Phenylmethyl ether reacts with HI to give phenol and methyl iodide and not iodobenzene and methyl alcohol. Why? *(Delhi 2010C)*

90. Describe the following :
Unsymmetrical ether *(1/2, AI 2009C)*

91. Why is the preparation of ether by acid dehydration of secondary alcohol not a suitable method? *(AI 2008C)*

92. The boiling points of ethers are much lower than those of the alcohols of comparable molar masses. *(1/3, Delhi 2007)*

SA I (2 marks)

93. Write the mechanism of the following reaction :

$$2CH_3CH_2OH \xrightarrow[413\ K]{\text{Conc. } H_2SO_4} CH_3CH_2 - O - CH_2 - CH_3$$

(Delhi 2016, 2015, 2013)

94. Give reasons for the following :
(i) Boiling point of ethanol is higher in comparison to methoxymethane.
(ii) $(CH_3)_3C—O—CH_3$ on reaction with HI gives CH_3OH and $(CH_3)_3C—I$ as the main products and not $(CH_3)_3C—OH$ and CH_3I. *(2/3, AI 2015)*

95. Give mechanism of preparation of ethoxy ethane from ethanol. *(Delhi 2013C)*

96. How is 1-propoxypropane synthesised from propan-1-ol? *(Delhi 2010)*

97. Name the reagents and write the chemical equations for the preparation of the following compounds by Williamson's synthesis :
(i) Ethoxybenzene
(ii) 2-Methyl-2-methoxypropane *(AI 2008)*