

CHEMISTRY

BOOKS - R G PUBLICATION

ALCOHOLS, PHENOLS AND ETHERS

Exercise

1. Arrange the following compounds in increasing order of reactivity towards Lucas reagent: CH_3CH_2OH , $CH_3CH(OH)CH_3$, $(CH_3)_3C(OH)$



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2. Explain why: Phenols are acidic in nature.



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3. Explain why: Ethers have lower boiling points than alcohols.



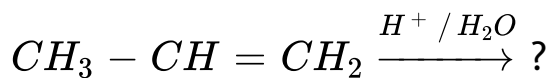
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4. Explain why: Propan-2-ol is more basic than propan-1-ol.



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5. Complete the following reactions:



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6. Complete the following reactions:

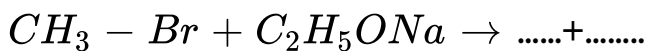


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7. Write the structural formula of propane-1,2,3-triol.

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8. Answer the following: Complete the following reaction-



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9. Explain why: Alcohols are more soluble in water compared to the ethers.

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10. What happens, when- Phenol is heated with zinc dust?

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11. Explain why: Phenols are acidic in nature.

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12. Give one general method of preparation of 3° alcohol. Give equation.

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13. Complete the following reaction and name the product. $CH_3 - CH = CH_2 + H_2O \xrightarrow{H^+}$.

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14. Give the structural formula of 2-Methylpropan-2-ol.

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15. Arrange the following compounds in increasing order of the boiling points.

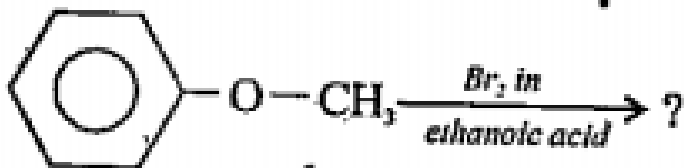
CH_3CHO , CH_3CH_2OH , $CH_3 - O - CH_3$, $CH_3CH_2CH_3$

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16. Give one general method of preparation of 3° alcohol. Give equation.

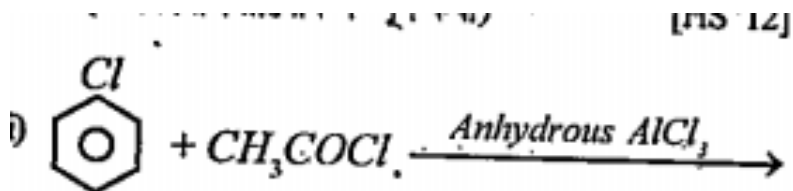
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17. Complete the following reaction



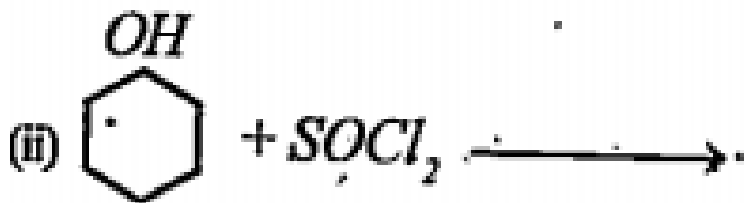
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18. Complete the following reactions:



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19. Complete the following reactions:



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20. Write one general method for the preparation of the following class of compounds with necessary chemical equations: Primary alcohol

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21. Write one general method for the preparation of the following class of compounds with necessary chemical equations: $1+1+1 = 3$

Primary alcohol

Phenol

Ether.



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22. Write one general method for the preparation of the following class of compounds with necessary chemical equations: $1+1+1 = 3$

Primary alcohol

Phenol

Ether.



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23. What happens, when- Ethanal is treated with methyl magnesium bromide and the product is hydrolysed,



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24. What happens, when- Phenol is heated with zinc dust?



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25. What happens, when- Methoxyethane is treated with excess HI.

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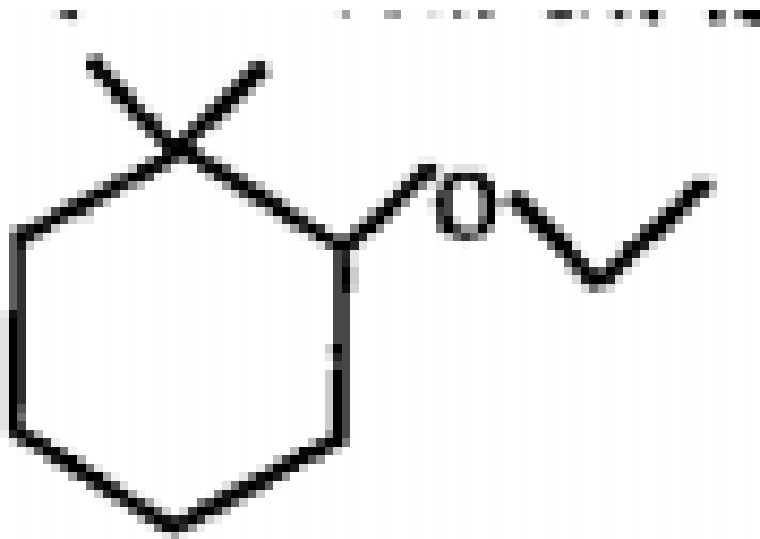
26. Give reason for the higher boiling point of ethanol in comparison to methoxymethane.

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27. Explain why alkoxy group (-OR) is ortho, para directing and activates the aromatic ring towards electrophilic substitution.

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28. Write the IUPAC name of the following compound.

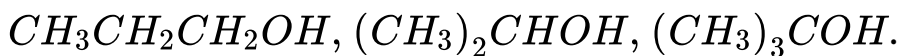


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29. Explain why propanol has higher boiling point than that of the hydrocarbon butane?

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30. Arrange the following alcohols in order of increasing acidic strength.

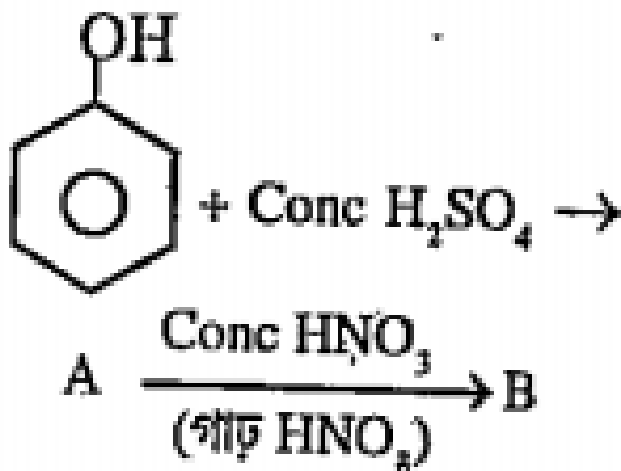


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31. Write the IUPAC name of aspirin.

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32. Identify A and B.



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33. What do you mean by denaturation of alcohol?

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34. Show how hydrogen bonds are formed in ether molecule.

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35. How methanol is poisonous to our health?

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36. What do you mean by fermentation of alcohol?

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37. How will you distinguish phenol & ethanol chemically?

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38. Of the two hydroxy organic compounds ROH and R'OH, the first one is basic and other is acidic in behaviour. How is R different from R'?

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39. What happens when: Butan-2-one is reduced by LiAlH_4

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40. What happens when: Chloro Benzen is fused with NaOH at high temperature and the product is acidified?

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41. What happen when Methoxybenzene is treated with Br_2 in ethanoic acid (Give eqn only).

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42. What happens when: Propanol treated with thionyl chloride?

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43. What happens when: phenol is treated with chloroform and NaOH.

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44. What happens when: Ethene is treated with an alkaline solution of potassium permanganate.

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45. What happens when: benzene is treated with propene in presence of phosphoric acid.

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46. What happens when: 2-methylpropane-2-ol vapours are passed over heated copper.

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47. What happens when: 1-methyl cyclo hexanol is dehydrated in presence of acid catalyst.

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48. What happens when: Methoxy benzene is treated with acetyl chloride in presence of anhydrous aluminium chloride.

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49. Write the mechanism of hydration of alkene.

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50. What is meant by hydroboration oxidation reaction?

Illustrate it with an example.

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51. How phenol is prepared by cumene process?

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52. Give an example of a reaction in which alcohol acts as nucleophile.

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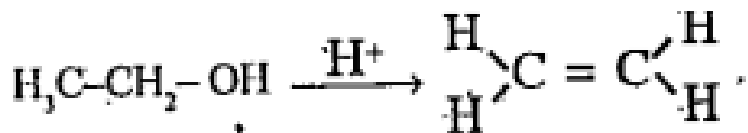
53. Drawing the various resonating structures, show that phenol is more acidic than alcohol.

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54. Describe Lucas test.

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55. Write the mechanism of the following reaction



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56. Ortho and para nitrophenols are more acidic than phenol. Draw the resonance structures of the corresponding phenoxide ions.

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57. How ethanol is prepared from molasses? Write the various reactions involved?

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58. Explain why is bimolecular dehydration not appropriate for the preparation of ethyl methyl ether?

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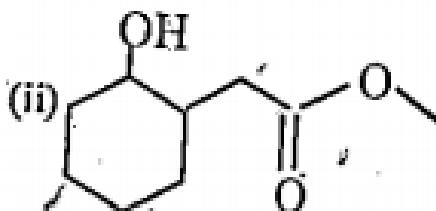
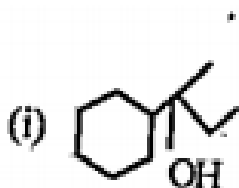
59. 2-methyl, 2-methoxy propane gives 2-iodo 2-methyl propane when treated with the HI but anisole produces phenol on the same treatment. Explain.

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60. Illustrate with examples the limitations of Williamson synthesis for the preparation of certain types of ethers.

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61. Write the IUPAC name of the following compounds:

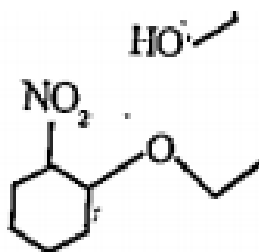


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62. Write the IUPAC name of the following compounds:



(vi)



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63. Write the IUPAC name of the following compounds:

(vii)



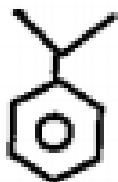
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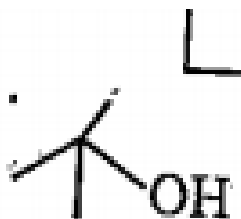
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64. Write the IUPAC name of the following compounds:

(ix)



(x)



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65. What happens when: Propene reacts with diborane



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66. What happens when: Prop-2-one reacts with ethyl magnesium bromide



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67. What happens when: Benzene reacts with oleum in presence of $NaOH / H^+$.

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68. What happens when: Salicylic acid reacts with acetic anhydride

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69. What happens when: Tertiary butanol heated with red hot copper at 573K

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70. What happens when: Phenol reacts with bromine water



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71. What happens when: Phenol is oxidised with chromic acid



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72. What happens when: Ethyl iodide reacts with Sodium ethoxide

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73. What happens when: Ethoxy benzene is treated with HBr.

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74. How will you Convert: Ethanol to methanol.

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75. How will you Convert: Methyl magnesium bromide to 2-methyl propan-2-ol



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76. How will you Convert: Benzyl alcohol to benzoic acid.

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77. How will you Convert: Anisole to 4-methoxy acetophenone.

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78. How will you Convert: Carbon monoxide to methanol.

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79. Write short notes on: Grignard reagent.



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80. Write short notes on: Reimer-Tiemann reaction



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81. Write short notes on: Kolbe's reactoin



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82. Write short notes on: Williamson's synthesis



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83. Write short notes on: Unsymmetrical ether.

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84. Give reasons of the following: The C-O-H bond angle in alcohols is slightly less than the tetrahedral angle.

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85. Give reasons of the following: $(CH_3)_3C - O - CH_3$ on reaction with HI give $(CH_3)_3C - I$ and CH_3OH as the main products and not $(CH_3)_3C - OH$ & $CH_3 - I$.



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86. Explain Why ortho-nitro phenol is more acidic than ortho methoxy phenol?



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87. Boiling point of glycol is high. why?



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88. How are the following conversions carried out:
Ethanol to 2-propanol.



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89. How are the following conversions carried out: Phenol to Acetophenone

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90. Explain Why ortho-nitro phenol is more acidic than ortho methoxy phenol?

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91. Ethers possess a dipole moment even if the alkyl radicals in the molecule are identical. Explain.

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92. Alcohols react both as nucleophiles as well as electrophiles. Write one reaction of each type and describe its mechanism.

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93. Draw the structures and name of the product formed if the following alcohols oxidized Assume that an excess of oxidizing agent is used. $CH_3(CH_2)_3OH$, 2-butanol, 2-methyl-1-propanol

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94. An organic compound A (C_3H_6O) is resistant to oxidation but forms compound B (C_3H_8O) on reduction. 'B' reacts with HBr to form the compound 'C'. C with Mg forms Grignard reagent 'D' which reacts with 'A' to form a product which on hydrolysis gives. E. Identify A to E



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95. An organic compound 'A' having molecular formula C_6H_6O gives a characteristic colour with aqueous $FeCl_3$ solution. When 'A' is treated with CO_2 and NaOH at 400K under pressure 'B' is obtained. The compound B on acidification gives compound C which react with

acetyl chloride to form D which is a popular pain killer.

Deduce the structure of A, B, C and D.



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