



CHEMISTRY

BOOKS - MAXIMUM PUBLICATION

Organic Chemistry : Some Basic Principles and Techniques

Exercise

1. Which of the following does not contain fused benzene ring?

A. Naphthalene

B. Anthracene

C. Diphenyl

D. Phenanthrene

Answer: C

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2. Homolytic fission of a covalent bond results in the formation of _____

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3. The IUPAC name of is

- A. (Z)-pent-2-en-2,3-diol
- B. 4-penten-2-yn-1-ol
- C. 1-pentene 3-yn-5-ol
- D. 5 Hydroxy-1-pentene 3-yne

Answer: B

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4. Lassigne's solution on treating with sodium nitro prusside solution gives a violet colour indication the presence of _____ in the organic compound.

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5. In Kjeldahl's method, nitrogen present is estimated as _____.

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6. Lassigne's solution on treating with sodium nitro prusside solution gives a violet colour indication the presence of _____ in

the organic compound.

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7. The best and latest technique for isolation, purification and separation of organic compounds is: a) Crystallisation b) Distillation c) Sublimation d) Chromatography

A. Crystallisation

B. Distillation

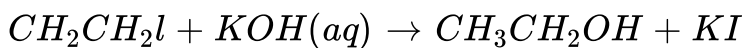
C. Sublimation

D. Chromatography

Answer: D

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8. The following reaction is classified as:



- A. Electrophilic Substitution
- B. Nucleophilic substitution
- C. Elimination
- D. Addition

Answer: B

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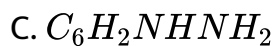
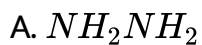
9. Which carbocation is more stable?

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10. Absolute alcohol cannot be obtained by fractional distillation because

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11. Lassaigne's test fails in



Answer: A

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12. Beilstein test is for the detection of _____

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13. Glycerine can be purified by _____

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14. 2-Butene exhibits geometrical isomerism. Represent the cis-trans isomers of 2-Butene.

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15. Explain ozonolysis with a suitable example.

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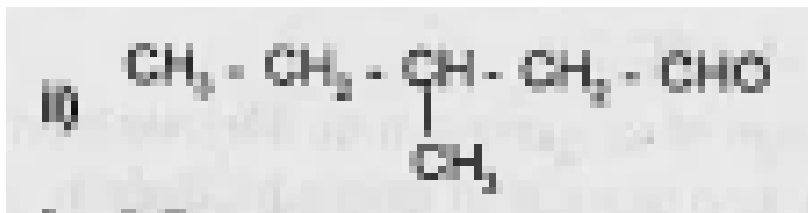
16. Draw the structures of the molecules represented by the IUPAC names, Pent-3-en-1-ol and 2 Nitrocyclohexene

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17. Write the IUPAC name of : $CH_3 - CO - CH_2 - CH_2 - CH_3$

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18. Write the IUPAC name of:



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19. Name the product obtained when HBr added to propene

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20. Write any two necessary condition for a compound to be aromatic.

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21. What are hybridisation states of each carbon atom in the following compounds?

$CH_2 = C = O$, $CH_3CH = CH_2(CH_3)_2CO$, $CH_2 = CHCN$, C_6H_6

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22. Which is expected to be more stable, $O_2NCH_2CH_2O$ or CH_3CH_2O and why?

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23. Write the structure of the following compound: Hexane-2, 4-dione

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24. Write the structure of the following compound: 3-Bromo-4-methyl hexane-2-ol

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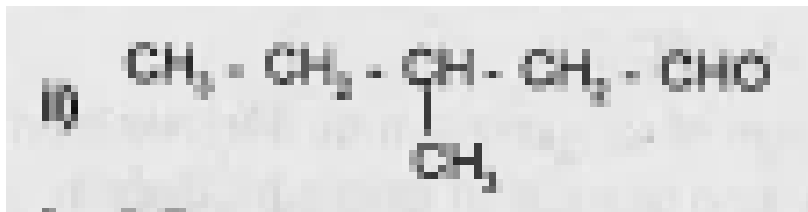
25. Write the structure of the following compound: 2-Bromo-6-methyl-5-heptenal

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26. Isomers are compounds with same formula and different properties. Write any 3 structural isomers of C_6H_{12}

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27. Write the IUPAC name of:



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28. How is nitrogen detected by Lassaignes test?

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29. Name a suitable technique for separation of the components from a mixture of benzene (b.p.353 K) and aniline (b.p.-457 K)

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30. Draw the structure of 2-propanone.

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31. Arrange the following carbocations in the increasing order of their stability. Justify. CH_3^+ , $CH_3CH_2^+$, $(CH_3)_2CH^+$

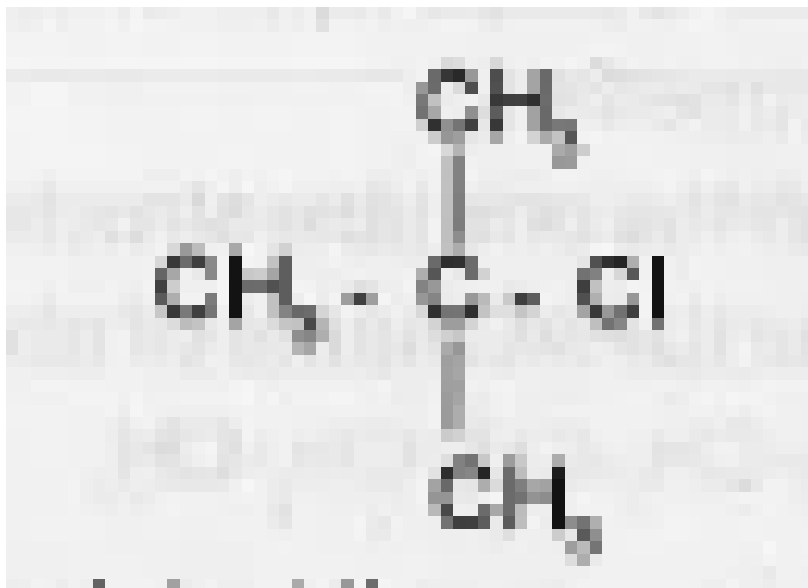
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32. What is the method used to separate a mixture of o-Nitrophenol from p-Nitrophenol? Which property is utilized for separation?

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33. Give the IUPAC name of the following compound.



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34. How can you detect the presence of nitrogen in an organic compound?

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35. Arrange the following in the increasing order of stability

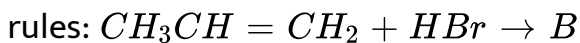


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36. Predict the product in the following reactions and identify the rules: $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HBr} \rightarrow \text{A}$

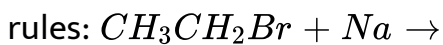
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37. Predict the product in the following reactions and identify the



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38. Predict the product in the following reactions and identify the



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39. Draw the structures of the following compounds. 3-hexenoic acid

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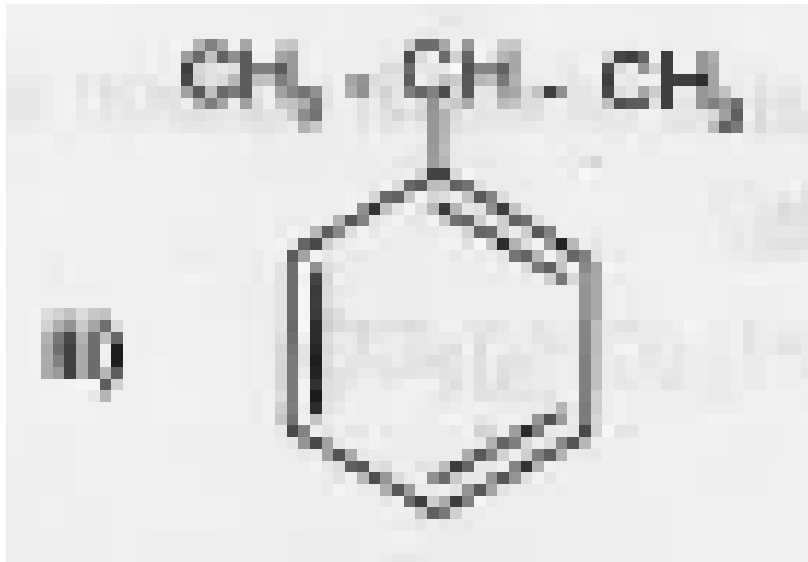
40. Draw the structures of the following compounds. 2-chloro-2-methyl butanol

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41. Draw the structures of the following compounds. 4-nitro-1-pent-1-yne

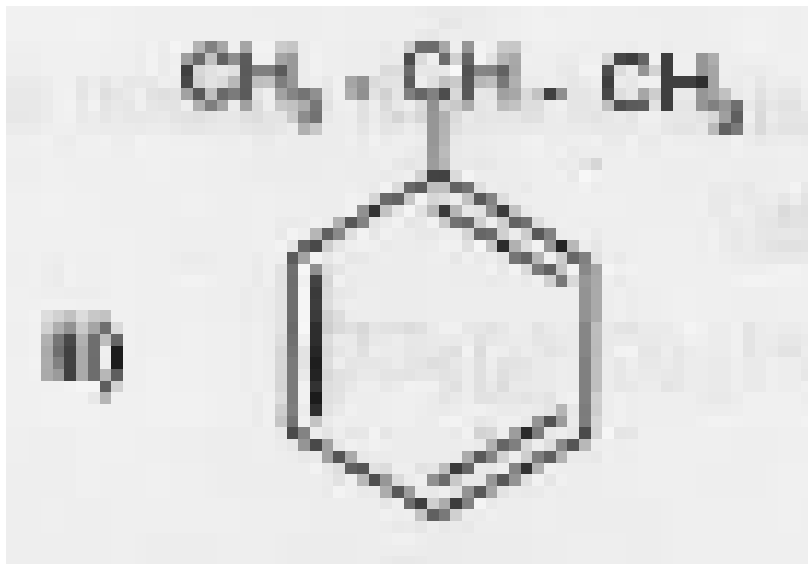
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42. Write the IUPAC names of the following:



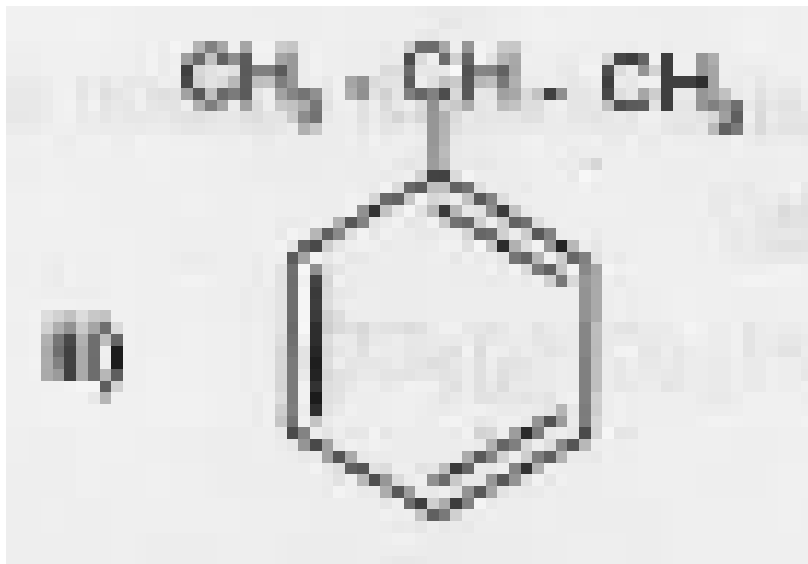
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43. Write the IUPAC names of the following:



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44. Write the IUPAC names of the following:



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45. Draw the structure of the following molecule: 3,4-Dimethylhept-3-ene

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46. Draw the structure of the following molecule: Neo-pentane

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47. Draw the structure of the following molecule: 3-Nitrocyclohexene

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48. What is the relationship between the members of following pairs of structures? Are they structural or geometrical isomers or resonance contributors?



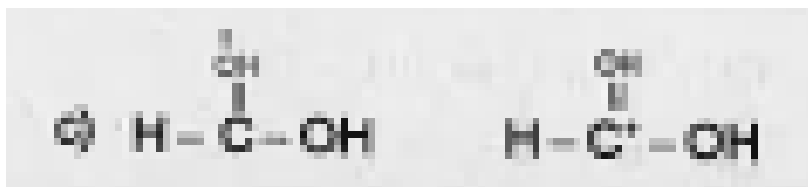
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49. What is the relationship between the members of following pairs of structures? Are they structural or geometrical isomers or resonance contributors?



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50. What is the relationship between the members of following pairs of structures? Are they structural or geometrical isomers or resonance contributors?



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51. Explain the reason for the fusion of an organic compound with metallic sodium for testing nitrogen, sulphur and phosphorus.

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52. Write the structural formula of 4-Ethyl-1-fluoro-2-nitrobenzene

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53. Write the structural formula of 2,3,6-Trimethyl octane.

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54. Write the structural formula of 1,2-Dibromo benzene.



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55. Categorize the following as nucleophile and electrophile : a)

HS^- b) BF_3 c) NO_2^+ d) C_2H_5O e) $(CH_3)_3N$ f) NH_2^-



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56. What is chromatography?



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57. What is Lassaigne's test?



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58. Write IUPAC names of the products obtained by addition of HBr to Hex-1-ene, in the absence of peroxide

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59. Write IUPAC names of the products obtained by addition of HBr to Hex-1-ene, in the presence of peroxide

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60. What is metamerism? Give example for metamers.

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61. What are free radicals? How are they formed?

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62. How will you prepare butane?

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63. Explain Markownikoff's rule for the addition reaction using a suitable example

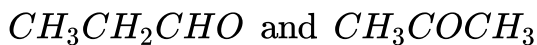
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64. Identify the isomerism exhibited by the following compounds.

$CH_3CH_2CH_2OH$ and $(CH_3)_2CHOH$

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65. Identify the isomerism exhibited by the following compounds.



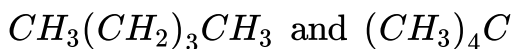
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66. Identify the isomerism exhibited by the following compounds.



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67. Identify the isomerism exhibited by the following compounds.



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68. Predict the products of



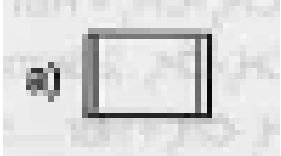
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69. Predict the products of

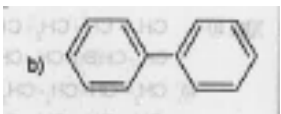


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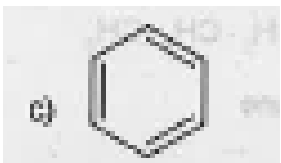
70. Classify the following compounds into aromatic and non aromatic



A.



B.



C.



D.

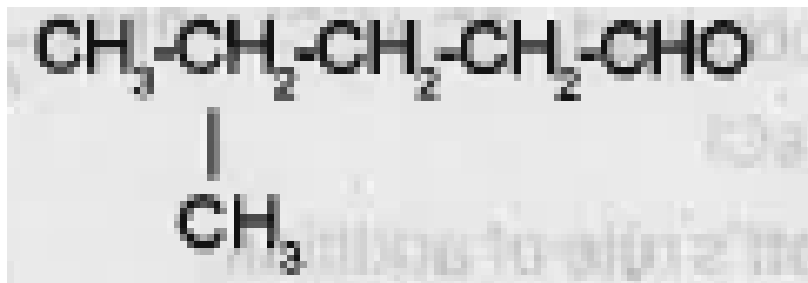
Answer:

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71. Which of the following compounds will show geometrical isomerism? A) $CH_3CH = CHCH_3$ B) $(CH_3)_2C = CHCH_2$

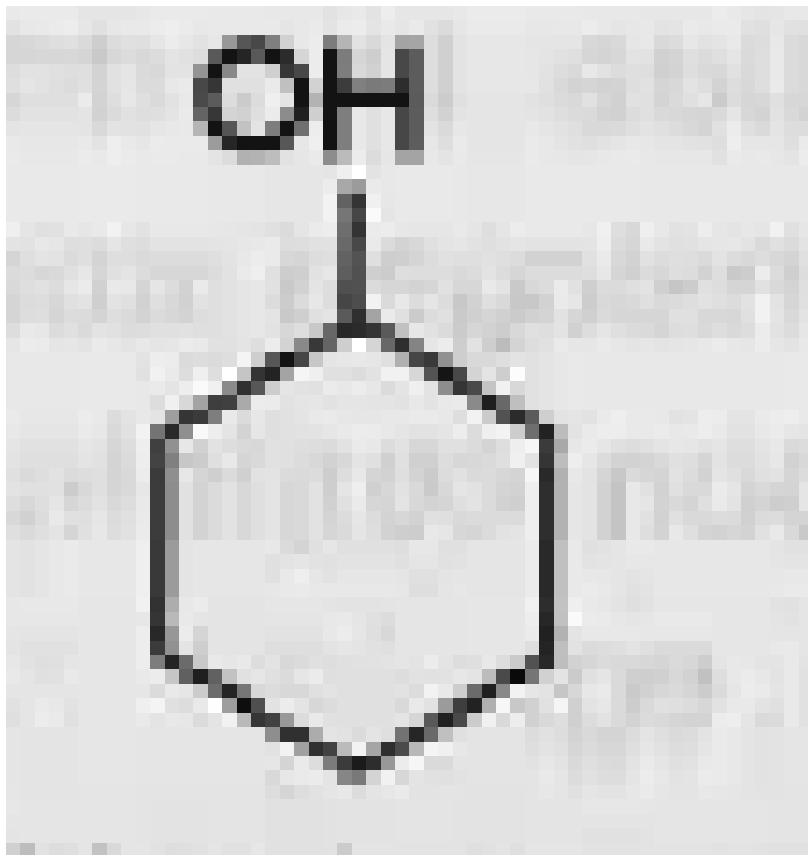
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72. Write the IUPAC name.



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73. Write the IUPAC name.



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74. Write the structure of the following. 2-Chloro-2-methylbutanol

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75. Write the structure of the following. 4-Nitro-1-pentene

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76. Write IUPAC names of the products obtained by addition reactions of HBr to hex-1-ene: In the absence of peroxide.

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77. Write IUPAC names of the products obtained by addition reactions of HBr to hex-1-ene: In the presence of peroxide.

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78. How will you convert: Benzene to toluene



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79. How will you convert: Benzene to nitrobenzene



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80. Explain the term Inductive effect



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81. Explain the term Nucleophile



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82. Write the structural formula of the following. 2,5,6-

Trimethyloctane

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83. Write the structural formula of the following. 2,4-

Dimethylpentane

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84. Suggest the suitable technique for separation of organic compounds given in the data. Aniline - water mixture

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85. Glycerine can be purified by -----



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86. Compounds having the same molecular formula exhibit different properties is called isomerism. Explain different types of isomerism with examples.



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87. Why is nitric acid added to sodium extract before adding silver nitrate for testing halogens?



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88. What is a homologous series?



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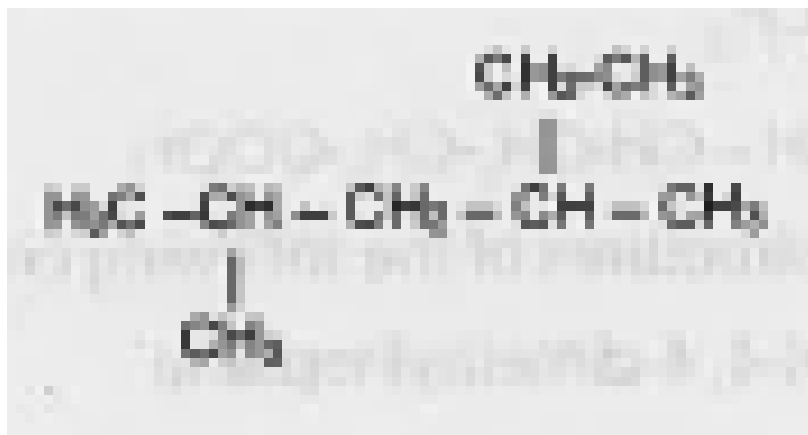
89. What is the general molecular formula of alkanes homologous series?

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90. What is the significance of CH_2 group in homologous series?

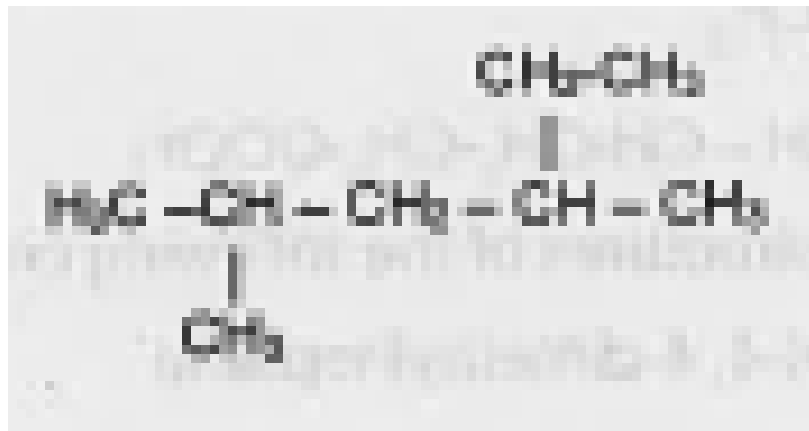
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91. Write the IUPAC names of the following compounds:



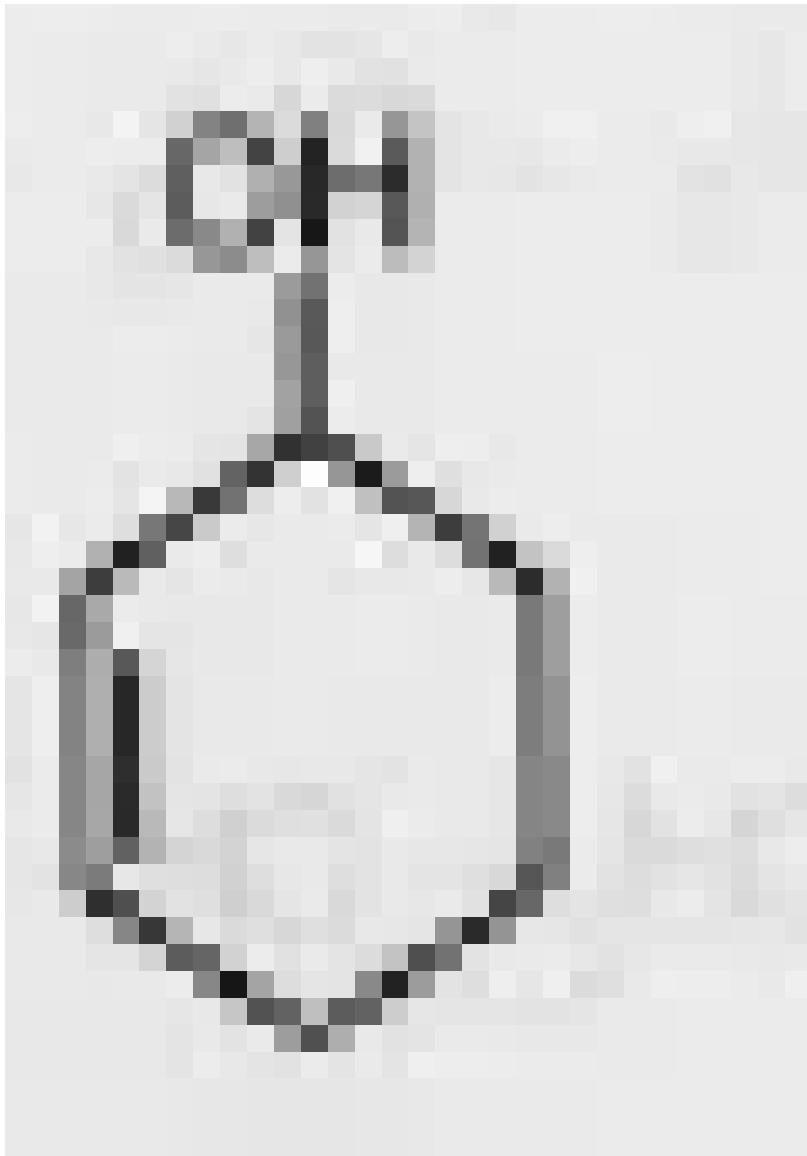
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92. Write the IUPAC names of the following compounds:



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93. Write the IUPAC names of the following compounds:



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94. Draw the structure of the molecules represented by the IUPAC names, pent-4-ene-2-ol

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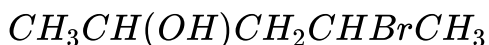
95. Draw the bond line structure of Cyclohexane

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96. Write the bond line structures of 2-Bromobutane

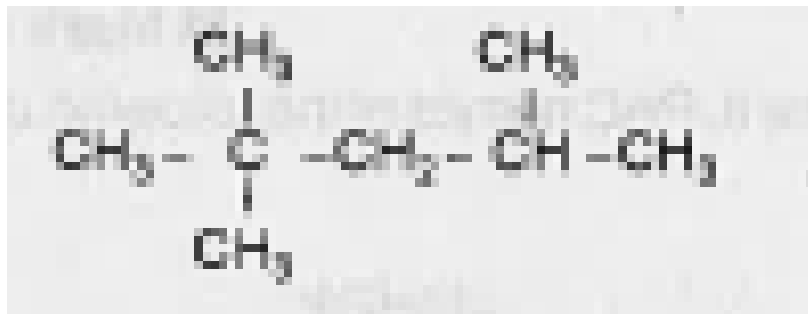
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97. Write the bond line structure of



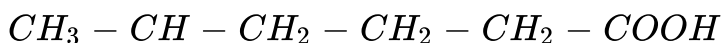
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98. Write the IUPAC names of the following.



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99. Write the IUPAC names of the following.



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100. Give the structures of the following compounds. 3-Ethyl-4, 4-dimethylheptane



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101. Give the structures of the following compounds. 6-Methyloctan-3-ol



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102. Detection of elements like nitrogen, halogens and sulphur are done using Lassigne's test. Discuss the chemistry of Lassigne's test for the above elements



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103. Hybridization influences the bond length and bond enthalpy in organic compounds: Compare the bond length and bond

strength of C-H bonds formed by sp and sp^3 hybridized carbon atoms. Give reason.

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104. How many σ and π bonds are present in the following molecules? $CH_3 - CH_2 - CH_3$

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105. How many σ and π bonds are present in the following molecules? $CH_3 - CH = CH_3$

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106. Write the general formula of the following homologous series: alkanes

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107. Write the general formula of the following homologous series: alcohol

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108. Write the general formula of the following homologous series: chloroalkane

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109. Give an example for a homologous series



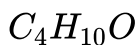
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110. Give the IUPAC name of the following compound:



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111. Write the metamers corresponding to the molecular formula



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112. Suggest a suitable method for the separation of a mixture of aniline - water mixture



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113. Give the chemical name of the compound responsible for the blue colour in the Lassaigne's test for nitrogen.

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114. Briefly explain the principle involved in Kjeldahl's method for the estimation of nitrogen.

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115. Give the complete, condensed and Bond line formula of 2-methyl pentane

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116. Give any three types of structural isomers. Give examples.



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117. What is Lassaigne's test?



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118. Name the method for estimation of Halogen



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119. Represent 1 - Methyl-3- propyl cyclohexane using bond line notation



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120. What is the type of hybridization of C in CH_3 ?

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121. Name the type of bond fission resulting in the formation of free radicals

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122. Organic compounds have to be purified before analysis. Which type of liquids can be purified using distillation under reduced pressure? Suggest an example.

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123. Name the two main types of chromatographic techniques based on the principle of differential adsorption

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124. In the Lassaigne's test for halogens they are precipitated as

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125. In what form is nitrogen estimated in the Dumas method?

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126. Many chemical properties of organic compounds can be explained on the basis of electron displacement effects. What is a resonance effect?



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127. Categorize the following functional groups into those have +R effect and - R effect : [$-NH_2$, $-NO_2$, $-COOH$, $-OH$]



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128. Different methods are used to purify organic compounds. Name any three methods of purification.



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129. On complete combustion, 0.246 g of an organic compound gave 0.198 g of CO_2 and 0.1014 g of H_2O . Determine the percentage composition of carbon and hydrogen in the compound.



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130. Hyper conjugation is a general stabilising interaction. Write the hyper-conjugative structures of $(CH_3 - CH_2^+)$ (ethyl cation).



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131. Write the structures of the following organic compounds. 2,5,6-Trimethyloctane. Hexane - 2,4 - dione. 5 - Oxohexanoic acid.



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132. Draw the structures of the following compounds. a) 2,3 - Dibromo - 1 - phenylpentane b) 4-Ethyl - 1 - fluoro - 2- nitrobenzene



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133. Write all possible chain isomers of the compound with molecular formula C_5H_{12} .

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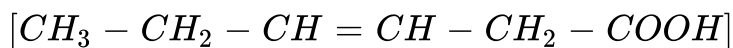
134. Write the complete, condensed and bondline structural formulae of 2-Bromobutane.

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135. In the Carius method of estimation of halogen, 0.15g of an organic compound gave 0.12g of AgBr. Find the percentage of Br in the compound.

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136. Write the IUPAC name



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137. How many's σ and π bonds are present in the following compound? $[CH_2 = C = CHCH_3]$

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138. Write the name of the test used to detect nitro gen, sulphur, halogens and phosphorous present in an organic compound.

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139. Explain any one method for the estimation of nitrogen present in an organic compound.

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140. What do you mean by the following terms? a) Homolytic fission, b) Heterolytic fission, c) Nucleophiles, d) Electrophiles

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141. Various methods for the purification of organic compounds are based on the nature of the compound and impurity present in it. Explain the principle involved in the following methods for the purification a) Distillation, b) Steam distillation

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142. Explain the different types of electron displacement effects in covalent bonds. (Hint: Inductive effect, resonance effect, electromeric effect, hyperconjugation)

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143. How is sodium fusion extract prepared? Using this, how will you detect the presence of Nitrogen, Sulphur and Halogen in an organic compound?

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144. Phenol exhibit resonance. Phenol exhibit resonance.

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145. Predict the directive influence of -OH group in Benzene ring

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146. Write the structural formula of the following compound. Pent-4-en-2-ol

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147. Write the structural formula of the following compound. 6-Hydroxy heptanal

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148. Reagents which attack organic compounds may be classified as electrophiles, nucleophiles and free radicals. Explain

nucleophiles and electrophiles with suitable examples.

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149. Name the type of the fission of a covalent bond which gives free radicals.

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150. Give the principle of estimation of nitrogen by Dumas method.

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151. Explain the concept of resonance with an example.

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152. Give the structural formula of the following compounds: i) 2, 4, 7- Trimethyloctane , ii) 2- chloro - 4 - methylpentane

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153. $[CH_3CH_2^-]$ or $(CH_3)_2CH^-$ which is more stable? Explain.

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154. Explain the chemistry behind crystallization.

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155. Which is more stable $[(CH_3)_3C^+]$ OR $CH_3CH_2^+$ Give a reason.

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156. Give the chemistry behind distillation under reduced pressure.



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