CHEMISTRY

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

ORGANIC CHEMISTRY SOME BASIC PRINCIPLES AND TECHNIQUES

Solved Problems

1. How many σ and π bonds are present in each of the following molecules?

(a) $HC \equiv CCH = CHCH_3$ (b) $CH_2 = C = CHCH_3$

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2. How many σ and π bonds are present in each of the following molecules?

(a) $HC \equiv CCH = CHCH_3$ (b) $CH_2 = C = CHCH_3$

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3. What is the type of hybridisation of each carbon in the compund ?

$CH_3Cl,$

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4. What is the type of hybridisation of each carbon in the compund ?

$(CH_3)_2CO,$

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5. What is the type of hybridisation of each carbon in the compund ?

$CH_3CN,$

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6. What is the type of hybridisation of each carbon in the compund ?

$HCONH_2,$

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7. What is the type of hybridisation of each carbon in the compund ?

$CH_3CH = CHCN$

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8. Write the state of hybridisation of carbon in the following compounds and shapes of each of the molecules.

(a) $H_2C = O$, (b) CH_3F, (c) $HC \equiv N$.

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(a) $H_2C = O$, (b) CH_3F, (c) $HC \equiv N$.

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10. Write the state of hybridisation of carbon in the following compounds and shapes of each of the molecules.

(a) $H_2C = O$, (b) CH_3F, (c) $HC \equiv N$.

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11. Expand each of the following condensed formulas into their complete structural formulas.

(a) $CH_3CH_2COCH_2CH_3$

(b) $CH_3CH = CH(CH_2)_3CH_3$

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(a) $CH_3CH_2COCH_2CH_3$

(b) $CH_3CH = CH(CH_2)_3CH_3$

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13. For each of the following compounds, write a condensed formula and also their bond-line formula.

(a) $HOCH_2CH_2CH_2CH(CH_3)CH(CH_3)CH_3$

(b) $N \equiv C - \overset{\overset{OH}{|}}{CH} - C \equiv N$

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14. For each of the following compounds, write a condensed formula and also their bond-line formula.

(a) $HOCH_2CH_2CH_2CH(CH_3)CH(CH_3)CH_3$

(b) $N \equiv C - \overset{\overset{OH}{|}}{CH} - C \equiv N$

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15. Expand each of the bond-line formula to show all the atom including carbon and hydrogen.

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16. Expand each of the bond-line formula to show all the atom including carbon and hydrogen.

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17. Expand each of the bond-line formula to show all the atom including carbon and hydrogen.

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18. Expand each of the bond-line formula to show all the atom including carbon and hydrogen.

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19. Structures and IUPAC names of some hydrocarbons are given below. Explain why the names given in the parentheses are incorrect.

(a) $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

2,5,6- Trimethyloctane

[and not 3,4,6-Trimethyloctane]

(b) $CH_3 - CH_2 - \underset{\underset{CH_2CH_3}{|}}{CH} - CH_2 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CH_3$

3-Ethyl-5-methylheptane

[and not 5-Ethyl-3-methylheptane]

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20. Write the IUPAC names of the compounds i-iv from their given structures.

(i) $\overset{1}{C}H_3 - \overset{2}{C}H_2 - \underset{\underset{OH}{|}}{\overset{3}{C}H} - \overset{4}{C}H_2 - \overset{5}{C}H_2 - \underset{\underset{CH_3}{|}}{\overset{6}{C}H} - \overset{7}{C}H_2 - \overset{8}{C}H_3$

(ii) $\underset{6}{CH_3} - \underset{5}{CH_2} - \underset{4}{\overset{\overset{O}{||}}{C}} - \underset{3}{CH_2} - \underset{2}{\overset{\overset{O}{||}}{C}} - \underset{1}{CH_3}$

(iii) $\underset{6}{CH_3} - \underset{5}{\overset{\overset{O}{||}}{C}} - \underset{4}{CH_2} - \underset{3}{CH_2} - \underset{2}{CH_2} - \underset{1}{COOH}$

(iv) $\underset{6}{CH} \equiv \underset{5}{C} - \underset{4}{CH} = \underset{3}{CH} - \underset{2}{CH} = \underset{1}{CH_2}$

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21. Write IUPAC name of the structure :

$$CH_3 - CH_2 - \overset{\overset{O}{||}}{C} - CH_3$$

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22. Write the IUPAC names of the compounds i-iv from their given structures.

(i) $\overset{1}{C}H_3 - \overset{2}{C}H_2 - \overset{3}{\underset{\underset{OH}{|}}{C}}H - \overset{4}{C}H_2 - \overset{5}{C}H_2 - \overset{6}{\underset{\underset{CH_3}{|}}{C}}H - \overset{7}{C}H_2 - \overset{8}{C}H_3$

(ii) $\underset{6}{CH_3} - \underset{5}{CH_2} - \underset{4}{\overset{\overset{O}{||}}{C}} - \underset{3}{CH_2} - \underset{2}{\overset{\overset{O}{||}}{C}} - \underset{1}{CH_3}$

(iii) $\underset{6}{C}H_3 - \overset{O}{\underset{5}{C}} - \underset{4}{C}H_2 - \underset{3}{C}H_2 - \underset{2}{C}H_2 - \underset{1}{C}OOH$

(iv) $\underset{6}{C}H \equiv \underset{5}{C} - \underset{4}{C}H = \underset{3}{C}H - \underset{2}{C}H = \underset{1}{C}H_2$

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23. Write the IUPAC name for the compounds

$CH \equiv C - CH = CH - CH = CH_2$

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24. Derive the structure of (i) 2-Chlorohexane, (ii) Pent-4-en-2-ol, (iii) 3-Nitrocyclohexene, (iv) Cyclohex-2-en-1-ol, (v) 6-Hydroxy- heptanal.

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26. Derive the structure of (i) 2-Chlorohexane, (ii) Pent-4-en-2-ol, (iii) 3-Nitrocyclohexene, (iv) Cyclohex-2-en-1-ol, (v) 6-Hydroxy- heptanal.

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27. Derive the structure of

Cyclohex-2-en-l-ol,

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28. Derive the structure of (i) 2-Chlorohexane, (ii) Pent-4-en-2-ol, (iii) 3-Nitrocyclohexene, (iv) Cyclohex-2-en-1-ol, (v) 6-Hydroxy- heptanal.

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29. Write the structural formula of:

(a) o-Ethylanisole, (b) p-Nitroaniline,

(c) 2,3 -Dibromo -1 - phenylpentane,

(d) 4-Ethyl-1-fluoro-2-nitrobenzene.

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(c) 2,3 -Dibromo -1 - phenylpentane,

(d) 4-Ethyl-1-fluoro-2-nitrobenzene.

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31. Write the structural formula of

2,3-Dibromo-1-phenylpentane,

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32. Write the structural formula of

4-Ethyl-1-fluoro-2-nitrobenzene.

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33. Using curved-arrow notation, show the formation of reactive intermediates when the covalent bond undergo heterolytic cleavage.

$CH_3 - SCH_3,$

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34. Using curved-arrow notation, show the formation of reactive intermediates when the following covalent bonds undergo heterolytic cleavage.

(a) $CH_3 - SCH_3$, (b) $CH_3 - CN$, (c) $CH_3 - Cu$

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Watch Video Solution

35. Using curved-arrow notation, show the formation of reactive intermediates when the following covalent bonds undergo heterolytic cleavage.

(a) $CH_3 - SCH_3$, (b) $CH_3 - CN$, (c) $CH_3 - Cu$

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36. Giving justification, categorise the following moelcules/ions as nucleophile or electrophile:

$HS^-, BF_3, C_2H_5O^-, (CH_3)_3N$:

$C\overset{+}{l}H_2, CH_3 - \overset{+}{C} = O, H_2N\ddot{:}^-, \overset{+}{N}O_2$

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37. Identify electrophilic centre in the following: $CH_3CH = O, CH_3CN, CH_3I.$

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38. Which bond is more polar in the following pairs of molecules: (a) $H_3C - H, H_3C - Br$

(b) $H_3C - NH_2, H_3C - OH$ (c) $H_3C - OH, H_3C - SH$

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39. Which bond is more polar in the following pairs of molecules: (a) $H_3C - H, H_3C - Br$

(b) $H_3C - NH_2, H_3C - OH$ (c) $H_3C - OH, H_3C - SH$

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40. Which bond is more polar in the following pairs of molecules:

(i) $H_3C - H, H_3C - Cl$

(ii) $H_3C - OH, H_3C - NH_2$

(iii) $H_3C - SH, H_3C - OH$

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41. In which C–C bond of $CH_3CH_2CH_2Br$, the inductive effect is expected to be the least?

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42. Write resonance structures of CH_3COO^- and show the movement of electrons by curved arrows.

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43. Write resonance structures of $CH_2 = CH - CHO$. Indicate relative stability of the contributing structures.

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44. Explain why the following two structures, I and II connot be the major contributors to the real structure of CH_3COOCH_3.

$$CH_3 - \overset{\overset{\cdot\cdot}{:}O:}{\underset{\overset{+}{I}}{C}} - \overset{\cdot\cdot}{\underset{\cdot\cdot}{O}} - CH_3 \leftrightarrow CH_3 - \overset{\overset{\cdot\cdot}{:}O:}{\underset{II}{C}} = \overset{+}{\underset{\cdot\cdot}{O}} - CH_3$$

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45. Explain why $(CH_3)_3\overset{+}{C}$ is more stable than $CH_3\overset{+}{C}H_2$ and $\overset{+}{C}H_3$ is the least stable cation.

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46. On complete combustion, 0.246 g of an organic compound gave $0.198g/$ of carbon dioxide and $0.1014g$ of water. Determine the percentage composition of carbon and hydrogen in the compound.

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47. In Dumas' method for estimation of nitrogen $0.3g$ of an organic compound gave 50 mL of nitrogen collected at 300 K temperature and 715 mm pressure. Calculate the percentage composition of nitrogen in the compound. (Awueous tension at $300K = 15$ mm)

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48. During estimation of nitrogen present in an organic compound by Kjeldahl's method, the ammonia evolved from 0.5 g of the compound in Kjeldahl's estimation of nitrogen, neutralized 10 mL of $1MH_2SO_4$. Find out the percentage of nitrogen in the compound.

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

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50. In sulphur estimation, 0.157 g of an organic compound gave 0.4813 g of barium sulphate. What is the percentage of sulphur in the compound?

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51. Write structures of different chain isomers of alkanes corresponding to the molecular formula C_6H_{14}. Also write their IUPAC names.

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52. Write structures of different isomeric alkyl groups corresponding to the molecular formula C_5H_{11}. Write IUPAC names of alcohols obtained by attachment of –OH groups at different carbons of the chain.

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53. Write IUPAC name of the compound :

$(CH_3)_3CCH_2CH(CH_3)_2$

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54. Write IUPAC names of the following compounds :

$(CH_3)_2C(C_2H_5)_2$

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55. Draw the structure for the compound :

tetra tert-butylmethane

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56. Write structural formulas of the following compounds :

(i) 3, 4, 4, 5–Tetramethylheptane

(ii) 2,5-Dimethyhexane

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57. Write structural formulas of the following compounds :

(i) 3, 4, 4, 5–Tetramethylheptane

(ii) 2,5-Dimethyhexane

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58. Write structures for each of the following compounds. Why are the given names incorrect? Write correct IUPAC names.

(i) 2-Ethylpentane

(ii) 5-Ethyl – 3-methylheptane

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59. Write structures for each of the following compounds. Why are the given names incorrect? Write correct IUPAC names.

(i) 2-Ethylpentane

(ii) 5-Ethyl – 3-methylheptane

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60. Sodium salt of which acid will be needed for the preparation of propane ? Write chemical equation for the reaction.

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61. Write IUPAC name of the compound :

$$(CH_3)_2CH - CH = CH - CH_2 - CH$$

$$||$$

$$CH_3 - CH - CH$$

$$|$$

$$C_2H_5$$

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62. Write IUPAC name of the compound :

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63. Write IUPAC name of the compound :

$$CH_2 = C(CH_2CH_2CH_3)_2$$

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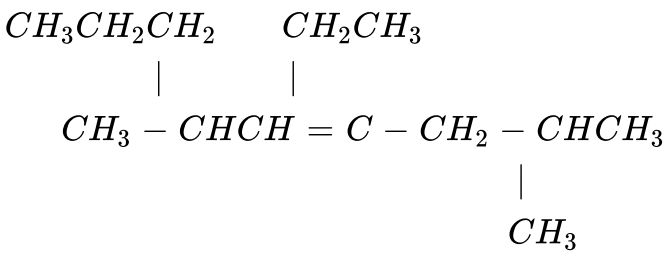
64. Write IUPAC name of the compound :



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65. Calculate number of sigma (σ) and pi (π) bonds in the above structure (i-iv).

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66. Write structures and IUPAC names of different structural isomers of alkenes corresponding to C_5H_{10}.

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67. Draw cis and trans isomers of the following compounds. Also write their IUPAC names :

(i)CHCl =CHCl

(ii)$C_2H_5CCH_3 = CCH_3C_2H_5$

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68. Draw cis and trans isomers of the following compounds. Also write their IUPAC names :

(i)CHCl =CHCl

(ii)$C_2H_5CCH_3 = CCH_3C_2H_5$

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69. Which of the following compounds will show cis-trans isomerism?

(i)$(CH_3)_2C = CH - C_2H_5$

(ii)$CH_2 = CBr_2$

(iii)$C_6H_5CH = CH - CH_3$

(iv)$CH_3CH = CClCH_3$

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70. Write IUPAC names of the products obtained by addition reactions of HBr to hex-1-ene

(i) in the absence of peroxide and (ii) in the presence of peroxide.

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71. Write IUPAC names of the products obtained by addition reactions of HBr to hex-1-ene

(i) in the absence of peroxide and (ii) in the presence of peroxide.

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72. Write structures of different isomers corresponding to the 5^{th} member of alkyne series. Also write IUPAC names of all the isomers. What type of isomerism is exhibited by different pairs of isomers?

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73. How will you convert ethanoic acid into benzene?

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Very Shory Answer Questions

1. Write the regents required for conversion of benzene to methyl benzene.

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2. How is nitrobenzene prepared?

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3. Write the conformations of ethane.

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4. How do you prepare ethyl chloride from ethylene?

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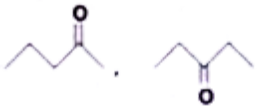
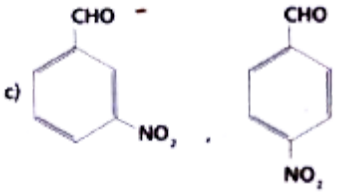
5. Write the IUPAC names of :

a) $CH_3 - CH_2 - CH_2 - CH = CH_2$

b) 

c) 

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6. Write the structures of : Trichlorethanoic acid, Neopentane, p-nitro benzaldehye.

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7. Discuss Lassigne's test.

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8. Explain the principle of chromatography.

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9. Explain why an organic liquld vaporizes at a temperature below its bolling point in Its steam distillation.

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10. Explain the following:

Crystallisation

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11. Explain the following:

Distillation.

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Shory Answer Questions

1. Complete the following reactions and name the products A,B and C.

$$CaC_2 \xrightarrow{H_2O} A \xrightarrow{\text{hot metal tube}} B \xrightarrow{AlCl_3 + CH_3Cl} C$$

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2. Name the product A,B and C formed in the following reactions. Give the equations for the reactions.

$$Ethy \leq \neq \xrightarrow{Br_2 / CCl_4} A \xrightarrow{Alc.KOH} B \xrightarrow{Br_2} C$$

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3. How does acetylene react with

Hydrogen ? Write the balanced equations for the above reactions.

Name the products.

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4. What is substitution reaction? Explain any two substitution reaction of benzene.

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5. What is dehydrologenation? Write the equation for the formation of alkene from alkyl halide.

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6. Which type of compound react with Ozone? Explain with one example.

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7. Given two examples each for position and functional isomerism.

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8. Explain the mechanism of halogenations of methane.

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9. How ethylene is obtained from ethyl alcohol? Write the reaction.

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10. Expalain th reaction of acetylene with :

Na in NH_3

Write the equation and name of the products.

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11. Explain cryatallization and sublimation phenomena whilch are used in the purification of organic compounds.

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12. Describe solvent extraction method to purify a compound.

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13. Explain the estimation of phosphorus and sulphur present in the organic compound

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14. Explain addition of HBr to Propene with the ionic mechanism

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15. What is the product formed when sodium proplonate is heated with soda lime?

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Long Answer Questions

1. Explain the classification of hydrocarbons.

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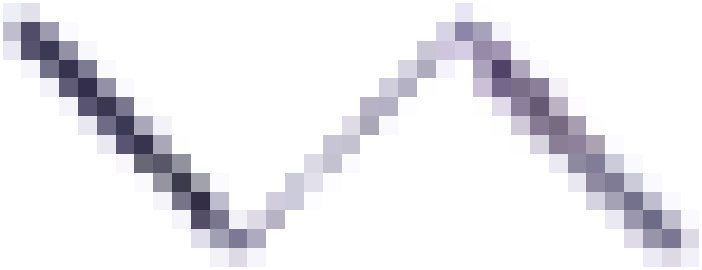
2. Write IUPAC name of the compound :



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3. Write IUPAC names of the following compounds.

$CH_2 = CH - C \equiv C - CH_3$

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4. IUPAC name of $CH_2 = CH - CH(CH_3)_2$ is

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5. Write IUPAC name of the compound :

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6. Write IUPAC names of the following compounds.

$$CH_3 - CH = CH - CH_2 - CH = CH - \underset{\underset{C_2H_5}{|}}{CH} - CH_2 - CH = CH_2$$

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7. Describe two methods of preparaton of ethane. Given any three reaction of ethane.

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8. Write the structural formulas and IUPAC names for all possible isomers having the number of double or triple bond as indicated:

C_4H_8 (one double bond)

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9. Write the structural formulas and IUPAC names for all possible isomers having the number of double or triple bond as indicated:

C_2H_5 (one triple bond)

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10. Write the structural formulas and IUPAC names for all possible isomers having the number of double or triple bond as indicated:

C_5H_{12} (no multiple bond)

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11. Write chemical equations for combustion reaction of the following hydrocarbons.

Butane

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12. Write chemical equation for combustion reaction of the hydrocarbon

Pentene

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13. Write chemical equation for combustion reaction of the hydrocarbon

Hexyne.

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14. Addition HBr to propene yields 2-bromopropane, while in the presence of benzoyl peroxide, the same reaction yields 1-bromopropane. Explain and give mechanism.

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15. Describe two methods of preparaton of ethane. Given any three reaction of ethylene with the Ozone?

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16. Describe two methods of preparaton of ethane. Given any three reaction of ethylene with the Hypohalous acid?

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17. Describe two methods of preparaton of ethane. Given any three reaction of ethylene with the Cold and dil.alk $KMnO_4$?

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18. Describe two methods of preparation of ethylene . Give equation for the reactions of ethylene with the

Heated with O_2 at high pressure

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19. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Hydrogen halide

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20. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Hydrogen

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21. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Bromine

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22. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the

reactions.

Water

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23. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Oxygen in presence of Ag at $200^{\circ} C$

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24. An alkene 'A' oz ozonolysis gives a mixture of ethanoal and pentan-3-one. Write the reaction, structure of the products and alkene-A. Give the IUPAC name of alkene-A.

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25. An alkene-A contains three C - C, eight C - H bonds and one C = C bond. A on ozonolysis give two moles of an aldehyde of molar mass 44u. Write IUPAC name of A.

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26. Given two methods of preparation of acetylene. How does it react with water and Ozone?

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27. How does acetylene react with the following reagents? Give the corresponding equations and name the product formed in the reactions?

Acetic acid

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28. How does acetylene react with the following reagents? Give the corresponding equations and name the product formed in the reactions?

Water

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29. How does acetylene react with the following reagents? Give the corresponding equations and name the product formed in the reactions?

Hydrogen

Watch Video Solution

30. How does acetylene react with the following reagents? Give the corresponding equations and name the product formed in the

reactions?

Halogens

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31. How does acetylene react with the following reagents? Give the corresponding equations and name the product formed in the reactions?

Hydrogen halide

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32. How does acetylene react with the following reagents? Give the corresponding equations and name the product formed in the reactions?

Ammonical $AgNO_3$ and Cu_2Cl_2

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33. Describe any two methods of preaparation of benzene with corresponding equtions. Benzene does not behave like an alkene, why? How do we mthyl benzene from benzens?

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34. How do we get benzene from acetylene? Give the corresponding equation. Explain the halogenation, alkylation, acylation, nitration and sulphonation of benzene.

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35. Explain the difference between sturcutural isomers and stero isomers.

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36. What is the difference between coformation and configuration in open chain molecules?

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37. What do you understand about geometrical isomerism? Explain the geometrical isomers of 2 - butene .

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38. Explain the method of writing $E-Z$ configurations for geometrical isomers taking $CHCl-CFBr$ as your example.

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39. If an alkene contains on carbon at double bond $Cl.\ Br,\ -CH_2-CH_2-OH$ and -CH(CH_(3))_(2)`. Write the E and Z configuration tions of it.

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40. Write a not on :

Distillation

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41. Write a not on :

Fractional distillation

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42. Write a not on :

Distillation under reduced pressure

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43. Write a not on :

Steam distillation

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44. Write the brief note on chromatography.

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45. Explain the following :

a) Column chromatography

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46. Explain the following :

b) Thin layer chromatography

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47. Explain the following :

c) Partition chromatography

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48. Discuss the estimation of nitrogen present in an organic compound by Dumas method. Mention the principles.

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49. Differentiate between the principal of estimation of nitrogen in an organic compound by (i) Kjeldehl's method and (ii) Dumas method.

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50. Explain inductive effect with a suitable example.

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51. Write a note on mesomeric effect.

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52. Describe resonance effect with one example.

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53. Explain how many types of organic reactlons are possible.

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54. Write the possible conformations of ethane and explain which is more stable.

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55. Explain aromatic electroplhilic substitution reactions of benzene.

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56. Explain electrophilic addition reactions of ethylene with mechanism.

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57. With the help of mechamism explain free radical halogenationis of allkanes.

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58. Discuss Markovnikov's rule and Kharash effect.

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59. How would you convert the following compounds into benzene ?

Chlorobenzene

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60. How would you convert the following compounds into benzene ?

Toluene

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61. How would you convert the following compounds into benzene ?

p - nitro toluene

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62. Why is Wurtz reaction not preferred for the preparation of alkanes containing odd number of carbon atoms ? Illustrate with one example.

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63. Write the equations involved in the detection of Nitrogen, Halogens and Sulphur in or-ganic compounds.

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64. How are carbon and hydrogen of an organic compound estimated?

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65. In the Duma's method for the estimation of nitrogen in an organic compound, nitrogen is determined in the form of

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66. Explain the estimation of phosphorus and sulphur present in the organic compound

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67. Explain Carius method for the determination of Halogens quantitatively in an organic compound.

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68. Discuss carcinogenicity and toxicity in atomatic hydrocarbons. Give two examples.

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Important Questions

1. Write the regents required for conversion of benzene to methyl benzene.

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2. How is nitrobenzene prepared?

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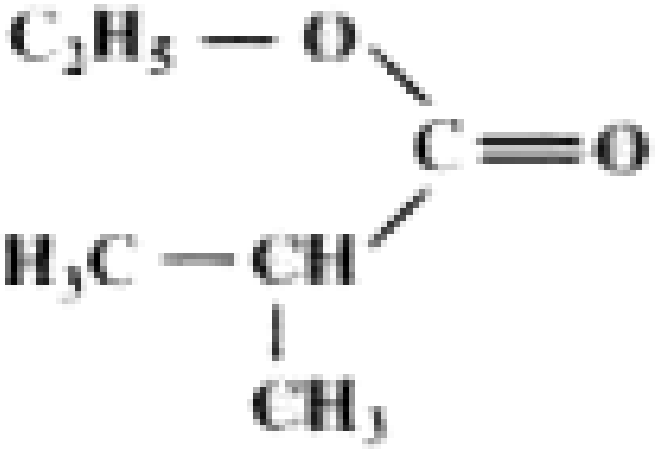
3. The IUPAC name of



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4. Discuss Lassigne's test.

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5. Explain the principle of chromatography.

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6. Complete the following reactions and name the products A,B and C.

$$CaC_2 \xrightarrow{H_2O} A \xrightarrow{\text{hot metal tube}} B \xrightarrow{AlCl_3 + CH_3Cl} C$$

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7. Name the product A,B and C formed in the following reactions. Give the equations for the reactions.

$$Ethy \leq \neq \xrightarrow{Br_2 / CCl_4} A \xrightarrow{Alc.KOH} B \xrightarrow{Br_2} C$$

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8. How does acetylene react with

Hydrogen ? Write the balanced equations for the above reactions. Name the products.

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9. What is substitution reaction? Explain any two substitution reactions of benzene.

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10. What is dehydrologenation? Write the equation for the formation of alkene from alkyl halide.

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11. Which type of compound react with Ozone? Explain with one example.

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12. Given two examples each for position and functional isomerism.

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13. How is ethylene prepared from ethyl alcohol? Write the reaction.

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14. Explain the reactions of acetylene with

a) Na in NH_3

b) chromic acid. Write the equations and name the products.

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15. Explain addition of HBr to Propene with the ionic mechanism

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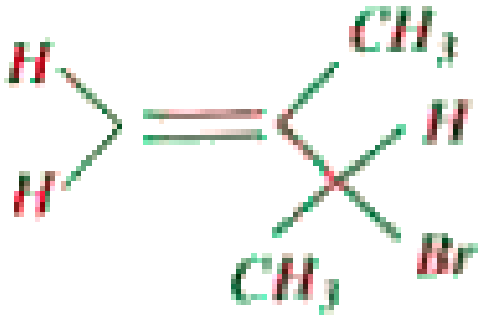
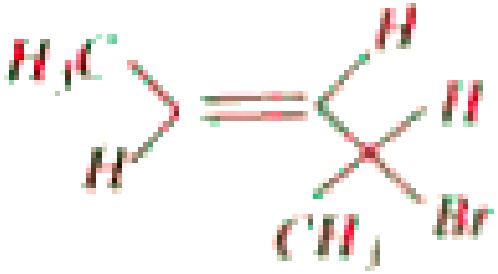
16. Write IUPAC names of the following compounds :

i) 

and

ii) 

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17. Write the structural formula and IUPAC names for all possible isomers having the number of double or triple bond as indicated :

1) C_4H_8 (one double bond)

2) C_5H_8 (one triple bond)

3) C_5H_{12} (no multiple bond)

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18. Write chemical equations for combustion reaction of the following hydrocarbons.

Butane

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19. Write chemical equation for combustion reaction of the hydrocarbon

Pentene

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20. Write chemical equation for combustion reaction of the hydrocarbon

Hexyne.

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21. Addition HBr to propene yields 2-bromopropane, while in the presence of benzoyl peroxide, the same reaction yields 1-bromopropane. Explain and give mechanism.

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22. Describe two methods of preparaton of ethane. Given any three reaction of ethylene with the Ozone?

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23. Describe two methods of preparaton of ethane. Given any three reaction of ethylene with the Hypohalous acid?

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24. Describe two methods of preparaton of ethane. Given any three reaction of ethylene with the Cold and dil.alk $KMnO_4$?

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25. Describe two methods of preparation of ethylene . Give equation for the reactions of ethylene with the

Heated with O_2 at high pressure

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26. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Hydrogen halide

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27. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Hydrogen

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28. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Bromine

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29. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Water

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30. How does ethylene react with the following reagents? Give the chemical equations and names of the product formed in the reactions.

Oxygen in presence of Ag at $200^{\circ} C$

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31. An alkene 'A' oz ozonolysis gives a mixture of ethanoal and pentan-3-one. Write the reaction, structure of the products and alkene-A. Give the IUPAC name of alkene-A.

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32. How do we get benzene from acetylene? Give the corresponding equation. Explain the halogenation, alkylation, acylation, nitration and sulphonation of benzene.

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33. What do you understand about geometrical isomerism? Explain the geometrical isomers of 2 - butene .

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34. If an alkene contains on carbon at double bond $Cl.\ Br,\ -CH_2-CH_2-OH$ and -CH(CH_(3))_(2)`. Write the E and Z configuration tions of it.

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35. Write the brief note on chromatography.

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36. Explain inductive effect with a suitable example.

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37. Write the possible conformations of ethane and explain which is more stable.

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38. Explain aromatic electroplhilic substitution reactions of benzene.

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39. Discuss Markovnikov's rule and Kharash effect.

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40. Why is Wurtz reaction not preferred for the preparation of alkanes containing odd number of carbon atoms ? Illustrate with one example.

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41. The catalyst used in Kjeldahl's method for the estimation of nitrogen is:

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42. Discuss carcinogenicity and toxicity in atomatic hydrocarbons. Give two examples.

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