

# CHEMISTRY

## BOOKS - OMEGA PUBLICATION

### SURFACE CHEMISTRY

#### Questions

1. What are structure of 3-hydroxycyclohexan-1-one.



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2. What are structure of 5,6-dimethylcyclohex-3-en-1-ol



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3. What are structure of 6-methyloctan-3-ol



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4. Write chain isomers of pentane.



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5. Write isomers of  $C_4H_9OH$



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6. Write chain isomers of  $C_4H_8$



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7. What do you mean by position isomers?



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8. write position isomer of but-1-ene?



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9. Write position isomers of  $C_4H_9Cl$



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10. Write position isomers of  $C_2H_4Cl_2$



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**11.** Write position isomers of dibromobenzene?



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**12.** What do you mean by functional group isomers?



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13. Write functional group isomers of  $C_2H_6O$



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14. How many isomers are possible for monosubstituted benzene?



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15. How many isomers are possible for disubstituted benzene?



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**16.** Give the IUPAC name of the alkane having the lowest molecular mass that contain a quaternary carbon.



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**17.** Draw the complete structure of bromoethane



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**18.** Draw the complete structure of bromomethane



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**19.** Draw the complete structure of 3-nitrocyclohexene



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20. Draw structural formula for tert butyl bromide



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21. Draw the structure for cis but-2-ene



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22. What is the hybridisation of each carbon in  
 $\text{CH}_2=\text{CH}-\text{CH}_3$



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23. What is the hybridisation of each carbon in  
 $\text{CH}_3\text{-CH=CH-CN}$



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24. What is the hybridisation of each carbon in  
 $(\text{CH}_3)_2\text{C=O}$



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25. The structural formula for 2-ethylprop-2-en-1-ol is:



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26. Which of the following contains amide functional group :

A. a.  $\text{CH}_3\text{CH}_2\text{OH}$

B. b.  $\text{CH}_2\text{-CH}_2\text{-CO-NH}_2$

C. c.  $\text{CH}_3\text{CH}_3$

D. d.  $\text{CH}_3\text{-CH}_2\text{-NH}_2$

**Answer:**



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27. The molecule in which the distance between neighbouring carbon atom is least:

A. a.  $\text{C}_6\text{H}_6$

B. b.  $\text{C}_2\text{H}_2$

C. c.  $\text{C}_2\text{H}_4$

D. d. C<sub>2</sub>H<sub>6</sub>

**Answer:**



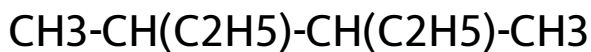
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**28.** The hybridisation of each carbon in the following compound : CH<sub>3</sub>-C=C-CH<sub>2</sub>-CH<sub>3</sub>



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29. The iupac name for structural formula is :



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30. Among the following, the one having longest chain is :

A. a. neopentane

B. b. isopentane

C. c. 2-methylpentane

D. d. 2,2-dimethylbutane

**Answer:**



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**31.** The IUPAC name of compound having formula  $(\text{CH}_3)_3\text{C}-\text{CH}=\text{CH}_2$



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**32.** The general formula of cycloalkanes is :



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33. The iupac name of the compound is :  $\text{CH}_3\text{-CH=CH-C=CH}$



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34. The iupac name of the compound :  $\text{CH}_3\text{-CH(CH}_3\text{)-CH(CH}_3\text{)}_2$



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**35.** The iupac name of the compound :  $\text{CH}_3\text{-CO-CH}_2\text{-CH}_2\text{-OH}$



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**36.** How many sigma and pi bonds are there in the molecule of tetracyanoethane ?



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**37.** The iupac name of the compound :  $\text{CH}_2=\text{CH}-\text{CH}(\text{CH}_3)_2$



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**38.** The iupac name for :  $\text{CH}_3-\text{CH}(\text{OH})-\text{CH}_2-\text{C}(\text{CH}_3)_2-\text{OH}$



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39. The structure of 4-methylpent-2-en-1-ol is

.....



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40. The iupac name of  $\text{CH}_3\text{-C}=\text{C-CH}(\text{CH}_3)_2$  is

.....



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**41.** The iupac name of the compound :  $\text{CH}_3\text{-CO-CH}_2\text{-C(CH}_3)_2\text{-CN}$



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**42.** The iupac name of  $\text{CH}_3\text{-CH}_2\text{-CH(CH}_3\text{)-CH(CH}_3\text{)-COCl}$



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**43.** Give the iupac name of the compound :



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**44.** The iupac name of  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH(CH=CH}_2\text{)-CH(C}_2\text{H}_5\text{)-CH}_2\text{-CH}_3$



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**45.** Draw the structure of isobutyl .



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**46.** Write the structural formula of the following : pentanedial



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**47.** Write the structural formula of following :  
2-(4-isobutyphenyl)propanoic acid.



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**48.** What do you mean by saturated hydrocarbons?



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**49.** What do you mean by unsaturated hydrocarbons?



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**50.** What do you mean by cyclic hydrocarbon ?





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51. What do you mean by aromatic hydrocarbons?



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52. Draw the structure of naphthalene.



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53. Draw the structure of anthracene?



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54. What are paraffins?



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55. Write iupac name of  $\text{CH}_3\text{-CH}(\text{CH}_3)\text{-CH}_2\text{-CH}(\text{CH}_2\text{CH}_3)_2$



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56. Write iupac name of  $\text{CH}_3\text{-CH}_2\text{-C}(\text{CH}_3)(\text{CH}_2\text{CH}_3)\text{-CH}_2\text{-CH}(\text{CH}_3)_2$



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57. Write structure of 4- isopropyl heptane



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58. Write iupac name of  $\text{CH}_3\text{-CH}_2\text{-C}(\text{CH}_3)_2\text{-CH}_2\text{-C}(\text{CH}_3)_3$



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59. Write structure of 5-sec-butyl-4-isopropyldecane



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60. Write structure of 5-(2,2-dimethylpropyl)nonane



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61. Write iupac name of  $C(CH_3)_4$



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62. Write iupac name of  $(CH_3)_2CHCH(CH_3)_2$



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63. Write iupac name of  $(\text{CH}_3)_3\text{C}-\text{CH}_2-\text{C}(\text{CH}_3)_3$



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64. Write iupac name of  $(\text{CH}_3)_2\text{C}-(\text{C}_2\text{H}_5)_2$



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65. Write the structural formulas for the following compound whose iupac names are

given: 3-ethyl-2-methylpentane



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**66.** Write the structural formulas for the following compound whose iupac names are given: 3,4,8-trimethyldecane



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**67.** Write the structural formulas for the following compound whose iupac names are

given: 3,4,4,5-tetramethylheptane



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**68.** Write the structural formulas for the following compound whose iupac names are given: 2,5-dimethylhexane



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**69.** Write the structural formulas for the following compound whose iupac names are

given: 3,3-dimethylpentane



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70. Write the structural formulas for the following compound whose iupac names are given: 2,3,5-trimethylhexane



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71. Write the structural formulas for the following compound whose iupac names are



given: 2,3,5-trimethyl-4-propylheptane



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72. What do you mean by catalytic hydrogenation?



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73. Convert propene into propane.



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**74.** Convert ethyne into ethane.



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**75.** How will you convert methyl bromide into ethane.



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**76.** How will you convert 2-bromopropane into 2,3-dimethylbutane.



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77. How will you convert Chloromethane into methane



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78. What is decarboxylation reaction?



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**79.** How will you convert sodium salt of ethanoic acid into methane.



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**80.** Convert ethanoic acid into ethane.



**Watch Video Solution**

**81.** How will you convert sodium propanoate into ethane?



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**82.** How will you convert potassium ethanoate into ethane?



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**83.** How will you convert propanoic acid into propane.



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**84.** How will you convert butane into isobutane ?



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**85.** How will you convert methane into nitromethane ?



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**86.** In the alkane  $\text{CH}_3\text{-CH}_2\text{-C}(\text{CH}_3)_2\text{-CH}_2\text{-CH}(\text{CH}_3)_2$ . Identify primary, secondary and tertiary carbon atoms and give the number of H atoms bonded to each one of these.



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**87.** How will you convert propyne into 1,1,2,2-tetrabromopropane.



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**88.** How will you convert ethyne into 1,1,2,2-tetrachloroethane.



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**89.** How will you convert ethyne into 1,1-dichloroethane.



**Watch Video Solution**



**90.** How will you convert propyne into 2,2-dibromopropane.



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**91.** Draw structure of 2,2-dichloroethanal.



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**92.** How will you convert propyne into 1,1-dichloropropan-2-one.



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**93.** How will you convert ethyne into ethanal.



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**94.** What is adsorption? Give one example.



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**95.** What is desorption ?



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**96.** Write four differences between adsorption and absorption.



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**97.** Distinguish between the meaning of the terms adsorption and absorption. Give one example of each.



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**98.** Calculate the frequency of the microwaves with wavelength  $4 \times 10^7$



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**99.** Adsorption is an exothermic process. Explain.



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**100.** Reversible adsorption is :



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**101.** which of the following factors affects the adsorption of a gas on solid ?



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**102.** Give any four characteristics of chemical adsorption.



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**103.** What is the difference between physical and chemical adsorptions?



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**104.** Calculate the wave number of the microwaves with wavelength  $4 \times 10^7$



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**105.** Calculate the frequency of a light wave whose time period is  $3 \times 10^{-10}$  sec )



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**106.** What is adsorption isobar?



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**107.** Draw and discuss adsorption isobar for physical adsorption.





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**108.** Why the rate of physical adsorption decreases with the rise of temperature ?



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**109.** A FM radio station broadcasts at a frequency of 103.1 MHz . What is the wavelength of these radiowaves ?



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**110.** The bharti station of all india radio , Delhi, broadcasts on a frequency of 1,368 KHz .

Calculate the wavelength



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**111.** Draw adsorption isobar for chemical adsorption



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**112.** A hot metal emits photon of light with energy  $3.0 \times 10^{-19}$  J. Calculate the frequency and wavelength of the photon ?



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**113.** Calculate the energy of a photon of light having frequency of  $2.7 \times 10^{13}$  S<sup>-1</sup>



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**114.** Give the different applications, of adsorption.



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**115.** Catalyst only



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**116.** Explain the Promoters .



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**117.** Explain the ozone layer.



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**118.** Differentiate between homogeneous and hetero geneous catalyst ?



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**119.** Give the mechanism of heterogeneous catalysed reaction.



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**120.** What are d-Block elements ? Write their general electronic configuration.



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**121.** Name the zeolite catalyst which convert alcohol to gasoline (petrol).



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**122.** What is shape selective catalysis?



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**123.** What are enzymes or biochemical catalysts ? Give an example.



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**124.** Explain two applications of enzymes.



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**125.** What are Enzymes ? Give important characteristics of enzyme catalysis.



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**126.** Explain mechanism of enzyme action.



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**127.** What name is given to the catalysis which is explained by lock-and-key model?



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**128.** What are colloids ?



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**129.** What is dispersed phase ? Give one example.



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**130.** What is dispersed phase ? Give one example.



**Watch Video Solution**

**131.** What are lyophilic and lyophobic sols ?

Give one example of each. Why lyophobic sol is easily coagulated ?



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**132.** Give three differences between lyophilic and lyophobic colloids.



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**133.** How are colloids classified on the basis of physical states of components.



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**134.** How are colloids classified on the basis of nature of dispersion medium.



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**135.** How are colloids classified on the basis of :  
interaction between dispersed phase and  
dispersion medium?



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**136.** Comment on the statement that “colloid  
is not a substance but a state of substance.”



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**137.** Explain the terms with suitable examples:

Alcosol



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**138.** Explain the terms with suitable examples:

Aerosol



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**139.** Explain the terms with suitable examples:

Hydrosol



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**140.** Give reason: Special type of filter paper are used for filtration of colloidal solutions.



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**141.** How the colloidal solution of Sulphur in water is prepared ?



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**142.** What is the difference between multimolecular and macromolecular colloids ? Give one example of each. How are associated colloids different from these two types of colloids?



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**143.** Define micelles.



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**144.** Define CMC.



**Watch Video Solution**

**145.** What is Kraft temperature ( $T_k$ ) ?



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**146.** What are soaps ? Give its disadvantage.



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**147.** Write the IUPAC Name of  
 $\text{CH}_3\text{CH}_2\text{CHNOCH}_2\text{CN}$



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**148.** Action of soap is due to emulsification and micelle formation comment.



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**149.** Give the name of different methods for preparation of colloids.



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**150.** Explain Bredig's Arc method by suitable diagram.



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**151.** What are different methods of peptization ?



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**152.** Define: Peptisation



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**153.** What is peptization ? What is cause of peptization ? Give one example.



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**154.** which are the properties of colloidal solution ?



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**155.** What is Tyndall effect ? What is the cause of it ?



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**156.** What is the cause of Tyndall effect ?



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**157.** Explain Brownian movement.



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**158.** Read the following passage and answer the questions.

When colloidal solutions are viewed under a powerful ultramicroscope, the colloidal particles appear to be in a state of continuous zig-zag motion all over the field of view. This motion was first observed by the British botanist, Robert Brown, and is known as Brownian movement.

This motion is independent of the nature of the colloid but depends on the size of the

particles and viscosity of the solution. Smaller the size and lesser the viscosity, faster is the motion.

The Brownian movement has been explained to be due to the unbalanced bombardment of the particles by the molecules of the dispersion medium. The Brownian movement has a stirring effect which does not permit the particles to settle and thus, is responsible for the stability of sols.

What is the cause of Brownian movement ?



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**159.** Write the reason for the stability of colloidal sols.



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**160.** Write the IUPAC Name of  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$



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**161.** Define electro-osmosis.





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**162.** What is coagulation ?



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**163.** Give reason : Bleeding from a fresh cut can be stopped by applying alum.



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**164.** Write notes on Hardy Schulze Rule ?



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**165.** Mention two ways by which lyophilic colloids can be coagulated.



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**166.** Explain what is observed :- when a beam of light is passed through a colloidal sol.



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**167.** Explain what is observed :- an electrolyte, NaCl is added to hydrated ferric oxide sol.



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**168.** Explain what is observed :- electric current is passed through a colloidal sol?



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**169.** What is electrophoresis ? What is its significance ?



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**170.** What is the cause of electrophoresis ?



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**171.** Which of the following has minimum Flocculation value for positively charged sol?





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**172.** Write the IUPAC Name of  
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHFCN}$



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**173.** What does reciprocal of gold number indicate ?



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**174.** Write the IUPAC Name of  $\text{CH}_3\text{CH}_2\text{CN}$



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**175.** Name the emulsion to which cold cream belongs to.



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**176.** Explain the term Emulsion giving a suitable example .



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**177.** Write the IUPAC Name of  $\text{CH}_3\text{CH}_2\text{CHFCHO}$



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**178.** Yellow light emitted from a sodium lamp has a wavelength of 480 nm. Calculate the frequency of this light.



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**179.** What is emulsification ? Write one example.



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**180.** Write two differences between sols and emulsions.



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**181.** Mention two uses of emulsions.





**Watch Video Solution**

**182.** Name the type of emulsion to which milk belongs to.



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**183.** Define emulsifier.



**Watch Video Solution**

**184.** Give five important applications of colloids in home and industry.



**Watch Video Solution**

**185.** Yellow light emitted from a sodium lamp has a wavelength of 480 nm. Calculate the wavenumber of this light.



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**186.** Write the IUPAC name of  
 $\text{CH}_3\text{CH}_2\text{CHNOCH}_2\text{COCl}$



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## Multiple Choice Questions

1. How will you convert propyne into propan-2-one



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2. How will you convert ethyne into vinyl cyanide.



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3. Draw structure of 1,3-dimethyl cyclopent-1-ene



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4. What will happen when ethyne treated with hydrogen in presence of platinum metal



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5. What will happen when propyne treated with hydrogen in presence of nickel catalyst?



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6. What is Lindlar's catalyst?



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7. What is birch reduction?



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



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9. Name a product obtained by heating butanoic acid with soda lime at 630K .



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10. Which salt on treatment with soda lime gives ethane?



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**11.** Draw the structure of following : 2-methyl-3-isopropyl heptane.



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**12.** Draw the structure of following :  
dicyclopropyl methane



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**13.** Draw the structure of following : n C<sub>4</sub>H<sub>10</sub>





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14. Write iupac name of following :  $\text{CH}_2=\text{CH}_2$



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15. Write iupac name of following :  $\text{CH}_3\text{-CH}=\text{CH}_2$



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16. Write iupac name of following :  $\text{CH}_3\text{-CH}_2\text{-CH=CH}_2$



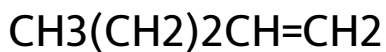
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17. Write iupac name of following :  $\text{CH}_3\text{-CH=CH-CH}_3$



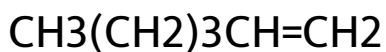
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18. Write iupac name of following :



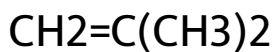
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19. Write iupac name of following :



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20. Write iupac name of following :



[Watch Video Solution](#)

21. Write iupac name of following :



[Watch Video Solution](#)

22. Write iupac name of following :  $\text{CH}_3\text{-CH}=\text{C}(\text{CH}_3)\text{-CH}(\text{CH}_3)\text{-CH}(\text{CH}_3)_2$



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23. Draw the structure of 3,4,5-trimethylhex-2-ene



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24. Draw the structure of 2-methylprop-1-ene



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**25.** Draw the structure of 5-methyl-3-propylhex-1-ene



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**26.** Draw the structure of 3-methylbut-1-ene



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27. Draw the structure of buta-1,3-diene



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28. Draw the structure of 3-propylpenta-1,4-diene



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29. Draw the structure of 4-methylpenta-1,3-diene



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**30.** Draw the structure of 4-phenylbut-1-ene



[Watch Video Solution](#)

**31.** Draw structure of cis 1,2-dibromoethene



[Watch Video Solution](#)

**32.** Draw structure of trans but-2-ene





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**33.** Draw structure of trans 1,2-dibromoethene



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**34.** Draw structure of maleic acid.



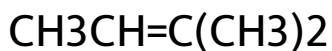
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**35.** Draw structure of fumaric acid.



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36. Write iupac name of following :



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37. Draw structure of penta-2,4-diene



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**38.** Draw structure of 4-ethyldeca-1,5,8-triene.



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**39.** Draw the cis and trans isomers of the following compounds :  $\text{CHCl}=\text{CHCl}$



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**40.** Adsorbed due to strong chemical force is called :

A. Chemisorption

B. Physisorption

C. Reversible adsorption

D. Both B and C.

**Answer: D**



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**41.** The wavelength of a spectral line of cesium is 460 nm. calculate the frequency of the line.



**42.** How many layers are adsorbed in chemical adsorption?

A. One

B. Two

C. Many

D. Zero

**Answer: A**



**43.** The heat of adsorption in physisorption lies in the range of (in kJ/ mol)

A. 40-400

B. 40-100

C. 10 – 40

D. 1 – 10

**Answer: C**



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44. Which of the following characteristic is not correct for physical adsorption?

A. Adsorption on solids is reversible.

B. Adsorption increases with increase in temperature.

C. Adsorption is spontaneous.

D. Enthalpy of adsorption is negative

**Answer: B**



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**45. Catalyst only**

A. decreases activation energy

B. increases activation energy

C. brings about equilibrium

D. none of these.

**Answer: A**



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**46.** The role of a catalyst in a reversible reaction is to

A. increase the rate of forward reaction

B. decrease the rate of forward reaction

C. alter the equilibrium constant of the reaction

D. allow the equilibrium to be achieved quickly

**Answer: D**



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47. The size of colloidal particles is in between

A.  $10^{-7} - 10^{-9} \text{ cm}$

B.  $10^{-9} - 10^{-11} \text{ cm}$

C.  $10^{-5} - 10^{-7} \text{ cm}$

D.  $10^{-2} - 10^{-3} \text{ cm}$

**Answer: C**



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**48.** Milk is a colloid in which a

A. liquid is dispersed in a liquid

B. solid is dispersed in a liquid

C. gas is dispersed in a liquid

D. sugar is dispersed in liquid.

**Answer: A**



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49. Which one of the following is correctly matched?

A. Emulsion - Curd

B. Foam -Mist

C. Aerosol - Smoke

D. Solid sol - Cake

**Answer: C**



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50. The substance that gets adsorbed on the surface of the solid is called

A. adsorbate

B. adsorbent

C. micelle

D. inner phase

**Answer: A**



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51. Adsorption is accompanied by

A. colligative property

B. oxidation process

C. reduction process

D. surface phenomenon

**Answer: D**



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52. True or False : Physical adsorption increases with rise in temperature whereas chemical adsorption decreases with rise in temperature.

- A. temperature increases
- B. temperature decreases
- C. temperature remains constant
- D. none of these

**Answer: B**



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53. Fossil fuels are formed when the temperature is low.

A. Physical

B. Chemical

C. Both

D. None

**Answer: A**



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54. Differentiate between absorption and adsorption.

A. Desorption

B. Ad-absorption

C. Sorption

D. None of these

**Answer: C**



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55. which of the following is correct ?

A.  $x / m \propto p^1$

B.  $x / m \propto p^{1/n}$

C.  $x / m \propto p^0$

D. all the above are correct for different ranges of pressure.

**Answer: D**



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56. which one of the following is not applicable to chemisorption ?

A. Effect of pressure is given by Freundlich adsorption isotherm

B. There is formation of monomolecular layer

C. It occurs at high temperature

D. It involves the formation of chemical bonds between adsorbent and adsorbate.

**Answer: A**



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**57. Which one of the following is a property of physisorption ?**

- A. Non-specific nature
- B. High specificity
- C. Irreversibility
- D. Unimolecular layer

**Answer: A**



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**58.** Which one of the following is wrong about physical adsorption ?

A. It involves only van der Waal's forces of attraction.

B.

C. It forms a bimolecular layer

D. It forms a unimolecular layer on the surface of the adsorbent.

**Answer: D**



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**59.** Give any four characteristics of chemical adsorption.

A. decreases with increase of temperature

B. increases with increase of temperature

C. first increases and then decreases with increase of temperature

D. first decreases and then increases with increase of temperature.

**Answer: C**



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**60.** The curve showing the variation of adsorption with pressure at constant temperature is called

- A. an isostere
- B. adsorption isotherm
- C. adsorption isobar
- D. all are correct

**Answer: B**



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**61.** Which of the following statement is correct?



- A. It forms monolayer
- B. It is reversible in nature
- C. It occurs at low temperature
- D. It is not specific in nature.

**Answer: A**



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**62.** Which of the following is a positively charged sol ?

A.  $Fe(OH)_2$

B.  $Sb_2S_3$

C.  $TiO_2$

D. silver sol

**Answer: A::C**



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**63.** The IUPAC Name of  $CH_3CH_2CH_2NH_2$

A. Propanamide

B. Propanamine

C. Butanamine

D. None

**Answer: C**



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**64.** The zig-zag motion of colloidal particles was first observed by :

A. John Tyndall

B. Robert Brown

C. Zsigmondy

D. Ostwald

**Answer: B**



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**65.** Blood may be purified by

A. dialysis

B. electro-osmosis

C. coagulation

D. filtration

**Answer: A**



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**66.** Adsorbed due to strong chemical force is called :

A. chemisorption

B. physisorption

C. reversible adsorption

D. Both B and C.

**Answer: A**



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**67.** The heat of adsorption in physisorption lies in the range of (in kJ/ mol)

A. 40-400

B. 40-100

C. 10 – 40

D. 1 – 10

**Answer: C**



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**68. Catalyst only**

A. decreases activation energy

B. increases activation energy

C. brings about equilibrium

D. None of these.

**Answer: C**



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**69.** The size of colloidal particles is in between

A.  $10^{-7} - 10^{-9} \text{ cm}$

B.  $10^{-9} - 10^{-11} \text{ cm}$

C.  $10^{-5} - 10^{-7} \text{ cm}$

D.  $10^{-2} - 10^{-3} \text{ cm}$



**Answer: C**



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**70.** How will you prove that milk is a colloidal solution ?

- A. liquid is dispersed in a liquid
- B. solid is dispersed in a liquid
- C. gas is dispersed in a liquid
- D. sugar is dispersed in a liquid.

**Answer: A**



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**71.** which one of the following is correctly matched?

A. Emulsion - Curd

B. Foam -Mist

C. Aerosol - Smoke

D. Solid sol - Cake.

**Answer: C**



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**72.** Chromatography is based on the principle of : chemical adsorption hydrogen bonding chemisorption physical adsorption.

A. Chemical adsorption

B. Hydrogen bonding

C. Chemisorption

D. Physical adsorption.

**Answer: D**



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**73.**  $As_2S_3$  sol is ,

- A. positive colloid
- B. negative colloid
- C. neutral colloid
- D. None of these.

**Answer: B**



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74. The role of a catalyst in a chemical reaction is to change:

A. enthalpy of a reaction

B. nature of products

C. activation energy

D. equilibrium constant.

**Answer: C**



75. In colloidal state, particle size range from :

10–1000Å, 20–50Å, 1–10Å, 1–280Å

A. 10-100 Å

B. 20-50 Å

C. 1-10 Å

D. 1-280 Å

**Answer: A**



**76.** Colloidal sol is :

- A. true solution
- B. suspension solution
- C. heterogeneous solution
- D. homogeneous solution

**Answer: C**



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77. Which of the following is a lyophilic colloid ?

A. Milk

B. Gum

C. Fog

D. Blood

**Answer: B**



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78. Which of the following has maximum value of flocculating



**Answer: B**



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