



CHEMISTRY

BOOKS - ACCURATE PUBLICATION

SURFACE CHEMISTRY

Multiple Choice Questions 1 Mark

1. The size of particles in suspension , true solution and colloidal solution varies in the order :

A. Suspension $>$ colloidal $>$ true solution

B. True solution > suspension > colloidal

C. Suspension > colloidal = true solution

D. None of these

Answer: A



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2. Which are not purely surface phenomena ?

A. Absorption, surface tension

B. Surface tension, viscosity

C. Adsorption, viscosity

D. Absorption, viscosity

Answer: D



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3. absorbed acetic acid on activated carbon is :

A. Adsorber

B. absorber

C. adsorbent

D. adsorbate

Answer: D



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4. Adsorbed due to strong chemical force is called :

- A. Chemisorption
- B. Physisorption
- C. Both (a) and (b)
- D. None of these

Answer: A



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5. Adsorption of gases on solid surface is exothermic because :

A. Free energy increases

B. Entropy decrease

C. Entropy increase

D. Interaction developed between gas and solid particles

Answer: D



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6. the nature of bonding forces in adsorption are:

- A. Purely physical such as van der Waals forces
- B. Purely chemical
- C. Both chemical and physical are possible
- D. None of these

Answer: C



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

- A. Heat of adsorption is negative
- B. It takes place at high temperature
- C. It is reversible
- D. It forms mono - molecular layer

Answer: C



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8. which one of the following characteristics is correct for physical adsorption ?

A. It is very specific

B. Adsorption on solids is irreversible

C. Adsorption decreases with decrease in temperature

D. Generally, both enthalpy and entropy of adsorption are negative

Answer: D



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9. Which of the following statements is not correct?

A. Physical adsorption is due to Vander Waals forces

B. Physical adsorption is irreversible

C. Chemical adsorption increases with increase in temperature up to certain limit then decreases

D. Enthalpy of adsorption for a chemical adsorption is greater than that of physical

adsorption

Answer: B



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10. which gas will be adsorbed on a solid to greater extent ?

- A. Having non polar molecule
- B. Having highest critical temperature
- C. Having lowest-critical temperature
- D. Having lowest critical pressure

Answer: B



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

A. Critical temperature

B. temperature of gas

C. Pressure of gas.

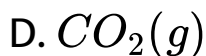
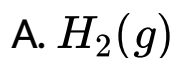
D. all of these

Answer: D



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12. which gas is adsorbed to maximum amount by activated carbon ?

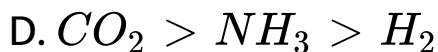
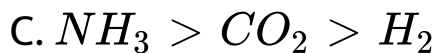
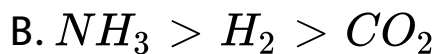


Answer: D



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13. the volume of gases NH_3 , CO_2 and H_2 adsorbed by one gram of charcoal at 300 K are in order of :



Answer: C



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14. which of the following is used to adsorb water ?

A. Silica gel

B. calcium acetate

C. Hair gel

D. Anhydrous $CaCl_2$

Answer: A



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15. Absorption and adsorptions are respectively :

- A. surface phenomena, bulk phenomena
- B. bulk phenomena, surface phenomena
- C. both are bulk phenomena
- D. Both arc surface phenomena

Answer: B



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16. Adsorption is multilayer in case of :

- A. physical adsorption
- B. chemisorption

C. both (a) and (b)

D. none of these

Answer: A



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17. Reversible adsorption is :

A. Chemical adsorption

B. physical adsorption

C. Both (a) and (b)

D. none of these

Answer: B



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18. the effect of pressure on adsorption is high if:

- A. temperature is low
- B. temperature is high
- C. temperature is very high
- D. larger charcoal piece is taken

Answer: A



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19. Sorption is the phenomenon :

A. reverse of adsorption

B. reverse of absorption

C. When absorption and adsorption take place
simultaneously

D. none of these

Answer: C



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20. A plot of $\log \left(\frac{x}{m} \right)$ against $\log P$ for the adsorption of a gas on a solid gives a straight line with slope equal to :

A. $1/n$

B. n

C. $\log K$

D. K

Answer: A



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21. The heat evolved in chemisorption lies in the range (in kJ/mol) of :

A. 80 to 240

B. 20 to 40

C. 40 to 80

D. 20 to 100

Answer: A



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22. The heat evolved in chemisorption lies in the range (in kJ/mol) of :

A. 20 to 40

B. 40 to 100

C. 100 to 200

D. 200 to 400

Answer: A



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23. A catalytic poison renders the catalyst ineffective because :

- A. It is preferentially adsorbed on the catalyst
- B. It adsorbs the molecules of the reactants
- C. It combines chemically with the catalyst
- D. It combines chemically with one of the reactants

Answer: A



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24. the catalyst used in the hydrogenation of oils is :

A. Fe

B. Ni

C. Pt

D. V_2O_5

Answer: B



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25. the function of zymase is to :

- A. Change starch into sugar
- B. Ferment glucose to alcohol and CO_2
- C. Change malt sugar into glucose
- D. Change starch into malt sugar and dextrin

Answer: B



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26. the conversion of maltose to glucose is possible by the enzyme :

A. Zymase

B. Lactase

C. Maltase

D. Diastase

Answer: C



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27. Shape selective catalysis is a reaction catalysed by : Zeolites, Enzymes, Platinum, Zeigler-Natta catalyst.

A. Enzymes

B. Ziegler-Natta catalyst

C. Zeolites

D. Platinum

Answer: C



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28. The process which is catalysed by one of the products is called :

A. acid base catalysis

B. auto catalysis

C. negative catalysis

D. homogeneous catalysis

Answer: B



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29. An inhibitor is essentially:

A. a negative catalyst

B. a heterogeneous catalyst

C. an auto catalyst

D. a homogenous catalyst

Answer: A



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30. A catalyst in the finely divided form is most effective because :

- A. less surface area is available
- B. more active sites are formed
- C. more energy gets stored in the catalyst
- D. none of these

Answer: D



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31. What happens when CO_2 is passed through lime water?

A. suspension

B. oil

C. colloidal sol

D. true solution

Answer: D



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32. Crystalloids differ from colloids mainly in respect of : electrical behaviour, particle nature, particle size, solubility.

A. Electrical behaviour

B. Particle nature

C. Particle size

D. Solubility

Answer: C



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33. surface tension of lyophilic sols is :

A. lower than water

B. more than water

C. equal to water

D. none of these

Answer: A



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34. which one of the following is not used for preparing lyophilic sols ?

A. starch

B. gum

C. gelatin

D. metal sulphide

Answer: D



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35. which one of the following is lyophilic colloid ?

A. Pt

B. Gum

C. Fog

D. Blood

Answer: B



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36. small liquid droplets dispersed in another liquid is called :

A. suspension

B. emulsion

C. gel

D. true solution

Answer: B



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37. Which of the following is an example of associated colloid ?

A. protein in water

B. soap in water

C. rubber in benzene

D. $FeCl_3$ in H_2O

Answer: B



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38. Fog is an example of colloidal system of:

- A. liquid in a gas
- B. gas in a liquid
- C. gas in a solid
- D. solid in a liquid

Answer: A



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39. which of the following is a lyophobic colloid ?

A. gelatin

B. sulphur

C. starch

D. gum Arabic

Answer: B



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40. which of the following in not a gel ?

A. Cheese

B. Jellies

C. Curd

D. Milk

Answer: D



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41. Bredig's arc method cannot be used for the preparation of colloidal sol of :

A. copper

B. gold

C. silver

D. sodium

Answer: D



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42. the minimum amount of an electrolyte required to cause coagulation of a sol is called :

A. Coagulation value

B. Gold number

C. Protective value

D. None of these

Answer: A



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43. the electrical charge on a colloidal particle is indicated by :

- A. Brownian movement
- B. Electrophoresis
- C. Tyndall effect
- D. Molecular sieves

Answer: B



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44. colloidal particles in a sol can be coagulated by

:

A. heating

B. adding an electrolyte

C. adding oppositely charged sol

D. any of the above methods

Answer: D



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45. peptization involves :

A. Precipitation of colloidal particles

B. Addition of electrolyte to precipitates to form colloidal solution.

C. Purification of colloids

D. Impact of molecules of the dispersion medium on the colloidal particles

Answer: D



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46. colloidal solution of gold is prepared by :

A. colloidal mill

B. double decomposition method

C. Bredig's arc method

D. peptization

Answer: C



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47. The formation of a colloidal from suspension is:

peptisation, condenstion, sedimentation,

fragmentation.

A. peptization

B. condensation

C. sedimentation

D. fragmentation

Answer: A



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48. the method usually employed for the destruction of a colloidal solution is ,

A. Dialysis

B. addition of electrolytes

C. diffusion through animal membrane

D. condensation

Answer: B



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49. Colloids can be purified by :

A. Condensation

B. peptization

C. Coagulation

D. dialysis

Answer: D



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50. protective sols are :

A. lyophilic

B. lyophobic

C. Both (a) and (b)

D. None of these

Answer: A



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51. Which one of the following statements is incorrect in the case of enzyme catalysis ?

- A. Enzyme catalysts are highly specific in nature.
- B. Enzyme catalysis is maximum at pH 5-7
- C. Enzyme catalysts are highly efficient
- D. None of these

Answer: D



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52. What is a colloidal solution ?

A. Smoke

B. Ink

C. Blood

D. Air

Answer: D



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53. which of the following statement is not true about the oil - in - water type emulsion ?

A. On addition of small amount of water, no separate layer of water appears

B. On addition of oil, separate layer of oil is formed

C. Addition of an electrolyte causes the conductivity of the emulsion to increase

D. Addition of small amount of oil soluble dye
makes the entire emulsion coloured

Answer: D



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54. Suspensions are :

- A. Visible to naked eye
- B. Visible through microscope
- C. both (a) & (b)
- D. Not visible by any means

Answer: C



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55. which of the following are colloids ? Sulphur sol, starch, Gold sol, soap solution.

A. Brownian movement

B. Dialysis

C. Ultra filtration

D. Wavelength

Answer: D



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56. A colloid always:

- A. Contains two phases
- B. is a true solution
- C. Contains three phases
- D. Contains only water-soluble particles

Answer: C



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57. When a colloidal solution is observed under an ultra-microscope, we can see :

A. Light scattered by colloidal particles.

B. Size of the particle

C. Shape of the particle

D. Relative size

Answer: A



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58. One desires to prepare a positively charged sol of silver iodide. This can be achieved by

A. adding small amount of $AgNO_3$ solution to KI solution in slight excess

B. adding small amount of KI solution to $AgNO_3$ solution in slight excess

C. mixing equal volumes of equimolar solutions of $AgNO_3$ and KI

D. None of these

Answer: B



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59. Cod Liver oil is

- A. fat dispersed in water
- B. water dispersed in fat
- C. water dispersed in oil
- D. fat dispersed in fat.

Answer: C



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60. Which of the following cannot be regarded as molecular solid?

- A. Sulphur
- B. Ferrichydroxide
- C. Arsenious sulphide
- D. Gold

Answer: D



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61. 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. $10^{-2} - 10^{-3}$

Answer: C



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62. Tyndall effect is observed in

A. NaCl in water

B. Milk in water

C. Sugar in water

D. None of these

Answer: B



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63. Butter is a colloid formed when

A. fat is dispersed in water

B. fat globules are dispersed in water

C. water is dispersed in fat

D. None of the these

Answer: C



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64. Milk is a colloid in which a

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

Answer: A



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65. Alums purify muddy water by:

A. forming Si complex with clay particles

B. sulphate part which combines, with the dirt
and remove it

C. aluminium which coagulates the mud
particles

D. making mud water soluble

Answer: C



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66. Cloud or fog is a colloidal system in which the dispersed phase and the dispersion medium are

A. Gas, Liquid

B. Liquid, gas

C. Liquid, liquid

D. Solid, Liquid

Answer: B



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67. Which one of the following is heterosporus?

A. Gum

B. Gelatin

C. Starch

D. Sulphur

Answer: D



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68. Cloud or fog is a colloidal system in which the dispersed phase and the dispersion medium are

A. Clay

B. Platinum

C. $Fe(OH)_3$

D. All of these

Answer: D



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69. Which of the following is a lyophilic colloid ?

A. Milk

B. Gum

C. Fog

D. Blood

Answer: B



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70. Surface tension of lyophobic colloids is

A. Lower than that of dispersion medium

B. More than that of dispersion medium

C. Almost same as that of dispersion medium

D. Can either be lower or more than dispersion
medium

Answer: C



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71. The disinfectant Dettol, when mixed with water,
gives :

- A. Water-in-oil emulsion
- B. Oil-in-water emulsion
- C. Gel

D. None on these

Answer: B



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72. Colloidal gold can be prepared by ,

A. Mechanical dispersion

B. Peptization

C. Bredig's Arc method

D. Hydrolysis

Answer: C



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73. The process which is responsible for the formation of delta at a place where river meet the sea is

- A. Peplization
- B. Colloidal formation
- C. Coagulation
- D. Emulsification

Answer: C



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74. Which one of the following is not an emulsion

A. Milk

B. Cold Cream

C. butter

D. Gum Arabic

Answer: D



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75. Write two differences between solution and emulsion.

- A. Heating
- B. Centrifugation
- C. Freezing
- D. All of these

Answer: D



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76. Which of the following is not a type of colloidal system?

A. Sol

B. Aerosol

C. Gel

D. None of these

Answer: D



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77. Blood may be purified by

A. Dialysis

B. Electro osmosis

C. Coagulation

D. Filtration

Answer: A



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78. The cause of Brownian movement is

A. Heat changes in liquid state

B. Convectional currents

C. The impact of molecules of the dispersion medium on the colloidal particles.

D. Attractive forces between the colloidal particles and molecules of dispersion medium.

Answer: C

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79. Arggyrolisasol, used as an eye lotion

A. Silver

B. Gold

C. Antimony

D. Sulphur

Answer: A



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80. Zigzag Random motion of colloidal particles is known as

A. Dialysis

B. Brownian movement

C. Electro osmosis

D. Tyndall effect

Answer: B



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81. Milk can be preserved by adding a few drops of

A. Formic acid solution

B. Formaldehyde solution

C. Acetic acid solution

D. Acetaldehyde solution

Answer: B



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82. In which of the following Tyndall effect is not observed ?

A. Suspensions

B. Emulsions

C. Sugar solution

D. Gold

Answer: C



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83. Point out the false statement

- A. Brownian movement and Tyndall effect are shown by colloidal systems
- B. Gold number is a measure of the protective power of lyophilic colloid
- C. The colloidal solution of a liquid in liquid is called gel

D. Hardy - Schulze rule is related with
coagulation

Answer: C



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84. Tyndall effect is shown by

A. Sol

B. Solution

C. Plasma

D. Precipitate

Answer: A



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85. Gold number is associated with

- A. Electrophoresis
- B. Purple of cassius
- C. Protective colloids
- D. Amount of pure gold

Answer: C



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86. Molecules of associated colloids contain:

- A. Lyophilic group
- B. Lyophobic group
- C. Precipitate
- D. Both (a) & (b)

Answer: D



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87. The migration of colloidal solute particles in a colloidal solution, when an electric current is applied to the solution is known as

- A. Brownian movement
- B. Electro osmosis
- C. Electrophoresis
- D. Electrodialysis

Answer: C



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

- A. be reflected
- B. be scattered
- C. be refracted
- D. give a rainbow

Answer: B



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89. The simplest way to check whether a system is colloidal is by

- A. Tyndall effect
- B. Brownian movement
- C. Electrodialysis
- D. Finding out particle size

Answer: A



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90. Under the influence for an electric field, the particles in a sol migrate towards cathode . The coagulation of the same sol is studied using NaCl , Na_2SO_4 and Na_3PO_4 solutions. Their coagulating values will be in maximum for :



Answer: C



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91. In coagulation of a (colloidal) solution of As_2S_3 , which has maximum coagulating power ?

A. NaCl

B. KCl

C. $BaCl_2$

D. $AlCl_3$

Answer: D



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92. Which of the following anions have greater coagulation value ?



Answer: D



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93. Colloidal sol is :

- A. Electrons
- B. Electrolytes
- C. Positively charged ions
- D. Compounds

Answer: B



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94. what is the correct sequence of the decreasing coagulation value of the following electrolyte for the coagulation of ferric hydroxide sol ?

(I) Na_3PO_4 (II) KCl (III) K_2SO_4 (IV) $K_4[Fe(CN)_6]$

A. KCl

B. KNO_3

C. K_2SO_4

D. $K_3[Fe(CN)_6]$

Answer: D



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95. Baeyer's reagent is

A. $AlCl_3$

B. $NaCl$

C. CaF_2

D. Glucose

Answer: D



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96. The stability of lyophilic colloids is due to which of the following ?

A. Charge on their particles

B. Large size of their particles

C. Small size of their particles

D. A layer of dispersion medium

Answer: D



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97. The role of a catalyst in a reversible reaction is to

A. Increase the rate of forward reaction

B. Decrease the rate of backward reaction

C. alter the equilibrium constant of the
reaction

D. Allow the equilibrium to be achieved quickly

Answer: D



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98. The function of gum Arabic in the preparation of an Indian ink is

A. Coagulation

B. Peptization

C. Absorption

D. Protective action

Answer: D



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99. At CMC, the surfactant molecules decompose, become completely soluble, associate, dissociate.

A. Decompose

B. Become completely soluble

C. Associate

D. Dissociate

Answer: C



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100. 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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1 Mark Questions

1. What is adsorption? Give one example.



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2. What do you understand by activation of adsorbent? How is it achieved?



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3. What is desorption ?



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4. Define Sorption.

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5. Define Occulusion.

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6. What is coagulation ?

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7. Define electrophoresis.



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8. Define electro-osmosis.



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9. What do you mean by gold number ?



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10. What is adsorption isotherm ?



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11. What is adsorption isobar?



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12. Write Freundlich adsorption isotherm equation at intermediate pressures.



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13. Write Freundlich adsorption isotherm equation at intermediate pressures.

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14. Write Freundlich adsorption isotherm equation at low pressures.

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15. What name is given to the catalysis when the state of the catalyst is the same as those of the

reactants.



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16. What name is given to the catalysis when the state of the catalyst is different from the state of reactants ?



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



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18. What are Enzymes ? What are their characteristics (properties)?



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19. What are colloids ?



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20. What are gels ? Give an example of elastic and non-elastic gel.



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21. What is peptisation ?



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22. Write notes on Hardy Schulze Rule ?



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23. What are emulsions ? Give an example of oil in water and water in oil emulsion.



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24. Define emulsifier.



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25. Name the type of emulsion to which milk belongs to.



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26. Define: Emulsification



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2 Marks Questions

1. Why the rate of chemical adsorption first increases and then decreases with rise of temperature ?



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

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3. Explain two applications of adsorption.

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4. Define Catalyst and Catalysis.

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5. What is homogeneous and heterogeneous catalysis? Give one example of each.





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6. What do you understand by activity and selectivity of a catalyst ? Give one example of each.



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



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8. Write two differences between true solution and colloidal solution.



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9. Give three differences between suspension and colloid solution.



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10. What is the difference between Lyophilic and Lyophobic sols?



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4 Marks Questions

1. Differentiate between physical adsorption and chemical adsorption.



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2. Give three differences between lyophilic and lyophobic colloids.



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Comprehension Questions

1. Read the given passage and answers following questions :

There are mainly two type of adsorption of gases on solids. If accumulation of gases on the surface of solid occurs on account of weak vander waal forces, the adsorption is termed as physical adsorption. When gas molecules or atoms held to solid surface by chemical bonds, adsorption is termed as chemical adsorption. The chemical bonds may be covalent or ionic. Chemical

adsorption involves a high energy of activation therefore it is referred as Activated adsorption. A physical adsorption at low temperature may pass into chemical adsorption temperature is increased.

What type of force exist in physical adsorption ?



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2. Read the given passage and answers following questions :

There are mainly two type of adsorption of gases on solids. If accumulation of gases on the surface of solid occurs on account of weak vander waal

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What are type of adsorption ?



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into chemical adsorption temperature is increased.

Give conditions of temperature which favours physical adsorption.



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4. Read the given passage and answers following questions :

There are mainly two type of adsorption of gases on solids. If accumulation of gases on the surface of solid occurs on account of weak vander waal forces, the adsorption is termed as physical adsorption. When gas molecules or atoms held to

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6. Read the given passage and answers following questions :

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physical adsorption at low temperature may pass into chemical adsorption temperature is increased.

How many types of adsorption of gases on solids?



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7. Explain the adaptation of plants to live in water?



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8. Read the given passage and answers following questions :

There are mainly two type of adsorption of gases

on solids. If accumulation of gases on the surface of solid occurs on account of weak vander waal forces, the adsorption is termed as physical adsorption. When gas molecules or atoms held to solid surface by chemical bonds, adsorption is termed as chemical adsorption. The chemical bonds may be covalent or ionic. Chemical adsorption involves a high energy of activation therefore it is referred as Activated adsorption. A physical adsorption at low temperature may pass into chemical adsorption temperature is increased.

What type of force exist in physical adsorption ?



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9. Read the given passage and answers following questions :

There are mainly two type of adsorption of gases on solids. If accumulation of gases on the surface of solid occurs on account of weak vander Waal forces, the adsorption is termed as physical adsorption. When gas molecules or atoms held to solid surface by chemical bonds, adsorption is termed as chemical adsorption. The chemical bonds may be covalent or ionic. Chemical adsorption involves a high energy of activation therefore it is referred as Activated adsorption. A physical adsorption at low temperature may pass

into chemical adsorption temperature is increased.

What type of activation energy in physical adsorption ?



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10. Read the given passage and answers following questions :

There are mainly two type of adsorption of gases on solids. If accumulation of gases on the surface of solid occurs on account of weak vander Waal forces, the adsorption is termed as physical adsorption. When gas molecules or atoms held to

solid surface by chemical bonds, adsorption is termed as chemical adsorption. The chemical bonds may be covalent or ionic. Chemical adsorption involves a high energy of activation therefore it is referred as Activated adsorption. A physical adsorption at low temperature may pass into chemical adsorption temperature is increased. What type of activation energy in physical adsorption ?



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11. What kind of movement do we see in plants?





12. Read the given passage and answers following questions :

Emulsion: It is a colloidal mixture in which both the dispersed phase and the dispersion medium are liquids. The two or more liquids present in the mixture are generally immiscible in nature.

Example: Milk. Gel: It is a colloid in which the dispersed phase i.e. liquid has combined with the dispersion medium i.e. solid to produce a semisolid material. **Example: jellies.**

Answer the following questions :

Which type of nature dispersed phase and medium exist?

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13. What are the three characteristics that are shown in all living organisms?

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14. Read the given passage and answers following questions :

Emulsion: It is a colloidal mixture in which both

the dispersed phase and the dispersion medium are liquids. The two or more liquids present in the mixture are generally immiscible in nature.

Example: Milk. Gel: It is a colloid in which the dispersed phase i.e. liquid has combined with the dispersion medium i.e. solid to produce a semisolid material. Example: jellies.

Answer the following questions :

What is colloidal mixture ?



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15. Read the given passage and answers following questions :

Emulsion: It is a colloidal mixture in which both the dispersed phase and the dispersion medium are liquids. The two or more liquids present in the mixture are generally immiscible in nature.

Example: Milk. Gel: It is a colloid in which the dispersed phase i.e. liquid has combined with the dispersion medium i.e. solid to produce a semisolid material. **Example: jellies.**

Answer the following questions :

Which type of material formed when dispersed phase and dispersion medium combined ?



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16. Read the given passage and answers following questions :

Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to 100nm consisting of dispersed phase and dispersion medium. The dispersed phase or dispersion medium may be solid, liquid or even a gas. Depending upon the nature of dispersion medium or dispersed phase, 8

types of systems are possible except for a gas dispersed in another gas because the gases are completely miscible with each other. The substances which have strong interaction with the dispersion medium are called lyophilic colloids while those which do not pass into colloidal state readily are called lyophobic colloids. Lyophobic sols are much less stable and are irreversible.

Answer the following questions :

What is the size of colloidal particles ?



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17. Read the given passage and answers following questions :

Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to 100nm consisting of dispersed phase and dispersion medium. The dispersed phase or dispersion medium may be solid, liquid or even a gas. Depending upon the nature of dispersion medium or dispersed phase, 8 types of systems are possible except for a gas dispersed in another gas because the gases are

completely miscible with each other. The substances which have strong interaction with the dispersion medium are called lyophilic colloids while those which do not pass into colloidal state readily are called lyophobic colloids. Lyophobic sols are much less stable and are irreversible.

Answer the following questions :

How many types systems are possible depending upon the nature of dispersion medium?



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18. Read the given passage and answers following questions :

Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to 100nm consisting of dispersed phase and dispersion medium. The dispersed phase or dispersion medium may be solid, liquid or even a gas. Depending upon the nature of dispersion medium or dispersed phase, 8 types of systems are possible except for a gas dispersed in another gas because the gases are

completely miscible with each other. The substances which have strong interaction with the dispersion medium are called lyophilic colloids while those which do not pass into colloidal state readily are called lyophobic colloids. Lyophobic sols are much less stable and are irreversible.

Answer the following questions :

Which substances have strong interactions with dispersion medium?



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19. Read the given passage and answers following questions :

Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to 100nm consisting of dispersed phase and dispersion medium. The dispersed phase or dispersion medium may be solid, liquid or even a gas. Depending upon the nature of dispersion medium or dispersed phase, 8 types of systems are possible except for a gas dispersed in another gas because the gases are

completely miscible with each other. The substances which have strong interaction with the dispersion medium are called lyophilic colloids while those which do not pass into colloidal state readily are called lyophobic colloids. Lyophobic sols are much less stable and are irreversible.

Answer the following questions :

Lyophobic colloids do not pass into which state?



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20. Read the given passage and answers following questions :

Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to 100nm consisting of dispersed phase and dispersion medium. The dispersed phase or dispersion medium may be solid, liquid or even a gas. Depending upon the nature of dispersion medium or dispersed phase, 8 types of systems are possible except for a gas dispersed in another gas because the gases are completely miscible with each other. The substances which have strong interaction with the dispersion medium are called lyophilic colloids

while those which do not pass into colloidal state readily are called lyophobic colloids. Lyophobic sols are much less stable and are irreversible.

Answer the following questions :

Which type of colloids are more stable?



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21. Why can a pace or footsteps not be used as a standard unit of length?



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22. Read the given passage and answers following questions :

The particles of colloidal solution possess electrical charge which is responsible for the stability of these solutions. The charge on colloidal particles arises because of selective adsorption of ions which are common with their own lattice. The presence of charge on colloidal particles can be determined with the help of phenomenon known as electrophoresis. However, when some electrolyte is added, the charge on the particles of, dispersed phase gets neutralized and precipitation takes place. This process is also called coagulation.

The coagulation is given by Hardy Schulze rules. According to these rules the ions carrying the charge opposite to that of sol particles are effective and coagulating power of an electrolyte is directly proportional to the fourth power of the valency of the ion. Coagulation can also occur by mutual precipitation , by electrophoresis, by persistent dialysis or by heating or cooling.

Answer the following questions :

Which electrolyte is most effective for coagulating $\text{Fe}(\text{OH})_3$ sol?



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23. Read the given passage and answers following questions :

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According to these rules the ions carrying the charge opposite to that of sol particles are effective and coagulating power of an electrolyte is directly proportional to the fourth power of the valency of the ion. Coagulation can also occur by mutual precipitation , by electrophoresis, by persistent dialysis or by heating or cooling.

Answer the following questions :

What happens to the charge of particles when electrolyte is added ?



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24. Read the given passage and answers following questions :

The particles of colloidal solution possess electrical charge which is responsible for the stability of these solutions. The charge on colloidal particles arises because of selective adsorption of ions which are common with their own lattice. The presence of charge on colloidal particles can be determined with the help of phenomenon known as electrophoresis. However, when some electrolyte is added, the charge on the particles of, dispersed phase gets neutralized and precipitation takes place. This process is also called coagulation.

The coagulation is given by Hardy Schulze rules. According to these rules the ions carrying the charge opposite to that of sol particles are effective and coagulating power of an electrolyte is directly proportional to the fourth power of the valency of the ion. Coagulation can also occur by mutual precipitation , by electrophoresis, by persistent dialysis or by heating or cooling.

Answer the following questions :

Name the other ways by which coagulation can occur.



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25. Read the given passage and answers following questions :

A catalytic process in which the catalyst and the reactants are present in different phases is known as a heterogeneous catalysis. This heterogeneous catalytic action can be explained in terms of the adsorption theory. The mechanism of catalysis involves the following steps: (i) Adsorption of reactant molecules on the catalyst surface. (ii) Occurrence of a chemical reaction through the formation of an intermediate. (iii) De-sorption of products from the catalyst surface (iv) Diffusion of products away from the catalyst surface. In this process, the reactants are usually present in the

gaseous state and the catalyst is present in the solid state. Gaseous molecules are then adsorbed on the surface of the catalyst. As the concentration of reactants on the surface of the catalyst increases, the rate of reaction also increases. In such reactions, the products have very less affinity for the catalyst and are quickly desorbed, thereby making the surface free for other reactants.

What is heterogeneous catalysis.



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26. Read the given passage and answers following questions :

A catalytic process in which the catalyst and the reactants are present in different phases is known as a heterogeneous catalysis. This heterogeneous catalytic action can be explained in terms of the adsorption theory. The mechanism of catalysis involves the following steps: (i) Adsorption of reactant molecules on the catalyst surface. (ii) Occurrence of a chemical reaction through the formation of an intermediate. (iii) De-sorption of products from the catalyst surface (iv) Diffusion of products away from the catalyst surface. In this

process, the reactants are usually present in the gaseous state and the catalyst is present in the solid state. Gaseous molecules are then adsorbed on the surface of the catalyst. As the concentration of reactants on the surface of the catalyst increases, the rate of reaction also increases. In such reactions, the products have very less affinity for the catalyst and are quickly desorbed, thereby making the surface free for other reactants.

Which theory explains heterogeneous catalytic action?



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27. Read the given passage and answers following questions :

A catalytic process in which the catalyst and the reactants are present in different phases is known as a heterogeneous catalysis. This heterogeneous catalytic action can be explained in terms of the adsorption theory. The mechanism of catalysis involves the following steps: (i) Adsorption of reactant molecules on the catalyst surface. (ii) Occurrence of a chemical reaction through the formation of an intermediate. (iii) De-sorption of products from the catalyst surface (iv) Diffusion of products away from the catalyst surface. In this

process, the reactants are usually present in the gaseous state and the catalyst is present in the solid state. Gaseous molecules are then adsorbed on the surface of the catalyst. As the concentration of reactants on the surface of the catalyst increases, the rate of reaction also increases. In such reactions, the products have very less affinity for the catalyst and are quickly desorbed, thereby making the surface free for other reactants.

What is diffusion ?



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28. If you place your wet uniform near a heater to dry it up, will it help you?



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29. Read the given passage and answers following questions :

A catalytic process in which the catalyst and the reactants are present in different phases is known as a heterogeneous catalysis. This heterogeneous catalytic action can be explained in terms of the adsorption theory. The mechanism of catalysis involves the following steps: (i) Adsorption of

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other reactants.

How many steps involved in mechanism of catalysis ?

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30. Motion of earth around the sun and oscillation of a pendulum is which kind of motion?

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31. Explain in brief- Cloud formation?

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32. Read the given passage and answers following questions :

Zeolites are aluminosilicates that are microporous in nature. Zeolites have a honeycomb like structure, which makes them shape-selective catalysts. They have an extended 3D-network of silicates in which some silicon atoms are replaced by aluminium atoms, giving them an Al-O-Si framework. The reactions taking place in zeolites are very sensitive to the pores and cavity size of the zeolites. Zeolites are commonly used in the petrochemical industry. A catalytic reaction which

depends upon the pore structure of the catalyst and on the size of the reactant and the product molecules is called shape-selective catalysis. For example, catalysis by zeolites is a shape selective catalysis. The pore size present in the zeolites ranges from 260-740 pm. Thus, molecules having a pore size more than this cannot enter the zeolite and undergo the reaction.

In which chemical industry Zeolites used ?



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33. Read the given passage and answers following questions :

Zeolites are alumino-silicates that are microporous in nature. Zeolites have a honeycomb like structure, which makes them shape-selective catalysts. They have an extended 3D-network of silicates in which some silicon atoms are replaced by aluminium atoms, giving them an Al-O-Si framework. The reactions taking place in zeolites are very sensitive to the pores and cavity size of the zeolites. Zeolites are commonly used in the petrochemical industry. A catalytic reaction which depends upon the pore structure of the catalyst

and on the size of the reactant and the product molecules is called shape-selective catalysis. For example, catalysis by zeolites is a shape selective catalysis. The pore size present in the zeolites ranges from 260-740 pm. Thus, molecules having a pore size more than this cannot enter the zeolite and undergo the reaction.

Upon which factor a catalytic reaction depends ?



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34. Read the given passage and answers following questions :

Zeolites are aluminosilicates that are microporous in nature. Zeolites have a honeycomb like structure, which makes them shape-selective catalysts. They have an extended 3D-network of silicates in which some silicon atoms are replaced by aluminium atoms, giving them an Al-O-Si framework. The reactions taking place in zeolites are very sensitive to the pores and cavity size of the zeolites. Zeolites are commonly used in the petrochemical industry. A catalytic reaction which depends upon the pore structure of the catalyst and on the size of the reactant and the product molecules is called shape-selective catalysis. For example, catalysis by zeolites is a shape selective

catalysis. The pore size present in the zeolites ranges from 260-740 pm. Thus, molecules having a pore size more than this cannot enter the zeolite and undergo the reaction.

What is the pore size of Zeolites ?



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35. Read the given passage and answers following questions :

The cleansing action of soap is due to emulsification and micelle formation. Soaps are basically sodium and potassium salts of long chain

fatty acids, $R\text{-COO-Na}^+$. The end of the molecule to which the sodium is attached is polar in nature, while the alkyl-end is non-polar. Thus, a soap molecule contains a hydrophilic (polar) and a hydrophobic (nonpolar) part. When soap is added to water containing dirt, the soap molecules surround the dirt particles in such a manner that their hydrophobic parts get attached to the dirt molecule and the hydrophilic parts point away from the dirt molecule. This is known as micelle formation. Thus, we can say that the polar group dissolves in water while the non-polar group dissolves in the dirt particle. Now, as these micelles are negatively charged, they do not coalesce and a

stable emulsion is formed.

Define soaps ?



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36. Read the given passage and answers following questions :

The cleansing action of soap is due to emulsification and micelle formation. Soaps are basically sodium and potassium salts of long chain fatty acids, $R-COO-Na^+$. The end of the molecule to which the sodium is attached is polar in nature, while the alkyl-end is non-polar. Thus, a soap

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How many parts of soaps exist ?



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37. Read the given passage and answers following questions :

The cleansing action of soap is due to emulsification and micelle formation. Soaps are basically sodium and potassium salts of long chain fatty acids, $R\text{-COO-}Na^+$. The end of the molecule to which the sodium is attached is polar in nature, while the alkyl-end is non-polar. Thus, a soap molecule contains a hydrophilic (polar) and a hydrophobic (nonpolar) part. When soap is added to water containing dirt, the soap molecules surround the dirt particles in such a manner that

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What is micelle formation?



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38. Read the given passage and answers following questions :

The cleansing action of soap is due to emulsification and micelle formation. Soaps are basically sodium and potassium salts of long chain fatty acids, $R\text{-COO-}Na^+$. The end of the molecule to which the sodium is attached is polar in nature, while the alkyl-end is non-polar. Thus, a soap molecule contains a hydrophilic (polar) and a hydrophobic (nonpolar) part. When soap is added to water containing dirt, the soap molecules surround the dirt particles in such a manner that their hydrophobic parts get attached to the dirt

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What is polar and non-polar groups ?

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39. When does a drought occur?

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40. Read the given passage and answers following questions :

In multi-molecular colloids, the colloidal particles are an aggregate of atoms or small molecules with a diameter of less than 1 nm. The molecules in the aggregate are held together by van der Waal's forces of attraction. Examples of such colloids include gold sol and sulphur sol. In macro-molecular colloids, the colloidal particles are large molecules having colloidal dimensions. These particles have a high molecular mass. When these particles are dissolved in a liquid, sol is obtained.

For example: starch, nylon, cellulose, etc. Certain substances tend to behave like normal electrolytes at lower concentrations. However, at higher concentrations, these substances behave as colloidal solutions due to the formation of aggregated particles. Such colloids are called aggregated colloids.

How many types of colloids exist ?

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41. Write the sources of water on earth?

 [Watch Video Solution](#)

42. Read the given passage and answers following questions :

In multi-molecular colloids, the colloidal particles are an aggregate of atoms or small molecules with a diameter of less than 1 nm. The molecules in the aggregate are held together by van der Waal's forces of attraction. Examples of such colloids include gold sol and sulphur sol. In macro-molecular colloids, the colloidal particles are large molecules having colloidal dimensions. These particles have a high molecular mass. When these particles are dissolved in a liquid, sol is obtained.

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At what concentration Certain substances tend to behave like normal electrolytes ?



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43. Read the given passage and answers following questions :

In multi-molecular colloids, the colloidal particles are an aggregate of atoms or small molecules with a diameter of less than 1 nm. The molecules in the aggregate are held together by van der Waal's forces of attraction. Examples of such colloids include gold sol and sulphur sol. In macromolecular colloids, the colloidal particles are large molecules having colloidal dimensions. These particles have a high molecular mass. When these particles are dissolved in a liquid, sol is obtained. For example: starch, nylon, cellulose, etc. Certain

substances tend to behave like normal electrolytes at lower concentrations. However, at higher concentrations, these substances behave as colloidal solutions due to the formation of aggregated particles. Such colloids are called aggregated colloids.

What are macromolecular colloids?



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44. In which of the forms, water exist on the earth?



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45. Read the given passage and answers following questions :

In 1916 Langmuir proposed theory of adsorption of a gas on the surface of the solid to be made up of elementary sites each of which would adsorb one gas. It is assumed that all adsorption sites are equivalent and the ability of a gas molecule to get bound to any one site is independent whether or not the neighbouring sites are occupied. Additionally, it is also assumed that dynamic equilibrium exists between adsorbed and non adsorbed gas molecule.

Following principles can be obtained from

Langmuir adsorption isotherm

- The gas adsorbed behaves ideally in a vapour phase.
- Only monolayer adsorption takes place.
- The surface of the solid is homogeneous.
- There are no lateral interactive force between the adsorbate molecule.
- The adsorbed gas molecules are localized.

Who proposed the theory of adsorption of a gas on the surface of the solid ?



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46. How plants loose water?



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47. Read the given passage and answers following questions :

There are mainly two type of adsorption of gases on solids. If accumulation of gases on the surface of solid occurs on account of weak vander Waal forces, the adsorption is termed as physical adsorption. When gas molecules or atoms held to solid surface by chemical bonds, adsorption is termed as chemical adsorption. The chemical

bonds may be covalent or ionic. Chemical adsorption involves a high energy of activation therefore it is referred as Activated adsorption. A physical adsorption at low temperature may pass into chemical adsorption temperature is increased. What type of activation energy in physical adsorption ?



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48. Read the given passage and answers following questions :

In 1916 Langmuir proposed theory of adsorption of

a gas on the surface of the solid to be made up of elementary sites each of which would adsorb one gas. It is assumed that all adsorption sites are equivalent and the ability of a gas molecule to get bound to any one site is independent whether or not the neighbouring sites are occupied. Additionally, it is also assumed that dynamic equilibrium exists between adsorbed and non adsorbed gas molecule.

Following principles can be obtained from Langmuir adsorption isotherm

- The gas adsorbed behaves ideally in a vapour phase.
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- The surface of the solid is homogeneous.
- There are no lateral interactive force between the adsorbate molecule.
- The adsorbed gas molecules are localized.

Who proposed the theory of adsorption of a gas on the surface of the solid ?



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49. How does heavy rain affect us?



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