CHEMISTRY

BOOKS - MODERN PUBLISHERS CHEMISTRY (HINGLISH)

SURFACE CHEMISTRY

Solved Examples

1. Three grams of oxygen are adsorbed on 1.2 g of charcoal powder at 300K and 0.7 atm. Express the mass number of moles and volume of oxygen at 300K, 0.7 atm and at STP adsorbed per gram of the adsorbent.

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2. $50ml$ of $1M$, oxalic acid is shaked with $0.6gm$ of charcoal. The final concentration of this solution after adsorption has been found to be $0.4M$. The amount of oxalic acid absorbed per gm of charcoal is

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3. One gram of charcoal adsorbs 100 mL of 0.5 MCH_3COOH to form a mono-layer and thereby the molarity of acetic acid is reduced to 0.49 M. Calculate the surface area of the charcoal adsorbed by each molecule of acetic acid. Surface acid of charcoal $= 3.01 \times 10^2 m^2 / gm$

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4. Around $20\ \%$ surface sites have adsorbed N_2. On heating N_2 gas evolved form sites and were collected at 0.001 atm and 298 K in a

container of volume $2.46cm^3$ the density of surface sites is $6.023 \times 10^{14} cm^{-2}$ and surface area is $1000cm^2$ find out the number of surface sites occupied per molecule of N_2.

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5. The following data were obtained for the adsorptionof carbon monoxide gas on 3.0 g of charcoal at $0^\circ C$ and1 atm pressure.

Pressure (mmHg)	200	400
Volume of gas adsorved,x (reduced to STP)	18.6	31.4

Calculate the values of the constants k and n using Freundlich adsorption equation.

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6. In a coagulation experiment, $5mL$ of As_2S_3 is mixed with distilled water and $0.1M$ solution of an electrolyte AB so that the

total volume is $10mL$. It was found that all solutions sontianing more than $4.6mL$. Of AB coagulate within 5 min. What is the flocculation value of AB for As_2S_3 solution?

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7. The coagulation of 200 ml of a colloidal solution of gold is completely prevented by adding 0.50 gm of starch to it before adding 1 ml of $10\,\%$ NaCl solution. Calculate the gold number of starch.

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Conceptual Question 1

1. How is adsorption of a gas is related to its critical temperature ?

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2. Compare the heat of adsorption for physical and chemical adsorption?

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3. In the case of chemisorption, why adsorption first increases and then decreases with temperature?

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4. Give reason why a finely divided substance is more effective as an adsorbents?

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5. A small amount of silica gel and anhydrous calcium chloride are placed separately in two coeners of a vessel containng water vapour. What phenomena will occur?

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6. Which will be adsorbed more readily on the surface of charcoal and why– NH_3 or CO_2?

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7. What will be the Freundlich's adsorption isotherm equation at high pressure?

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8. How do size of particles of adsorbent, pressure of gas and prevailling temperature influence the extent of adsorption of a gas on a solid ?

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9. Consider the adsorption isotherm given below and interpret the variation in the extent of adsorption $\left(\frac{x}{m}\right)$ when

a. Temperature increased at constant pressure.

b. Pressure increases at constant temperature.

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10. (a) Heat of adsorption is greater for chemisorptions than physisorprion. Why ?

(b) What is collodin ?

(c) Differentiate between peptisation and coagulation.

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11. Why is silica gel used as a dehumidizer?

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12. Name the enzyme which converts :

(i) Starch into maltose (ii)Glucose into alcohol (iii) Sucrose into glucose and fructose.

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13. Write one similarity between physisorption and chemisorption.

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Watch Video Solution

14. Which enzyme is used to convert glucose into ethyl alcohol?

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Conceptual Question 2

1. Why are lyophillic colloidal sols are more stable than lyophobic colloidal sol

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2. Give one test to distinguish whether the given emulsion is oil in water type or water in oil type emulsion.

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3. What is observed when sodium chloride is added to a colloidal solution of ferric hydroxide?

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4. Give an example of (i) micelles system (ii) macromolecular colloid.

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5. What is the difference between sol and gel ?

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6. What is the difference in the nature of a dilute soap solution and a concentrated soap solution ?

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7. What happens when colloidal solution of $fe(OH)_3$ and $As_2S(3)$ are mixed in equimolar propotions ?

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8. The conductance of an emulsion increases on adding common salt. What type of emulsion is this?

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9. What happens when a freshly precipitated $Fe(OH)_3$ is shaken with little amount of dilute solution of $FeCl_3$?

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10. What type of colloid is formed when a liquid is dispersed in a solid? Give an example:

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11. What is the significance of reciprocal of "gold number"?

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12. $50mL$ of standard gold solution needs $0.05mg$ of gelatin for its protection from coagulation. Calculate the gold number of gelatine?

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13. $100mL$ of a colloidal solution is completely precipitated by addition of $5mL$ of $1M$ $NaCl$ solution. Calculate the coagulation value of $NaCl$.

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14. What is the charge on the colloidal particles in the following ?

a. $Fe(OH)_3$ sol

b. As_2S_3 sol

c. Colloidal sol of sillver

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15. Which of the following is the most effective electrolyte for the coagulation of (Fe2O3.H2O)Fe3+ sol ?

$KCl, AlCl_3, MgCl_2, K_4\left[Fe(CN)_6\right]$

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16. Give reasons for the following :

(i) Peptizing agent is added to convert a precipitate into a colloidal solution.

(ii) Colloidal gold is used for intramuscular injection.

(iii) Cottrell's smoke precipitator is fitted at the mouth of a chimeny used in factories.

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19. What is colloidion?

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20. (a) Heat of adsorption is greater for chemisorptions than physisorprion. Why ?

(b) What is collodin ?

(c) Differentiate between peptisation and coagulation.

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21. Why is ferric chloride preferred over potassium chloride in case of a cut leading to bleeding?

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22. Why does the sky appear blue on a clear day ?

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23. A freshly formed precipitate of ferrie hydroxide can be converted to a colloidal sol by shaking it with a small quantity of ferric chloride. Explain.

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24. Why does leather get hardened after tanning ?

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25. Why is it necessary to remove CO when ammonia is obtained by Haber's process?

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26. Why do we add alum to purify water ?

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27. Out of $MgCl_2$ and $AICI_3$ which one is more effective in causing coagulation of negatively charged sol and why?

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28. Out of sulphur sol and proteins, which one forms multimolecular colloids?

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29. What are the dispersed phase and dispersion medium in milk

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30. (a) Write the dispersed phase and dispersion medium of milk.

(b) Write one similarity between physisorption and schemisorption.

(c) Write the chemical method by which $Fe(OH)_3$ sol is prepared from $FeCl_3$

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Ncert File Solved Ncert In Text Questions

1. Why are substance such as platinum and palladium often used for carrying out electrolysis of aqueous solutions?

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2. Why dows physisoption decrease with increase of temperature ?

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3. Why are powdered substances more effective adsorbent than their crystalline forms ?

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4. Why is it necessary to remove CO when ammonia is obtained by Haber's process?

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5. Why is ester hydrolysis slow in the beginning and becomes faster after some time?

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6. What is the role of desorption in the process of catalysis?

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7. What modification can you suggest in the Hardy Schulze law?

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8. Why is it essential to wash the precipitate with water before estimating it quantitatively?

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Ncert File Solved Ncert Textbook Exercises

1. Distinguish between the meaning of the terms adsorption and absorption. Given one example of each.

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2. Write differences between physisorption and chemisorption.

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3. Give reason why a finely divided substance is more effective as an adsorbents?

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4. What are the factors which influence the adsorption of a gas on a solid ?

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5. What is an adsorption isotherm? Describe Freundlich adsorption isotherm.

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6. What do you understend by activation of adsorbent? How is it achieved ?

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7. What role does adsorption play in heterogeneous catalysis ?

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8. Why is adsorption always exothermic ?

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9. How are the colloidal solutions classified on the the basis of physical states of the dispersed phase and dispersion medium ?

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10. Disuss the effect of pressure and temperature on the adsorption of gases on solides.

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11. What are lyophilic and lyophobic sols?Give one example of each type ? Why is hydrophobic sol easily coagulated ?

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12. What is the difference between multimolecular and macromolecular colloids? Give one example of each.

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13. What are enzymes ? Write in brief the mechanism of enzyme catalysis ?

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14. Physical states of components colloids classified on the basis ?

Watch Video Solution

15. Nature of dispersion medium colloids classified on the basis ?

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16. interaction between dispersed phase and dispersion medium colloids classified on the basis ?

View Text Solution

17. When a beam to light is passed through colloidal solution.

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18. Explain what is observed when ltbr. a. An electrolyte $NaCl$ is added to hydrated ferric oxide sol.

b. Electric current is passed through a colloidal sol.

c. When a beam of light is passed through a collidal solution.

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19. Explain what is observed when ltbr. a. An electrolyte $NaCl$ is added to hydrated ferric oxide sol.

b. Electric current is passed through a colloidal sol.

c. When a beam of light is passed through a collidal solution.

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20. What are emulsions ? What are their different types ? Give an example of each type ?

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21. What is demulsification ? Name two demulsifiers.

Watch Video Solution

22. Action of soap is due to emulsification and micelle formation. Comment.

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23. Give four examples of heterogeneous catalytic reactions.

Watch Video Solution

24. What do you mean by activity and selectivity of catalysts ?

Watch Video Solution

25. Describe some features of catalysis by zeolites.

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26. What is shape – selective catalysis ?

Watch Video Solution

27. Explain the following tem : Electrophoresis.

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28. Explain the following terms :

$a.\ Eletrophoresis$ $b.\ Coagation$

$c.\ Dialysis$ $d.\ Tyndalleffect$

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29. Explain the following terms :

$a.\ Eletrophoresis \quad b.\ Coagation$

$c.\ Dialysis \quad d.\ Tyndalleffect$

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30. TYNDALL EFFECT

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31. Give four uses of emulsion.

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32. What are micelles ? Give an example of a micelle system.

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33. Explain the terms with suitable examples:

Alcosol

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34. Explain the following terms with suitable examples.

(a) Gel (b) Liquid Aerosol (b) Hydrosol

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35. Explain the following terms with suitable examples :

$a.\ alcosol, b.\ Aeorsol, c.\ Hydrosol$

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36. Comment on the statement that colloid is not a substance but state of a substance

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Ncert File Solved Ncert Exemplar Problems Multiple Choice Question Type I

1. Which of the folowing process does not occur at the interface of phases?

A. crystallisation

B. heterogenous catalysis

C. homogeneous catalysis

D. corrosion

Answer:

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2. At the equilibrium position in the process of adsorption .....

A. $\Delta H > 0$

B. $\Delta H = T\Delta S$

C. $\Delta H > T\Delta S$

D. $\Delta H < T\Delta S$

Answer:

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3. Which of the following interface cannot be obtained?

A. liquid-liquid

B. solid-liquid

C. liquid-gas

D. gas-gas

Answer:

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4. The term 'sorption' stands for ..... .

A. absorption

B. adsorption

C. both absorption and adsorption

D. desorption

Answer:

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5. Extent of physisorption of a gas increases with ..... .

A. increase in temperature.

B. decrease in temperature.

C. decrease in surface area of adsorbent.

D. decrease in strength of van der Waals forces.

Answer:

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6. Extent of adsorption of adsorbate from solution phase increases with ..... .

A. increase in amount of adsorbate in solution.

B. decrease in surface area of adsorbent.

C. increase in temperature of solution.

D. decrease in amount of adsorbate in solution.

Answer:

Watch Video Solution

7. Which one of the following is not applicable to the phenomenon of adsorption?

A. $\Delta H > 0$

B. $\Delta G < 0$

C. $\Delta S < 0$

D. $\Delta H < 0$

Answer:

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8. Which of the following is not a favourable condition for physical adsorption?

A. high pressure

B. negative ΔH

C. higher critical temperature of adsorbate

D. high temperature

Answer:

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9. Physical adsorption of a gaseous species may change to chemical adsorption with

A. decrease in temperature

B. increase in temperature

C. increase in surface area of adsorbent

D. decrease in surface area of adsorbent

Answer:

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10. In physisorption adsorbent does not show specificity for any particular gas because ..... .

A. involved van der Waals forces are universal.

B. gases involved behave like ideal gases.

C. enthalpy of adsorption is low.

D. it is a reversible process.

Answer:

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11. Which of the following is an example of absorption?

A. Water on silica gel

B. Water on calcium chloride

C. Hydrogen on finely divided nickel

D. Oxygen on metal surface

Answer:

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12. On the basis of data given below predict which of the following gases shows least adsorption on a definite amount of charcoal?

Gas	CO_2	SO_2	CH_4	H_2
Critical temp./K	304	630	190	33

A. CO_2

B. SO_4

C. CH_4

D. H_2

Answer:

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13. In which of the following reactions heterogeneous catalysis is involved?

(i) $2SO_2(g) + O_2(g) \xrightarrow{NO(g)} 2SO_3(g)$

(ii) $2SO_2(g) \xrightarrow{Pt(s)} 2SO_3(g)$

(iii) $N_2(g) + 3H_2(g) \xrightarrow{Fe(s)} 2NH_3(g)$

(iv)

$$CH_3COOCH_3(l) + H_2O(l) \xrightarrow{HCl\,(l)} CH_3COOH(aq) + CH_3OH(aq)$$

A. (ii), (iii)

B. (ii), (iii), (iv)

C. (i), (ii), (iii)

D. (iv)

Answer:

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14. At high concentration of soap in water, soap behaves as ..... .

A. molecular colloid

B. associated colloid

C. macromolecular colloid

D. lyophilic colloid

Answer:

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15. Which of the following will show Tyndall effect?

A. Aqueous solution of soap below critical micelle concentration.

B. Aqueous solution of soap above critical micelle concentration.

C. Aqueous solution of sodium chloride.

D. Aqueous solution of sugar.

Answer:

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16. Write a method by which lyophobic colloids can be coagulated.

A. By addition of oppositely charged sol.

B. By addition of an electrolyte.

C. addition of lyophilic sol.

D. By boiling.

Answer:

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17. By which method precipitate is converted into colloids?

A. coagulation

B. electrolysis

C. diffusion

D. peptisation

Answer:

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18. Which of the following electrolytes will have maximum coagulating value for Ag/Ag^+ sol?

A. Na_2S

B. Na_3PO_4

C. Na_2SO_4

D. $NaCl$

Answer:

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19. A colloidal system having a solid substance as a dispersed phase and a liquid as a dispersion medium is classified as ..... .

A. solid sol

B. gel

C. emulsion

D. sol

Answer:

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20. The values of colligative properties of colloidal solution are of small order in comparison to those shown by true solutions of same concentration because of colloidal particles ..... .

A. exhibit enormous surface area.

B. remain suspended in the dispersion medium.

C. form lyophilic colloids.

D. are comparatively less in number.

Answer:

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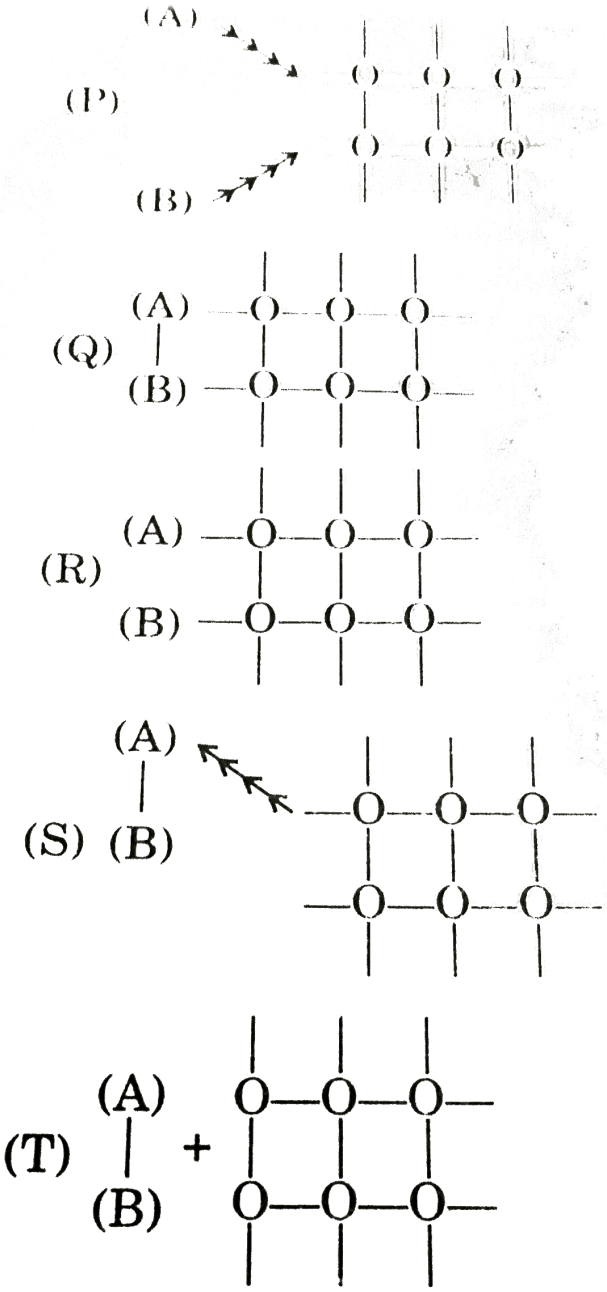
21. Arrange the following diagrams in correct sequence of steps involved in the mechanism of catalysis, in accordance with modern

adsorption theory.



A. $i \rightarrow ii \rightarrow iii \rightarrow iv \rightarrow v$

B. $i \rightarrow iii \rightarrow ii \rightarrow iv \rightarrow v$

C. $i \rightarrow iii \rightarrow ii \rightarrow v \rightarrow iv$

D. $i \rightarrow ii \rightarrow iii \rightarrow v \rightarrow iv$

Answer:

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22. Which of the following process is responsible for the formation of delta at a place where rivers meet the sea?

A. Emulsification

B. Colloid formation

C. Coagulation

D. Peptisation

Answer:

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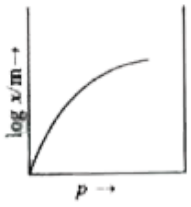
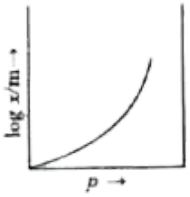
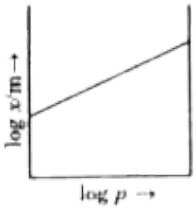
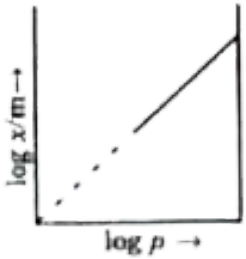
23. Which of the following curves is in accordance with Freundlich adsorption isotherm ?

A. 

B. 

C. 



D.

Answer:

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24. Which of the following process is not responsible for the presence of electric charge on the sol particles?

A. Electron capture by sol particles.

B. Adsorption of ionic species from solution.

C. Formation of Helmholtz electrical double layer.

D. Absorption of ionic species from solution.

Answer:

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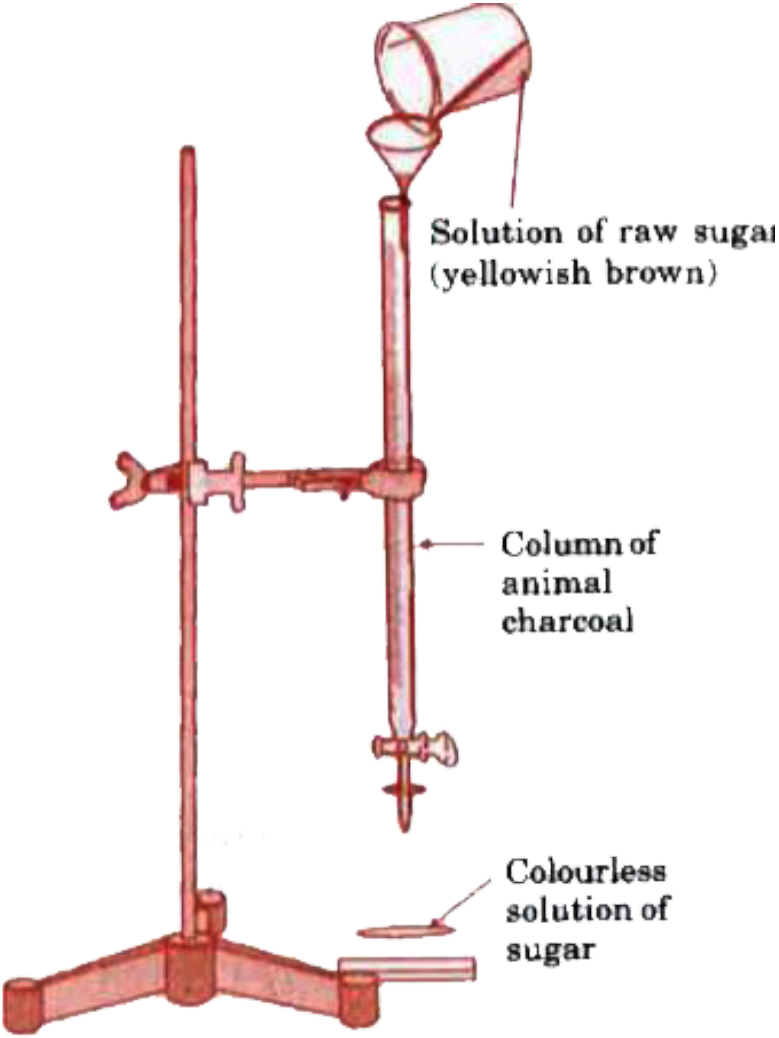
25. Which of the following phenomenon is applicable to the process shows in the figure ?



A. absorption

B. Adsorption

C. Coagulation

D. Emulsification

Answer:

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Ncert File Solved Ncert Exemplar Problems Multiple Coice Questions Type Ii

1. Which of the following options are correct?

A. Micelle formation by soap in aqueous solution is possible at all temperatures.

B. Micelle formation by soap in aqueous solution occurs above a particular concentration.

C. On dilution of soap solution micelles may revert to individual ions.

D. Soap solution behaves as a normal strong electrolyte at all concentrations.

Answer:

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2. Which of the following statements are correct about solid catalyst?

A. Same reactants may give different product by using different catalysts.

B. Catalyst does not change ΔH of reaction.

C. Catalyst is required in large quantities to catalyse reactions.

D. Catalytic activity of a solid catalyst does not depend upon the strength of chemisorption.

Answer:

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3. Freundlich adsorption isotherm is given by the expression $\frac{x}{m} = kP^{\frac{1}{n}}$ which of the following conclusions can be draw from this expression?

A. When $\frac{1}{n} = 0$, the adsorption is independent of pressure.

B. When $\frac{1}{n} = 0$, the adsorption is directly proportional to pressure.

C. When $n = 0$, $\frac{x}{m}$ vs P graph is a line parallel to x-axis.

D. When n = 0, plot of $\frac{x}{m}$ vs P is a curve.

Answer:

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4. H_2 gas is adsorbed on activated charcoal to a very little extent in comparison to easily liquefiable gases due to ..... .

A. very strong van der Waals interaction.

B. very weak van der Waals forces.

C. very low critical temperature.

D. very high critical temperature.

Answer:

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5. Which of the following statements are correct?

A. Mixing two oppositely charged sols neutralises their charges and stabilises the colloid.

B. Presence of equal and similar charges on colloidal particles provides stability to the colloids.

C. Any amount of dispersed liquid can be added to emulsion without destabilising it.

D. Brownian movement stabilises sols.

Answer:

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6. An emulsion cannot be broken by .....and ..... .

A. heating

B. adding more amount of dispersion medium

C. freezing

D. adding emulsifying agent

Answer:

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7. Which of the following substances will precipitate the negatively charged emulsions ?

A. KCl

B. Glucose

C. Urea

D. NaCl

Answer:

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8. Which of the following colloids cannot be coagulated easily?

A. Lyophobic colloids.

B. Irreversible colloids.

C. Reversible colloids.

D. Lyophilic colloids.

Answer:

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9. What happens when a Lyophilic sol is added to a Lyophobic sol?

A. Lyophobic sol is protected.

B. Lyophilic sol is protected.

C. Film of lyophilic sol is formed over lyophobic sol.

D. Film of lyophobic sol is formed over lyophilic sol.

Answer:

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10. Which phenomenon occurs when an electric field is applied to a colloidal solution and electrophoresis is prevented?

A. Reverse osmosis takes place.

B. Electroosmosis takes place.

C. Dispersion medium begins to move.

D. Dispersion medium becomes stationary.

Answer:

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11. In a reaction, catalyst changes ..... .

A. physically

B. qualitatively

C. chemically

D. quantitatively

Answer:

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12. Which of the following phenomenon occurs when a chalk stick is dipped in ink?

A. adsorption of coloured substance

B. adsorption of solvent

C. absorption and adsorption both of solvent

D. absoprtion of solvent

Answer:

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Ncert File Solved Ncert Exemplar Problems Short Answer Type Questions

1. Why is it important to have clean surface in surface studies ?

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2. Why is chemisorption referred to as activated adsorption?

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3. What type of solutions are formed on dissolving different concentrations of soap in water ?

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4. What happens when gelatin is mixed with gold sol ?

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5. How does it become possible to cause artificial rain by spraying silver iodide on the clouds?

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6. Gelatin which is a peptide is added in ice-creams. What can be its role ?

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7. What is collodion ?

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8. Why do we add alum to purify water ?

Watch Video Solution

9. What happens when aeledtric field is applied to colloidal solution ?

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10. What causes Brownian motion in colloidal dispersion?

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11. A colloid is formed by adding $FeCl_3$ in excess of hot water. What will happen if excess sodium chloride is added to this colloid?

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12. How do emulsifiers stabilise emulsion ? Name two emulsifiers.

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13. Why are some medicines more effective in the colloidal form ?

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14. Why does leather get hardened after tanning ?

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15. How does the precipitation of colloidal smoke take place in Cottrell precipitator?

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16. How will you distiguish between dispersed phase and dispersion medium in an emulsion ?

Watch Video Solution

17. On the basis of Hardy-Schulze rule explain why the coagulating power of phosphate is higher than chloride ?

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18. Why does bleeding stop by rubbing moist alum?

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19. Why is $Fe(OH)_3$ colloid positively charged when prepared by adding $FeCl_3$ to hot water ?

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20. Why do physisorption and chermisorption behave differently with rise in temperature ?

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21. What happens when dialysis is prolonged?

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22. Why does the white precipitate of silver halide become coloured in the presence of dye eosin?

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23. What is the role of activated charcoal in gas mask used in coal mines?

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24. How does a delta form at the meeting place of sea and river water?

Watch Video Solution

25. Given an example where physisorption changes to chemisorption with rise in temperature. Explain the reason for change.

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26. Why is desorption important for a substance to act as good catalyst?

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27. What is the role of diffusion in heterogeneous catalyst?

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28. How does a solid catalyst enhance the rate of combination of gaseous molecules?

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29. Do the vital functions of the body such as digestion get affected during fever ? Explain your answer,

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Ncert File Solved Ncert Exemplar Problems Matching Type Questions

1. Method of formation of solution is given in Column I. Match it with the type of solution given in Column II.

Column I	Column II
A. Sulphur vapours passed through cold water.	1. Normal electrolyte solution
B. Soap mixed with water above critical micelle concentration.	2. Molecular colloids
C. White of egg whipped with water.	3. Associated colloid
D. Soap mixed with water below critical micelle concentration.	4. Macromolecular colloids

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2. Match the statement given in Column I with the phenomenon given in Column II.

Column I	Column II
A. Dispersion medium moves in an electric field.	1. Osmosis
B. Solvent molecules pass through semipermeable membrane towards solvent side.	2. Electrophoresis
C. Movement of charged colloidal particles under the influence of applied electric potential towards oppositely charged electrodes.	3. Electroosmosis
D. Solvent molecules pass through semipermeable membranes towards solution side.	4. Reverse-osmosis

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3. Match the items given in Column I and Column II.

Column I	Column II
(i) Protective colloid	(a) $FeCl_3$ + NaOH
(ii) Liquid - liquid colloid	(b) Lyophilic colloids
(iii) Positively charged colloid	(c) Emulsion
(iv) Negatively charged colloid	(d) $FeCl_3$ + hot water

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4. Match the type of colloidal systems given in Column I with the name given in Column II.

Column I	Column II
(a) Solid in liquid	(i) Foam
(b) Liquid in solid	(ii) Sol
(c) Liquid in liquid	(iii) Gel
(d) Gas in liquid	(iv) Emulsion

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5. Match the items of Column I and Column II.

Column I	Column II
(a) Dialysis	(i) Cleansing action of soap
(b) Peptisation	(ii) Coagulation
(c) Emulsification	(iii) Colloidal sol formation
(d) Electrophoresis	(iv) Purification

View Text Solution

6. Match the items of Column I and Column II.

Column I	Column II
(a) Butter	(i) dispersion of liquid in liquid
(b) Pumice stone	(ii) dispersion of solid in liquid
(c) Milk	(iii) dispersion of solid in liquid
(d) Paints	(iv) dispersion of liquid in solid

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Ncert File Solved Ncert Exemplar Problems Assertion And Reason Type Questions

1. Assertion (A) An ordinary filter paper impregnated with collodion solution stops the flow of colloidal particles.

Reason (R) Pore size of the filter paper becomes more than the size of colloidal particle.

A. Assertion and reason both are correct and the reason is correct explanation of assertion.

B. Assertion and reason both are correct but reason does not explain assertion.

C. Assertion is correct but reason is incorrect.

D. Both assertion and reason are incorrect.

Answer:

Watch Video Solution

2. Assertion (A) Colloidal solution show colligative properties.

Reason (R) Colloidal particles are large in size.

A. Assertion and reason both are correct and the reason is correct explanation of assertion.

B. Assertion and reason both are correct but reason does not explain assertion.

C. Assertion is correct but reason is incorrect.

D. Both assertion and reason are incorrect.

Answer:

Watch Video Solution

3. Assertion (A) Colloidal solutions do not show Brownian motion.

Reason (R) Brownian motion is responsible for stability of sols.

A. Assertion and reason both are correct and the reason is correct explanation of assertion.

B. Assertion and reason both are correct but reason does not explain assertion.

C. Assertion is correct but reason is incorrect.

D. Assertion is incorrect but reason is correct.

Answer:

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4. Assertion (A) Coagulation power of Al^{3+} is more than Na^{+}.

Reason (R) Greater the valency of the flocculating ion added, greater is its power to cause precipitation (Hardy-Schulze rule) .

A. Assertion and reason both are correct and the reason is correct explanation of assertion.

B. Assertion and reason both are correct but reason does not explain assertion.

C. Assertion is correct but reason is incorrect.

D. Both assertion and reason are incorrect.

Answer:

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5. Assertion (A) Detergents with low CMC are more economical to use.

Reason (R) Cleansing action of detergents involves the formation of micelles. These are formed when the cocentration of detergents becomes equal to CMC.

A. Assertion and reason both are correct and the reason is correct explanation of assertion.

B. Assertion and reason both are correct but reason does not explain assertion.

C. Assertion is correct but reason is incorrect.

D. Both assertion and reason are incorrect.

Answer:

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Quick Memory Test A Say True Or False

1. Chemisorption

Watch Video Solution

2. Following are the terms about activity and selectivity:

I. Acitivity is the ability of catalysts to accelerate chemical reactions and selectivity is the ability of catalysts to direct reaction to yield particular products.

II. Activity is the ability of catalyst and selectivity is the ability of catalysts to accelerate chemical reactions. Select the correct term :

Watch Video Solution

3. $Al(NO_3)$ has higher coagulating power then $MgSO_4$ for $Fe(OH)_3$ sol.

Watch Video Solution

4. Gel is a system in which liquid is the dispersed phase and solid is the dispersion medium

Watch Video Solution

5. Greater the gold number of a protective colloid, greater is its protecting power.

View Text Solution

6. Greater the flocculation value of an electrolyte, greater is its coagulating power.

Watch Video Solution

7. Adsorption is always multimolecular.

View Text Solution

Quick Memory Test B Complete The Missing Links

1. Milk is an example of

Watch Video Solution

2. In a process , adsorption and absorption take place together. This is defined by

Watch Video Solution

3. Physical adsorption is :

Watch Video Solution

4. The formation of micelles takes place only above

Watch Video Solution

5. Movement of colloidal particles under the influence of electrostatic field is

Watch Video Solution

6. The phenomenon of scattering of light by colloidal particle is celled.....

Watch Video Solution

7. The swelling of 'gel' when placed in water is called:

Watch Video Solution

8. The process of separating a crystalloid from a colloid by filtration og diffusion through a membrane is called

Watch Video Solution

9. colloidal solution of gold is prepared by :

Watch Video Solution

10. In whipped cream, the dispersion medium is ..... and dispersed phase is..... .

Watch Video Solution

11. In benzosol, the dispersion medium is ..... .

Watch Video Solution

12. The size of the colloidal particles is in between :

Watch Video Solution

13. A graph between the amount of gas adsorbed per gram of the absorbent and equilibrium pressure of the adsorbate at constant temperature is called ..... .

View Text Solution

14. The value of equilibrium constant is independent of the speed with which the equilibrium is attained.

Watch Video Solution

15. The formation of micelles takes place only above

Watch Video Solution

Quick Memory Test C Choose The Correct Alternative

1. Adsorption is exothermic/endothermic process.

View Text Solution

2. CHEMISORPTION

Watch Video Solution

3. Freundlich adsorption isotherm is

Watch Video Solution

4. Substances like gum, starch form lyophilic lyophobic sols.

View Text Solution

5. The formation of micelles takes place only above

Watch Video Solution

6. Multimolecular colloids have lyophilic/lyophobic character.

Watch Video Solution

7. Colloidal solutions form homogeneous/heterogeneous mixtures

Watch Video Solution

8. When FeC_3 solution is added to NaOH a negatively charged sol is obtained. It is due to the:

Watch Video Solution

Revision Exercise Objective Questions Multiple Choice Questions

1. Rate of physisorption increases with :

A. decrease in temperature

B. increase in temperature

C. decrease in pressure

D. decrease in surface area

Answer:

Watch Video Solution

2. The number of phases in colloidal system are

A. 1

B. 2

C. 3

D. 4

Answer:

Watch Video Solution

3. Alum purifies muddy water by

A. Dialysis

B. Adsorption

C. Coagulation

D. Forming a true solution.

Answer:

Watch Video Solution

4. The disease kala azar is cured by

A. colloidal antimony

B. milk of magnesia

C. argyrols

D. colloidal gold

Answer:

Watch Video Solution

5. The movement of dispersion medium under the influence of an electric field is called _____ .

A. electrodialysis

B. electrophoresis

C. electroosmosis

D. cataphoresis

Answer:

Watch Video Solution

6. At CMC, the surfactant molecules :

A. associate

B. dissociate

C. decompose

D. become completely soluble.

Answer:

Watch Video Solution

7. Milk is an example of

A. emulsion

B. suspension

C. foam

D. sol.

Answer:

Watch Video Solution

8. Tyndall effect is due to

A. electric charge

B. scattering of light

C. absorption of light

D. none of these.

Answer:

Watch Video Solution

9. Fog is a colloidal system of :-

A. liquid dispersed in a gas

B. gas dispersed in a gas

C. solid dispersed in gas

D. solid dispersed in liquid

Answer:

Watch Video Solution

10. Blood is purified by :

A. coagulation

B. dialysis

C. electro-osmosis

D. filtration

Answer:

Watch Video Solution

11. Blue colour of water in sea is due to

A. refraction of blue light by impurities in sea water

B. scattering of light by water

C. refraction of blue sky by water

D. None of these

Answer:

Watch Video Solution

12. The cause of Brownian-movement is

A. heat change in liquid state

B. attractive force between colloidal particles and dispersion medium

C. bombardment of the colloidal particles by the molecules of the dispersion medium

D. interaction of charged particles

Answer:

Watch Video Solution

13. The emulsifying agent in milk is

A. maltose

B. casein

C. lactose

D. none of these

Answer:

Watch Video Solution

14. Clouds represent an example of dispersion of

A. liquid dispersed in gas

B. solid dispersed in gas

C. solid dispersed in liquid

D. none of these

Answer:

Watch Video Solution

15. which of the following is a lyophobic colloid ?

A. Starch in water

B. Gum in water

C. Soap in water

D. Gold sol

Answer:

Watch Video Solution

16. At high concentration of soap in water, soap behaves as ..... .

A. molecular colloid

B. associated colloid

C. macro molecular colloid

D. lyophilic colloid

Answer:

Watch Video Solution

17. The ability of the protective colloid is measured in terms of.....

A. gold number

B. flocculation number

C. valence of counter ion

D. Tyndall effect.

Answer:

Watch Video Solution

18. The function of enzymes in the living system is to

A. maintain pH

B. catalyse biochemical process

C. provide immunity

D. transport oxygen

Answer:

Watch Video Solution

19. The ultrafiltration process of purification of colloidal solutions is based on:

A. optical properties of colloids

B. electrical properties of colloids

C. magnetic properties of colloids

D. size of colloids

Answer:

Watch Video Solution

20. In physical adsorption, the forces associated are :

A. strong Coulombic

B. covalent

C. van der Waals

D. hydrogen bonding

Answer:

Watch Video Solution

21. The colloidal system of a solid dispersed in liquid medium is :

A. Gel

B. Aerosol

C. Emulsion

D. Foam

Answer:

Watch Video Solution

22. Which of the following has minimum gold number ?

A. Gelatin

B. Starch

C. Gum arabic

D. Sodium oleate

Answer:

Watch Video Solution

23. Which of the following is not a favourable condition for physical adsorption?

A. High pressure

B. $-\Delta H$

C. High temperature

D. None of these

Answer:

Watch Video Solution

24. Which property of colloids is not dependent on the change on colloidal particles?

A. Coagulation

B. Electro-osmosis

C. Tyndall effect

D. None of these

Answer:

Watch Video Solution

25. Tyndall effect is observed when:

A. True solution

B. Precipitate

C. Colloidal solution

D. Vapour

Answer:

Watch Video Solution

26. In the coagulation of solution As, S, which has maximum coagulating value

A. NaCl

B. KCl

C. $BaCl_2$

D. $AlCl_3$

Answer:

Watch Video Solution

27. Which one of the following will have the highest coagulating power for a ferric hydroxide solution-

A. KCl

B. K_2SO_4

C. Na_3PO_4

D. $NaCl$

Answer:

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28. Match the type of colloidal system (column I) with its example (column II)

Column I	*Column II*
(*i*) Solid in liquid	(*A*) butter
(*ii*) Liquid in solid	(*B*) whipped cream
(*iii*) Liquid in liquid	(*C*) gold sol
	(*D*) milk

A. (i)-(C), (ii)-(A), (iii)-(D)

B. (i)-(B), (ii)-(A), (iii)-(C)

C. (i)-(C), (ii)-(B), (iii)-(D)

D. (i)-(B), (ii)-(A), (iii)-(D)

Answer:

Watch Video Solution

29. Match the type of colloidal system (column I) with its example (column II)

Column I	*Column II*
(*i*) Macromolecular	(*A*) proteins
(*ii*) Multimolecular	(*B*) soap sol
(*iii*) Associated	(*C*) gold sol

A. (i)-(A), (ii)-(B), (iii)-(C)

B. (i)-(C), (ii)-(A), (iii)-(B)

C. (i)-(C), (ii)-(B), (iii)-(A)

D. (i)-(A), (ii)-(C), (iii)-(B)

Answer:

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30. Match the type of colloid (column I) with its property (column II)

Column I	Column II
(i) Lyophilic	(A) irreversible
(ii) Lyophobic	(B) stable
	(C) stable and reversible

A. (i)-(B), (ii)-(C)

B. (i)-(A), (ii)-(C)

C. (i)-(B), (ii)-(A)

D. (i)-(A), (ii)-(B)

Answer:

Watch Video Solution

31. Match the sol (column I) with its charge (column II)

Column I	Column II
(i) $Al_2O_3 . xH_2O$	(A) negative
(ii) Sb_2S_3	(B) positive
	(C) neutral

A. (i)-(B), (ii)-(C)

B. (i)-(B), (ii)-(A)

C. (i)-(C), (ii)-(A)

D. (i)-(A), (ii)-(B)

Answer:

Watch Video Solution

32. Match the phenomenon (column I) with its significance (column II)

Column I	Column II
(i) Tyndall effect	(A) to detect charge on colloids
(ii) Electrophoresis	(B) to purify colloids
(iii) Hardy Schulze rule	(C) to distinguish between colloid and true solution
	(D) to measure flocculation tendency

A. (i)-(C), (ii)-(A), (iii)-(D)

B. (i)-(C), (ii)-(B), (iii)-(D)

C. (i)-(A), (ii)-(C), (iii)-(B)

D. (i)-(C), (ii)-(D), (iii)-(A)

Answer: A

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Revision Exercise Passage Based Questions

1. How are colloid classified on the basis of: ltbtgt (a) physical state of components

(b) nature of dispersion medium

(c) interaction between dispersed phase and dispersion medium ?

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2. How are colloid classified on the basis of: ltbtgt (a) physical state of components

(b) nature of dispersion medium

(c) interaction between dispersed phase and dispersion medium ?

Watch Video Solution

3. How are colloid classified on the basis of: ltbtgt (a) physical state of components

(b) nature of dispersion medium

(c) interaction between dispersed phase and dispersion medium ?

Watch Video Solution

4. How are colloid classified on the basis of: ltbtgt (a) physical state of components

(b) nature of dispersion medium

(c) interaction between dispersed phase and dispersion medium ?

Watch Video Solution

5. How are colloid classified on the basis of: ltbtgt (a) physical state of components

(b) nature of dispersion medium

(c) interaction between dispersed phase and dispersion medium ?

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6. Which of the following electrolytes will be most effective in the coagulation of gold sol :

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7. Which phenomenon occurs when an electric field is applied to a colloidal solution and electrophoresis is prevented?

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8. The minimum concentration of an electrolyte required to cause coagulation or flocculation of a sol is called its flocculation value. It is expressed in

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9. for the coagulation of 50 mL of ferric hydroxide sol 10 mL of 0.5 M KCl is required. What is the coagulation value of KCl ?

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10. The minimum concentration of an electrolyte required to cause coagulation or flocculation of a sol is called its flocculation value. It is expressed in

Watch Video Solution

Revision Exercise Assertion Reason Questions

1. Assertion(A): Activity of an enzyme is pH dependent.

Reason(R): Change in pH affects the solution of the enzyme in water.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer:

Watch Video Solution

2. Assertion(A): Small quanity of soap is used to prepare a stable emulsion.

Reason(R): Soap lowers the interfacial tension between oil and water.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer:

Watch Video Solution

3. Assertion : Sea water looks blue.

Reason : Due to scatting of light by colloidal impurities present in sea water.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer:

Watch Video Solution

4. Assertion : For a negatively charged sol., the coagulation value of NaCl and $MgCl_2$ are 52.0 and 0.72 respectively.

Reason : Greater charge of cation causes slower coagulation.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer:

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5. Assertion : The micelle formed by sodium stereate in water has $-COO^-$ groups at the surface.

Reason : Surface tension of water is reduced by the addition of stereate.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer:

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6. each question constain STATEMENT-1(Assertion) and STATEMENT - 2 (reason). examine the statement carefully and work the correct answer accoridng to the instructions given below :

STATEMENT-1: The conversion of fresh precipitate to colloidal state is called peptization.

STATEMENT-2: It is caused by addition of common ions.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer:

Watch Video Solution

Revision Exercise Very Short Answer Questions

1. Adsorption is always exothermic in nature , Do you agree ?

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2. State Hardy schulze rule.

Watch Video Solution

3. What is Kraft temperature?

Watch Video Solution

4. How does chemical adsorption of a gas on the surface of a solid very with temperature ?

Watch Video Solution

5. What causes Brownian movement in a colloidal solution?

Watch Video Solution

6. What is an adsorption isotherm ?

Watch Video Solution

7. Write Freundlich adsorption isotherm equation at low pressure.

Watch Video Solution

8. Freundlich adsorption isotherm is

Watch Video Solution

9. What will be the Freundlich's adsorption isotherm equation at high pressure?

Watch Video Solution

10. What is occlusion?

Watch Video Solution

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

Watch Video Solution

12. Name the type of emulsion to which butter belong to.

Watch Video Solution

13. Which of the two, adsorption or absorption, is surface phenomenon?

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14. Given one example each of lyophobic sol and lyophilic so .

Watch Video Solution

15. Give one example each of sol and gel.

Watch Video Solution

16. Given one example eacg of 'oil water' and 'water oil' emulsion.

Watch Video Solution

17. Out of $BaCl_2$ and KCl, which is more effective in causing coagulation of a negatively charged colloidal sol ? Give reason.

Watch Video Solution

18. Write one similarity between physisorption and chemisorption.

Watch Video Solution

19. The enzymes which convert glucose into ethyl alcohol is

Watch Video Solution

20. Define positive and negative catalysis.

Watch Video Solution

21. The dispersed phase and dispersion medium in soap lather are respectively :

Watch Video Solution

22. What is differnece between an emulsion and a gel ?

Watch Video Solution

23. Which will be adsorbed more readily on the surface of charcoal and why– NH_3 or CO_2?

Watch Video Solution

24. Of physisorption and chemisorption which type of adsorption has a higher enthalphy of adsorption ?

Watch Video Solution

25. Give an example of 'shape-selective catalyst'.

Watch Video Solution

26. What is the effect of temeperature on chemisorption?

Watch Video Solution

27. Why is adsorption always exothermic ?

Watch Video Solution

28. What are the dispersed phase and dispersion medium in milk

Watch Video Solution

29. Write a method by which lyophobic colloids can be coagulated.

Watch Video Solution

30. Write the main reason for the stability of colloidal sols.

Watch Video Solution

31. What type of colloid is formed when a solid is dispersed in a liquid? Given an example.

Watch Video Solution

32. CO(g) and $H_2(g)$ react to give different products in the presence of different catalysts. Which ability of the catalyst is shown by these reactions ?

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Revision Exercise Short Answer Question

1. Distinguish between the meaning of the terms adsorption and absorption. Given one example of each.

Watch Video Solution

2. Define adsorption and write two important differences between physical adsorption and chemisorption.

Watch Video Solution

3. What do you mean by activity and selectivity of catalysts ?

Watch Video Solution

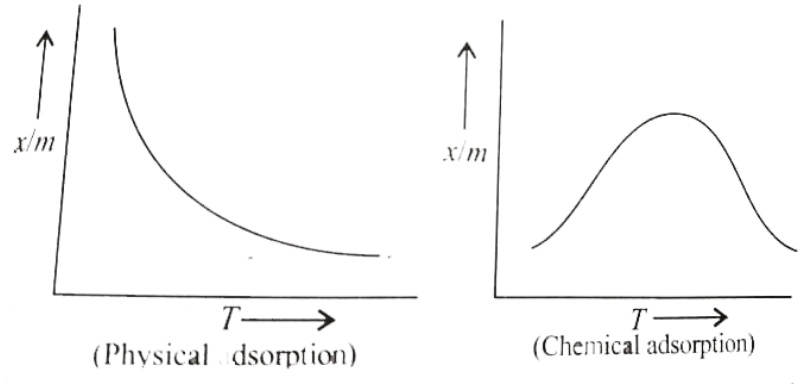
4. State Hardy schulze rule.

Watch Video Solution

5. How are colloids classified on the basis of charge ? How will you account for the charge on these particles ?

Watch Video Solution

6. Physical and chemical adsorption respond differently with a rise in temperature. What is this difference and why is it so? It brgt



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7. Explain the following terms:

(i) Peptization (ii) dialysis (iii) Hardy-Schulze ruel

Watch Video Solution

8. Explain why does ferric hydroxide sol get coagulate on addition of solution of potassium sulphate ?

Watch Video Solution

9. Give reasons for the following :

(i) Peptizing agent is added to convert a precipitate into a colloidal solution.

(ii) Colloidal gold is used for intramuscular injection.

(iii) Cottrell's smoke precipitator is fitted at the mouth of a chimeny used in factories.

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10. What are lyophilic and lyophobic sols ? Give one example of each type. Which one of these two types of sols is easily coagulated and why?

Watch Video Solution

11. Give two differences between lyophilic and lyophobic colloids.

Watch Video Solution

12. How will you justify that milk is an emulsion of oil in water with the help of dye test?

Watch Video Solution

13. How will you justify that milk is an emulsion of oil in water with the help of dilution test ?

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14. TYNDALL EFFECT

Watch Video Solution

15. Define dialysis.

Watch Video Solution

16. In electrophoresis,

Watch Video Solution

17. Explain the following terms :

$a.\ Eletrophoresis \quad b.\ Coagation$

$c.\ Dialysis \quad d.\ Tyndalleffect$

Watch Video Solution

18. Peptization is:

Watch Video Solution

19. Difine emulsification?

Watch Video Solution

20. Explain the terms 'Brownian movement' and 'peptization'.

Watch Video Solution

21. What do you mean by activity and selectivity of catalysts ?

Watch Video Solution

22. Explain how the phenomenon of pdsorption finds application in each of the following processes :

(i) Production of vacuum

(ii) Heterogeneous catalysis

(iii) Froth Floatation process

Watch Video Solution

23. Explain how the phenomenon of pdsorption finds application in each of the following processes :

(i) Production of vacuum

(ii) Heterogeneous catalysis

(iii) Froth Floatation process

Watch Video Solution

24. Explain how the phenomenon of adsorption finds application in each of the following processes :

(i) Production of vacuum

(ii) Heterogeneous catalysis

(iii) Froth Floatation process

Watch Video Solution

25. MICELLES

Watch Video Solution

26. Define 'peptization'

Watch Video Solution

27. Define each of the following terms:

(i) Micelles (ii) Peptization (iii) Desorption

Watch Video Solution

28. TYNDALL EFFECT

Watch Video Solution

29. What is ment by coagulation of colloidal solution ? Describe briefly and three methods by which coagulation of lyophobic sols can be carried out.

Watch Video Solution

30. Describe a comspicuous change observed when

(i) a solution of $NaCl$ is added to a sol of hydrated ferric oxide.

(ii) a beam of light is passed through a solution of NaCl and then through a sol.

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31. Enzyme Catalysis

Watch Video Solution

32. Explain the difference between a homogeneous and heterogeneous catalyst. Give an example of each.

Watch Video Solution

33. Taking two examples of heterogeneously catalyzed reactions, explain how a heterogeneous catalyst helps in the reaction.

Watch Video Solution

34. What are protective colloids? How are the colloids stabilised? Explain the term gold number.

Watch Video Solution

35. Give two differences between macromolecular colloids and associated colloids.

Watch Video Solution

36. Explain the following terms :

(i)Peptization (ii)Loyphobic colloids (iii)Dialysis

Watch Video Solution

37. What are associated colloids ?

Watch Video Solution

38. Give reason why a finely divided substance is more effective as an adsorbents?

Watch Video Solution

39. What is an adsorption isotherm? Describe Freundlich adsorption isotherm.

Watch Video Solution

40. What is the difference between oil/water (O/W) type and water/oil (W/O) type emulsions? Give an example of each type.

Watch Video Solution

41. Physical adsorption is :

Watch Video Solution

42. Give one example of oil in water type emulsion.

Watch Video Solution

43. Give two differences between lyophilic and lyophobic colloids.

Watch Video Solution

44. What is heterogeneous catalysis? Give an example.

Watch Video Solution

45. The equation for Freundlich adsorption isotherm is

Watch Video Solution

46. What is 'Tyndall effect' ? Name two mixtures which show this effect.

Watch Video Solution

47. Define the following terms :

(i) Kraft temperature

(ii) Peptization

(iii) Electrokinetic potential

Watch Video Solution

48. CMC (Critical Micelle Concentration) is

Watch Video Solution

49. When negatively charged colloids like As_2S_3 sol is added to positively charged $Fe(OH)_3$ sol in suitable amounts

Watch Video Solution

50. (a) In reference to Freundlich adorption isotherm write the expression for adsorption of gases on solids in the form of an equation.

(b) Write an important characteristic of lyophilic solc.

(c) Based on type of particles of dispersed phase, give one example each of associated colloid and mulimolecular colloid.

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51. Lyophilic sols are

Watch Video Solution

52. (a) In reference to Freundlich adorption isotherm write the expression for adsorption of gases on solids in the form of an equation.

(b) Write an important characteristic of lyophilic solc.

(c) Based on type of particles of dispersed phase, give one example each of associated colloid and mulimolecular colloid.

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53. Why dows physisoption decrease with increase of temperature ?

Watch Video Solution

54. Why are powdered substances more effective adsorbent than their crystalline forms ?

Watch Video Solution

55. Give the decreasing order of flocculating power of the following ions in the coagulation of a negative sol. Na^+, Ba^{2+}, Al^{3+}

Watch Video Solution

56. Explain the cleansing action of soaps.

Watch Video Solution

57. Classify the type of colloidal sol in the following based on the basis of physical state:

smoke, milk, pumice stone, foam, rubber, cheese, gem stones.

Watch Video Solution

58. What is Hardy- Schulze law?

Watch Video Solution

59. Write differences between physisorption and chemisorption.

Watch Video Solution

60. Why does bleeding stop by rubbing moist alum?

Watch Video Solution

61. Distinguish between the meaning of the terms adsorption and absorption. Given one example of each.

Watch Video Solution

62. Write on difference in each of the following:

(a) Multimolecular colloid and Associated colloid

(b) Coagulation and Peptization

(c) homogenous catalysis and Heterogeneous catalysis.

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63. Why does leather get hardened after tanning?

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64. Lyophilic sols are more stable than lyophobic sols because

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65. Why is it necessary to remove CO when ammonia is obtained by Haber's process?

Watch Video Solution

66. Define adsorption. Write any two features which distinguish physisorption from chemisorption.

Watch Video Solution

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

Watch Video Solution

68. Distinguish between the meaning of the terms adsorption and absorption. Given one example of each.

Watch Video Solution

69. (i) Differentitate between adsorbtion and absorption.

(ii) Out of $MgCl_2$ and $AlCl_3$, which one is more effective in causing

coagulation of negatively charged sol and why?

(iii) Out of sulphur sol and proteins, which one forms multimolecular colloids?

Watch Video Solution

70. (i) Differentitate between adsorbtion and absorption.

(ii) Out of $MgCl_2$ and $AlCl_3$, which one is more effective in causing coagulation of negatively charged sol and why?

(iii) Out of sulphur sol and proteins, which one forms multimolecular colloids?

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71. Define adsorption and write two important differences between physical adsorption and chemisorption.

Watch Video Solution

72. Sea gel is

Watch Video Solution

73. TYNDALL EFFECT

Watch Video Solution

74. Define the following terms giving an example of each:

(i) Associated colloids (ii) Lyophilic sol

(iii) Adsorption

Watch Video Solution

75. TYNDALL EFFECT

Watch Video Solution

76. Define coagulation. Differentiate between physical adsorption and chemical adsorption.

Watch Video Solution

77. Give two differences between lyophilic and lyophobic colloids.

Watch Video Solution

78. How do size of particles of adsorbent, pressure of gas and prevailling temperature influence the extent of adsorption of a gas on a solid ?

Watch Video Solution

79. Define coagulation value.

Watch Video Solution

80. TYNDALL EFFECT

Watch Video Solution

81. Why does the sky appear blue on a clear day ?

Watch Video Solution

82. Which of the following process is responsible for the formation of delta at a place where rivers meet the sea?

Watch Video Solution

83. Ferric chloride is applied to stop bleeding cut because

Watch Video Solution

84. Fog is formed by

Watch Video Solution

85. Peptization is:

Watch Video Solution

86. What happens if an electric field is applied to a colloidal sol ?

Watch Video Solution

87. What are emulsions ? What are their different types ? Give an example of each type ?

Watch Video Solution

88. Explain the terms: Zeta potential, electrophoresis and electroosmosis.

Watch Video Solution

89. Write one difference in each of the following:

(i) Lyophobic sol Lyophilic sol

(ii) Solution and Colloid

(iii) Homogenous catalysis and Heterogeneous catalysis

Watch Video Solution

90. what is the difference between solutions and colloids ?

Watch Video Solution

91. Write one difference in each of the following:

(i) Lyophobic sol Lyophilic sol

(ii) Solution and Colloid

(iii) Homogenous catalysis and Heterogeneous catalysis

Watch Video Solution

92. Write two differences between multimolecular colloids and macromolecular colloids ?

Watch Video Solution

93. Write one difference between each of the following:

(i) Multimolecular colloid and Macromolecular colloid

(ii) Sol and Gel

(iii) O/W emulsion and W/O emulsion

Watch Video Solution

94. Write one difference between each of the following:

(i) Multimolecular colloid and Macromolecular colloid

(ii) Sol and Gel

(iii) O/W emulsion and W/O emulsion

Watch Video Solution

95. Indicate a chemical reaction involving a homogeneous catalyst.

Watch Video Solution

96. Explain the terms 'Brownian movement' and 'peptization'.

Watch Video Solution

97. Comment on the statement that colloid is not a substance but state of a substance

Watch Video Solution

98. State Hardy schulze rule.

Watch Video Solution

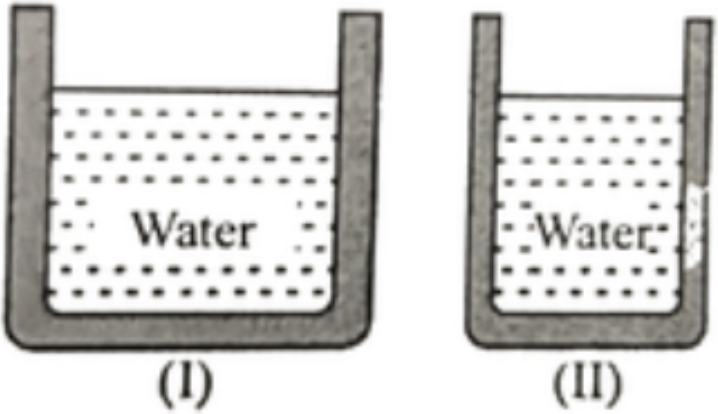
99. Why are lyophilic colloids used as protective colloids?

Watch Video Solution

100. What is the role of activated charcoal in gas mask used in coal mines?

Watch Video Solution

101. From the following figure, the correct observation is :-



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102. (i) What is the role of activated charcoal in gas mask ?

(ii) A colloidal sol is prepared by the given method in figure. What is the charge on hydrated ferric oxide colloidal particles formed in the test tube ? How is the sol represented?

(iii) How does chemisorption vary with temperature?

Watch Video Solution

103. Classify colloids where dispersion medium is water. State their characterstics and write one example of each of these classes.

Watch Video Solution

104. Whate happens in the following activities and why?

(i) An electrolyte is added to a hydrated ferric oxide sol in water.

(ii) A bean of light is passed through a colloidal solution.

(iii) An electric current is passed through a colloidal soluidal solution.

Watch Video Solution

105. Explain what is observed

(i) when a beam of light is passed through a colloidal sol.

(ii) and electrolyte, NaCI is added to hydrated ferric oxide sol.

(iii) electric curret is passed through a colloidal sol.

Watch Video Solution

106. Explain what is observed

(a) When an electrolyte NaCl is added to ferric hydroxide sol.

(b) When an emulsion is subjected to centrifugation.

(c) When direct currect is passed through a colloidal sol.

(d) When a beam of light is passes through a colloidal solution.

Watch Video Solution

107. Write three distinct features of chemisorptions which are not found in physisorptions.

Watch Video Solution

108. What are the characteristics of the following colloids ? Give one example of each

(i) Multimolecular colloids

(ii) Lyophobic sol

(iii) Emulsions.

Watch Video Solution

109. What are the characteristics of the following colloids ? Give one example of each

(i) Multimolecular colloids

(ii) Lyophobic sol

(iii) Emulsions.

Watch Video Solution

110. What are the characteristics of the following colloids ? Give one example of each

(i) Multimolecular colloids

(ii) Lyophobic sol

(iii) Emulsions.

Watch Video Solution

111. What are Associated Colloids ? Given an example.

Watch Video Solution

112. Define the following terms giving an example of each:

(i) Associated colloids (ii) Lyophilic sol

(iii) Adsorption

Watch Video Solution

113. Define the following terms giving an example of each:

(i) Associated colloids (ii) Lyophilic sol

(iii) Adsorption

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114. Give reason for the Physisorption decreases with increase in temperature.

Watch Video Solution

115. Alum purifies muddy water by

Watch Video Solution

116. Brownian movement is found in

Watch Video Solution

117. O/W type emulsion means

Watch Video Solution

118. Define zeta, potential.

Watch Video Solution

119. Define the Multimolecular colloids.

Watch Video Solution

120. Write on difference in each of the following:

(a) Multimolecular colloid and Associated colloid

(b) Coagulation and Peptization

(c) homogenous catalysis and Heterogeneous catalysis.

Watch Video Solution

121. Write on difference in each of the following:

(a) Multimolecular colloid and Associated colloid

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(c) homogenous catalysis and Heterogeneous catalysis.

Watch Video Solution

122. Write one difference in each of the following:

(i) Lyophobic sol Lyophilic sol

(ii) Solution and Colloid

(iii) Homogenous catalysis and Heterogeneous catalysis

Watch Video Solution

123. What are the dispersed phase and dispersion medium in milk

Watch Video Solution

124. Write one similarity between physisorption and chemisorption.

Watch Video Solution

125. (a) Write the dispersed phase and dispersion medium of milk.

(b) Write one similarity between physisorption and schemisorption.

(c) Write the chemical method by which $Fe(OH)_3$ sol is prepared from $FeCl_3$

Watch Video Solution

126. What happens when :

(a) freshly prepared precipitate of $Fe(OH)_3$ is shaken with a small amount of $FeCl_3$ solution

(a) persistent dialysis of a colloidal solution is carried out

(c) an emulsion centrifuges ?

Watch Video Solution

127. What happens when persistent dialysis of colloidal solution is carried out?

Watch Video Solution

128. What happens when :

(a) freshly prepared precipitate of $Fe(OH)_3$ is shaken with a small amount of $FeCl_3$ solution

(a) persistent dialysis of a colloidal solution is carried out

(c) an emulsion centrifuges ?

Watch Video Solution

129. Define the Coagulation with a suitable example.

Watch Video Solution

130. Multimolecular colloids are present in :

Watch Video Solution

131. Explain the following terms with suitable examples.

(a) Gel (b) Liquid Aerosol (b) Hydrosol

Watch Video Solution

Revision Exercise Long Answer Questions

1. Define adsorption and write two important differences between physical adsorption and chemisorption.

Watch Video Solution

2. What role does adsorption play in heterogeneous catalysis ?

Watch Video Solution

3. What is electrophoresis ? What is its significance ?

Watch Video Solution

4. What is electrodialysis?

Watch Video Solution

5. What are protective colloids?

Watch Video Solution

6. What do you mean by activity and selectivity of catalysts ?

Watch Video Solution

7. TYNDALL EFFECT

Watch Video Solution

8. What are emulsions ? What are their different types ? Give an example of each type ?

Watch Video Solution

9. What do you mean by peptisation ?

Watch Video Solution

10. Explain the difference between a homogeneous and heterogeneous catalyst. Give an example of each.

Watch Video Solution

11. The cause of Brownian-movement is

Watch Video Solution

12. What is the difference between multimolecular and macromolecular colloids? Give one example of each.

Watch Video Solution

13. What do you mean by gold number?

Watch Video Solution

Higher Order Thinking Skills

1. SnO_2 forms positively charged colloidal sol in acidic medium and negatively charged colloidal sol in basic medium. Explain ?

Watch Video Solution

2. Why is chemical adsorption unimolecular while physical adsorption is multimolecular?

Watch Video Solution

3. Adsorption of a gas on the surface of solid is sgenerally accompanied by decrease in entropy but still it is spontaneous in naturre. Explain.

Watch Video Solution

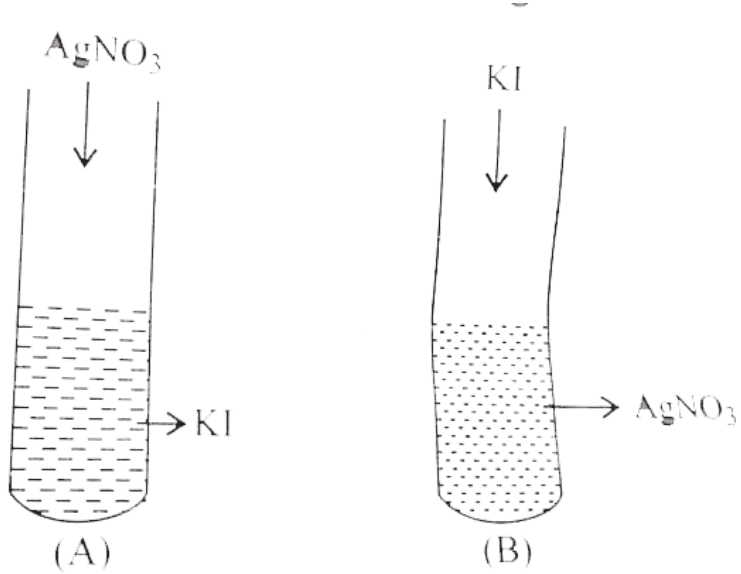
4. Why are medicines more effective in collidal state ?

Watch Video Solution

5. Assertion: The passage of H_2S through aqueous solution of SO_2 gives yellow turbidty of S in solution. Reason: The yellow turbidity of S is in colloidal state due to oxidation of H_2S by $SO_2(aq)$.

Watch Video Solution

6. A colloidal solution of Agl is prepared by two different methods as shown in the figure below:



What is the charge of Agl colloidal particles in the two test tubes (A) and (B) ?

b. Given reasons for the origin of charge.

Watch Video Solution

7. Why the sun looks red at the time of setting ?

Watch Video Solution

8. In an adsorption experiment, a graph between $\log\left(\frac{x}{m}\right)$ versus $\log P$ was found to be linear with a slope of 45° . The intercept on the $\log\left(\frac{x}{m}\right)$ axis was found to be 0.3010 . Calculate the amount of the gas adsorbed per gram of charcoal under a pressure of 0.5 atm`

.

Watch Video Solution

9. 50 mL of 1M oxalic acid is shaken with 0.5 g of wood charcoal. The final concentration of the solution after adsorption is 0.6 M. Calculate the amount of oxalic acid adsorbed per gram of charcoal.

Watch Video Solution

10. One gram of a water insoluble substance of density $0.8gcm^{-3}$ is dispersed in 1 L of water forming a colloidal solution having 10^{13} particles of spherical shape per mm^3. Calculate the radius of the particle.

Watch Video Solution

Competition File Objective Type Questions A Multiple Choice Questions With Only One Correct Answer

1. Which of the following statements is not correct regarding physical adsorption ?

A. It is not specific

B. It forms monomolecular layers

C. It has low heat of adsorption

D. It is reversible.

Answer:

Watch Video Solution

2. For adsorption of a gas on a solid, the plot of log (x/m) vs log P is linear with a slope equal to [n being a whole number]:

A. k

B. log k

C. n

D. 1/n

Answer:

Watch Video Solution

3. Which of the following in not correct regarding the absorption of a gas on the surface of solid ?

A. On increasing temperature, adsorption increases continuously

B. Enthalpy and entropy changes are negative

C. Adsorption is more for specific substance

D. It is reversible reaction

Answer:

Watch Video Solution

4. Adsorption is a surface phenomenon and it differs feom adsorption which occurs throughout the body of the substance which absorbs. In physisorption, the attractive forces are mainly van

der Waals' forces while in chemisorption actual bonding occurs between the particles of adsorbent and adsorbente. Generally, easily liquefying gases are adsorbed more easily on the surface of a solid as compared to teh gases whihc are liquefied with difficult. Adsorption increases with the increases in pressure and decreases as the temperature is increases.

According to adsorption theory of catalysis, the speed of the reaction increases because

A. the concentration of the reactant molecules at the active centres of the catalyst becomes high due to adsorption,

B. in the process of adsorption, the activation energy of the molecules becomes large.

C. adsorption produces heat which increases the speed of the reaction

D. adsorption lowers the activation energy of the reaction.

Answer:

Watch Video Solution

5. Which of the following characteristics is not correct for physical adsorption ?

A. Adsorption increases with increase in temperature.

B. Adsorption is spontaneous.

C. Both enthalpy and entropy of adsorption are negative.

D. Adsorption on solid is reversible.

Answer:

Watch Video Solution

6. The volume of gases NH_3, CO_2 and CH_4 adsorbed by one gram of charcoal at 298 K are in

A. $H_2 > CH_4 > CO_2 > NH_3$

B. $CH_4 > CO_2 > NH_3 > H_2$

C. $NH_3 > CO_2 > CH_4 > H_2$

D. $CO_2 > NH_3 > CH_4 > H_2$

Answer:

Watch Video Solution

7. Adsorption is accompanied by :

A. decrease in enthalpy and increase in entropy

B. increase in enthalpy and increase in entropy

C. decrease in enthalpy and decrease in entropy

D. increase in enthalpy and decrease in entropy

Answer:

Watch Video Solution

8. The enthalpy of physical adsorption is about

A. zero

B. $20 - 50kJmol^{-1}$

C. $200 - 500kJmol^{-1}$

D. very high

Answer: B

Watch Video Solution

9. The colloidal system in which the disperse phase and dispersion medium are both liquids is known as :

A. a gel

B. an aerosol

C. an emulsion

D. a foam.

Answer:

Watch Video Solution

10. Freshly prepared precipitates can be easily dispersed by shaking it with dispersion medium. This process is called

A. Peptisation

B. Electrophoresis

C. Dispersion

D. Dialysis

Answer:

Watch Video Solution

11. The presence of electric charge on colloidal particles is indicated by the property, called :

A. Osmosis

B. Electrolysis

C. Dialysis

D. Electrophoresis

Answer:

Watch Video Solution

12. The process of separation of colloids by passing through semi permeable membrane is called

A. Filtration

B. Electrophoresis

C. Dialysis

D. Ultrafiltration

Answer:

Watch Video Solution

13. Size of colloidal particles is

A. 0.1-1 nm

B. 1 nm - 100 nm

C. 100 nm - 1000 nm

D. 1000 - 10000 nm.

Answer:

Watch Video Solution

14. An example of micelle is:

A. Sodium stearate

B. Gold sol.

C. Solution of NaCl

D. Ruby glass.

Answer: A

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15. Effective electrolyte to cause the flocculation of a negatively charged arsenic sulphide colloid is :

A. KCl

B. $MgCl_2$

C. $K_3Fe(CN)_6$

D. $AlCl_3$

Answer: D

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16. Colloidal particles exhibit Tyndall effect due to

A. polarisation of light

B. scattering of light

C. reflection of light

D. refraction of light.

Answer:

Watch Video Solution

17. Which of the following is most effective in causing the coagulation of ferric hydroxide sol :-

A. K_2SO_4

B. $K_3Fe(CN)_6$

C. KCl

D. K_2CO_3

Answer:

Watch Video Solution

18. Soaps essentially form a colloidal solution in water and remove the greasy matters by :

A. coagulation

B. emulsification

C. adsorption

D. absorption

Answer:

Watch Video Solution

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

A. Protein + Water

B. Soap + Water

C. Rubber + Benzene

D. $As_2O_3 + Fe(OH)_3$

Answer:

Watch Video Solution

20. Which type of property is the Brownian movement of colloidal sol?

A. Electrical

B. Optical

C. Mechanical

D. Colligative

Answer:

Watch Video Solution

21. When KI is added to silver nitrate solution, the sol formed may be written as:

A. $AgI \quad I^-$

B. $AgIAg^+$

C. $AgINO_3^-$

D. $NO_3^- \, AgIAg^+$.

Answer:

Watch Video Solution

22. Out of the following, which reaction gives rise to a colloidal sol:

A. $MgCO_3 \rightarrow MgO + CO_2$

B. $2Na + 2H_2O \rightarrow 2NaOH + H_2$

C. $2HNO_3 + 3H_2S \rightarrow 3S + 4H_4O + 2NO$

D. $Cu + CuCl_2 \rightarrow Cu_2Cl_2.$

Answer:

Watch Video Solution

23. Blue colour of water in sea is due to

A. refraction of blue light by impurities in sea water

B. scattering of light by water

C. refraction of blue sky by water

D. none of these.

Answer:

Watch Video Solution

24. Alum helps in purifying water by

A. forming silicon complex with clay particles

B. sulphate part which combines with dirt and removes it

C. aluminium which coagulates the mud particles

D. making mud water soluble.

Answer:

Watch Video Solution

25. The coagulation power of an electrolyte for As_2S_3 decreases in the order:

A. $Na^+ > Al^{3+} > Ba^{2+}$

B. $PO_4^{3-} > SO_4^{2-} > Cl^-$

C. $Cl^- > SO_4^{2-} > PO_4^{3-}$

D. $Al^{3+} > Ba^{2+} > Na^+$

Answer:

Watch Video Solution

26. The volume of a colloidal particle V_C as compared to the volume of a solute particle in a true solution V_S could be

A. $\frac{V_C}{V_S} \approx 1$

B. $\frac{V_C}{V_S} = 1$

C. $\frac{V_C}{V_S} = 10^{-3}$

D. $Al^{3+} > Ba^{2+} > Na^+$

Answer:

Watch Video Solution

Competition File Objective Type Questions B Multiple Choce Questions From Competitive Examinations

1. If x is amount of adsorbate and m is amount of adsorbent, which of the following relations is not related to adsorption process ?

A. x/m = f (p) at constant T

B. x/m = f(T) at constant p

C. p = f(T) at constant (x/m)

D. $\frac{m}{x} = p \times T$

Answer:

Watch Video Solution

2. The formation of micelles takes place only above

A. Inversion temperature

B. Boyle temperature

C. Critical temperature

D. Kraft temperature

Answer:

Watch Video Solution

3. Collodion is a 4% solituon of which one of the following in alcohol-enter mixture ?

A. nitroglycerine

B. celluloseacetate

C. glycoldinitrate

D. nitrocellulose

Answer:

Watch Video Solution

4. The protcting power of lyophilic colloidal solution is expressed in terms of

A. coagulation value

B. gold number

C. critical micelle concentration

D. oxidation number

Answer:

Watch Video Solution

5. In freundlich adsorption isotherm, the value of 1/n is :

A. between 0 and 1 in all cases

B. between 2 and 4 in all cases

C. 1 in case of physical adsorption

D. 1 in case of chemisorption

Answer:

Watch Video Solution

6. Which one of the following statements is incorrect about enzyme catalysis ?

A. Enzymes are mostly proteinous in nature.

B. Enzyme action is specific.

C. Enzymes are denatured by ultraviolet rays and at high temperature.

D. Enzymes are least reactive at optimum temperature.

Answer: D

Watch Video Solution

7. Which of the following statement is correct for the spontaneous adsorption of a gas ?

A. ΔS is negative and therefore, ΔH should be highly positive

B. ΔS is negative and therefore, ΔH should be highly negative

C. ΔS is positive and therefore, ΔH should be negative

D. ΔS is positive and therefore, ΔH should be highly positive

Answer: B

Watch Video Solution

8. Which property of colloids is not dependent on the change on colloidal particles?

A. Electrophoresis

B. Electro-osmosis

C. Tyndall effect

D. Coagulation

Answer:

Watch Video Solution

9. The correct ascending order of adsorption of the following gases on the same mass of charcoal at the same temperature and pressure is

A. $CH_4 < H_2 < SO_2$

B. $H_2 < CH_4 < SO_2$

C. $SO_2 < CH_4 < H_2$

D. $H_2 < SO_2 < CH_4$

Answer:

Watch Video Solution

10. Which of the following statements is incorret about physisorption?

A. It is reversible in nature.

B. It forms multilayer.

C. It involves high activation energy.

D. The extent of physisorption decreases with increase of temperature.

Answer:

Watch Video Solution

11. Fog is a colloidal solution of

A. solid in gas

B. gas in gas

C. liquid in gas

D. gas in liquid

Answer:

Watch Video Solution

12. The coagulation value in millimoles per litre of the electrolyes used for the coagulation of As_2S_3 are given below:

I. $(NaCl) = 52$, II. $(BaCl_2) = 0.69$

III. $(MgSO_4) = 0.22$

The correct order of their coagulating power is

A. I gt II gt III

B. II gt I gt III

C. III gt II gtI

D. III gt I gt II

Answer:

Watch Video Solution

13. On which of the following properties does the coagulating power of an ion depend?

A. The magnitude of the charge on the ion alone

B. Size of the ion alone

C. Both magnitude and sign of the charge on the ion

D. The sign of charge on the ion alone

Answer:

Watch Video Solution

14. Which mixture of the solutions will lead to the formation of negatively charged colloidal $[Agl]^-$ sol. ?

A. 50 mL of 0.1 M $AgNO_3$ + 50 mL of 0.1 M KI

B. 50 mL of 1 M $AgNO_3$ + 50 mL of 1.5 M KI

C. 50 mL of 1 M $AgNO_3$ + 50 mL 2 M KI

D. 50 mL of 2 M $AgNO_3$ + 50 mL of 1.5 M KI

Answer:

Watch Video Solution

15. According to Freundlich adsorption isotherm, which of the following is correct?

A. $\frac{x}{m} \propto p^1$

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

C. $\frac{x}{m} \propto p^0$

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

Answer:

Watch Video Solution

16. On adding one mL of solution of 10% NaCl to 100 mL of gold sol in the presence of 0.25 g of starch, the coagulation is just

prevented. The gold number of starch is

A. 0.25

B. 0.025

C. 2.5

D. 25

Answer: D

Watch Video Solution

17. The dispersed phase and dispersion medium in soap lather are respectively :

A. gas and liquid

B. liquid and gas

C. solid and gas

D. solid and liquid

Answer: A

Watch Video Solution

18. Which of the following will be the most effective in the coagulation of $Fe(OH)_3$ sol ?

A. Na_2HPO_3

B. $NaNO_3$

C. Na_3PO_4

D. Na_2SO_4

Answer:

Watch Video Solution

19. Which is correct about physical adsorption ?

A. High temperature and high pressure favour adsorption.

B. High temperature and low pressure favour adsorption.

C. Low temperature and high pressure favour adsorption.

D. Low temperature and low pressure favour adsorption.

Answer:

Watch Video Solution

20. The coagulating power of electrolytes having ions Na^+, Al^{3+} and Ba^{2+} for aresenic sulphide sol increases in the order :-

A. $Al^{3+} < Na^+ < Ba^{2+}$

B. $Al^{3+} < Ba^{2+} < Na^+$

C. $Na^+ < Ba^{2+} < Al^{3+}$

D. $Ba^{2+} < Na^{+} < Al^{3+}$

Answer:

Watch Video Solution

21. the stability of lyophilic colloids is due to

A. adsorption of covalent molecules on the colloid

B. the size of the particles

C. the charge on the particles

D. Tyndall effect.

Answer:

Watch Video Solution

22. The amount of electrolytes required to coagulate a given amount of AgI colloidal solution (-ve charge) will be in the order

A. $NaNO_3 > Al(NO_3)_3 > Ba(NO_3)_2$

B. $Al(NO_3)_3 > Ba(NO_3)_2 > NaNO_3$

C. $Al(NO_3)_3 > NaNO_3 > Ba(NO_3)_2$

D. $NaNO_3 > Ba(NO_3)_2 > Al(NO_3)_3$

Answer:

Watch Video Solution

23. Gold sol can be prepared by

A. hydrolysis of gold(III) chloride

B. oxidation of gold by aqua regia

C. peptization

D. reduction of gold(III) chloride with formalin solution.

Answer:

Watch Video Solution

24. For Freundlich isotherm, a groph of log x/m is plotted against log p.

A. $\frac{1}{n}, k$

B. $\log \frac{1}{n}, k$

C. $\frac{1}{n}, \log k$

D. $\log \frac{1}{n}, \log k$

Answer:

Watch Video Solution

25. Which of the following colloids cannot be easily coagulated ?

A. Multimolecular colloids

B. Irreversible colloids

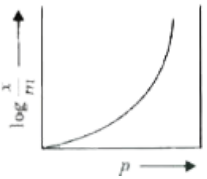
C. Lyophobic colloids

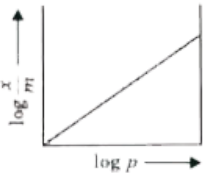
D. Macromolecular colloids

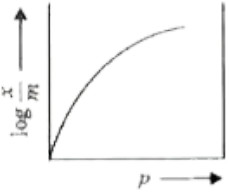
Answer:

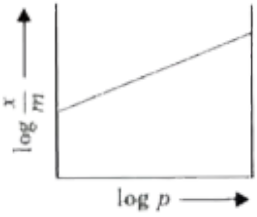
Watch Video Solution

26. Which of the following curves is in accordance with Freundlich adsorption isotherm ?

A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

27. 3 g of activated charcoal was added to 50 mL of acetic acid solution (0.06 N) in a flask. After an hour, It was filtered and the strength of the filtrate was found to be 0.42 N. Calculate the amount of acetic acid adsorbed per gram of charcoal.

A. 42 mg

B. 54 mg

C. 18 mg

D. 36 mg

Answer:

Watch Video Solution

28. Write one similarity between physisorption and chemisorption.

A. Force of attraction

B. Enthalpy of adsorption

C. Temperature effect

D. Effect of surface area

Answer:

Watch Video Solution

29. Which of the following statements is incorret about physisorption?

A. The forces involved are van der Waals forces.

B. More easily liquefiable gases are adsorbed easily.

C. Under high pressure, it results into mutimolecular layer on adsorbent surface.

D. $\Delta H_{\text{adsorption}}$ is low and +ve

Answer:

Watch Video Solution

30. For a linear plot of log (x/m) versus log p in a Freundlich adsorption isotherm, which of the following statements is correct ? (K and n are constants)

A. both k and 1/n appear in the slope term.

B. 1/n appears as the intercept.

C. Only 1/n appears as the slope.

D. log (1/n) appears as the intercept.

Answer:

Watch Video Solution

31. Which of the following is not favourable condition for physical adsorption ?

A. High pressure

B. Low temperature

C. High temperature

D. Higher critical temperature of adsorbate

Answer:

Watch Video Solution

32. Which of the following process is responsible for the formation of delta at a place where rivers meet the sea?

A. peptization

B. colloidal formation

C. emulsification

D. coagulation

Answer:

Watch Video Solution

33. The Tyndall effect is observed only when following conditions are satisfied :

(a) The diameter of the dispersed particles is much smaller than the wavelength of the light used.

(b) The diameter of the dispersed particles is not much smaller than the wavelength of the light used

(c) The refractive indices of the dispersed phase and dispersion medium are almost similar in magnitude.

(d) The refractive indices of the dispersed phase and dispersion medium differ greatly in magnitude.

A. (A) and (C)

B. (B) and (C)

C. (A) and (D)

D. (B) and (D)

Answer:

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34. The coagulation power of an electrolyte for As_2S_3 decreases in the order:

A. $NaCl < BaCl_2 < AlCl_3$

B. $BaCl_2 < AlCl_3 < NaCl$

C. $AlCl_3 < NaCl < BaCl_2$

D. $AlCl_3 < BaCl_2 < NaCl$

Answer:

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35. Which of the following electrolytes will have maximum coagulating value for Ag/Ag^+ sol?

A. Na_2S

B. Na_3PO_4

C. Na_2SO_4

D. $NaCl$

Answer:

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36. Gold sol is not a

A. lyophobic sol

B. negatively charged sol

C. macromolecular sol

D. multimolecular colloid

Answer:

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37. Which of the following statement is true about the adsorption?

A. $\Delta H < 0$ and $\Delta S < 0$

B. $\Delta H > 0$ and $\Delta S < 0$

C. $\Delta H < 0$ and $\Delta S > 0$

D. $\Delta H = 0$ and $\Delta S < 0$

Answer:

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38. Which of the following is an example of homogeneous catalysis?

A. Oxidation of NH_3 in Ostwald's process

B. Oxidation of SO_2 in Contact process

C. Oxidation of SO_2 in lead chamber process

D. Manufacture of NH_3 by Haber's process

Answer:

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39. Critical micelle concentration for a soap solution is 1.5×10^{-4} mol L^{-1}. Micelle formation is possible only when the concentration of soap solution in mol L^{-1} is

A. 2.0×10^{-3}

B. 4.6×10^{-5}

C. 7.5×10^{-5}

D. 1.1×10^{-4}

Answer:

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40. The precipitation power of an electrolyte increases with

A. rise in temperature

B. charge of an ion

C. ionic radii

D. atomic radii

Answer:

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41. A gas undergoes physical adsorption on a surface and follows the givn Freundlich adsoprtion isotherm equation $\frac{x}{m} = kp^{0.5}$. Adsorption of the gas increases with:

A. Decrease in p and decrease in T

B. Increase in p and increase in T

C. Increase in p and decrease in T

D. Decrease in p and increase in T

Answer:

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42. An example solid sol of

A. Butter

B. Gem stones

C. Paint

D. Hair cream

Answer:

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43. For coagulation of arsenious sulphide sol, which one of the following salt solution will be most effective ?

A. $AlCl_3$

B. $NaCl$

C. $BaCl_2$

D. Na_3PO_4

Answer:

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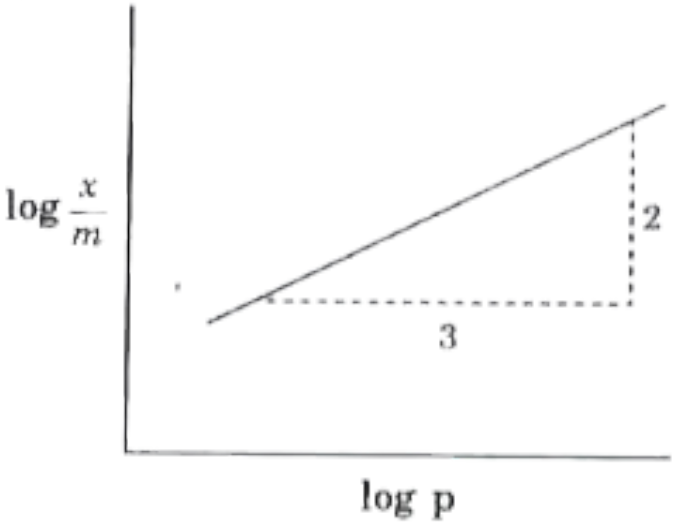
44. Adsorption of a gas follows Freundlich adsorption isotherm. x is the mass of the gas adsorbed on mass m of the adsorbent. The plot of $\log \frac{x}{m}$ versus log p is shown in the graph. $\frac{x}{m}$ is proportional to:



A. $p^{2/3}$

B. $p^{3/2}$

C. p^3

D. p^2

Answer:

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45. Among the following, the false statement is :

A. Latex is a colloidal solution of rubber particles which are positively charged

B. Tyndall effect can be used to distinguish between a colloidal solution and a true solution.

C. It is possible to cause artificial rain by throwing electrified sand carrying charge opposite to the one on clouds from an aeroplane.

D. Lyophilic sol can be coagulated by adding an electrolyte.

Answer:

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46. Among the following , the surfactant that will form micelles in aqueous solution at the lowest molar concentration at amibemt conditions, is :

A. $CH_3(CH_2)_{15}N^+(CH_3)_3Br^-$

B. $CH_3(CH_2)_{11}OSO_3^-Na^+$

C. $CH_3(CH_2)_6COO^-Na^+$

D. $CH_3(CH_2)_{11}N^+(CH_3)_3Br^-$

Answer:

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47. Among the electrolytes $Na, SO_4, CaCl_4, Al_2(SO_4)_3$ and NH_4Cl, the most effective coagualting agent for Sb_2S_3 sol is :

A. Na_2SO_4

B. $CaCl_2$

C. $Al_2(SO_4)_3$

D. NH_4Cl

Answer:

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48. Methylene blue, from its aqueous solution is adsorbed on activated charcoal at $25^\circ C$. For this process, the correct statement is

A. the adsorption requires activation at $25^{\circ} C$.

B. the adsorption is accompanied by a decrease in enthalpy.

C. the adsorption increases with increase of temperature.

D. the adsorption is irreversible.

Answer:

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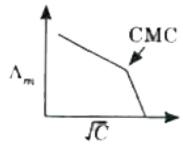
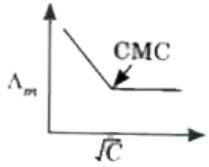
49. Which one of the following forms micells in aqueous solution above certain concentration?

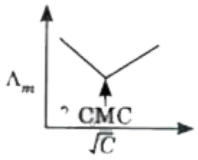
A.



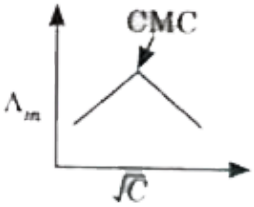
B.



C.



D.



Answer:

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Competition File Objective Type Questions C Multiple Choice Questions With More Thanone Correct Answers

1. Which of the following increase(s) the activation of a solid adsorbent?

A. subdividing the solid adsorbent

B. carrying out adsorption at very elevated temperature

C. blowing superheated steam through porous adsorbent

D. polishing the surface of solid adsorbent

Answer:

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2. Which of the following statements are correct?

A. The protective power of a colloid may be measured by reciprocal of gold number

B. A gel is a colloidal system in which a solid is dispersed in a liquid.

C. For positively charged sol, the coagulating power of coagulating ion decreases as : $PO_4^{3-} > SO_4^{2-} > Cl^-$

D. In colloids, the particles constituting the dispersed phase adsorb only those ions preferentially which are opposite with the own lattice ions.

Answer:

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3. Which of the following is/are not true in Langmuir adsorption isotherm ?

A. At high pressure, $\frac{x}{m} = kP$

B. Plot of log (x/m) and log P is a straight line

C. At low pressure, $\frac{x}{m} = kP$

D. in intermediate range of pressure, $\frac{x}{m} = kP^{1/n}$ (n = whole number)

Answer:

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4. The correct statement(s) pertaining to the adsorption of a gas on a solid surface is (are)

A. Adsorption is always exothermic

B. Physisorption may transform into chemisorption at high temperature

C. Physisorption increases with increasing temperature but chemisorption decreases with increasing temperature.

D. Chemisorption is inore exothermic than physisorption, however it is very slow due to higher energy of activation.

Answer:

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5. Choose the correct reason(s) for the stability of the lyophobic colloidal particles.

A. Preferential adsorption of ions on their surface from the solution.

B. Preferential adsorption of solvent on their surface from the solution.

C. Attraction between different particles having opposite charges on their surface.

D. Potential difference between the fixed layer and the diffused layer of opposite charges around the colloidal particles.

Answer:

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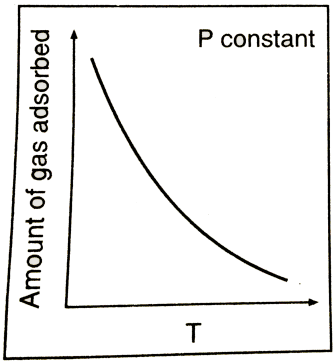
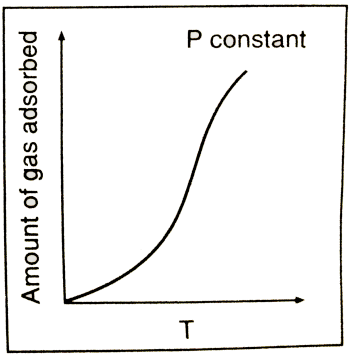
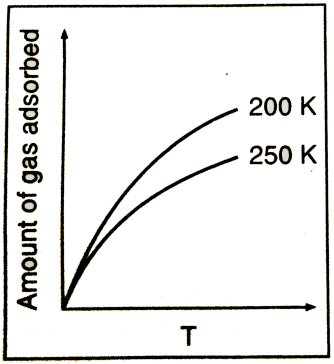
6. The given graph/data I,II,III and IV represent general trends observed for different physisorption and chemisorption processes under mild conditions of temperature and pressure . Which of the following choice(s) about I,II,III, and IV is/are correct ?



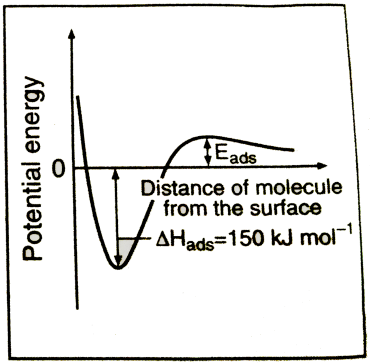
(I)



(II)



(III)



(IV)

A. I is physisorption and II is chemisorption

B. I is physisorption and III is chemisorption

C. IV is chemisorption and II is chemisorption

D. IV is chemisorption and III is chemisorption

Answer:

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7. When O_2 is adsorbed on a metallic surface, electron transfer occurs form the metal to O_2. The true statement (s) regarding this adsorption is (are)

A. O_2 is physisorbed

B. heat is released

C. occupancy of π_{2p} of O_2 is increased

D. bond length of O_2 is increased.

Answer:

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8. The correct statement(s) about surface properties is (are)

A. cloud is an emulsion type of colloid in which liquid is dispersed phase and gas is dispersion medium.

B. the critical temperatures of ethane and nitrogen are 563 K and 126 K, respectively. The adsorption of ethane will be more than that of nitrogen on same amount of activated charcoal at a given temperature.

C. adsorption is accompanied by decrease in enthalpy and decrease in entropy of the system.

D. Brownian motion of colloidal particles does not depend on the size of the particles but depends on viscosity of the solution.

Answer:

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Competition File Objective Type Questions D Multiple Choice Questions Based On The Given Passage Comprehension

1. The colloidal system in which the disperse phase and dispersion medium are both liquids is known as :

A. less than those of true solution

B. more than those of suspension

C. in the range 10 pm to 10^6 pm

D. in the range 10Å to 1000Å

Answer:

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2. The colloidal system in which the disperse phase and dispersion medium are both liquids is known as :

A. Lyophobic sols can be easily prepared only by mixing.

B. Lyophilic sols are stable and irreversible.

C. Lyophobic sols are unstable and are not reversible

D. The particles of lyophobic sol are heavily solvated

Answer:

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Competition File Objective Type Questions Matrix Match Type Questions

1. Match the example given in Column I with the type of colloid given in Column II.

Column I	Column II
(A) Whipped cream	(p) Emulsion
(B) Medicines	(q) Sol
(C) Cell fluids	(r) Colloids having gas as dispersion phase
(D) Foam	(s) Colloids having liquid dispersion medium

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2. Match the entries of Column I with appropriate entries in Column II.

Column I	Column II
(A) Lyphobic colloids	(p) liquid fats dispersed in water
(B) Lyophilic colloids	(q) behave as normal electrolyte at low concentration and colloidal at high concentration
(C) Micelles	(r) get coagulated by electrolytes
(D) Emulsions	(s) show Tyndall effect.

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3. Match the column I with type of colloid given in column II

Column I	Column II
(A) Starch sol	(p) Associated
(B) Soap sol	(q) Multimolecular
(C) Gelatin sol	(r) Macromolecular
(D) Gold sol	(s) Lyophilic

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Competition File Objective Type Questions Matching List Type Questions

1. Match list I with list II and select the correct answer using the code :

List I (Type of colloid)	List II (Example)
P. Liquid in solid	1. Hair cream
Q. Gas in liquid	2. Cheese
R. Liquid in liquid	3. Fog
S. Liquid in gas	4. Whipped cream

A.

P	Q	R	S
2	1	3	4

B.
P	Q	R	S
1	3	2	4

C.
P	Q	R	S
2	4	1	3

D.
P	Q	R	S
1	4	2	3

Answer:

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2. Match list I of enzymatic reaction with enzyme given in list II :

List I	List II
P. Proteins $\longrightarrow$ Amino acid	1. Zymase
Q. Glucose $\longrightarrow$ Ethyl alcohol + CO_2	2. Lacto bacilli
R. Starch $\longrightarrow$ Maltose	3. Pepsin
S. Milk $\longrightarrow$ Curd	4. Diastase

A.
P	Q	R	S
3	4	1	2

B.
P	Q	R	S
4	1	3	2

C.
P	Q	R	S
3	4	2	1

D.

P	Q	R	S
3	1	4	2

Answer:

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