CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

SURFACE CHEMISTRY

Example

1. In a coagulation experiment , a sol of As_2S_3 is mixed with distilled water and 0.2m solution of an electrolyte, AB so that total volume is 20 mL. It was found that all solutions containing more than 4.5mL of AB get coagulated within two minutes. What is the flocculation value of AB for As_2S_3 ?

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2. On addition of 2mL of 5% NaCl to 10 mL gold sol in the presence of 0.025 g starch , the coagulation is just prevented. What is the gold number of starch ?

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Intext Questions

1. What is meant by adsorption ?

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2. Define the terms adsorbent and adsorbate.

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3. What is meant by the term absorption.

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4. Reversible adsorption is :

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5. What is meant by chemisorption?

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6. What is desorption ?

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7. What is sorption ?

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8. What is the sign of ΔH and ΔS for adsorption process.

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9. Which out of helium and neon would adsorb on the surface of charcoal more readily and why?

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10. Is chemisorption reversible or irreversible?

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11. Define specific surface area.

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12. What is occlusion ?

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13. Write the name of an adsorbent for easily liquefiable gases.

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14. Give an example of sorption.

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15. A piece of silica gel is placed in the water vapours. Will the gel adsorb or absorb water vapours?

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16. What is saturation pressure ?

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17. What is Freundlich adsorption isotherm ?

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18. How can the Freundlich adsorption isotherm be represented when the value of n is less than one?

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19. What is activated charcoal ?

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20. How metallic adsorbents be activated ?

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21. How does a catalyst work?

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22. What is meant by activity of a catalyst?

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23. What do you mean by selectivity of catalysts?

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24. What is ZSM-5? What is its formula ?

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25. Name two industrial processes in which heterogeneous catalysts are employed.

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26. Give one example of a chemical reaction involving homogeneous catalyst.

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27. Is a colloidal system homogeneous or heterogeneous ?

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28. What type of substances form lyophobic sols ?

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29. Write two differences between multimolecular colloids and macromolecular colloids.

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30. Are the sols of metals hydrophilic or hydrophobic?

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31. Give an example of associated colloid.

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32. Colloidal solution can be made in water and in air as media. What distinctive names are given to these two types of sols ?

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33. To which colloidal system does milk belong?

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34. To which colloidal system does smoke belong?

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35. Which out of gold sol and gelatin in water sol is a lyophilic sol?

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36. Which out of the following is a macromolecular and multimolecular colloid ? Starch sol, sulfur sol.

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37. How will you obtain a colloidal solution of arsenious sulfide?

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38. Is haemoglobin negatively or positively charged sol?

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39. Can a gas mixed with another gas forms a colloidal solution? Give reason for your answer.

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40. Can colloidal solutions be filtered through normal filter papers ?

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41. What is meant by the term peptization ?

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42. Explain the terms with suitable examples:

Alcosol

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43. Explain the terms with suitable examples:

Aerosol

Watch Video Solution

44. Explain the terms with suitable examples:

Hydrosol

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45. How can a colloidal solution be distinguished from the true solution of the same substance ?

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46. In what way a sol different from a gel ?

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47. State one difference between an emulsion and a sol.

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48. What are the physical states of dispersed phase and dispersion medium of froth ?

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Watch Video Solution

49. What is Brownian movement ?

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50. Describe electrophoresis briefly.

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51. Define the term "Tyndall effect".

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52. What is the "coagulation" process?

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53. What causes Brownian movement in a colloidal solution?

Watch Video Solution

54. What is an emulsion ?

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Exercise Part I Objective Questions

1. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The process of separating a crystalloid from a colloid by diffusion through a semipermeable membrane is.....

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2. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

Brownian movement is due to unequal bombardment of molecules of.....on the colloidal particles.

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3. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase ,

dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

Migration of colloidal particles under the influence of electric field is known as.....

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4. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The process of purifying a colloidal solution by placing it in a parchment bag kept in water is called.....

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5. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The process of converting a suspension into a colloidal solution on the addition of an electrolyte is called.....

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6. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The phenomenon of precipitation of a colloidal solution by the addition of an electrolyte is known as.....

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7. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The colloidal solution of a liquid in a liquid is called.....

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8. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The protective action of different colloids is compared in terms of.....

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9. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

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

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10. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase ,

dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The lyophilic colloids which stabilize a lyophobic sol are known as.....

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11. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

The phenomenon of scattering of light by colloidal particles is referred to as.....

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12. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

Colloidal solutions are heterogeneous and consist of two phases, namely (i).....and (ii).....

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13. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

On adding a few drops of dilute ferric chloride solution to freshly

precipitated ferric hydroxide, a red colloidal solution is obtained. The phenomenon is known as .....

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14. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

Alum is widely used for water purification because it ..... the mud particles.

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15. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase ,

dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

By using light, a colloidal solution can be differentiated from a true solution by ..... effect.

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16. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , product, electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

In autocatalysis, one of the..... of the reaction acts as a catalyst.

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17. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, active, dispersed phase , dispersion medium , free , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

Rough surfaces have more.....centres on account of ..... unsatisfied valencies.

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18. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , heterogeneous, coagulation , coagulates, emulsion , gel , homogeneous , Tyndall effect , protective colloids , electrodialysis)

Intermediate compound formation theory explains ..... catalysis.

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19. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , specific , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

Enzymes are highly.....in action.

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20. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , adsorption , coagulates, emulsion , gel, gold number, tyndall effect, protective colloids, electrodialysis)

Heterogeneous catalysis is successfully explained by..... theory.

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21. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, negative , dispersed phase , dispersion medium , positive , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

A catalyst which enhances the rate of the reaction is called a ..... catalyst while which decreases its speed is called a ..... catalyst.

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22. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , Mn+2 , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

Oxidation of oxalic acid by acidified $KMnO_4$ is catalysed by .....

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23. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect , protective colloids , electrodialysis)

A catalytic promoter ..... the efficiency of a catalyst whereas a catalytic poison ..... the efficiency of catalyst.

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24. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, heterogeneous , dispersed phase , dispersion medium , homogeneous , electro-osmosis , coagulation , coagulates, emulsion , gel)

$SO_2(g) + \frac{1}{2}O_2(g) \xrightarrow{Pt} SO_3(g)$ is an example of ..... catalysis.

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25. Fill in the blanks by choosing the appropriate word/words from those given in the brackets.(dialysis, peptization , dispersed phase , dispersion medium , electrophoresis , electro-osmosis , coagulation , coagulates, emulsion , gel , gold number , Tyndall effect ,

protective colloids , electrodialysis)

A catalyst decreases.....of a reaction.

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26. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

Coagulation is the property of the dispersion of colloidal particles.

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27. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

Electro-osmosis is the movement of the particles of colloids under the influence of electric current.

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28. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

A colloidal solution is homogeneous.

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29. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

Osmotic pressure of a colloidal solution is much higher than that of true solutions.

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30. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

The size of the colloidal particles is of the order of 0.1 nm -1 nm.

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31. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

Colloidal solution of a liquid dispersed in a liquid is called a gel

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32. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

Viscosity of a lyophilic sol is same as that of dispersion medium.

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33. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

Catalyst increases the rate of forward reaction and decreases the rate of backward reaction in a reversible process.

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34. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

Catalyst is a substance which alters the equilibrium constant.

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35. Correct the following statements by changing the underlined part of the sentence (Do not change the whole sentence)

A catalyst does not participate in reaction mechanism.

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Exercise Part I Objective Questions Complete The Followings Statements By Selecting The Correct Alternative From The Choices Given

1. Physical adsorption is:

A. irreversible

B. highly specific

C. not very specific

D. unpredictable

Answer: C

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2. Physical adsorption is considerable at

A. low temperature

B. room temperature

C. high temperature

D. none of these

Answer: A

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3. In the adsorption of oxalic acid by activated charcoal, the activated charcoal is known as:

A. adsorbent

B. adsorbate

C. absorber

D. absoibate

Answer: A

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4. The rate of chemisorption :

A. is independent of pressure

B. decreases with increase of pressure

C. increases with increase of pressure

D. none of these

Answer: C

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5. Decoloriization of coloured solution by animal charcoal is an example of:

A. sorption

B. desorption

C. absorption

D. adsorption

Answer: D

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6. Gel is:

A. liquid dispersed in gas

B. liquid dispersed m solid

C. solid dispersed in gas

D. gas dispersed in solid

Answer: B

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Watch Video Solution

7. Out of the following, hydrophobicsol is:

A. gum

B. starch

C. gelatin

D. sulfure

Answer: D

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8. Milk is an example of:

A. Emulsion

B. Suspension

C. Foam

D. Sol

Answer: A

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9. Smoke is a dispersion of:

A. A solid in gas

B. A gas in solid

C. A gas in gas

D. A liquid in gas.

Answer: A

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10. An emulsifier is an agent which:

A. Stabilizes emulsion

B. Homogenises an emulsion

C. Accelerates the dispersion

D. Aids the flocculation of an emulsion

Answer: A

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11. Which of the following processes does not occur at the interface of phases ?

A. Crystallization

B. Heterogeneous catalysis

C. Homogeneous catalysis

D. Corrosion

Answer: C

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12. 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: B

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13. Which of the following interfaces cannot be obtained ?

A. Liquid-liquid

B. Solid-liquid

C. Liquid-gas

D. Gas-gas

Answer: D

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14. The term 'sorption' stands for _____ .

A. absorption

B. adsorption

C. both absorption and adsorption

D. desorption

Answer: C

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15. 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: B

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16. 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: A

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17. 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: A

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18. 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: D

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19. 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: B

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20. 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: A

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

A. Water on silica gel

B. Water on anhydrous calcium chloride

C. Hydrogen on finely divided nickel

D. Oxygen on metal surface

Answer: B

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22. On the basis of data 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_2

C. CH_4

D. H_2

Answer: D

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

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

(ii) $2SO_2(g) + O_2(g) \xrightarrow{Pt(s)} 2SO_3(g)$

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

(iv)

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

options- a). (i), (iii)

b) (ii), (iii), (iv)

c) (i), (ii), (iii)

d) (iv)

A. (i), (iii)

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

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

D. (iv)

Answer: B

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24. At high concentration of soap in water, soap behaves as _____ .

A. molecular colloid

B. associated colloid

C. macromolecular colloid

D. lyophilic colloid

Answer: B

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25. 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: B

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26. Lyophobic sol can be protected

a) by addition of oppositely charged sol

b) by addition of an electrolyte

c) by addition of lyophilic sol.

d) by boiling:

A. by addition of oppositely charged sol

B. by addition of an electrolyte

C. by addition of lyophilic sol.

D. by boiling:

Answer: C

27. Freshly prepared precipitate sometimes gets converted to colloidal solution by _____ .

A. coagulation

B. electrolysis

C. diffusion

D. peptization

Answer: D

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

a) Na_2Sb)Na_3PO_4c)Na_2SO_4d)NaCl`

A. Na_2S

B. Na_3PO_4

C. Na_2SO_4

D. $NaCl$

Answer: D

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29. 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: D

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30. The values of colligative properties of colloidal solutions are of small order in comparision 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.

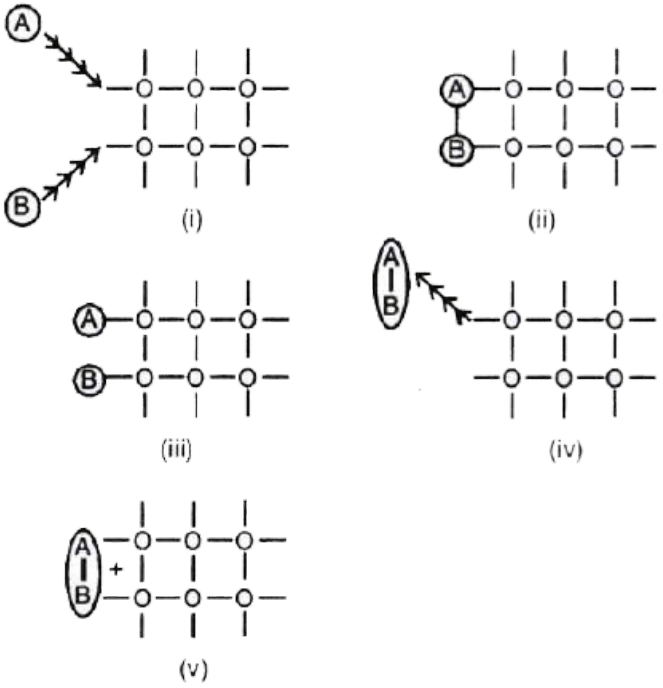
C. form lyophilic colloids.

D. are comparatively less in number.

Answer: D

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

adsorption theory.



A. (i) (ii) (iii) (iv) (v)

B. (i) (iii) (ii) (iv) (v)

C. (i) (iii) (ii) (v) (iv)

D. (i) (ii) (iii) (v) (iv)

Answer: B

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32. 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. Peptization

Answer: C

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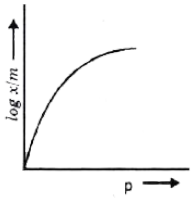
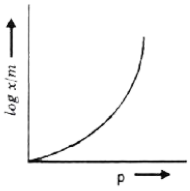
33. Which of the following curves is in accordance with Freundlich adsorption isotherm ?

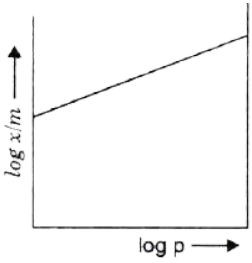
A.



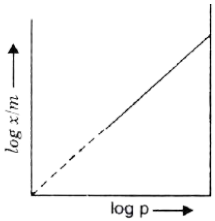
B.



C.



D.



Answer: C

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34. Which of the following processes 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: D

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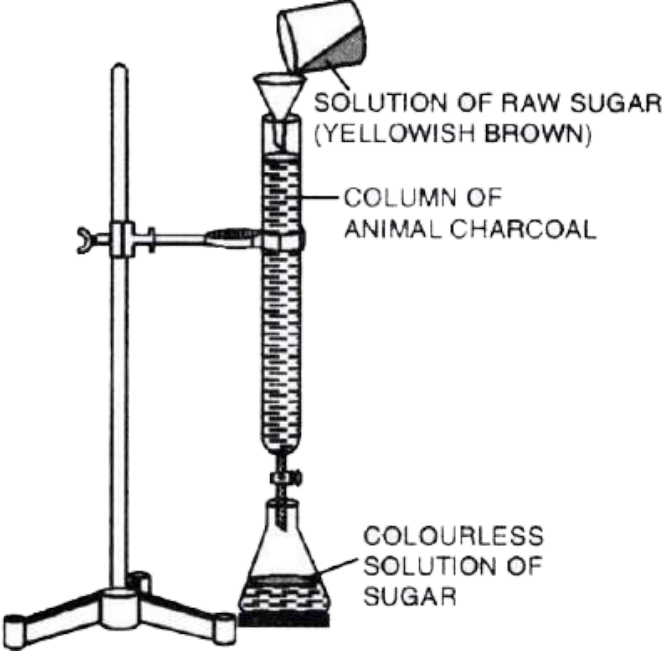
35. Which of the following phenomenon is applicable to the process shown in the Fig. ?



A. Absorption

B. Adsorption

C. Coagulation

D. Emulsification

Answer: B

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Exercise Part I Objective Questions Match The Following

1. Match the following :

(*i*) Positively charged sol	(*a*) Gold number
(*ii*) Negatively charged sol	(*b*) Dialysis
(*iii*) Protective power of a lyophilic colloid	(*c*) Milk
(*iv*) Emulsion	(*d*) $Al(OH)_3$
(*v*) Gel	(*e*) As_2O_3
(*vi*) Purification of colloids	(*f*) Cheese
(*vii*) Promoter	(*g*) NO
(*viii*) Heterogeneous catelyst	(*h*) V_2O_5
(*ix*) Homogeneous catalyst	(*i*) Acetanilide
(*x*) Inhibitor	(*j*) MO

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Exercise Part Ii Descriptive Questions Very Short Answer Questions

1. Why all adsorptions are exothermic in nature ?

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2. Why heat of chemisorption is more than heat of physisorption?

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3. What is meant by positive and negative adsorptions?

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4. Why activated charcoal is a better adsorbent than ordinary charcoal ?

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5. How will you prove the selective nature of adsorption ?

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

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7. Out of the following gases which will be adsorbed more readily on the surface of charcoal :

$NH_3 > CO_2 > O_2$

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

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9. What happens when a colloidal sol of $Fe(OH)_3$ is mixed with that of As_2S_3?

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

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11. What happens when a beam of light is passed through As_2S_3 sol?

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12. KCl is added to $Fe(OH)_3$ sol?

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13. What is the main cause of charge on a colloidal solution?

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14. How are gold number and protective power of colloid related?

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15. What is demulsification ?

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16. Give four uses of emulsions.

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17. What are micelles ? Give an example of a micellers system.

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18. How does soap help in washing clothes?

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

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

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21. Why lyophilic colloidal sols are more stable than lyophobic colloidal sols ?

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22. How can a colloidal solution be distinguished from the true solution of the same substance ?

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23. Colloidal solution can be made in water and in air as media. What distinctive names are given to these two types of sols ?

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24. Of NH_3 and N_2 which gas will be adsorbed more readily on the surface of charcoal and why?

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25. What is the basic difference between adsorption and absorption.

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26. What is meant by 'shape-selective catalysis' of reactions ?

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27. What are lyophobic colloids? Give one example for them.

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28. How can we make dialysis fast?

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29. What is meant by Gold number of starch is 10-15?

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30. The size of colloidal particles ranges between

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31. Explain why river mouths have to periodically dredged to keep it navigable.

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Exercise Part Ii Descriptive Questions Short Answer Questions

1. Depict graphically the variation of the extent of adsorption with temperature at constant pressure for physical and chemical adsorptions.

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2. What forces are responsible for attraction of a substance to the surface of a solid ?

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3. Give the mathematical relationship between the extent of adsorption and pressure at constant temperature and explain the symbols used.

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4. Derive the variation of x/m versus temperature for physical adsorption process. Explain the nature of the curve.

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5. Distinguish between physisorption and chemisorption.

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6. What is an 'adsorption isotherm ? Describe Freundlich adsorption isotherm.

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7. 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

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8. What is meant by colloid and colloidal state? How does the theory of selective adsorption explain the origin of charge on colloidal particles ?

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9. 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?

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10. Distinguish between multimolecular and macromolecular colloids.

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11. What are multimolecular and macromolecular colloids? Give one example of each type. How are associated colloids different from them?

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12. Define each of the following terms

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

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13. Distinguish between mutlimolecular, macromolecular and associated colloids. Give one example of each.

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14. What are micelles ? Give an example of a micellers system.

Watch Video Solution

15. Write three differences between true solutions and colloidal solutions.

Watch Video Solution

16. How are the following sols produced ?

(a) Sulfur sol (b) Collodion.

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17. Explain briefly dialysis.

Watch Video Solution

18. Explain the following terms:

Electrodialysis

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19. Explain the following terms:

Phases of a colloidal solution.

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20. Define Gold number.

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21. Special type of filter papers are used for the filtration of colloidal solutions. Give reasons.

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22. Define coagulation.

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23. Bleeding from a fresh cut can be stopped by applying alum. Give reasons.

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24. Briefly describe the Bredig's arc method for the preparation of lyophobic colloids.

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25. What is Tyndall effect ? Mention one of its applications.

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Watch Video Solution

26. Explain what is meant by Tyndall effect ?

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27. What happens when freshly precipitated $Fe(OH)_3$ is shaken with small amount of $FeCl_3$ solution ?

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28. Describe briefly the purification of a colloid by dialysis.

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29. Explain the following terms:

Tyndall effect

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30. Explain the following terms:

Dialysis

Watch Video Solution

31. What is meant by an emulsion and emulsifying agents?

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32. Give four uses of emulsions.

Watch Video Solution

33. What is demulsification ?

Watch Video Solution

34. What is the main cause of charge on a colloidal solution?

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35. Differentiate between:

Dialysis and ultrafiltration

Watch Video Solution

36. Differentiate between:

Electrophoresis and electro-osmosis.

Watch Video Solution

37. What are micelles ? Give an example of a micellers system.

Watch Video Solution

38. What is meant by critical micelle concentration and Kraft temperature ?

Watch Video Solution

39. Differentiate between lyophilic and lyophobic colloids.

Watch Video Solution

Watch Video Solution

40. Differentiate between sol and emulsion.

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41. Milk is an emulsion. Identify the dispersed phase and emulsifier in milk.

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

Watch Video Solution

43. What are lyophilic and lyophobic colloids ? Give four differences between them. Also give one example of each.

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44. Why potash alum is added to purify water?

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45. The adsorption of solutes from solution by solid adsorbents can be expressed by a logarithmic function. Write that logarithmic form of the equation.

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46. Give one difference between gel and sol.

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47. What are macromolecular and multimolecular colloids? Give one example in each case.

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48. What is common in aquasols and solid aerosols ? Also find the point of distinction between them.

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49. Does colloidal state represent a different class of substance? Comment.

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50. Write short notes on

Hardy-Schulze's rule

Watch Video Solution

51. Write short notes on

Peptization

Watch Video Solution

52. What is Hardy Schulze's rule ? Justify the use of gelatin as a protective colloid.

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53. Explain the terms emulsions and micelles. Action of soap is due to emulsification and micelle formation. Comment.

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54. What are micelles ? Give an example of a micellers system.

Watch Video Solution

55. Explain the terms associated colloids and peptization.

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56. Explain the phenomenon which takes place when ferric hydroxide solution is added to gold solution. Write whether the gold solution is multimolecular or macromolecular?

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57. Explain the terms:

interfaces

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58. Explain the terms:

cataphoresis.

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59. Explain the following:

Gold number

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60. Explain the following:

Coagulation

Watch Video Solution

61. Explain the following:

Flocculating value

Watch Video Solution

62. Explain the terms with suitable example.

Electrodialysis

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63. Explain the terms with suitable example.

Brownian movement

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64. Write three distinctive features of chemisorption which are not found in physisorption.

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65. Name the two groups into which phenomenon of catalysis can be divided. Give an example of each group with the chemical equation involved.

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66. Describe a conspicuous change observed when

a solution of NaCl is added to a sol of hydrated ferric oxide.

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67. Describe a conspicuous change observed when

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

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68. What is meant by coagulation of a colloidal solution ? Describe briefly any three methods by which coagulation of a lyophobic sol can be carried out.

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69. Explain the following terms giving one example of

Miscelles

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70. Explain the following terms giving one example of

Aerosol

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71. Give reasons for the following:

Rough surface of a catalyst is more effective than smooth surface.

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72. Give reasons for the following:

Ne gets easily absorbed over charcoal than He.

Watch Video Solution

73. Write the differences between physisorption and chemisorption with respect to the following:

(i) Specificity (ii) Temperature dependence (iii) Reversibility and (iv) Enthalpy change

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74. What are the characteristics of the following colloids

Multimolecular colloids

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75. What are the characteristics of the following colloids

Lyophobic sols

Watch Video Solution

76. What are the characteristics of the following colloids

Emulsions

Watch Video Solution

77. What happens when freshly precipitated $Fe(OH)_3$ is shaken with small amount of $FeCl_3$ solution ?

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78. Why is finely divided substance more effective as an adsorbent ?

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79. In reference to Freundlich adsorption isotherm, write the expression for adsortion of gases on solids in the form of an equation.

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80. Write an important characteristic of lyophilic sols.

Watch Video Solution

81. Based on type of particles of dispersed phase give one example each of associated colloid and multimolecular colloid.

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Exercise Part Ii Descriptive Questions Long Answer Questions

1. What do you understand by the term adsorption, absorption and sorption ?

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2. Distinguish between physical adsorption and chemical adsorption.

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3. Why is adsorption accompanied by the decrease of both enthalpy as well as entropy of the system? Which factors help in increasing the extent of physical adsorption of the gas on charcoal powder?

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4. Give any four applications of adsorption.

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5. What do you understand by adsorption isotherm and adsorption isobar ? Explain Freundlich adsorption isotherm for the adsorption of gases on solids.

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6. Explain briefly dialysis.

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7. What is the origin of charge on colloidal particles?

Watch Video Solution

8. Explain briefly five important applications of colloids.

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9. Write short notes on

Peptization

Watch Video Solution

10. Write notes on :

Ultrafiltration

Watch Video Solution

Watch Video Solution

11. Write notes on :

Protective colloids

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12. How do you account for the following:

Curdling of milk

Watch Video Solution

13. How do you account for the following:

Tail of comets

Watch Video Solution

14. How do you account for the following:

Use of potash alum in the purification of water.

Watch Video Solution

15. How do you account for the following:

Cleansing action of soap

Watch Video Solution

16. How do you account for the following:

Medicines are more effective in their colloidal form.

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17. What is the state of dispersed phase and the dispersion medium (solid, liquid or gas) in smoke, mist, milk and gels?

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18. A certain colloidal solution is not affected by the addition of small amounts of electrolytes.

(i) What type of a sol is it?

(ii) Compared to that of the dispersion medium what would you expect the surface tension and viscosity of the sol to be?

(iii) Will the colloidal particles be easily detectable in an ultramicroscope?

(iv) Give an example of such a sol.

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19. In what type of sol will the surface tension and viscosity be similar to that of the dispersion medium?

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20. Briefly describe the preparation of colloidal As_2S_3. How can you demonstrate the presence of colloidal particles in the solution and electric charge for the particles ?

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21. Sols can be hydrophilic and hydrophobic. What do these terms mean?

Watch Video Solution

22. How does electrophoresis provide information about the sign of charge on colloidal particles ?

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

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24. Colloidal sulphur exhibits Brownian movement while a solution of sulphur in carbon disulphide does not. Explain.

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25. Describe briefly how gold sols can be prepared ?

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26. Define Gold number.

Watch Video Solution

27. Name any two protective colloids.

Watch Video Solution

28. Why is the cotton cloth required to be treated with a mordant, before dyeing ?

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29. In what respect electrophoresis differ from electrolysis ?

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30. What are enzymes inhibitors ?

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31. Explain the term heterogeneous catalysis. Give examples of heterogeneous catalysis involving:

(i) solid reactants (ii) liquid reactants and (iii) gaseous reactants.

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32. What is the role of adsorption in heterogeneous catalysis?

Watch Video Solution

33. Explain the terms:

(i) Active centres (ii) inhibitors (iii) promoters and (iv) catalytic poisons on the basis of adsorption theory.

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34. How are colloids classified on the basis of

(i) physical states of components

(ii) nature of dispersion medium

(iii) interaction between dispersed phase and dispersion medium ?

Watch Video Solution

35. Give two chemical methods for the preparation of colloidal solutions.

Watch Video Solution

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

Watch Video Solution

37. What is demulsification ?

Watch Video Solution

38. Give four uses of emulsions.

Watch Video Solution

39. What do you mean by STDs?

Watch Video Solution

40. Describe some features of catalysis by zeolites.

(i) Medicines are more effective in their colloidal form.

(ii) Lyophilic colloids are more stable than lyophobic colloids.

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41. Explain either Brownian movement or Tyndall effect.

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Isc Examination Questions

1. What is a catalyst ? Give one example each of homogeneously and heterogeneously catalysed reaction.

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2. Give one example each of homogeneous and heterogeneous catalysis.

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3. What is meant by promoter ? Give an example.

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4. Give one example (equation of a homogeneously catalysed reaction and name the catalyst.

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