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CHEMISTRY

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SURFACE CHEMISTRY

Evaluation Textbook Choose The Correct Answer

1. For Freudlich isortherm a graph of log $\frac{x}{m}$ is plotted against log P. The slope of the line and its y axis intercept respectively corresponds to:

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: C

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2. Which of the following is incorrect for physisorption?

A. reversible

B. increasees with increase in temperature

C. low heat of adsorption

D. increases with increase in surface area

Answer: B

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3. Which one of the following characteristicks are associated with adsorption ?

A. ΔG and ΔH are negative but ΔS is positive

B. ΔG and ΔS are negative but ΔH is positive

C. ΔG is negative but Δ H and ΔS are positive

D. $\Delta G \Delta H$ and ΔS all negative.

Answer: D

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4. Fog is collodial solution of :

A. solid in gas

B. gas in gas

C. liquid in gas

D. gas in liqide

Answer: C

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5. Assertion: Coagulation power of Al^{3+} is more than Na^{+}.

Reason : greater the valency of the focculating ion added, greater is tis power to casuse precipitation.

A. if bo th assertion and reason are true and reason is the correct explanation of assertion.

B. if bo th assertion and reason are true but reason is not the correct explanation of assertion.

C. assertion is true but reason is false

D. both assertion and reason are false

Answer: A

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6. Statement : To stop bleeding from an injury ferric chloride can be applied ,Which comment about the statement is justify ?

A. It is not true , ferric chlorid is a poison

B. It is true ,Fe^{3+} ions coagulated blood which is the negatively charged sol

C. It is not ,ferric chloride is ionic and gets into the blood stream .

D. It is true ,coagulation takes place because of formation of neagatively charged sol with Cl^{-}.

Answer: B

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7. Hair cream is:

A. gel

B. emulsion

C. solid sol

D. sol

Answer: B

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8. The most effective electrolyte for the coagulation of AS_2S_3 Sol is:

A. NaCl

B. Ba$(NO_3)_2$

C. $K_3\left[Fe(CL)_6\right]$

D. $AL_2(SO_4)_3$

Answer: D

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9. Which one of the following is not a surfactant?

A. $CH_3-(CH_2)_{15}-N-(CH_3)_2CH_2Br$

B. $CH_3-(CH_2)_{15}-NH_2$

C. $CH_3-(CH_2)_{16}-CH_2OSO_2^-Na^+$

D. $CH_3-(CH_2)_{14}-CH_2-COO^-Na^+$

Answer: B

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10. The phenomenon observed when a beam of light is passed through a collodial solution is :

A. Cataphoresis

B. Electrophoresis

C. Coagulation

D. Tyndall effect

Answer: D

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11. In an electric field , the particles of a collodial system move towards cathode.The coagulation of the same sol is studies using $K_2SO_4-(I)Na_3PO_4-(II),K_4[Fe(CN_6)]-(III)$ NaCl$-(iv)$Their cpagulation power should be:

A. $II > I > IV > III$

B. $III > II > I > IV$

C. $I > II > III > IV$

D. None of these

Answer: B

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12. Collodian is a 4 solution of which is one of the folowing compounds in alcohol ether mixture?

A. Nitroglycerine

B. Cellulose acetate

C. Glycoldinitrate

D. Nitrocellulose

Answer: D

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13. Which one of the follwing is an example for homogeneous catalysis?

A. manufacture of ammonia by Habers process.

B. manufacture of sulphuric acid by contact process.

C. hydrogenation of oil

D. Hydrogenation of sucrose in presence of all HCL.

Answer: D

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14. The coagulation values in millimoles per litre of the electrolytes 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. $III > II > I$

B. $I > II > III >$

C. $I > III > II$

D. $II > III > I >$

Answer: A

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15. Adsorption of gas on solid metal surface is spontaneous and exothermic ,then

A. ΔH increases

B. ΔS increases

C. ΔG increases

D. ΔSincreases

Answer: D

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

A. $\frac{x}{m} = f(P)$ at constant T

B. $\frac{x}{m} = f(T)$ at constant P

C. P=f (T) at constant $\frac{x}{m}$

D. $\frac{x}{m} = PT$

Answer: D

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17. On which of the following properties does the coagulation power of an ion depend?

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

B. Size of the ion alone.

C. The magnitude of the charge of the ion alone.

D. The sign of charge on the ion alone.

Answer: A

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Evaluation Textbook Answer The Following Question

1. Give two important characterstics of physisorption.

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2. Different physisorption and chemisorption.

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

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

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5. Heat of adsorption is greater for chemisorption than physisorption why?

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6. In a coaglation experiment 10ml of a colloid (X) is mixture with distiled water and 0.1m solution of an electrolyte AB so that the volume is 20ml . It was found that all solution containing more than 6.6ml of AB coagulation with in 5 minutes .What is the flocculation values ofAB for sol (X)?

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7. Peptising agent is added of convert precipitate into collodial solution . Explain with an example .

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8. What happen when a collodial sol of $Fe(OH)_3$ and As_2S_3 are mixed ? being negatively charged there charges are neutralised on mixing . Hence precipitation (coagulation) occurs.

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9. What is the different between a sol and a gel?

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10. Why are lyophilic collodial sols are more stable than lyophobic collodial sol .

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11. Addition of Alum purifies water .why?

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

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13. What are enzymes? Write a brife note on the mechanism of enzymes catalysis.

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14. What do you mean by activity and selectivity catalyst?

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15. Describe some feature of catalysis by Zeolites.

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16. Give three use of emulsions.

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17. Why does bleeding stop by rubbing moist alum?

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

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19. Comment to the statement : colloid is not a substance but is a state of substances.

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20. Explaine any one method for coagulation.

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21. Write a note on electro osmosis.

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22. Write a note on catalystic poison.

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23. Explaine intermediated compounds formation theory of catalysis with an example.

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24. What is the different between homogenous and hetrogenous catalysis?

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25. Describe adsorption theory of catalysis.

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Other Important Questions Answers Choose The Correct Answer

1. Which of the following is true with respect of adsorption?

A. $\Delta G < 0, \Delta S > 0, \Delta H < 0$

B. $\Delta G < 0, \Delta S < 0, \Delta H < 0$

C. $\Delta G > 0, \Delta S > 0, \Delta H < 0$

D. $\Delta G < 0, \Delta S < 0, \Delta H > 0$

Answer: B

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2. Which of the following statement is incorect regarding physisorption?

A. It occures because of vander waals forces.

B. More easily liquefiable gases are adsorbedr readily .

C. Under high preasure . It result into multi moleculer layer on adsorbent surface.

D. Enthalpy of adsorption in low and positive.

Answer: D

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3. 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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4. In physisorption adsorbent does not show apecificity for any particular gas because:

A. involved vander waals forces are universal

B. gases involved behave like ideal gases

C. enthalpy of adsorptionis low

D. it is a reversible gas

Answer: A

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5. Which of the following is an example of adsorption?

A. water on silica gel

B. water on calcium carbide

C. hydrogen on finely divided nickel

D. oxygen on metal surface

Answer: C

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6. On the basis of data given below predict which of the following gases show least adsorptionon a definite amount of charcoal

A. CO_2

B. SO_2

C. CH_4

D. H_2

Answer: D

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7. Which is following are the characteristics of chemisorption?

(i)High heat of adsorption

(ii)Irreversiblity

(iii) Low activation energy

A. (i)and(ii) only

B. (i) and(iii) only

C. (ii) and (iii) only

D. (i) ,(ii) and (iii)

Answer: A

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8. The plot of $\frac{x}{m}$(along Y-axix) verses log C(along X-axis) in the Freundlich adsorption isotherm is a horizontal line parallel to X - axis when,

A. $n = 0$

B. $n = 1$

C. $n = \infty$

D. such a plot is impossible

Answer: C

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9. Which of t he following wil show tyndall effect?

A. Aqueous solution of soap below critical miscelle concentration .

B. Aqueous solution of soap above critical miscelle concentration

C. Aqueous solution of sodium cloride

D. Aqueous solution of sugar

Answer: B

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10. Method by which lyophobic sol can be proected:

A. addition of oppositely charged sol

B. addition of an electrolyte

C. addittion of lyophilic sol

D. by boilling

Answer: C

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11. Freshly prepared precipitate sometimes gets convert to collodial solution by?

A. coagulation

B. electrolysis

C. diffusion

D. peptisation

Answer: D

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12. Which of thefollowing electrolytes will have maximum coagulating valuefor $\frac{Agl}{Ag^{+}}$ Sol?

A. Na_2S

B. Na_3PO_4

C. Na_2SO_4

D. NaCl

Answer: B

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13. A collodial system having a solid substances as a dispersed phase and liquid as dispersion medium is classified as:

A. solid sol

B. gel

C. emulsion

D. sol

Answer: D

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14. Which of the following process is responsible for the formation of delta at place where river meets sea?

A. Emulsification

B. Colloid formation

C. Coagulation

D. Peptisation

Answer: C

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15. When an execess of very dilute aqueous solution lf KI is added to a very dilute aqueous solution of silver nitrate , the collodial particles of silver iodide are associated with which of the following helmholtz double layer?

A. $Ag : Ag^{+} : I^{-}$

B. $AgI : K^{+} : NO_3^{-}$

C. $AgI : NO_3^{-} : Ag^{+}$

D. $AgI : I^{-} : K^{+}$

Answer: D

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16. The ratio of number of moles of $AgNO_3$, $Pb(NO_3)_2$ and $Fe(NO_3)_3$ required for coagulation of a definite amount of collodial sol of silver iodide prepared by mixing $AgNO_3$ with excess of Ki will be:

A. $1:2:3$

B. $3:2:1$

C. $6:3:2$

D. $2:3:6$

Answer:

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17. Gelatin is mostly used in making ice creams in order to:

A. prevent formation of collodial sol.

B. enrich fragrance

C. prevent crystallisation and stablise the mix.

D. modify the taste.

Answer:

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Other Important Questions Answers Ii Answer The Following Questions

1. Give three examples of adsorption

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2. Distiguish between adsorption and absorption.

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3. What are adsorbent and adsorbates ?Give examples

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4. What is an interface ?

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5. Meantion the characteristicks of adsorption.

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6. What do you understand by the term sorption ?

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7. What is the term used for sorption of gases on metal suface?

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8. Give three examples for chemical adsorption or chemisorption.

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9. Give two examles of physical adsorption

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10. Explain the nature of the force of attraction that exist between an adsorbent and a adsorbent in (i) physical adsorption ad (ii) chemisorption.

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11. Why is adsorption exothermic?

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12. 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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13. What are adsorption isothermic and isobars Explain.

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14. Derive Freundlich adsorption isothermic.

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15. Explaine the application of adsorption (i) in the use of gas masks , (ii) in the use of softening hard water ,(iii) in decolorisation of sugar.

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16. What are adsorption indicators?

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17. Distiguish between homeogenous catalysis and hetrogenous catalysis with suitable examples.

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18. Name the catalyst used in the following :

(i) Habers process in the manufacture of ammonia.

(ii) Oxidation of ammonia.

(iii) Hydrogenation of alkenes .

(iv) Decomposition of H_2O_2

(v) Formation of acetophenone from benzene and ethanoyl chloride . Also give equations for the reaction.

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19. Mention the characteristic s of catalysts .

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20. What are promoters ? Explaine with an example

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21. Explain the action of anhydrous aluminium chloride in Friedel = crafts reaction.

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22. Give the mechanism of the following reaction bases on intermadiate formation theory

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23. Mention the limitations of intermediate compounds formation theory of catalysis.

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24. Explaine the salient features of adsorption theory of catalysis.

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25. What are active centre ? How does the presence of active centre influence the rate of caralysed reaction?

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26. What is the role of a promoter in hetrogeneous catalysis?

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27. What are catalytic poison ? How do they affect a catalysed reaction?

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28. Give some examples of enzyme catalyses.

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29. Briefly outline the charachteristicks of enzyme catalysed reaction.

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30. Explaine phase transfer catalysis with an example.

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31. Name the dispersed phase and dispersed medium in the folowing : fog dust , sharing cream , milk, paints.

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32. Give the name of the collodial and one example for (i) a gas dispered in solid , (ii) a liquid dispersed in a solid (iii) a solid dispersed in a solid.

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33. Briefly outline the principal involved in the preparation of collodial solution by dispersion methods .

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34. Explain how collodial particles of metal are prepared by electro dispersion method.

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35. Explaine peptisation with an example.

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36. Explaine the principle involved the preparation of collodial by condensation method .

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37. What is the principle involved in the purifiacation of collodial solution by dialysis?

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38. Explaine why ? (i) collodial particles are not visible to the naked eye,(ii) collodial partiles pass through ordinary filter paper ,(iii) the sky apears blue , (iv) finist gold sol is red in colour.

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39. Explaine Tyndall effect .

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40. Give an account of Brownian movement.

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41. Explaine the term electrophorosis.

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42. Give example for positively charged and negatively charged colloids.

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43. Account for the charge on collodial particles.

View Text Solution

44. Account for the stability of a colloid.

View Text Solution

45. Explaine the term coagulation ot flocculation .

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46. Peptising agent is added of convert precipitate into collodial solution . Give reason.

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47. Explaine what is observed (i) when a beam of light is passed through the collodial solution , (ii) an electrolyte , NaCl is added to freeic hydroxide solution (iii) electric current is passed through a collodial solution .

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

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49. A collodial is formed by adding $FeCl_3$ in excess of hot water . What will happen is excess of feric chloride is added to this colloid?

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50. How does boling of a colloid helps the coagulation of a collodial solution?

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51. Explaine protective action of lyophilic colloids.

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View Text Solution

52. Define gold number . Mantion its use.

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53. What are emulsion ? Mention various types of emulsion.

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54. Give one example each for (i) oil in water and (ii) water in oil emulsions.

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55. What is emulsification?

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56. What is an emulsifier or emulsifcation agent?

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57. Mention the properties of emulsion .

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