CHEMISTRY

BOOKS - R SHARMA CHEMISTRY (HINGLISH)

SURFACE CHEMISTRY

Follow Up Test 1

1. Which of the following is wrong ?

A. Boundary separating two bulk phase is also known as surface of interface.

B. Interface is represented by separating the bulk phases by a hyphen or a slash.

C. There is no interface between gases

D. The bulk phases are always pure compounds.

Answer: A

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2. When a finely divided active carbon or clay is stirred into a dilute solution of a dye, we observe that the intensity of colour in the solution is decreased on account of

A. adsorption

B. adsorption

C. desorption

D. sorption

Answer: B

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3. The term adsorption refers strictly to the existence of an concentration of any particular component (molecular species) at the surface of a liquid or solid phase than is present in the bulk.

A. higher

B. lower

C. higher or lower

D. equal

Answer: A

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4. The cause of adsorption is the presence of _____on the surface of a liquid or a solid.

A. pores

B. cores

C. channels

D. residual forces

Answer: D

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5. Occlusion is the absorption of a

A. gas into the bulk of a solid

B. gas into the bulk of a liquid

C. liquid into the bulk of a solid

D. liquid into the bulk of a liquid

Answer: A

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6. Which of the following is correct regarding adsorption ?

A. ΔG is negative, but ΔH and ΔS are positive

B. ΔG and ΔH are negative, but ΔS is positive

C. ΔG and ΔS are negative, but ΔH is positive

D. ΔG , ΔH , and ΔS are alll negative

Answer: D

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Follow Up Test 2

1. If the adsorbate is held on the surface of an adsorbent by force of van der Waals type, the adsorption is called

A. van der Waals adsorption

B. physical adsorption

C. physisorption

D. All of these

Answer: D

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2. If the force holding the adsorbate are nearly as storng as experienced in usual chemical bonding, the adsorption is given the name

A. chemisorption

B. chemical adsorption

C. Langmuir adsorption

D. all of these

Answer: D

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3. A given surface of an adsorbent does not show any prefence for physical adsorption of a

particular gar because the vander Waals' forceS are

A. weak

B. universal

C. strong

D. intermediate

Answer: B

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4. The extent of adsorption of a gas depends upon the

A. nature of the adsorbate

B. nature of the adsorbent

C. specific area of the adsorbent

D. All of these

Answer: D

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5. Which of the following gases is adsorbed most by activated charcoal?

A. SO_2

B. CH_4

C. H_2

D. All are equally adsorbed

Answer: A

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6. Enthalpy of chemisorption is as high as_____$KJmol_{-1}$.

A. 400

B. 240

C. 80

D. 40

Answer: A

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7. Adsorption is accompanied by the evolution of heat. Thus, according to Le Chatelier's principle the amount of surface adsoebed should

(i) decrease with increase in temperature

(ii) decrease with decrease in temperature

(iii) increase with increase in temperature

(iv) increase with decrease in temperature

A. $(ii), (iii)$

B. $(i), (iii)$

C. $(i), (iv)$

D. $(ii), (iv)$

Answer: C

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8. Which of the following gas molecules have minimum value of enthalpy of chemisorption on an iron surface?

A. NH_3

B. H_2

C. CO

D. C_2H_4

Answer: B

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9. Multilayer adsorption occurs in

A. chemical adsorption

B. physical adsorption

C. both of these

D. None of these

Answer: B

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10. Which of the following expressions describes Freundlich adsorption isotherm?

A. $x/m = kP^n$

B. $x/m = k\sqrt{P}$

C. $x/m = kP^{1/n}$

D. $x/m = P^{1-n}$

Answer: C

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11. Langmuir's adsorption equation which describes the amount of gas adsorbed on a solid surface is written as

$$\frac{P}{x/m} = \frac{1}{ab} + \frac{P}{b}$$

where x/m is the extent of adsorption, a and b are constants and P is the gas pressure. On

the basis of the above equation indicate which of the following statements is correct ?

A. At low vslue of P, $x/m \propto P$

B. At high value of P, $\frac{x}{m} \rightarrow a/b$ (i.e adsorption is indenpendent of pressure)

C. Between the low and high values of P , the above equation becomes $x/m = kP^{1/n}$, which is the Freundlich equation (here K and n are constant).

D. All of these

Answer: D

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12. Which of the following separations is possible due to different adsorption tendencies of the solutes of a solution ?

A. chromatographic separation

B. gravity separation

C. magnetic separetion

D. hydraulic separation

Answer: A

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Follow Up Test 3

1. The role of a catalyst in a chemical reaction is no change the

A. yield of the final products

B. heat of the reaction

C. activation energy

D. equilibrium concentration

Answer: C

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2. Which of the following is an example of an autocatalytic reaction ?

A. Hydrogenation of vegetable oil using Ni Catalyst

B. Breakdown of $._{6}^{14}C$

C. Thermal decomposition of a mixture $KClO_3$ and MnO_2 .

D. Decomposition of nitroglycerine

Answer: D

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3. Which is wrong in case of enzyme catalysis ?

A. Enzymes are highly reactiojn specific

B. An enezyme raises activation energy

C. Enzymes work at an optimum pH level

D. Enzymes work best at an optimum temperature

Answer: B

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4. Which of the following statement is incorrect ?

A. Thermite process requires Mg as a catalyst

B. V_2O_5 is used as a catalyst in the oxidation of SO_2 to SO_3 .

C. Iron is used as a catalyst in the hydrogenation of oil.

D. Deacon process requires $CuCl_2$ as a catalyst

Answer: C

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5. Enzymes

A. lose their activity above $40^{\circ} C$

B. can catalyze any reaction

C. do not act as catalysts in biochemical reactions.

D. are catalysts found in organisms

Answer: D

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6. During the titration of oxalic acid againts $KMnO_4$, the auto catalyst used is

A. Mn^{2+}

B. H^+

C. CO_2

D. MnO_4^{2-}

Answer: A

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7. Which of the following is known as a Ziegler-Natta catalyst ?

A. $TiCl_2 / AlCl_3$

B. $FeSO_4 / H_2O_2$

C. $TiCl_4 / Al(C_2H_5)_3$

D. $AlCl_3 / CuCl_2$

Answer: C

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8. Which of the following statement is incorrect ?

A. A catalyst does not get used up in a reaction

B. A catalyst does not alter the equilibrium

C. A catalyst modifiles the rate of a reaction without itself getting used up in the reaction.

D. A catalyst functions indefinitely

Answer: D

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9. Which of the following is known as Wilkinson's catalyst?

A. $RhCl(PPh_3)_3$

B. $Ir(CO)(PPh_3)_3$

C. $TiCl_4$

D. $RhCl(PPh_3)_3$

Answer: A

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10. The enzyme which can catalyse the conversion of glucose to ethanol is

A. diastase

B. maltase

C. invertase

D. zymase

Answer: D

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11. Which of the following catalyse is employed is contact process for the manufacture of sulphuric acid?

A. Platinised asbestos

B. Vanadium pentoxide

C. Platinised asbestos or vanadium pentoxide (V_2O_5) , temperature $673 - 723K$.

D. Finely divided iron, molybdenum as promoter, condi-tions, 200 bar pressure and $723 - 773K$ temperature

Answer: C

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12. The enzyme activity is increased in the presence of certain substances, known as

A. isoenzymes

B. coenzymes

C. subsienzymes

D. vitalenzymes

Answer: B

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13. The catalytic converter in the car's exhaust system which converts polluting exhaust gases into non-toxic one contains a _____ catalyst.

A. heterogeneous

B. enzyme

C. homogeneous

D. acid-base

Answer: A

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Follow Up Test 4

1. Substances which diffused rapidly through water and certain membranes were called

A. emulsions

B. crystalloids

C. gels

D. colloids

Answer: B

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2. A colloidal system consists of

A. a dispersed phase only

B. a dispersioin medium only

C. a dispered phase and a dispersion medium

D. $NaCl$ and water

Answer: C

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3. Solutions differ from colloids mainly in respect of their

A. solubility

B. particle nature

C. particle size

D. electric behaviour

Answer: C

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4. Particles of _____ are certainly visible under a microscope

A. true solution

B. colloidal system

C. suspension

D. all of these

Answer: C

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5. Which of the following is a true solution?

A. copper sulphate solution

B. mudddy water

C. cement

D. milk

Answer: A

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Follow Up Test 5

1. Depending upon whether the dispersed phase and the dispersion medium are solids, liquids or gases _____ types of colloidal systems are possible.

A. three

B. six

C. eight

D. nine

Answer: C

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2. Sol is a general term usually applied to

A. a solid dispersed in a liquid

B. a solid dispersed in a solid

C. a solid dispersed in a gas

D. all of these

Answer: D

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3. Which of the following statements is correct?

A. Emulsion is the general term used for a colloid formed by the dispersion of a liquid in a liquid.

B. Dispersion of either a solid or liquid in a liquid in a gas forms an acrosol.

C. Dispersion of a solid in a solid forms a solid sol

D. All of these

Answer: D

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4. Which of the following colloidal systems is called a foam?

A. Gas dispersed in a liquid

B. Gas dispersed in a solid

C. Solid dispersed in a liquid

D. Gas dispersed in a gas

Answer: A

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5. Pumice stone and foam rubber are examples of

A. gels

B. emulsions

C. solid foams

D. liquid foams

Answer: C

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6. If the dispersed phase is a solid and thye dispersion medium is a liquid, then colloidal system is known as a/an.

A. gels

B. sol

C. solid foams

D. emulsion

Answer: B

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Follow Up Test 6

1. Which of the followimg statements is correct?

A. If the mutual affinity between the dispersed phase and dispersion medium is great, the colloidal system is solid to be lyophilic.

B. If the mutual affinity between the dispersed phase and dispersion medium is small, the colloidal system is solid to be lyophilic.

C. In a sol if water is the dispersion medium, the system is termed

hydrophobic

D. All of these

Answer: D

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2. Which one of the following is an example of a hydrophobic colloidal sol?

A. A starch solution in water

B. A gold sol

C. A jelly

D. A gelatin

Answer: B

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3. Which one of the following is an example of a hydrophilic colloidal sol?

A. Rubber in benzene

B. Rubber in water

C. Starch in alcohol

D. As_2S_3 in benezene.

Answer: B

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4. Which of the following statements is incorrect?

A. In a lyophilic sol, the presence of an electrolyte is not essential for stability

B. Lyophilic sols are reversible

C. In Lyophobic sols, colloidal particles do not migrate in an electric field

D. Ultramicroscopic imaging of lyophobic sols shows particles in motion

Answer: C

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Follow Up Test 7

1. Depending upon the type of the particles of the dispersed phase, colloids are classified as.

A. multimolecular colloids

B. macromolecular colloids

C. associated colloids

D. all of these

Answer: D

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2. Which of the following is naturally occurring macromolecular colloid?

A. Nylon

B. Cellulose

C. Gold sol

D. Sulphur

Answer: B

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3. Which of the following statements is correct in the context of micelles?

A. Micelles are ture solutions

B. Micelles are formed below critical micelle concentration.

C. Micelles are formed above critical micelle concentration.

D. Micelles are not associated colloids

Answer: C

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4. Micelles are formed above a particular temperature called

A. Kraft temperature

B. Boyle temperature

C. absolute temperature

D. critical temperature

Answer: A

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5. Which of the following is correct in the context of sodium stearate, $CH_3(CH_2)_{16}COO^-Na^+$.

A. It is a major component of many bar soaps

B. The $-COO^-$ group is the polar-ionic head and is hydrophilic

C. The $R-$ group is the nonpolar- tail and is hydrophobic

D. All of these

Answer: D

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6. Grease (or oil) can be removed from the surface of clothes by washing with soap water. Which one of the following is true in the context of the above statement?

A. The polar-ionic heads of the soap molecules dissolve in grease.

B. The nonpolar tails of the soap molecules are hydrophilic and so these molecules are easily dissolve in water.

C. The nonpolar tails of the soap molecules dissolve in grease.

D. The polar-ionic heads of the saop molecules are hydrophobic and thus

these molecules are easily dissolved in grease.

Answer: C

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Follow Up Test 8

1. Which of the following condensation methods is used to prepare colloidal solution of arsenious sulphide?

A. Double decomposition

B. Oxidation

C. Reduction

D. Hydrolysis

Answer: A

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2. When a true solution is mixed with an excess of the other solvent in which the solute

is insoluble but solvent is miscible, a _____ is obtained

A. lyophilic sol

B. hydrophobic sol

C. lyophobic sol

D. hydrophilic sol

Answer: C

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3. In mechanical dispersion, the coarse suspension of the substance is brought into a colloidal state in the dispersion medium by grinding it in a

A. colloid mill

B. ball mill

C. ultraviolet disintegrator

D. all of these

Answer: D

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4. Electrical disintegration or Bredig's arc method cannot be used for the preparation of colloidal sol of _____.

A. potassium

B. platinum

C. silver

D. gold

Answer: A

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5. Peptization is a process of :

A. in which colloidal particles move in an electric field.

B. of purification of colloids

C. of precipitation of colloidal particles

D. of dispersing precipitates into colloidal sols

Answer: D

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6. Which of the following colloidal sols are prepared by shaking the lyophilic material with dispersion medium?

(i) Gelatin , (ii) Gum

(iii) Starch , (iv) Egg albumin

A. $(i), (iv)$

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

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

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

Answer: C

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Follow Up Test 9

1. The process of removing dissolved substance from a colloidal solution by means of diffusion through a suitable membrane is termed as.....

A. dialysis

B. pyrolysis

C. photolysis

D. hydrolysis

Answer: A

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2. The most important application of dialysis is in the purification of

A. urine

B. blood

C. water

D. both (1) and (2)

Answer: B

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3. The separation of colloidal particles from the particles having molecular dimensions is known as

A. electroosmosis

B. electrophoresis

C. electrodialysis

D. electrolysis

Answer: C

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4. The process of separating the colloidal particles from the solvent and solutes present in the collaidal solution by specially prepared

filters, which are permerable to all substances excepts the colloidal particles is known as

A. selective filtration

B. ultrafiltration

C. graded filtration

D. restricted filtration

Answer: B

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5. The usual collodion is a _____ solution of nitrocellulose in a mixture of alcohol and ether.

A. 6%

B. 7%

C. 4%

D. 5%

Answer: C

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6. Ultra-centrifugation used to purify colloidal solution is based on the difference of

A. electrical change

B. density

C. size

D. all of these

Answer: B

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Follow Up Test 10

1. Which of the following colligative properties of colloidal solutions is used to determine the molecular mass?

A. Relative lowering of vapor pressure

B. Elevation of boiling point

C. Depression of freezing point

D. Osmotic pressure

Answer: D

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2. If a strong beam of light is passed through a colloidal sol place in a dark space, the part of the beam gets illuminated. This phenomenon is called

A. Tyndall effect

B. Brownian effect

C. Dorn effect

D. Hardy-Schulze effect

Answer: A

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3. The Tyndall effect is due to the fact that colloidal particles___ light in all directions in space.

A. reflect

B. refract

C. scatter

D. diffract

Answer: C

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4. Storng Tyndall effect is observed only when

(i) the refractive indices of the dispersed phase and the dispersion medium differ greatly in magnitude

(ii) the diameter of the dispersed particles is biggest than the wavelength of the light used

(iii) the refractive indices of the dispersed phase and the dispersion medium are similar

(iv) the diameter of the dispersed particles is not much smaller than the wavelength of the light used.

A. $(i), (ii)$

B. $(i), (iv)$

C. $(iii), (iv)$

D. $(ii), (iii)$

Answer: B

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5. Typdall effect is used to distinguish between a colloidal solution and a true solution. Zsigmondy (1903) used Tyndall effect to set up an apparatus known as

A. ultramicroscope

B. submicroscope

C. paramicroscope

D. tunnelingmicroscope

Answer: A

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6. Three beams of white light passing through a colloid of sulphur particles in water change from orange to pink and blush green because the colour of colloidal solution depends on the

A. wavelength of light scattered by the dispersed particles.

B. size of the colloidal particles

C. position of viewers

D. all of these

Answer: D

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7. The cause of Brownian-movement is

A. the attractive force between the colloidal particales and the molecules of the dispersion medium.

B. heat change in liquid state

C. convectional current

D. the collision of the molecules of the dispersion medium with the calloidal particles

Answer: D

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8. The most important property of lyophobic colloidal dispersion is that the colloidal particles always carry an electric change. The

nature of this charge is the same on all the particles in a given colloidal solution and may be either positive or negative. Which of the following is an electronegative colloid?

A. Arsenious sulphide sol

B. Ferric hydroxide sol

C. Haemoglobin

D. Methylene blue

Answer: A

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9. The charge on the lyophobic sol particles is due to

A. electron capture by sol particles during electrodispersion of metals

B. preferential adsorption of ions from solution

C. formulation of electrical double layer

D. all of these

Answer: D

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10. Which of the following statements is correct?

A. If freshly formed precipitate of stannic oxide is peptized by a small amount hydrochloric acid, the sol carries a positive charge but if peptized by a small amount of sodium hydroxide, the sol carries a negative cahrge.

B. If a dilute solution of silver nitrate is added to a slight excess of a dilute solution of potassium iodide, a negatively charged sol of silver iodide is formed. But if a dilute solution of potassium iodide is added to a slight excess of dilute solution of silver nitrate, a positively charged sol of silver iodide is formed

C. If Fe Cl_3 is added to excess of hot water, a positively charged sol of hydrated ferric oxide is formed by when ferric chloride is added to $NaOH$, a negatively charged sol is obtained.

D. All of these

Answer: D

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11. Electrokinetic potential (or zeta potential) is the

A. potential difference between the fixed layer and the diffused layer of opposite charges

B. potential energy of colloidal particles

C. potential required to bring about coagulation of a colloidal sol.

D. potential required to give the particles a speed of $1 cm / \sec$ in the sol

Answer: A

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

A. electro-osmosis

B. electrodialysis

C. electrophoresis

D. electrolysis

Answer: C

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13. Process of aggregation of colloidal particles into an insoluble precipitate by the addition of some suitable electrolye is known as

A. coagulations

B. flocculation

C. peptization

D. precipitation

Answer: A

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14. The coagulation of the lyophobic sols can be carried out by

A. electrophoresis

B. persistent dialysis

C. addition of electrolytes

D. all of these

Answer: D

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15. The minimum amount of an electrolyte in_____ that must be added to one litre of a colloidal solution so as to cause its complete

coagulation in two hours is called the precipitation or coagulation value of the electrolyte.

A. milligrams

B. moles

C. milli moles

D. grams

Answer: C

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16. The capacity of an ion to coagulate a colloidal solution depends on

A. the magnitude of charge only

B. its size only

C. both the size of ion and the magnitude of charge in it

D. both sign and magnitude of charge.

Answer: D

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17. Which of the following sols are relativity difficult to coagulate?

A. (i), (iii)

B. (ii), (iii)

C. (i), (ii)

D. (iii), (iv)

Answer: B

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18. Which of the following is a protective colloid?

A. Gelatine

B. Potato starch

C. Egg albumen

D. All of these

Answer: D

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19. To measure the protective action of action of different lyophilic sols quantitatively, the gold number was introduced by Zsig-mondy. It is defined as the minimum number of dry protective colloid which much be added to $10ml$ of a specially prepared red gold sol just to prevent a change to vlolet (i.ie an incease in particle size) on the addition of $1ml$ of 10 precent sodium chloride solution.

A. millimoles

B. grams

C. milligrams

D. moles

Answer: C

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20. Which of the following is the best protective colloid?

A. Potato starch

B. Gurn arabic

C. Egg albumen

D. Gelatine

Answer: D

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Follow Up Test 11

1. Emulsions are colloids in which both dispersed phase and dispersion medium are

A. liquids

B. solids

C. gases

D. vapors

Answer: A

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2. Which of the following is an example of oil in water emulsion?

A. Cod liver oil

B. Butter

C. Cold cream

D. Vanishing cream

Answer: D

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3. The principal emulsifying agents for O/W emulsions are pro

(i) proteins , (ii) gums

(iii) natural soaps , (iv) synthetic soaps

A. (iii), (iv)

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

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

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

Answer: C

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4. The type of emulsion formed depends upon

A. the relative amounts of the two liquids

B. nature of the emulsifying agent

C. both of these

D. none of these

Answer: C

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5. Which of the following is not correct about emulsions?

A. The droplets in emulsions are often positively charged.

B. They can be precipitated by electrolytes

C. They show Brownian movement

D. They show Tyndall effect

Answer: A

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6. Which of the following techniques are applied for demulsi-fication?

A. Freezing

B. Boiling

C. Centrifugation

D. All of these

Answer: D

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7. Gels are colloids in which the dispersed phase is a_____ and the dispersion medium is a____.

A. liquid, solid

B. solid,liquid

C. gas, solid

D. solid, gas

Answer: A

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8. Which of the following is/are elastic gel?

A. Silica

B. Alumina

C. Gelatin

D. Ferric oxide

Answer: C

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9. Gels on standing exude small amounts of liquid. The phe-nomena is known as

A. Imbibitions

B. syneresis

C. thixotropy

D. swelling

Answer: B

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Follow Up Test 12

1. Which of the following is not a correct statement?

A. The deltas at the mouths of great rivers are formed by the precipitation of the charged, carriedas suspension in the river water, by the action of salts present in sea water.

B. Bleeding due to a cut can be stopped by applying ferric chloride solution due to coagulation of positively charged blood particles by Cl^- ions.

C. Gelatin is added to ice cream as a protective agent so as to preserve its smoothness.

D. The chrome-tanning of leather is brought about by the penetration of

positively charged particles of hydrated chromic oxide into the leather.

Answer: B

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2. Latex is a colloidal solution of rubber particles which are

A. negatively charged

B. positively charged

C. neutral

D. zwitter ions

Answer: A

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3. Which of the following is correct ?

A. Argyrol is a silver sol used as an eye lotion

B. Colloidal antimony is used in curing Kalaazar

C. Colloidal gold is used for intramuscular injection

D. All of these

Answer: D

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4. Cottrell precipitator is a device to coagulate the

A. dirt particles of sewage water

B. mud or clay particles from drinking water

C. solid particles of carbon from smoke

D. colloidal particles of any sol.

Answer: C

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Question Bank Level I

1. All adsorptions occur with release in energy and are found to be exothermic in nature. In an adsorption process, the enthalpy change for adsorption of one____ of adsorbate on an adsorbent surface is called enthaply or heat of adsorption for the particular adsorption.

A. mole

B. gram

C. gram atom

D. gram molecule

Answer: A

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2. The variation in the amount of gas adsorbed by the adsorbent with pressure at constant temperature can be expressed by means of a curve termed as adsorption

A. isobar

B. isotherm

C. isochore

D. isostere

Answer: B

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3. Which one of the following substance is not a colloid?

A. Milk

B. Smoke

C. Ruby glass

D. Chlorophyll

Answer: D

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4. Brownian movement can be seen easily in case of

A. true solution

B. colloidal solution

C. suspension

D. all of these

Answer: B

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5. Micelles are formed above a particular temperature called

A. Critical temperature

B. Boyle temperature

C. Inversion temperature

D. Karft temperature

Answer: D

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Level Ii

1. Which of the following statements is incorrect?

A. Physical adsorption occurs readily at low temperature

B. Physical adsorptionis characterized by small enthalpy of adsorption $\left(20-40KJmol^{-1}\right)$

C. Physicay adsorption is reversible and the adsorption equilibrium is established

rapidly

D. Chemical adsorption occurs at a law temperature

Answer: D

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2. Which of the following expressions describes Freundlich adsorption isotherm?

A. $\log \frac{x}{m} = \log k + \frac{1}{n} \log P$

B. $\log \frac{x}{m} = \log k - \frac{1}{n} \log P$

C. $\log \frac{x}{m} = \log k + n \log P$

D. $\log \frac{x}{m} = \log k - n \log P$

Answer: D

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3. An exothermic chemical reaction is catalyzed by X . Which of the following statements is correct in this context?

A. X decreases E_a

B. X does not affect the equilibrium constant

C. A catalyst is highly specific

D. All of these

Answer: D

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4. In a reversible reaction, a catalyst

A. affects only the reverse reaction

B. affects only the forward reaction

C. affects both the forward and reverse reactions to the same extent

D. increases the rate of forward but deceases the rate of backward reaction.

Answer: C

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5. Which of the following statement is incorrect ?

A. A catalyst initiates a chemical reaction

B. A catalyst remains unchanged in concentration at the end of a reacton

C. A catalyst does not alter the equilibrium in a reversible reaction

D. A catalyst is generally specific in a reaction

Answer: A

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6. The size of a particle in a colloidsal solution is

A. of the order of molecular size $(1m\mu)$

B. greater than $1m\mu$

C. within the range $1\mu - 1m\mu$

D. none of these

Answer: C

Watch Video Solution

7. Which of the following statement is incorrect ?

A. A colloidal solution is also known as a sol

B. If the dispersion medium is an organic liquid, the system is termed organosol.

C. If the dispersion medium is water the system is termed hydrosol.

D. If the dispersion medium is an organic liquid, the system is termed aquasol.

Answer: D

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8. If the dispersed phase is a liquid and the dispersion medium is a solid , the collide is known as a/an

A. an emulsion

B. a foam

C. a soid sol

D. a solid emulsion

Answer: D

9. Which of the following is an example of a solid aerosol ?

A. Smoke

B. Fog

C. Cloud

D. Mist

Answer: A

 Watch Video Solution

10. Substances that form aggerated particles (micelles) at higher concentration are known as

A. associated colloids

B. lyophilic colloids

C. multimolecular colloids

D. lyophobic colloids

Answer: A

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11. The blue colour of the sky is duo to

A. scattering of light due to the ozone layer

B. scattering of light from the sun

C. scattering of light from particles of dust in the atmosphere

D. all of these

Answer: C

Watch Video Solution

12. Which of the following ions has the least flocculating power?

A. Cl^-

B. SO_4^{2-}

C. PO_4^{3-}

D. $\left[F(CN)_6\right]^{4-}$

Answer: A

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13. Which characteristic is not associated with chemical adsorption?

A. Heat of adsorption is greater than $50KJmol^{-1}$

B. It is irreversible

C. It is not very specific

D. It forms monolayer

Answer: C

Watch Video Solution

14. Adsorption is an exothermic process. The amount of substance adsorbed should

A. increase with decrease in temperature

B. increase with increase in temperature

C. decrease with decrease in temperature

D. decrease with increase in temperature

Answer: D

 Watch Video Solution

15. Fog is a colloid consisting of

A. gas dispersed in a liquid

B. liquid dispersed in a gas

C. gas dispersed in a gas

D. solid dispersed in a liquid

Answer: B

 Watch Video Solution

16. Which one of the following acts as the best coagulating agent for ferric hydroxide sol?

A. Magnesium chloride

B. Potassium ferrocyanide

C. Aluminium chloride

D. Potassium ferricyanide

Answer:

Watch Video Solution

17. Although nitrogen does not adsorb on surface at room temperature, it adsorbs on the same surface at $83K$. Which one of the following statements is correct?

A. At $83K$, there is formation of monomolecular layer

B. At $83K$, there is formation of multimolecular layer

C. At $83K$, nitrogen molecules are held by chemical bonds

D. At $83K$, nitrogen is adsorbed as atoms.

Answer: B

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18. The electrical disintegration method used for perparing the gold sol involves:

A. electrodialysis

B. micelle formation

C. congulation

D. dispersion as well as condensation

Answer: D

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19. Which of the following is an example of heterogeneous catalysis reaction ?

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

B. Hydrolysis of aqueous sucrose solution in the presence of aqueous mineral acid.

C. $2H_2O_2(l) \xrightarrow{Pt(s)} 2H_2O(l) + O_2(g)$

D. Hydrolysis of liquid ester in the presence of aqueous mineral acid.

Answer: C

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20. Bredig's arc method cannot be used to prepare colloidal solution of which of the following

A. Pt

B. Fe

C. Ag

D. Au

Answer: B

Watch Video Solution

21. Milk is

A. fat dispersed in water

B. fat dispersed in milk

C. fat dispersed in fat

D. water dispersed in fat

Answer: A

Watch Video Solution

22. The fresh precipitate can be transformed in colloidal state by

A. peptization

B. coagulation

C. diffusion

D. None of these

Answer: A

Watch Video Solution

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

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

B. $CH_3(CH_2)_{14}CH_2NH_2$

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

D. $OHC(CH_2)_{14}CH_2COO^- Na^+$

Answer: B

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24. surface tension of lyophilic sols is

A. lower than that of H_2O

B. more than that of H_2O

C. equal to that of H_2O

D. None of these

Answer: A

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25. Which is used in ending charge on colloidal solution?

A. Electrons

B. Electrolytes

C. Positively charged sols

D. Compounds

Answer: B

Watch Video Solution

26. Methylene blue, from its aqueous solution, is adsorbed on activated charcoal at $25^{\circ}C$. For 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 irrvessible

Answer: B

Watch Video Solution

27. Among the following electrolytes, which is the most effective coagulation agent for Sb_2S_3 solution?

A. $Al_2(SO_4)_3$

B. NH_4Cl

C. $CaCl_2$

D. Na_2SO_4

Answer: A

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28. Which of the following statement is incorrect ?

A. At the critical micelle concentration (CMC) the surfactant molecules associate

B. The ability of an ion to bring about coagulation of a given colloid depends upon both magnitude and sign of its charge.

C. If a beam of light is passed through true solution then it is visible

D. During dialysis solvent molecules and ions can diffuse

Answer: C

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29. Which one of the following is correctly matched?

A. Solid sol-cake

B. Aerosol-smoke

C. Foam-mist

D. Emulsion-curd

Answer: B

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Level Iii

1. Which of the following is incorrect regarding Langmuir adsoroption isothem?

A. Langmuir desived an adsorption isotherm on theoretical consideration based on kinetic theory of gases.

B. Langmuir isotherm is based on the assumption that every adsorption site is equivalent and that the ability of a particle to bind there is independent of

whether or not nearby sites are occupied.

C. Langmuir considered adsorption to consist of the two opposing processes.

D. The Langmuir isotherm is generally more successful in interpreting the data than the Freundlich isotherm when a multilayer is formed.

Answer: D

 Watch Video Solution

2. Blue rock salt is classified as

A. solid dispersed in a solid dispersion medium

B. liquid dispersed in a liquid dispersion medium

C. liquid dispersed in a solid dispersion medium

D. solid dispersed in a liquid dispersion medium

Answer: A

 Watch Video Solution

3. The coagulation of $100mL$ of a colloidal solution of gold is completely prevented by adding $0.25g$ of starch to it before adding $10mL$ of $10\,\%\,NaCl$ solution. The gold number of starch is

A. 25

B. 2.5

C. 250

D. 0.25

Answer: A

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4. Cow milk is an example of natural emulsion stabilized by

A. lactic acid

B. lactose

C. casein

D. agar

Answer: C

Watch Video Solution

5. The coagulating power of electrolytes having inos $Na^{\oplus}$, Al^{3+} and Ba^{2+} for arsenic sulphide sol increases in the order

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

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

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

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

Answer: D

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6. The critical temperatures of O_2, N_2, H_2 and CO_2 are $154.3K, 126K, 33.2K,$ and $304K$

respectively. The extent of adsorption on tungsten is highest in case of

A. H_2

B. N_2

C. O_2

D. CO_2

Answer: D

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7. Which among the following statements are crrect with respect to adsoption of gases or a solid?

(i) The extent of adsorption is equal to kP^n according to Freundlich isotherm

(ii) The extent of adsorption is equal to $kP^{1/n}$ according to Freundlich isotherm

(iii) The extent of adsorption is equal to $(1+bP)/aP$ according to Langmuir adsorption isotherm

(iv) The extent of adsorption is equal to $ap/(1+bP)$ according to Langmuir isothem

(v) Frecundlch adsorption isotherm fails at low pressure

A. (i) and (ii)

B. (ii) and (iii)

C. (ii) and (iv)

D. (ii) and (v)

Answer: C

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8. Which one of the following is a false statement?

A. Cell fluid is an example of sol

B. Jelly is an example of gel

C. Hair cream is an exmaple of emulsion

D. Cheese is an example of emulsion

Answer:

 Watch Video Solution

9. The coagulation of $200mL$ of a positive colloid took place when $0.73gHCl$ was added to it without changing the volume much. The flocculation value of HCl for the colloid is

a. 36.5 , b. 100 , c. 200 , d. 150

A. 0.365

B. 36.5

C. 100

D. 200

Answer:

Watch Video Solution

10. Given below, catalyst and corresponding process/reaction are matched. The mismatch is

A. $\left[RhCl(P(Ph_3))_2\right]$: Hydrogenation

B. $TiCl_4 + Al(C_2H_5)^3$: Polymerization

C. N_2O_5 : Haber Bosch Process

D. Nickel : Hydrogenation

Answer: C

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11. $10^{-4}g$ of gelatian is required to be added to $100cm^{23}$ of a standard gold sol to just prevent its coagulation by the addition of $1cm^3$ of $10\,\%\,NaCl$ solution to it. Hence the gold number of gelatain is

A. 10

B. 1.0

C. 1

D. 0.01

Answer: D

 Watch Video Solution

12. The colloidal solutions of gold prepared by different methods have different colors due to :

A. variable valency of gold

B. different concentration of gold particles

C. different types of impurities

D. different diameter of colloidal particles

Answer: D

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13. $3g$ of actived chacoal was added to some of acetic acid solution $(0.06N)$ in a flask. After an hour it was filterred and the strength of the filtrate was found to be $0.042N$. The amount of acetic adsorbed (per gram of charcoal) is:

A. $36mg$

B. $42mg$

C. $54mg$

D. $18mg$

Answer: C

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14. The molecular formula of a commercial resin used for exchanging ions in water softening is $C_8H_7SO_3Na(mol.Wt.206)$.

What would be the maximum uptake of Ca^{2+} ions by the resin when expressed in mole per gram resin?

A. $\frac{1}{206}$

B. $\frac{1}{412}$

C. $\frac{2}{309}$

D. $\frac{1}{103}$

Answer: C

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15. The correct statements pertaining to the adsorption of a gas on a solid surface are

(i) Adsorption is always exothermic

(ii) Physisorption may transform into chemisorption at high temperature

(iii) Physisorption increases with increasing temperature but chemisorotion decrease with increasing temperature

(iv) Chemisorption is more exothermic than physisoption, however, it is very slow due to higher energy of activation

A. $(i), (ii), (iii), (iv)$

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

C. $(i), (iii)$

D. $(ii), (iv)$

Answer: D

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16. Assertion (A): Micelles are formed by surfactant molecules above the critical micellization concentration (CMC) .

Reason(R): The conductivity of a solution

having surfactant molecules decreases sharply at the CMC .

A. Statement 1 is True, statement 2 is True, statement 2 is a corect explanation for statement 1

B. Statement 1 is True, statement 2 is True, statement 2 is a not corect explanation for statement 1

C. Statement 1 is True, statement 2 is False

D. Statement 1 is False, statement 2 is True

Answer: B

Watch Video Solution

17. Gold numbers of protective colloids A, B, C and D are $0.5, 0.1, 010$ and 0.005 respectivaly. The correct order of their protective power is

A. $D < A < C < B$

B. $C < B < D < A$

C. $A < C < B < D$

D. $B < D < A < C$

Answer: C

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18. In Langumir's model of adosrption of a gas on a solid surface :

A. the rate of dissociation of adsorbed molecules from the surface does not depend upon the surface covered.

B. the adsorption at a single site on the surface may involve multiple molecules at the same time

C. the mass of gas striking on a given area of surface is independent of the pressure of the gas

D. the mass of gas striking on a given area of surface is proportional to the pressure of the gas

Answer: D

Watch Video Solution

19. 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. $\frac{V_C}{V_S} \approx 10^3$

B. $\frac{V_C}{V_S} \approx 10^{-3}$

C. $\frac{V_C}{V_S} \approx 10^{23}$

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

Answer: A

Watch Video Solution

20. The dispersed phase in colloidal iron (III) hydroxide and collodial gold is positively and negtively charged respectively with of the following statement is not correct ?

A. Sodium sulphate solution causes coagulation in both sols

B. Mixing the sols has no effect

C. Coagulation in both sols can be brought about by electrophoresis

D. Magnesium chloride solution coagulates the gold sol more readily than the iron (III) hydoxide sol.

Answer: B

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21. Which of the following statements is incorrect?

A. Freundlich equation for adsorption of gases (xg) on a solid (mg) at constant temperature can be expressed as

$$\log. \frac{x}{m} = \log K + \frac{1}{n} \log P$$

B. If a liquid is dispersed in solid medium then this is called as gel

C. Ziegler-Natta catalyst $\left[Al(C_2H_5)_3 + TiCl_4\right]$ is used for linear polymerisation to prepare high density polythylene $(HDPE)$

D. Enthalpy of adsorption is low and positive

Answer: D

Watch Video Solution

22. Which of the following statements is not correct?

A. The number of mols of lead nitrate needed to coagulate 2 mol of $[AgI]I^-$ is $1/2$

B. Dalda is prepared from oils by reduction

C. The color of sky is due to wavelength of sacttered light

D. The basic principle of cottrell precipitator is neutralization of charge on colloidal particles.

Answer: A

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23. Which of the following is not correct?

A. Peptisation is the process in which precipitates are converted into colloids

B. The physical states of dispersing phase and dispersion medium in colloid like pesticide spray respectively are liquid and gas

C. $\Delta G \angle 0, \Delta S \angle 0$ and $\Delta H \angle 0$ for adsorption.

D. Manufacture of sulphuric acid by lead chamber process is a heterogeneous catalysis

Answer: D

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24. Which of the following statements is not correct?

A. Lyophilic sols are self-stabilized

B. Adsorption of gases on solid surface is generally exothermic because entropy decreases

C. Metal sulphides from lyophilic sols

D. When H_2S gas is passed through nitric acid, the product is colloidal particles of amorphous sulphur

Answer: C

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Level Iv

1. For the coagulation of $100mL$ of arsenious sulphide solution $5mL$ of $1MNaCl$ is reqired.

The coagulating power of $NaCl$ is

A. 50

B. 47.6

C. 52.4

D. 0.0476

Answer: B

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2. Which of the following is used to produce smoke screens?

A. Calcium

B. Zinc sulphide

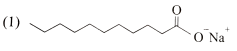
C. Sodium carbonate

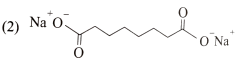
D. Zinc phosphate

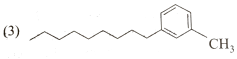
Answer: A

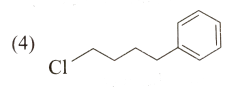
 Watch Video Solution

3. Which of the following molecules is most suitable to disperse benzen in water?

A. 

B. 

C. 

D. 

Answer: A

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4. The formation of a colloidal from suspension is

A. peptisation

B. condensation

C. sedimentation

D. fragmentation

Answer: D

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5. Among the following, which surfactant will form micelles in aqueous solution at the lowest molar concentration at ambient conditions?

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

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

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

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

Answer: B

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6. Plot of log x/m against log p is a straigh line inclined at an angle of 46° . When the pressure is 0.5 atom and Freundlich parameter k is 10.0 , the amount of the solute adsorbed per gram of adsorbent will be $(\log 5 = 0.6990)$:

A. $2g$

B. $1g$

C. $5g$

D. $3g$

Answer: C

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Archives

1. 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. $I > II > III$

B. $II > I > III$

C. $III > II > I$

D. $III > I > II$

Answer: C

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2. Which one of the following chargcterisitic is associated with adsorption?

A. ΔG and ΔS are negative but ΔH is positive

B. ΔG is negative but $\Delta H$and ΔS are positive

C. ΔG , ΔH and ΔS all are negative

D. ΔG and ΔH are negative but ΔS is positive

Answer: C

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

A. Coagulation

B. Electrophoresis

C. Electroosmosis

D. Tyndall effect

Answer: D

Watch Video Solution

4. Which of the following statements of correct for the spontaneous adsoption 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 highly negative.

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

Answer: B

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5. In frenudlich 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 cases of physical adsorption

D. 1 in cases of chemisorption

Answer: A

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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

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7. The ease of adsorption of the hydrated alkali metal ions om ion-exchange resins follows the order:

A. $Li^+ < K^+ < Na^+ < Rb^+$

B. $Rb^+ < K^+ < Na^+ < Li^+$

C. $K^+ < Na^+ < Li^+$

D. $Na^+ < Li^+ < K^+ < Rb^+$

Answer: B

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8. 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: B

Watch Video Solution

9. If x is the amount of adsorbate and m is the amount of adsorbent, which of the following relation is related to adsorption process?

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

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

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

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

Answer: A

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10. The Langmuir adsorption isotherm is deduced using the assumption.

A. The heat of adsorption varies with coverage

B. The adsorbed molecules interact with each other

C. The adsorption takes place in multilayers.

D. The adsorption sites are equivalent in their ability to adsob the particles.

Answer: D

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11. A plt of log $\frac{X}{m}$ vs. log P for the adsorption of a gasd on a solid gives a straight line with slope equal to :

A. log K

B. $-\log K$

C. n

D. $1/n$

Answer: D

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

A. Glucose

B. Urea

C. Dodecy trimethyl ammonium chloride

D. Pyridinimum chlroide

Answer: C

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13. which of the following forms cationic micelles above certain concentration?

A. Cetyltrimethy lammonium bromide

B. Sodium dodecyl sulphate

C. Sodium acetate

D. Urea

Answer: A

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14. Which of the following statements about the zeolites is false?

A. They are used as cation exchangers

B. They have open structures which enables them to take up small molecules

C. They are aluminosilicates having three dimensional network

D. In zeolites some of rthe SiO_4^{4-} anions are replaced by AlO_4^{5-} and AlO_6^{9-} ions.

Answer: D

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15. According to the adsorption theory of catalysis the speed of the reaction increases because

A. adsorption lowers the activetion energy of the reaction

B. the concentration of reaction molecules at the active centres of the catalyst becomes high due to adsorption

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

D. adsorption produces heat which nincrease the speed of the reaction

Answer: A

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16. Position of nonpolar and parts in micells is

A. Polar at outer surface but nonpolar at inner surface

B. Polar at inner surface but nonpolar at outer surface

C. Distributed all over the surface

D. Present in the surface only

Answer: A

Watch Video Solution

17. Which is not correct regarding the adsorption of a gas on surface of a solid?

A. It is reversible in nature

B. Adsorption is more for some specific substance

C. On increasesing temperature, adsorption increases continuosly

D. Enthalpy and entropy changes are negative

Answer: C

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18. The method usually employed for the precipitation of a colloidal solution is

A. dialysis

B. condensation

C. diffusion through animal membrane

D. addition of electrolytes

Answer: D

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