CHEMISTRY

JEE MAIN AND ADVANCED

SURFACE CHEMISTRY

Example

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

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2. In which of the following does adsorption take place and why?

(i) Silica gel placed in the atmosphere saturated with water

(ii) Anhyd. $CaCl_2$ place in the atmosphere saturated with water.

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3. Which adsorption has high energy of activation?

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4. Which adsorption is specific and which is not specific in nature?

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5. What is the effect of surface area on adsorption?

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6. 50 ml of 1 M oxalic acid (mol. wt. = 126) is shaken with 0.5 g of wood charcoal. The final

concentration of soultion after adsorption is 0.5 M. Calculate the amount of oxalic acid adsorbed

per gram of charcoal.

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

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8. Write the name of two substances which can act as catalytic posons.

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9. By which process ammonia is manufactured? Which catalyst is used in Haber's process?

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10. Which catalyst is used in the preparation of CH_3OH by the reaction of $CO(g)\&H_2(g)$?

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11. Write the name of groups of periodic table from which catalytic actibity of metals increases

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12. Write five characteristics of enzyme Catalysis.

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13. What is the name of most accepted mechanism of enzyme catalysis?

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14. Give two differences between lyophilic and lyophobic colloids.

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15. Give two examples of each

(i) Aerosol (ii) solid sol

(iii) Foam

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16. Which type of compound can form micelles? Give example

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17. By which process colloids of metals are prepared?

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

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19. What is Hardy- Schulze law?

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20. How lyophobic colloids prevented from coagulation?

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21. Define zeta, potential.

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22. Graph between log x/m and log P is a straight line at angle of 45° with intercept 0.4771 on y-axis. Calculate the amount of gas adsorbed in gram per gram of adsorbent when pressure is 3 atm.

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23. For the coagulation of 100 ml of arsenious sulphide sol, 5 ml of 1 M KCI is required What is

The coagulating power fo KCl?

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24. On addition of $1mL$ solution of $10\,\%\,NaCl$ to $10mL$ gold sol in the presence of $0.0250g$ of starch, the coagulation is just prevented. What is the gold number of starch?

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Try Yourself

1. Why is adsorption always exothermic ?

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2. What is the effect on entropy change $(\triangle S)$ in adsorption?

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3. Which adsorption takes place at low temperature?

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4. Low temperature is favourable for ..... reactions.

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5. Which type of gases are readily adsorbed by solids?

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6. Write any two characteristics of Chemisorption.

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7. Why does physisorption decrease with increase in temperature ?

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8. What is the change in mass and composition of catalyst after the completion of cheical

reactions?

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9. Write the name of scientist who suggested the term catalyst first?

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10. Metals of how many groups of periodic table show macimum catalytic activity.

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11. Which catalyst is used to convert alcohol directly to petrol?

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12. What are optimum temperature and pH for the enzymes to act best ?

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13. Which enzyme converts milk into curd?

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14. By which method precipitate is converted into colloids?

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15. Give one example each of multimolecular and macro-molecular colloids.

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17. What is the dispersed phase and dispersion medium in gel?

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19. Write the name of four methods to coagulate lyphobic colloids

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20. What is most accepted reason for the presence of charge on colloids?

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Assignment Section A

1. The phenomenon of corrosion is a

A. Surface phenomenon

B. Bulk phenomenon

C. Physical change

D. All of these

Answer: A

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2. The interface betbeen a solid and gas may be represented by

(a) Solid - gas (b) Solid + gas

(c) Solid / gas

A. a' and 'b'

B. b' and 'c'

C. a' and 'c'

D. Only 'b'

Answer: C

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3. Which one of the following is not the characteristic of physiorption?

A. Reversible in nature

B. Specific in nature

C. Low adsorption enthalpy

D. Depends on nature of gas

Answer: B

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4. Physisorption

A. Needs high activation energy

B. Depends on the surface area

C. Results into unimolecular layer

D. Increases with the increase of temperature

Answer: B

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5. Freundlich isotherm explains the behaviour of adsorption

A. Correctly

B. Approximately

C. Wrongly

D. At very high temperature only

Answer: B

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6. Which statement is incorrect for chemisorption?

A. It is an exothermic process

B. It increases with increase in surface area

C. It is highly specific

D. It is recersible in nature

Answer: D

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7. Name the catalyst and promoter in the Haber's process for the manufacture of ammonia.

A. Fe and Mo

B. Mo and Fe

C. Ni and Mo

D. Fe and Ni

Answer: B

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8. Following reaction is an example of

$$4NH_3(g) + 50_2(g) \xrightarrow{Pt(s)} 4NO(g) + 6H_2O(g)$$

A. Homogeneous catalysis

B. Heterogeneous catalysis

C. Enzyme catalysis

D. Peptization

Answer: B

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9. Which one of the following is the source of enzyme pepsin?

A. Stomach

B. Yeast

C. Proteins

D. Mouth

Answer: A

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10. In ostwold's process for the manufacture of nitric acid the catalyst used is

A. Finely divided iron

B. Vanadium pentoxide

C. Platinised asbestos

D. Molybdenum

Answer: C

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11. Dispersed phase and dispersion medium of gel are respectively

A. Solid, liquid

B. Liquid, solid

C. Liquid, gas

D. Gas, liquid

Answer: B

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12. Which of the following is not an example of intrinsic (lyophilic) colloids?

A. Gelatin

B. Albumin

C. Starch

D. Sol of gold

Answer: D

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13. O/W type emulsion means

A. Oxygen dispersed in water

B. Water dispersed in oxygen

C. Oil dispersed in water

D. Water dispersed in oil

Answer: C

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14. During synthesis of ammonia by Haber's process,

'CO' acts is

A. Poison

B. Promoter

C. Catalyst

D. Inert substance

Answer: A

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15. Spontaneous adsorption of a gas on a solid surface is exothermic process because

A. Entropy decreases during process

B. It is exothermic

C. $T \triangle S$ is negative

D. It occurs only at high temperature

Answer: B

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16. The minimum number of millimoles of electrolyte rquired to coagulate one litre of colloidal solution is

A. Gold number

B. Coagulating power

C. Coagulating value

D. Hardy Schulze constant

Answer: C

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17. Freundlich isotherm explains the behaviour of adsorption

A. Room temperature

B. Low pressure

C. High temperature

D. High pressure

Answer: D

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18. In which of the following process adsorption plays an important role?

(a) Froth floatation process

(b) Chromatographic analysis

(c) Control of humidity

(d) heterogeneous catalysis

A. b' 'c' & 'd' only

B. a' 'b' & 'd' only

C. b' & 'd' only

D. All 'a' 'b' 'c' & 'd'

Answer: D

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19. Adsorption Theory Of Heterogeneous Catalysis

A. Formation of colloids

B. Heterogeneous catalysis

C. Electrophoresis

D. All of these

Answer: B

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20. Which statement is not correct for zeolites?

A. These are shape selective catalysts

B. All zeolites convert alcohol directly into.gasoline

C. These are microporous aluminosilicates

D. Many zeolites are found in nature

Answer: B

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21. Enzymes are

A. Biochemical catalysts

B. Nitrogenous organic compounds

C. Produced by living plants and animals

D. All of these

Answer: D

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22. Which of the following is not an example of enzyme catalysed reaction?

A. Hydrogenation of vegetable oils

B. Inversion of cane sugar

C. Conversion of proteins into peptides in intestine

D. Conversion of milk into curd

Answer: A

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23. At what PH range the rate of enzyme catalyzed reaction is maximum ?

A. 1 to 4

B. 5 to 7

C. 7 to 9

D. 9 to 13

Answer: B

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24. Identify the correct order of steps in heterogeneous catalysis.

(i) Adsorption of reactant molecules on the surface of the catalyst.

(ii) Diffusion of reactant to the surface of the catalyst.

(iii) Formation of reactions product on the catalyst surface.

(iv) Diffusion of reactions product from the catalyst surface.

(v) Formation of activated intermediate.

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

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

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

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

Answer: D

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25. Decomposition of urea into ammonia and carbon dioxide is catalysed by

A. Biochemical catalyst

B. Inorganic catalyst

C. Shape selective catalyst

D. All of these

Answer: A

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26. A colloid is a

A. Homogeneous system

B. Heterogeneous system

C. Both (1) & (2)

D. Pure matter

Answer: B

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27. Colloides may be classified on the basis of types of particles of the dispersed phase into

A. Lyophilic colloids and lyophobic colloids

B. Sol, gel, aerosol, emulsion etc

C. Multimolecular, macromolecular and associated colloids

D. Recersible and irreversible colloids

Answer: C

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28. Which of the following groups of colloids contains members of only aerosol?

A. Milk, cloud, froth

B. Paints, dust, fog

C. Cheese, milk, mist

D. Smoke, fog, cloud

Answer: D

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29. Lyophobic colloids

A. May be prepared by simply mixing metals with dispersion medium

B. Are reversible solutions

C. Cannot be easily coagulated

D. Need stabilising agents for their preservation

Answer: D

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30. If $T_k =$ Kraft temperature and CMC = Critical micelle concentration then the formation of micelles takes place only

(i) Below T_k

(ii) Below CMC

(iii) Above T_k

Above CMC

A. (i) and (iv)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i) and (ii)

Answer: C

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31. Which of the following is not a group of macromolecular colloids?

A. Starch, protein, polythene

B. Nylon, synthetic rubber, cellulose

C. Synthetic detergents, sulphur sol, proteins

D. Enzymes, polystyrene, starch

Answer: C

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32. Which one is wrongly match?

A. Micelles - Associated colloids

B. Lyophilic colloids- Reversible solution

C. Cheese - Sol

D. ZSM - 5 - shape selective catalyst

Answer: C

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33. Which is incorrect for cleansing action of soaps?

A. Soap molecules form micelle

B. Hydrophilic part of stearate projects outward of droplet

C. Soap helps in emulsification

D. Negatively charged sheath form aggregates

Answer: D

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34. Colloids can be prepared by

A. Tyndall effect

B. Electrophoresis

C. Dialysis

D. Peptization

Answer: D

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35. Tyndell effect is observed when

A. The diameter of the dispersed partivles is much

smaller then the wavelength of the light used

B. The refractive indices of the dispersed phase and the dispersion medium differ greatly in magnitude

C. Light passes through true solution

D. A single ray of light is focussed on the colloidal aolution

Answer: A, B

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36. Type of collcidal solutions result when $AgNO_3$ Solution is added to Kl solution and when Kl solution is added so $AgNO_3$ soultion are respectively

A. Negatively and postitvely charged

B. Both negatively charged

C. Positively and negatively charged

D. Both positively charged

Answer: A

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37. Zeta potential is the potential difference between

A. Any two colloidal particles having opposite charges

B. The fixed layer and the diffused layer having same charges

C. The layer of adorbed ions and the mobile layer having opposite charges

D. Two colloidal layers having same charges

Answer: C

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38. The movement of colloidal particles under an applied electrical potential is called

A. Precipitation

B. Stabilisation

C. Electrophoresis

D. Brownian movement

Answer: C

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39. The correct order of the flocculating power in the coagulation of a positive sol is

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

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

C. $SO_4^{2-} > PO_4^{3-} > [Fe(CN)_6]^{4-}$

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

Answer: B

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40. Components of milk may be obtained by

A. Heating

B. Freezing

C. Centrifuging

D. Both (1) & (3)

Answer: D

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41. Which is the incorrect statement

A. Emulsions of oil in water are unstable

B. Emulsifying agent stavilises an emulsion

C. For stabilisation of W/O emulsion soap is used

D. The droplets in emulsions can be precipitated by electrolytes

Answer: C

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42. According to Hardy-Schulze rule for greater power of precipitation flocculating ion should have greater

A. Size

B. Mass

C. Valence

D. Number of electron

Answer: C

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43. Which of the following does not represent freundlich adsorption isotherm?

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

B. $n \log \frac{x}{m} = \log p + n \log k$

C. $\frac{x}{m} = kp^{\frac{1}{n}}$

D. $\left(\frac{x}{m}\right)^n = kp$

Answer: D

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

A. Ultrafiltration

B. Dialysis

C. Bredig Arcs method

D. Cataphoresis

Answer: B

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45. Water vapours can be adsorbed and absorbed respectibely by

A. Silica gel and $CaCl_2$

B. Chalk and $CaCl_2$

C. $CaCl_2$ and silica gel

D. $CaCl_2$ and chalk

Answer: A

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46. The hydrolysis of ethylmethanoate is slow in beginning and becomes taster after some time as it is autocatalysed by

A. Methanol

B. Ethanol

C. Methanoic acid

D. Ethanoic acid

Answer: C

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47. Colloidion which is solution of nitro-cellulose in a mixture of alcohol and ether is used

A. To coagulate colloidal particles

B. To make ultra filter paper

C. As emulsifying agent

D. For tanning

Answer: B

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48. Cottrell precipitator is used

A. To prepare high quality emulsions

B. To precipitate smoke

C. In purification of water

D. To remove excessive fog for safe landing of aeroplanes

Answer: B

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49. Precipitation occurs when hydrated ferric oxide and arsenious sulphide are mixed. It is due to

A. Electroosmosis

B. Electrophoresis

C. Catalysis

D. Mutual coagulation

Answer: D

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50. Whaen solvent such as alcohol and acetone are added to hydrophilic solution

A. Coagulation occurs

B. Formation of interfacial film between two layers takes place

C. Dehydration of dispersed phase occurs

D. Negatively charged colloidal solution results

Answer: C

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51. The enthalpy of chemisorption is ..... Than the enthalpy of physisorption.

A. > 1

B. < 1

C. $= 1$

D. Cannot be determined

Answer: A

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Assignment Section B

1. Which gas is adsorbed easily at solid surface?

A. SO_2

B. H_2

C. O_2

D. N_2

Answer: A

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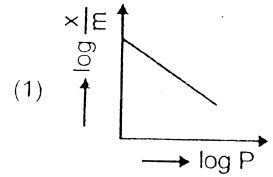
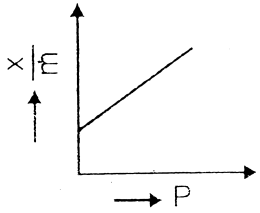
2. What is an adsorption isotherm? Describe Freundlich adsorption isotherm.

A.

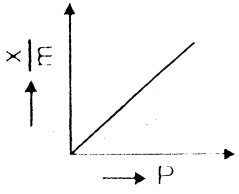


B.

C.



D.



Answer: B

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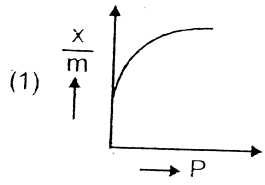
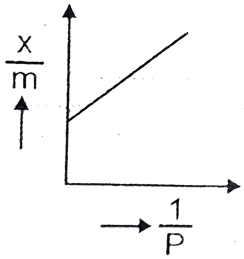
3. For Langmuir adsorption isotherm, which is correct?

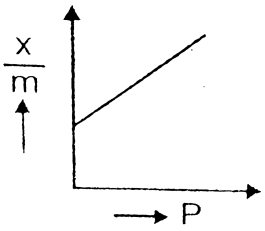
A. (1)



B.



C.



D. None of these

Answer: D

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4. Which is not an application of adsorption?

A. Purification of water by its exchange

B. To create vacuum

C. Chromatographic analysis

D. humidity control

Answer: A

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5. Which method of preparation of sol involves chemical reaction?

A. Hydrolysis

B. Mechanical dispersion

C. Exchange of solvent

D. All of these

Answer: A

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6. The pH value of the solution in which a particular amino acid does not migrate under the influence of electric field is called the:

A. Neutralisation point

B. End point

C. Isoelectric point

D. All of these

Answer: C

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7. As_2S_3 Colloidal solution obtained when As_2O_3 is Saturated with H_2S. Which is the diffused part?

A. As^{+3}

B. S^{-2}

C. H^{+}

D. O^{-2}

Answer: B

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8. Fixed parts of a colloidal solution of AgI are respectively $[AgI]I^{-}$ and $[AgI]Ag^{+}$ in presence of

A. KI and $AgNO_3$

B. $AgNO_3$ and KI

C. KI and KIO_3

D. $AgNO_3$ and $Ba(NO_3)_2$

Answer: A

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9. 1 mole of AgI/Ag^+ sol is coagulated by

A. $100ml1MK_2SO_4$

B. Fe^{+3}

C. 1 mol of Na^+

D. None of these

Answer: D

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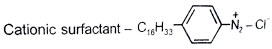
10. Which is incorrectly matched?

A. Anionic surfactant $-C_{17}H_{35}COONa$

B. Cationic surfactant 

C. Erionite $-Na_2K_2CaMg(AlO_2)_2(SiO_2)_26H_2O$

D. None of these

Answer: D

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11. Gold number of starch is 25. How much of it is required to prevent coagulation of 100 ml of gold sol adding 1 ml of $10\ \%\ NaCl$ solution?

A. 25 mg

B. 250 mg

C. $2.5mg$

D. $0.250mg$

Answer: B

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Assignment Section C

1. When a hydrophilic sol like gelatin is subjected to electric field, the sol particle moves

A. Towards anode when $pH >$ isoelectric point

B. In both directions at isoelectric pH

C. Towards cathode when $pH <$ isoelectric point

D. All of these

Answer: A::C

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2. Which is/are correct statements?

A. Physical adsorption always increases when temperature increases

B. Physical adsorption decreases when temperature increases

C. Chemical adsorption is reversible

D. Monolayer is formed is chemical adsorption

Answer: B::D

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3. Which is/are application (s) of adsorption?

A. Humidity can be controlled by adsorption

B. Inert gases cannot be separated by adsorption

C. Softening of hard Water takes place by adsorption

D. Colouring matter can be removed from the solution by adsorption

Answer: A::C::D

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4. Which is/are correct about emulsions?

A. Demulsification can take place by chemical methods only

B. Small amount of water cannot be mixed in water-in-oil emulsion

C. Sodium oleate is used to prepare oil-in-water emulsion

D. Calcium oleate is used to prepare water-in-oil emulsion

Answer: B::C::D

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5. Associated colloids

A. Behave as electrolytes at low concentration

B. Behave as colloids at low concentration

C. $C_{17}H_{35}COONa$ is an example of associated colloid

D. Associated colloids are formed below Kraft's temperature

Answer: A::C

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6. Wchich is/are correct statement?

A. Lyophilic colloids are irreversible

B. Lyophilic colloids do not migrate in electric field or migrate in any direction

C. In lyophobic colloids no hydration takes place

D. Lyophilic are more stable and lyophobic less

stable

Answer: B::C::D

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7. Which colloid can be coagulated by Al^{+3}?

A. Haemoglobin

B. TiO_2

C. As_2S_3

D. CdS

Answer: C::D

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8. Coagulation value is

A. Minimum concentration of electrolyte required to cause coagulation

B. Expressed in millimoles per litre

C. Expressed in milligram

D. Also known as flocculation value

Answer: A::B::D

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9. Which is/are correct about protective colloids?

A. Haemoglobin cannot be used as a protective colloids

B. Protective colloids are responsible for the stability of paints ink etc

C. Lyophobic colloids act as protective colloids

D. Gelatin is a better protective colloid than gum arabic

Answer: B::D

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10. Which is an example of auto-catalysis?

A. Hydrolysis of methyl acetate

B. Oxidation of Na_2SO_3 in presence of Na_2AsO_3

C. Oxidation of oxalic acid by $KMnO_4$

D. None of these

Answer: A::C

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11. Which forms multi molecular layers during adsorption :

A. Physical adsorption always increases when temperature increases

B. van der Waals' adsorption

C. Chemical adsorption is reversible

D. All of these

Answer: A::B

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Assignment Section D

1. The conductivity test is positive for

A. O/W

B. W/O

C. Both (1) & (2)

D. None of these

Answer: A

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2. Which property is observed in an emulsion?

A. Tyndall effect

B. Brownian motion

C. Both (1) & (2)

D. None of these

Answer: C

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3. In milk which acts as an emulsifier?

A. Gelatin

B. Albumin

C. Casein

D. None of these

Answer: C

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Assignment Section E

1. Assertion : During adsorption, $\Delta G, \Delta H$ and ΔS decrease i.e., their values become negative.

Reason : Adsorption is a spontaneous process. Randomness ofr disorder decreases during adsorption.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct explanation for Statement - 1

B. Statement -1 is True, Statement -2 is True, Statement -2 is NOT a correct explanation for Statement - 2

C. Statement - 1 is True, Statement - 2 is False

D. Statement - 1 is False, Statement - 2 is True

Answer: A

2. STATEMENT - 1 : Colloids can be purified by dialysis

and

STATEMENT - 2 : Colloidal particles easily pass parchment paper or animal membrane.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct explanation for Statement - 2

B. Statement -1 is True, Statement -2 is True, Statement -2 is NOT a correct explanation for Statement - 3

C. Statement - 1 is True, Statement - 2 is False

D. Statement - 1 is False, Statement - 2 is True

Answer: A

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3. STATEMENT -1 : AL^{3+} ions have greater precipitating power for As_2S_3 than Na^+ ions

and

STATEMENT -2 As_2S_3 sol is a negatively charged sol.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct explanation for Statement - 1

B. Statement -1 is True, Statement -2 is True, Statement -2 is NOT a correct explanation for Statement - 1

C. Statement - 1 is True, Statement - 2 is False

D. Statement - 1 is False, Statement - 2 is True

Answer: B

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4. STATEMENT -1 : An electrolyte having greatre coagulating power has greater flocculation value.

and

STATEMENT -2 : Flocculation value of an electrolyte for different colloidal solutions is different.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct explanation for Statement - 1

B. Statement -1 is True, Statement -2 is True, Statement -2 is NOT a correct explanation for Statement - 1

C. Statement - 1 is True, Statement - 2 is False

D. Statement - 1 is False, Statement - 2 is True

Answer: D

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5. STATEMENT -1 : Tyndall effect is due to scattering of light by particles.

and

STATEMENT -2 : Colloidal particles due to charge scatter the light to the maximum extent.

A. Statement -1 is True, Statement -2 is True, Statement -2 is a correct explanation for Statement - 5

B. Statement -1 is True, Statement -2 is True, Statement -2 is NOT a correct explanation for Statement - 6

C. Statement - 1 is True, Statement - 2 is False

D. Statement - 1 is False, Statement - 2 is True

Answer:

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Assignment Section F

1. Match the following

Column -I	Column -II
(A) Aerosol	(p) Optical property
(B) Emulsion	(q) Electrical property
(C) Tyndall effect	(r) Smoke
(D) Dialysis	(s) Medicines

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2. Match the following

Column -I	Column -II
(A) Paint	(p) Solid in dispersed phase
(B) Gem stones	(q) Solid as dispersion medium
(C) Cheese	(r) Liquid as dispersion medium
(D) Milk	(s) Liquid in dispersed phase

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3. Match the following :

Column I	Column II
(A) Physisorphtion	(p) absorption of N_2 on tron surface at 83 K
(B) Chemisorption	(q) absorption of N_2 on ion surface and 773 k
$(C)\ \frac{x}{m} = kp^{1/m}(n > 1)$	(r) Langmuir absorption isotherm
$(D)\ \frac{X}{m} = \frac{ap}{1+bp}$	(s) Freundich adsorption sotherm
	(t) Multimolecular layer formation is possible

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4. Match the following :

Column -I	Colum
(A) Addition of H_2 on alkenes	(p) Hor
(B) Hydrolysis of an organic ester	(q) Het
(C) Conversion of alcohol directly into gasoline (petrol)	(r) Sha
(D) Hydrolysis of urea	(s) Enz
	(t) Use

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Assignment Section G

1. Find the value of $\log\left(\frac{\text{volume of colloidal particels}}{\text{Volume of solute particles in true solution}}\right)$ (In case of limiting value)

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2. Fine the no of phases involved in thermal decomposition of $KClO_3$ in presence of $MnO_2(s)$.

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3. On addition of one ml solution of $10\ \%\ NaCl$ to 10 ml gold solution in the presence of 0.009 g of an anticoagulant, the coagulation is prevented. What is the gold number of anticoagulant?

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Assignment Section H

1. STATEMENT-1 : According to the lock - and - key model. When the key (substrate) fits the $lock$ (active site)

the chemical change bedins.

STATEMENT-2 : Modern X-ray crystallographic and spectroscopic methods show that in many cases, the

enzyme changes shape when the substrate lands at the active site.

STATEMENT- 3 : Enzyme catalysed reactions processed through a fast, reversible formation of an enzyme

substrate complex, followed by a slow conversion to product and free enzyme.

A. T F T

B. F T T

C. T T T

D. T T F

Answer: (3)

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2. STATEMENT-1 : Lyophilic sols can easily be coagulated.

STATEMENT- 2 : Lyophobic sols are stabilised by addition of lyophilic solutions.

STATEMENT- 3 : The colloidal solution of ice in an organic solvent such as $CHCl_3$ is an example of hydrophobic

sol.

A. T F T

B. F T T

C. T F F

D. F F T

Answer: (2)

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Assignment Section I

1. For coagulation of 195 ml of As_2S_3 solution 10 ml of 1 M NaCl is required. Calculate the coagulating power of $NaCl$.

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2. The coagulation of 200 ml of a colloidal solution of gold is completely prevented by adding 0.50 gm of starch to

it before adding 1 ml of $10\ \%$ NaCl solution. Calculate the gold number of starch.

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3. Write down the correct increasing order of flocculation value

a. $NaCl$, $CaCl_2$, $AlCl_3$

b. KBr, $K_2C_2O_4$, $K_3\left[Fe(CN)_6\right]$, $K_4\left[Fe(CN)_6\right]$.

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4. Calculate the ionic mobility of colloidal particles in arsenic colloidal solution, if zeta potential is $0.045V$ (Dielectric constant = 81, Viscosity of liquid $= 1.008$ centipoise)

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5. A sample of charcoal weighing $6g$ was brought into contact with a gas contained in a vessel of one litre capacity at $27^{\circ}C$. The pressure of the gas was found to fall from 700 to 400 mm. Calculate the volume of the gas (reduced to STP) that is adsorbent under the condition of the experiment $\left(\text{density of charcoal sample is} 1.5 gcm^{3}\right)$.

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Assignment Section J

1. At 1 atm and 273 K the volume of nitrogen gas required to cover a sample of silica gel, assuming Langmuir monolayer adsorption , is found

to be $1.30 cm^3 g^{-1}$ of the gel. The area occupied by a nitrogen molecule is $0.16 nm^2$. Find out the no. of surface sites occupied per molecule of N_2.

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2. The mass a of the solute adsorbed per gram, pf splid adsorbent occurs by Freundlich's isotherm, i.e.,

$a = KC^n$, where k and n are 0.160 and 0.431 respectively Calculate the moles of acetic acid (molecular mass $= 60.05 gmol$) that 1 kg of charcoal would adsorb from a 0.837 M Vinegar solution.

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3. Around $20\,\%$ surface sites have adsorbed N_2. On heating N_2 gas evolved form sites and were collected at 0.001 atm and 298 K in a container of volume $2.46 cm^3$ the density of surface sites is $6.023 \times 10^{14} cm^{-2}$ and surface area is $1000 cm^2$ find out the number of surface sites occupied per molecule of N_2.

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4. A possible mechanism for hydrogenation of ethylene, in presence of mercury vapour, is

$C_2H_2 + H_2 \rightarrow C_2H_2(\text{overall})$

Steps : $Hg + H_2 \xrightarrow{K_1} Hg + 2H$

$H + C_2H_4 \xrightarrow{K_2} C_2H_2$

$C_2H_2 + H_2 \xrightarrow{K_3} C_2H_6 + H_-$

$H + H \xrightarrow{K_4} H_2$

Determine the rate of formation of C_2H_2 in terms of rate constants and the concentrations $[Hg], [H_2]$ and $[C_2H_4]$

Assume that H and C_2H_5 reach steady state concentration.

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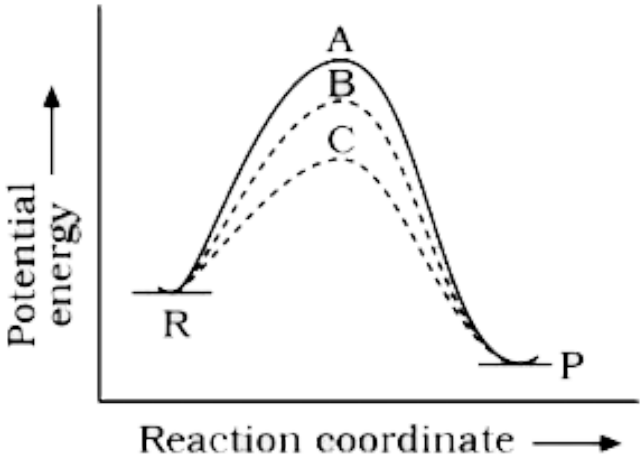
5. If a homogeneous catalytic reaction follows three alternative paths A, B and C, then which of the following indicates the relative ease with which

the reaction moves?



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6. Suppose we have a cube of $1.00cm$ length. It is cut in all three directions, so as to produce eight cubes, each $0.50cm$ on edge length. Then suppose these 0.50 cm cubes are each subdivided into eight cubes 0.25 cm on edge length, and so on. How many of these successive subdivisions are required before the cubes are reduced in size to colloidal dimensions of $100nm$.

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Exercise

1. Which is not a characteristic of physical adsorption ?

A. Enthaipy of adsorption is low

B. It is due to weak intermolecular van der Waal forces

C. It forms unimolecular layer on adsorbent

D. It require very small activation energy for the adsorption.

Answer: C

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2. Adsorption depends upon

A. Activation of the adsorbent.

B. Surface area

C. Pressure on the gas

D. All of these

Answer: D

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3. According of Langmuir adsorption isotherm amount of gas adsorbed at very low pressure

A. Directly propoftional to the pressure

B. Proportional to $P^{1/n}$ (where $n > 1$)

C. Inverself proportional to the pressure

D. Independent to the pressure of the gas

Answer: A

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4. In Freundlich adsorption isotherm, at moderate pressure extent of adsorption (x/m) directly proportional to P^x . The value of x is

A. 1

B. Zero

C. ∞

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

Answer: D

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5. Adsorption isostere are

A. Plot at constant pressure. Between $\frac{x}{m}$ and temperature.

B. Plot at constant volume , between $\frac{x}{m}$ and pressure.

C. Plot at constant $\frac{x}{m}$ between pressure and temperature

D. A special type of adsorption isotherm

Answer: C

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6. 50 ml of 1 M oxalic acid (mol. wt. = 126) is shaken with 0.5 g of wood charcoal. The final

concentration of soultion after adsorption is 0.5 M. Calculate the amount of oxalic acid adsorbed

per gram of charcoal.

A. 6.1

B. 6.2

C. 6.4

D. 6.3

Answer: D

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7. In case of chemical adsorption,

A. It continuously increases with increases in temperature

B. It continuously decreases with decreases in temperature

C. It increases with increase in temperature in low temperature zone than-decreases

D. Adsirption is not effected by the temperature.

Answer: C

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8. The heat of adsorption of physical adsorption is nearly

A. 20 - 40 kJ /mol

B. 40 - 100 kJ / mol

C. 40 - 200 kJ / mol

D. 40 - 400 kJ / mol

Answer: A

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9. For the adsorption, generally

A. $\Delta H = +ve, \Delta S = +ve, \Delta G = -ve$

B. $\Delta = +ve, \Delta S = -ve, \Delta G = -ve$

C. $\Delta H = -ve, \Delta S = -ve, \Delta G = -ve$

D. $\Delta H = -ve, \Delta S = -ve, \Delta G = +ve$

Answer: C

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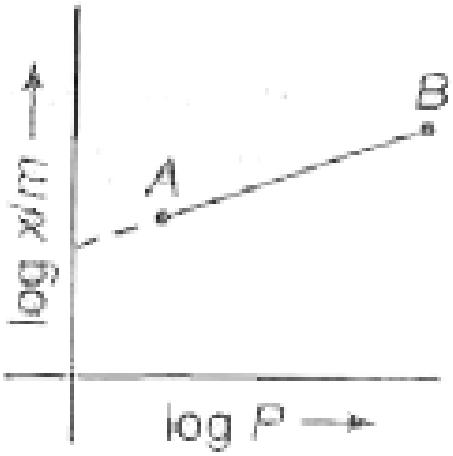
10. In Freundich adsorption isotherm

The slope of the AB line



A. log K

B. log n

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

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

Answer: D

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11. Tyndall effect in colloidal solution is due to

A. Reflection of light

B. Refraction of light

C. Scattering of light by dispersed phase

D. Scattering of light by dispersion medium

Answer: C

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12. Select the positive sol in the following

A. $Al(OH)_3$ sol

B. Gold sol

C. CdS sol

D. Gum

Answer: A

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13. 0 . 25 g lyophillic colloid is added to 100 ml gold solution to prevent the coagulation on adding 1 ml 10% NaCl Solution . What will be gold number of tyophilic colloid ?

A. 250

B. 125

C. 25

D. 0.25

Answer: C

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14. The gold number of Galatin . Gum and Starch are 0.005, 0 . 15 and 25 respectively . Which colloid has highest protection power ?

A. Gelatin

B. Starch

C. Gum

D. All have equal protection power

Answer: A

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15. What will be nature of charge on colloidal particie when $FeCl_3$ is added to excess of hot water ?

A. Positive

B. Negative

C. Neutral

D. Some times positive and some times negative

Answer: A

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16. Tyndall effect is more effectively shown by

A. True solution

B. Lyophilic coiloid

C. Lyophobic colloid

D. Suspensions

Answer: C

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17. An emulsifier is a substance which :

A. Destabilises the emulsion

B. Stabilises the emulsion

C. Coagelate the emulsions

D. Measures the stability of the coagulated colloidal solutions

Answer: B

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18. The potential differnce between the fixed particles layer and the diffused layer having opposite charge id called :

A. Zeta potential

B. Beta potential

C. Alpha potential

D. Gamma potential

Answer: A

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19. The maximum power to precipitate arsenious suiphide is of

A. H_2SO_4

B. Na_3PO_4

C. $CaCl_2$

D. $AlCl_3$

Answer: D

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20. Which one of the following statements is not correct ?

A. Tyndall effect in colloidal solution solution is due to scattering of light

B. Hardy - Schuize rule is applicable only to the coagulation of lyophilic sols

C. Bule colour of the sky is due to scattering of light by dust particies

D. Greater flocculation value on an electrolyte means its poor coagulating power

Answer: B

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Assignment Section A Objective Type Questions

1. Which one of the following is a property of physisorption ?

A. Non-specific nature

B. High specificity

C. lrreversibility

D. Single layer adsorption

Answer: A

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2. Which of the following is not a characteristic of chemisorption ?

A. lrreversible nautre

B. Δ H is the order of 500 J

C. Specific in nature

D. Increases with increase of surface area

Answer: B

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3. Freundlich adsorption isotherm gives a straight line on plotting :

A. x/m versus P

B. log x / m versus P

C. log x / m versus log

D. x / m versus 1 / P

Answer: C

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4. Which can absorb large volume of hydrogen gas ?

A. Colloidal solution of palladium

B. Finely divided nickel

C. Finely divided platinum

D. Colloidal $Fe(OH)_3$

Answer: A

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5. The process of froth floatation and chromatography are based on

A. Emulsification

B. Adsorption

C. Absorption

D. none of these

Answer: B

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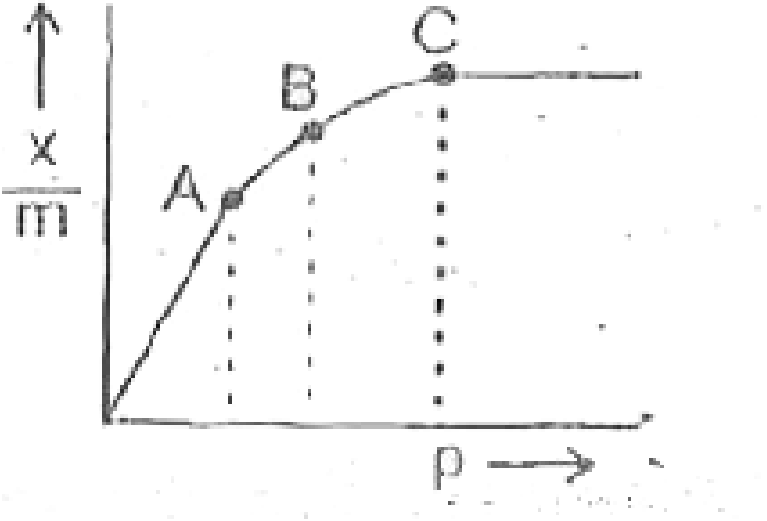
6. The graph plotted against adsorption versus pressure P at constant temperature, the Freundich equation at A, B, C respectively are (if n $>$ 1)



A. $\frac{x}{m} = kp, \frac{x}{m} = kp^{y_n}, \frac{x}{m} = kp^0$

B. $\frac{x}{m} = kp, \frac{x}{m} = kp^n, \frac{x}{m} = kp^{1/n}$

C. $\frac{x}{m} = kp^{1/n}, \frac{x}{m} = kp^n, \frac{x}{m} = kp^{1/n}$

D. $\frac{x}{m} = kp^{\infty}, \frac{x}{m} = kp^{1/n}, \frac{x}{m} = kp^n$

Answer: A

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7. The intercept on Y - axis in the graph of log $\frac{x}{m}$ versus log P gives

A. $\frac{1}{n}(n > 1)$

B. k

C. log k

D. Temperature

Answer: C

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8. Which of the following is correct about the adsorption of N_2 over Iron ?

A. It is always physically adsorbed

B. Extent of adsorption over iron decreases with the increase in temperature first and then increases

C. It is always chemically adsorbed

D. N_2 is never adsorbed over iron

Answer: B

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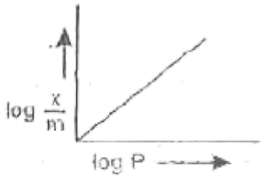
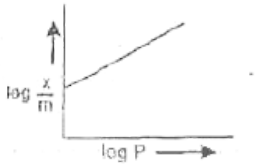
9. By plotting log x/m on y-axis and log P on x-axis we s hould get

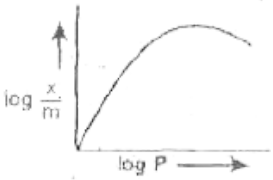
A.



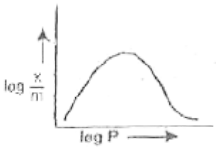
B.



C.



D.



Answer: B

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10. In adsorption from solution phase, the Freundlich adsorption isotherm is modifined as

A. $\frac{x}{m} = k.T^{1/n}$

B. $\frac{x}{m} = R.T^{1/n}$

C. $\frac{x}{m} = nkP^{1/n}$

D. $\frac{x}{m} = KC^{1/n}$

Answer: D

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11. Size of colloidal particle is

A. 1 nm to 100 nm

B. 1 nm to 1000 nm

C. 10 nm to 1000 nm

D. 100 nm to 1000 nm

Answer: B

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12. Which is not a colloidal solution ?

A. Smoke

B. Ink

C. Air

D. Blood

Answer: C

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13. Lyophobic colloids are :-

A. Reversible colloids

B. Irreversible colloids

C. Protective colloids

D. Gum , proteins

Answer: B

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14. Which of the following processess best describes the purification of muddy water by addition of alum?

A. Adsorption

B. Coagulation

C. Dialysis

D. Electrodialysis

Answer: B

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15. Colloidal solution commonly used in treatment of eye disseae is :

A. Colloidal sulphur

B. Colloidal silver

C. Colloidal gold

D. Colloidal antimony

Answer: B

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16. Micelles formation takes place

A. At CMC and at kraft temperature

B. At CMC and at above kraft temperature

C. At above CMC and at kraft temperature

D. Above CMC and above kraft temperature

Answer: D

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17. Which of the following is positively charged colloidal particle ?

A. As_2S_3

B. $Al_2O_3.\ xH_2O$

C. Au

D. Pt

Answer: B

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18. Colloidal can be purified by

A. Tyndall effect

B. Coagulation

C. Peptization

D. Ultrafiltration

Answer: D

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19. Which of the following has minimum protecting power ?

A. Gelatin (Gold no . = 0 . 0 1)

B. Dextrin (Gold no = 15)

C. Potato starch (Gold no . = 25)

D. Albumin (Gold no . = 0 . 25)

Answer: C

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

A. Electrophoresis

B. Dialysis

C. lonisation

D. Electrodialysis

Answer: A

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21. An emulsifier is an agenet which

A. Accelerates the dispersion

B. Stabilises the emulsion

C. Homogenizes the emulsion

D. Dissociate emulsions

Answer: B

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22. Gelatin is often used as an ingredient in the manufacture of ice -cream . The reason for this is :

A. To prevent the formation of a colloid

B. To stabilize the colloid and prevent crystal growth

C. To cause the mixture to solidify

D. To improve the flavour

Answer: B

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

A. Formic acid solution

B. Formaldehyde solution

C. Acetic acid solution

D. Acetaldehyde solution

Answer: B

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24. When a river enters the sea, a delta is formed . Formation of delta is due to

A. Peptization

B. Coagulation

C. Emulsification

D. Dialysis

Answer: B

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25. Which statement is incorrect ?

A. Higher the gold number of lyophilic sol better is itsprotective action

B. Lower the gold number of a lyophilic sol batter is its protective action

C. The Bredig's arc method is usually suitable for preparing sols of inert metals

D. The osmotic pressure method gives the average molar mass of a polymer

Answer: A

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26. The potential differnce between the fixed particles layer and the diffused layer having opposite charge id called :

A. Zata potential

B. Streaming potential

C. Dom potential

D. Colloidal potential

Answer: A

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27. When dilute aqueous solution of $AgNO_3$ (excess) is added to KI solution, positively charged sol of AgI in formed due to adsorption of

A. K^+

B. Ag^+

C. l^-

D. NO_3^-

Answer: B

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28. In the preparation of AgI sol, the excess fo $AgNO_3$ is added to potassium iodide solution. The particles of the sol will acquire

A. Nagative charge

B. Positive charge

C. No charge

D. Unpredictable

Answer: A

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29. Which of the following method is not employed for the purification of colloids ?

A. Electrodialysis

B. Dialysis

C. Ultracentrifugation

D. Peptisation

Answer: D

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30. During purification of colloidal sol by ultracentrifugation which of the following is . Observed ?

A. Collodial particles are settled at the bottom of ultracentrifuge tube

B. Impurities are settled at the bottom of the ultracentrifuge tube

C. Impurities are removed through ultrafilters

D. Its rate can be increased by applying pressure

Answer: A

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31. A positive colloid will be formed when

A. NH_4OH is added dropwise in dilute solution of $FeCl_3$

B. H_2S is passed in dilute $AsCl_3$ solution

C. Dilute $AgNO_3$ solution is added to saturated Agl solution

D. Gelatin is dissolved in water

Answer: C

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32. Which of the following has the highest and lowest cogulating power? $(AI^{+3}, Na^{+}, Mg^{+2}, Ba^{+2})$?

A. Al^{+3}, Na^{+}

B. Na^{+}, Al^{+3}

C. Ba^{+2}, Al^{+3}

D. They have same flocculation value

Answer: B

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33. Most effective coagulant for a colloidal solution of arsenic sulphide in water is

A. 0 . 1 M sodium phosphate

B. 0 . 1 zinc sulphate

C. 0 . 1 M zinc nitrate

D. 0 . 1 M aluminium chloride

Answer: D

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34. Flocculation value is expressed in terms of

A. Millimoles of electrolyte per litre of solution

B. Motes of electrolyte per litre of solution

C. Gram of electrolyte per litre of solution

D. mMillimoles of electrolyte per millilitre of solution

Answer: A

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35. Colloidal particles in soap sol carry

A. Nagative charge

B. Positive charge

C. No charge

D. Either positive on nagative charge

Answer: A

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36. Which of the following metal sols. cannot be prepared by Bredig's arc method -

A. Gold

B. Silver

C. Platinum

D. Sodium

Answer: D

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37. When SO_2 is bubbled into H_2S gas, colloidal sol is formed. What type of colloidal sol is it ?

A. Lyophillic sol of sulphur is formed

B. Lyophobic sol of slphur is formed

C. Suspension of water and sulphur is formed

D. A ture solution of suiphur in water is formed

Answer: B

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38. The stabilization of a dispersed phase in a lyopobic colloid is due to

A. The viscosity of the medium

B. The surface tension of the medium

C. Affinity for the medium

D. The formation of an electrical double layer betweeen the two phases

Answer: D

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

A. Presence of basic group

B. Preferential adsorption of OH^- ions

C. Self dissociation

D. Electron capture by sol particles

Answer: B

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40. The example of homogeneous catalysis is

A. Formation of NH_3 in Haber's process

B. Formation of NO in Ostwald's process

C. Formation of SO_3 in Lead chamber process

D. Formation of SO_3 in Contact process

Answer: C

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Assignment Section B Previous Year Questions

1. Which one of the following statements is not correct ?

A. Catalyst does not initiate any reaction

B. The value of equilibrium constant is changed in the presence of a catalyst in the reaction at equilibrium

C. Enzymes catalyse mainly bio - chemical reactions

D. Coenzymes increase the catalytic activity of enzyme

Answer: B

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

A. ΔG and ΔS are nagative but ΔH is positive

B. ΔG is nagative but ΔH and ΔS are positive

C. ΔG, ΔH and ΔS all are nagative

D. ΔG and ΔH are nagative but ΔS is positive

Answer: C

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4. Fog is a colloidal solution of

A. Gas in gas

B. Liquid in gas

C. Gas in liquid

D. Solid in gas

Answer: B

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5. which property of colloidal solution is independent of charge on the colloidal particles ?

A. Tyndall effect

B. Coagulation

C. Electrophoresis

D. Electro-osmosis

Answer: A

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

A. Coagulation

B. Electrophoresis

C. Eectro-osmosis

D. Tyndall effect

Answer: D

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

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

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

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

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

Answer: B

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

A. Enzymes are denaturated by ultraviolet rays and at high temperature

B. Enzymes are least reactive at optimum temperature

C. Enzymes are mostly proteinous in nature

D. Enzyme action is specific

Answer: B

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

A. 1 in case of physical adsorption

B. 1 in case of chemisorption

C. Between 0 and 1 in all cases

D. Between 2 and 4 in all cases

Answer: C

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10. The protecting power of lyophilic colloidal sol is expressed in terms of

A. Critical miscelle concentration

B. Oxidation number

C. Coagulation value

D. Gold number

Answer: D

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

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

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

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

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

Answer: A

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

A. The adsorbed molecules interact with each other

B. Theadsorption takes place in multilayers

C. The adsorption sites are equivalent in their adility to adsorb the pparticles

D. The heat of adsorption varies with coverage

Answer: C

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13. A plot of log x/m versus log p for the adsorption of a gas on a solid gives a straight line with slope equal to:

A. $-\log k$

B. n

C. $\frac{1}{n}$

D. log k

Answer: C

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

A. Urea

B. Dodecyl trimethyl ammonium chloride

C. Pyridinium chloride

D. Glucose

Answer: B

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Assignment Section B Questions Asked Prior To Medical Ent Exams 2005

1. When a few typical solutes are separated by a particular selective membrane such as protein particles, blood corpuscles, this process is called:

A. Transpiration

B. Endosmosis

C. Dialysis

D. Diffusion

Answer: C

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2. A colloidal system has particles of which of the following size ?

A. $10^{-9}mto10^{-12}m$

B. $10^{-6}mto10^{-9}m$

C. $10^{-4}mto10^{-10}m$

D. $10^{-5}mto10^{-7}m$

Answer: B

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3. The ability of ion to bring about coagulation of a given collidal solution depends upon

A. Magnitude of the charge

B. Both magnitude and sign of charge

C. Its charge only

D. Sign of the charge alone

Answer: B

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4. At the critical micelle concentration, the surfactant molecules :

A. Associate

B. Dissociate

C. Decompose

D. Become completely soludle

Answer: A

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5. Which one of the following method is commonly used method for destruction of colloid:

A. Dialysis

B. Condensation

C. Filteration by animal membrane

D. By adding electrolyte

Answer: D

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6. Pure water can be obtained from sea water by

A. Centrifugation

B. Plasmolysis

C. Reverse osmosis

D. Sedimentation

Answer: C

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

A. On increasing temperature adsorption increases continuously

B. Enthalpy and entropy change is negative

C. Adsorption is more for some specific substance

D. It is a reversible reaction

Answer: A

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8. Position of non-polar and polar parts in micelle is

A. Polar at outer surface but non polar at inner surface

B. Polar inner surface non polar at outer surface

C. Distributed over all the surface

D. Are present in the surface only

Answer: A

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

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

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

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

D. Adsorption lowers the activation energy of the reaction

Answer: D

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

A. Sodium dodecyl sulphate

B. Sodium acetate

C. Urea

D. Cetyltrimethylammonium bromide

Answer: D

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Assignment Section C Assertion Reason Type Questions

1. A : AgI changes to nagatively charged colloidal solution in presence of KI.

R : It is due to adsorption of I^- on AgI .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: A

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2. Statements : A colloide gets coagulated by addition of an electrolyte . .

Expabnations : The rate of coagultion depends on the magnitude and sing of the charge of the coagulant ion.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: B

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3. A : In physical adsorption, heat of adsorption is low i.e., 20 - 40 kJ /mol.

R : On increasing temperature, physical adsorption increases.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: C

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4. A : Starch and gelatin are loyophillic colloid.

R : They have strong interaction, with the dispersion medium

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: A

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5. A : Micelles can be formed at above CMC and at below Kraft temperature.

R : For NaCl solution, Kraft temperature is 60° C .

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: D

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6. A : Lyophillic sols are mors stable than lyophobic sols.

R : Lyophilic sols are more readily hydrated than lyphobic sols

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: A

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7. Assertion : Aqueous gold colloidal sol is red in colour.

Reason : The colour arised due to scattering of hight by particles of gold.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: A

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8. A : Al^{+3} can be used for the cagulation of As_2S_3 sol .

R : Al^{+3} reacts with As_2S_3 to give Al_2S_3

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: C

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9. A : Soap has both hydrophilic and hydrophobic gropus .

R : Soap acts as emulsifier in cleaning action.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: B

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10. Assertion : Catalysts increase the reaction velocity.

Reason : Catalysts provide large surface area for reactions to occur.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, mark (1)

B. If both Assertion & Reason are true but reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark (3)

D. If both Assertion and Resson are false statements , then mark (4)

Answer: B

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