



CHEMISTRY

BOOKS - DISHA CHEMISTRY (HINGLISH)

SURFACE CHEMISTRY

Chemistry

1. Which of the following statements is not true about the oil-in-water type emulsion?

- A. On addition of small amount of water,
no separate layer of water appears
- B. On addition of oil, separate layer of oil is
formed
- C. Addition of an electrolyte causes the
conductivity of the emulsion to increase
- D. Addition of small amount of oil soluble
dye colours the entire emulsion
coloured

Answer: D



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

A. High pressure

B. Negative ΔH

C. Higher critical temperature of adsorbate

D. High temperature

Answer: D



3. The disperse phase in colloidal iron III Hydroxide and colloidal gold is positively and negatively charged, respectively. What is the following statement is not correct?

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

B. Mixing the sols has no effect

C. Sodium sulphate solution causes coagulation in both sols

D. Magnesium chloride solution coagulate,
the gold sol more readily than the iron
III hydroxide sol

Answer: B



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4. Among the following, correct statement is:

A. Brownian movement is more
pronounced for smaller particles than

for bigger-particles

B. Sols of metal sulphides are lyophobic

C. Hardy Schulze law states that bigger the size of the ions the greater is its coagulating power

D. One would expect charcoal to adsorb chlorine more than hydrogen sulphide

Answer: A



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5. One desires to prepare a positively charged sol of silver iodine . This can be achieved by

A. adding small amount of $AgNO_3$

solution to KI solution in slight excess

B. adding small amount of KI solution to

$AgNO_3$ solution in slight excess

C. mixing equal volumes of equimolar

solutions of $AgNO_3$ and KI

D. None of these

Answer: B



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6. How many layers are adsorbed in chemical adsorption?

A. One

B. Two

C. Many

D. Zero

Answer: A



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7. Adsorption of gases on solid surfaces is exothermic reaction because

- A. Free energy increases
- B. Enthalpy is positive
- C. Entropy increases
- D. Enthalpy is negative

Answer: D



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8. Cod Liver oil is

A. fat dispersed in water

B. water dispersed in fat

C. water dispersed in oil

D. fat dispersed in fat

Answer: C



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

A. decrease in temperature

B. increase in temperature

C. increase in surface area of adsorbent

D. decrease in surface area of adsorbent

Answer: B



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10. Hydrolysis of urea is an examples of

- A. Homogenous catalyst
- B. Heterogenous catalyst
- C. biochemical catalyst
- D. zeolite catalyst

Answer: C



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11. Alum helps purifying water by

A. forming Si complex with clay particles

B. sulphate part which combines with the dirt and removes it

C. aluminium which coagulates the mud particles

D. making mud water soluble

Answer: C



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12. The efficiency of an enzyme in catalysing a reaction is due to its capacity

A. to form a strong enzymes-substrates complex

B. to decrease the bond energies of substrate molecule

C. to change the shape of the substrate molecules

D. to lower the activation energy to the
reaction

Answer: D



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13. Tyndall effect is shown by

A. Sol

B. solution

C. plasma

D. precipitate

Answer: A



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14. The cause of Brownian movement is

A. Heat changes in liquid state

B. Convection currents

C. The impact of molecules of the dispersion medium on the colloidal

particles

D. Attractive forces between the colloidal particles and molecules of dispersion medium.

Answer: C



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

A. 

B. 

C. 

D. 

Answer: C



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16. Which of the following kind of catalysis can be explained by the adsorption theory?

A. Homogenous catalyst

B. Acid-base catalyst

C. Heterogeneous catalyst

D. Enzyme catalyst

Answer: C



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17. The electrolytic impurity of a sol can most easily be separated by

A. dialysis

B. electrosmosis

C. electrophoresis

D. electro dialysis

Answer: D



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18. Which of the following constitutes irreversible colloidal system in water as dispersion medium?

A. Clay

B. Platinum

C. $Fe(OH)_3$

D. All of these

Answer: D



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

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

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

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

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

Answer: D



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20. Gold numbers of some colloids are :

0.005 – 0.01, Grum arabic : 0.15 – 0.25,

Oleate : 0.04 – 1.0, Starch:15 – 25. Which among these is a better protective colloid?

A. Gelatin

B. Starch

C. Oleate

D. Gum arabic

Answer: A



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21. Colloidal gold is prepared by

A. Mechanical dispersion

B. Peptisation

C. Bredig's Arc method

D. Hydrolysis

Answer: C



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22. Freundlich equation for adsorption of gases (in amount of x g) on a solid (in amount of m g) at constant temperature can be expressed as

A. $\frac{\log(x)}{m} = \log p + \frac{1}{n} \log K$

B. $\frac{\log(x)}{m} = \log K + \frac{1}{n} \log p$

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

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

Answer: B



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23. Given below, catalyst and corresponding process/reaction are matched. The one with mismatch is

A. $[RhCl(PPh_3)_2]$: Hydrogenation

B. $TiCl_4 + Al(C_2H_5)_3$: Polymerization

C. V_2O_5 : Haber-Bosch process

D. Nickel : Hydrogenation

Answer: C





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24. Which of the following does not contain a hydrophobic structure?

A. Linseed oil

B. Lanolin

C. Glycogen

D. Rubber

Answer: D



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25. The heats of adsorption in physisorption lie in the range (in kJ/mol)

A. 40 – 400

B. 40 – 100

C. 10 – 40

D. 1 – 10

Answer: C



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

A. Adsorption increase with increase in temperature

B. Adsorption is spontaneous

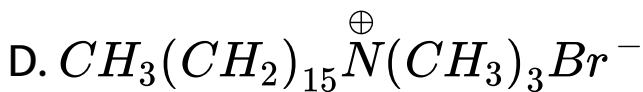
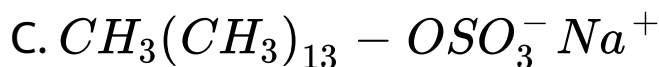
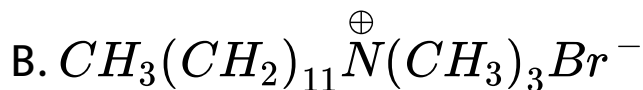
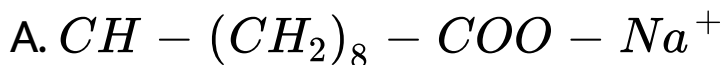
C. Both enthalpy and entropy of adsorption are negative

D. Adsorption on solids is reversible

Answer: A



27. Under ambient conditions, which among the following surfactants will form micelles in aqueous solution at lowest molar concentration?



Answer: D



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28. Flocculation value of $BaCl_2$ is much less than that of KCl for sol A and flocculation value of Na_2SO_4 is much less than that of NaBr for sol B. The correct statement among the following is:

A. Both the sols A and B are negatively charged

B. Sol A is positively charged and Sol B is negatively charged

C. Both the sols A and B are positively charged

D. Sol A is negatively charged and sol B is positively charged

Answer: D



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29. The density of gold is $19\text{g}/\text{cm}^3$. If $1.9 \times 10^{-4}\text{g}$ of gold is dispersed in one litre of water to give a sol having spherical gold particles of radius 10nm , then the number of gold particles per mm^3 of the sol will be

A. 1.9×10^{12}

B. 6.3×10^{14}

C. 6.3×10^{10}

D. 2.4×10^6

Answer: D



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30. The stability of lyophilic colloids is due to which of the following?

- A. Charge on their particles
- B. Large size of their particles
- C. Small size of their particles
- D. A layer of dispersion medium

Answer: D



31. Colloid of which one of the following can be prepared by electrical dispersion method as well as reduction method?

- A. Sulphur
- B. Ferric hydroxide
- C. Arsenious sulphide
- D. Gold

Answer: D



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32. Example of intrinsic colloid is

A. glue

B. sulphur

C. Fe

D. As_2S_3

Answer: A



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33. A particle adsorption process has the following characteristics, (i) It arises due to van der Waals forces and (ii) it is reversible. Identify the correct statement that describes the above adsorption process:

A. Adsorption is monolayer

B. Adsorption increases with increase in temperature

C. Enthalpy of adsorption is greater than 100 kJ mol^{-1}

D. Energy of activations is low

Answer: D



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34. In petrochemical industry alcohols are directly converted to gasoline by passing over heated

A. Platinum

B. ZSM-5

C. Iron

D. Nickel

Answer: B



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35. In langmuir's model of adsorption of a gas on a solid surface

A. the mass of gas striking a given area of surface is proportional to the presence

of the gas

B. the gas striking a given area of surface is

independent of the pressure of the gas

C. the rate of dissociation of adsorbed

molecules from the surface does not

depend on the surface covered

D. the adsorption at a single site on the

surface may involve multiple molecules

at the same time

Answer: A



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36. Which of the following electrolytes is least effective in coagulating ferric hydroxide solution?

A. KBr

B. K_2SO_4

C. K_2CrO_4

D. $K_4[Fe(CN)_6]$

Answer: A



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37. Is a silver sol used as an eye lotion

A. Amytol

B. Argyrol

C. Ciprofloxacin

D. Cylol

Answer: A



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38. Which of the following is not emulsifying agent for W/O emulsion?

A. Lampblack

B. Long chain alcohol

C. Proteins

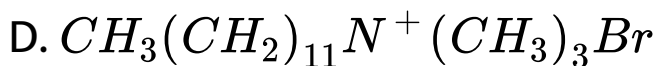
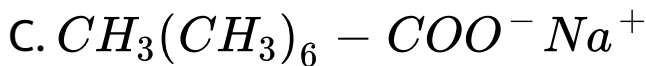
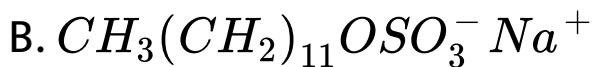
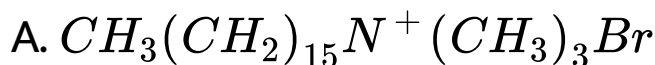
D. Heavy metal salts of fatty acids

Answer: C



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39. Among the following, the surfactant that will form micelles in aqueous solution at the lowest molar concentration at ambient condition is :-



Answer: B



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40. At low pressure the fraction of the surface covered follows

- A. zero order reaction
- B. second order reaction
- C. first order reaction
- D. fractional order

Answer: C



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41. The following statements relate to the adsorption of gases on a solid surface. Identify the incorrect statement among them:

A. Enthalpy of adsorption is negative

B. Energy appears as heat

C. On adsorption, the residual forces on the surface are increased

D. Entropy of adsorption is negative

Answer: C



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42. Peptization involves

- A. Precipitation of colloidal particles
- B. disintegration of colloidal aggregates
- C. evaporation of dispersion medium
- D. impact of molecules of the dispersion medium on the colloidal particles

Answer: B



43. The isoelectric-points of a colloiddally dispersed material is the pH value at which

A. the dispersed phase migrate in an electric field

B. the dispersed phase does not migrate in an electric field

C. the dispersed phase has pH equal to 7

D. the dispersed phase has pH equal to zero

Answer: B



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44. When solution of 5g of iodine in CS_2 was shaken with the same volume of water. The amount of iodine in water is (Distribution

coefficient $\frac{C_{CS_2}}{C_{CS_2}} = 420$

A. 1.19

B. 0.0019

C. 0.0119

D. 0.119

Answer: C



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