Self Practice Paper (SPP)

1. For adsorption of a gas on a solid, the plot of log (x/m) Vs log P is linear with a slope equal to [n being a whole number]
(1) K (2) log K (3) n (4) 1/n

2. Surface tension of lyophilic sols is :
(1) Lower than that of H_2O (2) More than that of H_2O
(3) Equal to that of H_2O (4) None of the above

3. On passing light from collidal solution, the effect due to scattering of light is known as :
(1) Electrophrosis (2) Tyndall effect (3) Electromosis (4) Coagulation

4. Tyndall effect is shown by :
(1) Sol (2) Solution (3) Plasma (4) Precipitation

5. Milk is an example of :
(1) True solution (2) Gel (3) Suspension (4) Emulsion

6. Most effective ion to coagulate a negative sol is :
(1) PO_4^{3-} (2) Al^{3+} (3) Ba^{2+} (4) K^+

7. Which of the following electrolytes will be most effective in the coagulation of gold sol :
(1) $NaNO_3$ (2) $K_4[Fe(CN)_6]$ (3) Na_3PO_4 (4) $MgCl_2$

8. The stability of lyophilic colloid is due to which of the following :
(1) Charge on their particles (2) Large size of their particles
(3) Small size of their particles (4) Solvation by dispersion medium

9. A colloidal solution is subjected to an electrical field. The particles move towards anode. The coagulation of the same solution is studied using NaCl, $BaCl_2$ and $AlCl_3$ solutions. Their coagulating power should be
(1) NaCl > $BaCl_2$ > $AlCl_3$ (2) $BaCl_2$ > $AlCl_3$ > NaCl
(3) $AlCl_3$ > $BaCl_2$ > NaCl (4) $BaCl_2$ > NaCl > $AlCl_3$

10. Which of the following is most effective in coagulating a ferric hydroxide sol :
(1) KCl (2) KNO_2 (3) K_2SO_4 (4) $K_3[Fe(CN)_6]$

11. Fog is an example of colloidal system of :
(1) Liquid dispersed in gas (2) Gas dispersed in gas
(3) Solid dispersed in gas (4) Solid dispersed in liquid

12. The charge on As_2S_3 sol is due to the adsorbed :
(1) H^+ (2) OH^- (3) O^{-2} (4) S^{-2}

13. The sky looks blue due to :
(1) Dispersion (2) Reflection (3) Transmission (4) Scattering

14. Tyndall effect will be observed in :
(1) Solution (2) Percipitate (3) Sol (4) Vapour

15. The Brownian motion is due to :
(1) Temperature fluctuation within the liquid phase
(2) Attraction and repulsion between charge on the colloidal particles
(3) Impact of molecules of the dispersion medium on the colloidal particles
(4) Convective current

16. In coagulating the colloidal solution of As_2S_3 which has the minimum coagulating value :
(1) NaCl (2) KCl (3) $BaCl_2$ (4) $AlCl_3$

17. Positive sol is :
(1) Gold (2) Gelatin (3) As_2S_3 (4) None

18. Which one is a lyophobic colloid :
(1) Gelatin (2) Starch (3) Sulphur (4) Gum arabic

19. Smoke is an example of :
(1) Gas dispersed in liquid (2) Gas dispersed in solid
(3) Solid dispersed in gas (4) Solid dispersed in solid

20. A colloidal solution of arsenious sulphide is most readily coagulated by the addition of a normal solution?
(1) NaCl (2) $CaCl_2$ (3) Na_3PO_4 (4) $Al_2(SO_4)_3$

21. A colloid always :
(1) Contains two phases (2) Is a true solution
(3) Contains three phases (4) Contains only water soluble particles

22. Which of the following ions has maximum flocculation value :
(1) $[Fe(CN)_6)]^{4-}$ (2) Cl^- (3) SO^{2-}_4 (4) PO^{-3}_4

23. Which of the following gases, will be adsorbed maximum on a solid surface :
(1) CO_2 (2) O_2 (3) N_2 (4) H_2

24. Which of the following is a mismatch :
(1) Lyophilic colloids – reversible sols
(2) Associated colloids – micelles
(3) Tyndall effect – scattering of light by colloidal particle
(4) Electrophoresis – movement of dispersion medium under the influence of electric field

25. A negative catalyst will
(1) raise the energy of activation for a given reaction
(2) take away the internal energy of reactants and deactivate them
(3) catalyse the backward reaction more than the forward one, thereby shifting equilibrium backward.
(4) none of these

26. A liquid is found to scatter a beam of light but leaves no residue when passed through the filter paper. The liquid can be described as
(1) a suspension (2) Oil (3) a colloidal sol (4) a true solution

27. Which of the following kinds of catalysis can be explained by the adsorption theory?
(1) heterogeneous catalysis (2) enzyme catalysis
(3) homogeneous catalysis (4) acid base catalysis

28. Which of the following relations is (are) correct according to Freundlich ?
(i) x/m = constant
(ii) $x/m = \text{constant} \times p^{1/n}$ $(n > 1)$
(iii) $x/m = \text{constant} \times p^n$ $(n > 1)$
(1) All are correct (2) All are wrong (3) (ii) is correct (4) (iii) is correct

29. The physical adsorption of gases on the solid surface is due to
(1) vander Waals forces (2) covalent bonding (3) hydrogen bonding (4) All of these

30. Correct equation of Freundlich isotherm is
(1) $\log\left(\frac{x}{m}\right) = \log K + \frac{1}{n}\log C$ (2) $\log\left(\frac{x}{n}\right) = \log m + \frac{1}{m}\log C$
(3) $\log\left(\frac{x}{m}\right) = \log C + \frac{1}{K}\log C$ (4) $\log\left(\frac{x}{m}\right) = \log C + \frac{1}{n}\log K$

31 The solution in which the light is scattered by the particles is :
(1) Suspension (2) Colloidal solution (3) True solution (4) None of these

32. Blood is purified by :
(1) Dialysis (2) Electro-osmosis (3) Coagulation (4) Filtration

33. Which of the following is most effective in coagulating a ferric hydroxide sol :
(1) KCl (2) KNO_2 (3) K_2SO_4 (4) $K_3[Fe(CN)_6]$

34. Which one is colloid :
(1) NaCl (2) Urea (3) Cane Sugar (4) Blood

35. Gold number is minimum in case of :
(1) Gelatin (2) Egg albumin (3) Gumarabic (4) Starch

36. The size of a colloidal particle is :
(1) > 0.1 μ (2) 1m μ to 0.1 μ (3) < 0.1 μ (4) More than 3000 m μ

37. Which one of the following is not a colloidal system :
(1) Smoke (2) Ink (3) Air (4) Blood

38. Which of the following will have highest coagulation power for As_2S_3 colloid ?
(1) PO^{3-}_4 (2) SO^{2-}_4 (3) Na^+ (4) Al^{3+}

39. Tyndall effect in colloidal solutions is due to :
(1) Scattering of light (2) Reflection of light
(3) Absorption of light (4) Presence of electrically charged particles

40. Colloidal solution of silver is prepared by :
(1) Colloidal milk (2) Double decomposition method
(3) Bredig's method (4) Peptization

41. The arsenious sulphide sol has - ve charge. The maximum power of precipitating is of :
(1) H_2SO_4 (2) Na_3PO_4 (3) $CaCl_2$ (4) $AlCl_3$

42. Which of the following ions will be most effective in coagulating the As_2S_3 sol :
(1) Fe^{3+} (2) Ba^{2+} (3) Cl^- (4) PO_4^{3-}

43. When a graph is plotted between log x/m and log p, it is straight line with an angle 45° and intercept 0.3010 on y-axis. If initial pressure is 0.3 atm, what will be the amount of gas adsorbed per gm of adsorbent :
(1) 0.4 (2) 0.6 (3) 0.8 (4) 0.1

44. Which of the following relations is (are) correct according to Freundlich ?
(i) x/m = constant
(ii) $x/m = \text{constant} \times p^{1/n}$ (n > 1)
(iii) $x/m = \text{constant} \times p^n$ (n > 1)
(1) All are correct (2) All are wrong (3) (ii) is correct (4) (iii) is correct

45. The principle(s) involved in the chromatographic operation is (are) :
(1) Adsorption (2) Absorption (3) Partition (4) None

SPP Answers

1.	(4)	**2.**	(1)	**3.**	(2)	**4.**	(1)	**5.**	(4)	**6.**	(2)	**7.**	(4)
8.	(4)	**9.**	(3)	**10.**	(4)	**11.**	(1)	**12.**	(4)	**13.**	(4)	**14.**	(3)
15.	(3)	**16.**	(4)	**17.**	(2)	**18.**	(3)	**19.**	(3)	**20.**	(4)	**21.**	(1)
22.	(2)	**23.**	(1)	**24.**	(4)	**25.**	(1)	**26.**	(3)	**27.**	(1)	**28.**	(3)
29.	(1)	**30.**	(1)	**31**	(2)	**32.**	(1)	**33.**	(4)	**34.**	(4)	**35.**	(1)
36.	(2)	**37.**	(3)	**38.**	(4)	**39.**	(1)	**40.**	(3)	**41.**	(4)	**42.**	(1)
43.	(2)	**44.**	(3)	**45.**	(1)								

SPP Solutions

1. $\frac{x}{m} = KP^{1/n}$, $\log \frac{x}{m} = \log K + \frac{1}{n} \log P$

2. That's why lyophilic colloid has affinity for water.

3. Scattering of light by colloidal particles is known as Tyndall effect.

4. Tyndall effect is shown by colloidal solution.

5. In milk, liquid fat particles are dispersed in water.

6. Higher the charge on coagulating ion, higher the coagulating power.

7. Gold sol is – ve sol, so coagulating ion is cation.

8. Lyophilic colloid is solvated by dispersion medium and becomes more stable.

9. Coagulating power $\propto$ charge on coagulating ion.

10. Effectiveness of coagulation by electrolyte $\propto$ charge on coagulating ion.

11. Fog is an example of liquid dispersed in gas.

12. As_2S_3 colloidal sol is obtained when As_2O_3 is saturated with H_2S :

$$As_2O_3 + 3H_2S \rightarrow As_2S_3 + 3H_2O.$$

As_2S_3 adsorbs S^{2-} ions (common between H_2S and As_2S_3 and thus is negatively charged).

$$As_2S_3 + H_2S \rightarrow As_2S_3 \quad S^{2-} : 2H^+.$$

13. Light is scattered by colloidal particles present in environment so sky looks blue.

14. Colloidal particle shows Tyndall effect because of it's larger size.

15. Brownian motion is due to impact of molecules of the dispersion medium on the colloidal particles.

16. As_2S_3 is negatively charged sol so more positively charged ion will have minimum coagulating value .

17. Gelatin is positive sol.

18. Sulphur is a lyophobic colloid.

19. Smoke is an example of solid dispersed in gas.

20. Arsenious sulphide is negatively charged sol so more the charge on cation of electrolyte, more the efficiency of electrolyte for coagulation.

21. Colloid is heterogeneous, biphasic solution.

22. Smaller the charge on coagulating ion, higher the flocculation value.

23. Easily liquefiable gases like CO_2 are adsorbed to a greater extent than gases like O_2, N_2 and H_2

24. Electrophoresis means movement of colloidal particles under the influence of electric field.

25. Negative catalyst provides a path of higher activation energy

26. These are the properties of colloidal solution.

27. Adsorption theory is given for heterogeneous catalyst. Example : adsorption of gas on solid surface.

28. According to Freundlich adsorption isotherm, $\frac{x}{m} \propto kp^{1/n}$ (n > 1).

29. Physical adsorption is due to vander waals forces.

30. According to Freundlich isotherm : $\frac{x}{m} = Kp^{1/n}$ or $\log \frac{x}{m} = \log K + \frac{1}{n} \log P$ (For solution, P = C).

31 Colloidal particles scatter light because of their larger size.

32. Blood is colloidal solution which can be purified by dialysis.

33. Effectiveness of coagulation by electrolyte $\propto$ charge on coagulating ion.

34. Blood is colloid solution.

35. Higher the protecting power of lyophilic colloid, lesser the gold number and gelatin has highest protecting power among the given options.

36. Size of colloidal particles 10Å to 10^4Å which is 10^{-9} m (1 mμ) to 10^{-6} m (1μ).

37. Pure air is air in air type of homogeneous mixture.

38. As_2S_3 is – ve charged colloidal solution. Coagulation power charge on cation

39. Colloidal particles are large sized so they scatter light.

40. Colloidal sol of less reactive metal such as gold, silver, platinum, copper, lead etc can be prepared by Bredig's method.

41. Power of precipitating $\propto$ charge on cation.

42. According to Hardy-Schulze rule

43. $\log \frac{x}{M} = \log k + \frac{1}{n} \log P$

$\frac{1}{n} = \tan 45°$ $\log k = 0.3010$

$n = 1$ $k = 2$

$\frac{x}{m} = 2 \times (0.3)^1$

$x = 0.6$

44. According to Freundlich adsorption isotherm, $\frac{x}{m} \propto kp^{1/n}$ (n > 1).

45. Chromatography is based upon adsorption theory.