

TOPIC : SURFACE CHEMISTRY

1. Tyndall effect in colloidal solution is due to
 - (a) Scattering of light
 - (b) Reflection of light
 - (c) Absorption of light
 - (d) Presence of electrically charged particles
2. Butter is a colloid containing
 - (a) Fat dispersed in water
 - (b) Fat dispersed in oil
 - (c) Water dispersed in fat
 - (d) None of these
3. Which of the following is not used for purification of colloidal solutions ?
 - (a) Dialysis
 - (b) Ultra-centrifugation
 - (c) Filtration
 - (d) Electrodialysis
4. Protecting power of a lyophilic sol is expressed in terms of
 - (a) Coagulation value
 - (b) Gold number
 - (c) Both of the above
 - (d) None of these
5. For the process of adsorption, ΔH is
 - (a) Positive
 - (b) Negative
 - (c) Zero
 - (d) May be positive or negative
6. Gold number is minimum for
 - (a) Starch
 - (b) Gelatin
 - (c) Gum arabic
 - (d) Albumin
7. Fog is an example of
 - (a) Foam
 - (b) Aerosol
 - (c) Gel
 - (d) Emulsion
8. Which of the following metallic sols cannot be prepared by Bredig's method ?
 - (a) Gold
 - (b) Silver
 - (c) Platinum
 - (d) Sodium
9. Activated charcoal is a good adsorbent for
 - (a) O_2
 - (b) N_2
 - (c) H_2
 - (d) CH_4
10. For physisorption, heat of adsorption is generally in the range
 - (a) 20-40 kJ
 - (b) 40-60 kJ
 - (c) 100-150 kJ
 - (d) 300-400 kJ
11. Brownian movement is a property of colloidal solution
 - (a) Optical
 - (b) Mechanical
 - (c) Colligative
 - (d) Electrical
12. A colloidal solution may be coagulated by
 - (a) Adding electrolyte
 - (b) Heating
 - (c) Adding oppositely charged sol
 - (d) All of the above
13. The average molecular mass of colloidal particles can be determined by study of
 - (a) Elevation in boiling point
 - (b) Osmotic pressure
 - (c) Tyndall effect
 - (d) Lowering of vapour pressure
14. Palladium is a good adsorbent for
 - (a) CO_2
 - (b) SO_2
 - (c) CO
 - (d) H_2
15. Which adsorption does not take place at very low temperature ?
 - (a) Physisorption
 - (b) Chemisorption
 - (c) Both of the above
 - (d) None of these
16. Silver iodide is used for producing artificial rain because AgI
 - (a) Is easy to spray at high altitudes
 - (b) Is insoluble in water
 - (c) Is a cheap chemical
 - (d) Has crystal structure similar to ice
17. Which of the following colloidal solutions do not contain negatively charged colloidal particles ?
 - (a) $Fe(OH)_3$ sol
 - (b) As_2S_3 sol
 - (c) Blood
 - (d) Gold sol.

18. Which of the following is a hydrophobic sol?
(a) Protein sol (b) Starch sol
(c) Gum sol (d) $\text{Fe}(\text{OH})_3$ sol
19. In adsorption of acetic acid on charcoal, the acetic acid is
(a) Absorbent (b) Adsorbent
(c) Absorbate (d) Adsorbate
20. When beam of light is passed through a colloidal solution ?
(a) It passes through as such
(b) It is reflected
(c) It is scattered
(d) It is completely absorbed
21. The best coagulant for the precipitation of $\text{Fe}(\text{OH})_3$ is
(a) Na_3PO_4 (b) NaNO_3
(c) Na_2SO_4 (d) NaCl
22. Alum purifies muddy water by
(a) Dialysis (b) Coagulation
(c) Electrophoresis (d) Emulsification
23. The electrical charge on colloidal particles is indicated by
(a) Brownian movement
(b) Electrophoresis
(c) Ultramicroscope
(d) Tyndall effect
24. Which of the following electrolytes will have maximum coagulating power for arsenious sulphide sol ?
(a) NaCl (b) CaCl_2
(c) MgSO_4 (d) AlCl_3
25. Which of the following electrolysis has maximum coagulating power for ferric hydroxide sol ?
(a) Na_3PO_4 (b) Na_2SO_4
(c) MgCl_2 (d) AlCl_3
26. Migration of colloidal particles under the influence of an electric field is known as
(a) Electro-dialysis (b) Electro-osmosis
(c) Electrophoresis (d) None of these
27. Freundlich adsorption isotherm is applicable to adsorptions involving
(a) Unimolecular layers
(b) Multimolecular layers
(c) Both of the above
(d) None of these
28. $\text{Fe}(\text{OH})_3$ is prepared in the presence of a little excess of FeCl_3 , the charge on the colloidal particles would be
(a) Negative (b) Positive
(c) Neutral (d) None of these
29. Coagulation value of an electrolyte is expressed in units of
(a) moles per litre (b) millimoles/litre
(c) milligrams per litre (d) millimoles per millilitre
30. Which colloid is used in treating eye disease ?
(a) Colloidal sulphur (b) Colloidal antimony
(c) Colloidal gold (d) Colloidal silver
31. At CMC the surfactant molecules
(a) decompose
(b) become completely soluble
(c) associate
(d) dissociate
32. Which of the following electrolytes will have maximum flocculation value for $\text{Fe}(\text{OH})_3$ sol ?
(a) NaCl (b) Na_2S
(c) $(\text{NH}_4)_3\text{PO}_4$ (d) K_2SO_4
33. The lyophilic colloid among the following is
(a) Blood (b) Gold sol
(c) $\text{Fe}(\text{OH})_3$ sol (d) Starch
34. Which of the following is an example of associated colloid ?
(a) Polyethylene sol (b) Rubber sol
(c) PVC sol (d) Soap sol
35. Gold number gives
(a) The amount of gold present in the colloid
(b) The amount of gold required to break the colloid
(c) The amount of gold required to protect the Colloid
(d) None of these

36. Which of the following are examples of aerosols ?
 (a) Whipped cream (b) Tooth paste
 (c) Fog (d) Soap lather
37. Which of the following will have the highest coagulating power for As_2S_3 colloid ?
 (a) PO_4^{3-} (b) SO_4^{2-}
 (c) Al^{3+} (d) Na^+
38. Which one of the following is not a property of hydrophilic sols ?
 (a) High concentration of dispersed phase can be easily attained
 (b) These are irreversible in nature
 (c) Viscosity and surface tension are about the same as for water
 (d) The charge of the particle depends on the pH value of the medium ; it may be positive, negative or even zero.
39. Flocculation value is expressed in terms of
 (a) millimoles of electrolyte per litre of solution
 (b) moles of electrolyte per litre of solution
 (c) grams of electrolyte per litre of solution
 (d) millimoles of electrolyte per millilitre of solution
40. The coagulation power of an electrolyte for arsenious sulphide sol decreases in the order
 (a) Na^+ , Al^{3+} , Ba^{2+} (b) PO_4^{3-} , SO_4^{2-} , Cl^-
 (c) Al^{3+} , Ba^{2+} , Na^+ (d) Cl^- , SO_4^{2-} , PO_4^{3-}
41. Which of the following statements is not true ?
 (a) Blood is a positively charged sol
 (b) Soap solution contains ionic micelles as the colloidal particles
 (c) An oil in water emulsion easily spreads over surface of water
 (d) Colloidal particles have dimensions in the range 10^{-7} to 10^{-5} cm.
42. Which of the following is the correct expression for Freundlich adsorption isotherm
 (a) $\frac{x}{m} = \log h + \frac{1}{n} \log p$
 (b) $\log p = \log k + \log \frac{x}{m}$
 (c) $\frac{x}{m} = kp^n$
 (d) $\frac{x}{m} = kp^{1/2}$
43. Which of the following statements is not true for chemisorption ?
 (a) It is highly specific
 (b) Involves strong interactions between adsorbent and adsorbate
 (c) Extent of adsorption always decreases with increase in temperature
 (d) Adsorption is restricted to monomolecular layers
44. The STEM (Scanning Transmission Electron Microscope) is used to determine
 (a) Charge of the colloid
 (b) Size of the colloid
 (c) Colour of the colloid
 (d) Nature of the colloid
45. Point out the false statement
 (a) Brownian movement and Tyndall effect is shown by colloidal systems
 (b) Gold number is a measure of the protective power of a lyophilic colloid
 (c) The colloidal solution of a liquid in liquid is called gel
 (d) Hardy-Schulze rule is related with coagulation

ANSWERS KEY

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