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Day 19 - Surface Chemistry-sub

NEET Chemistry

Reg.No.: ________

Answer All the Question (Each Question contain one mark)

Total Marks : 40

Part – A

1) At the equilibrium position in the process of adsorption

(a) \( \Delta H > 0 \)  (b) \( \Delta H = T \Delta S \)  (c) \( \Delta H > T \Delta S \)  (d) \( \Delta H \Delta S \)

2) The heats of adorption in physisorption lies in range (in kJ/mol)

(a) 40-400  (b) 10-40  (c) 200-400  (d) 40-100

3) In which of the following reactions heterogeneous catalysis involved? I.

\[ 2CO_2 (g) + O_2 (g) \xrightarrow{\text{NO(g)}} 2SO_3 (g) \]

II. \[ 2CO_2 (g) = O_2 (g) \xrightarrow{\text{Pt(s)}} 2SO_3 (g) \]

III. \[ N_2 (g) + 3H_2 (g) \xrightarrow{\text{Fe(s)}} 2NH_3 (g) \]

IV. \[ CH_3COOCH_3 (l) + H_2O (l) \xrightarrow{\text{HCL(l)}} CH_3COOH (aq) + CH_3OH (aq) \]

(a) II and III  (b) II, III and IV  (c) I, II and III  (d) Only IV

4) Colloidal solution of gold prepared by different methods are of different colours because of

(a) variable valency of gold  (b) different concentrations of gold particles

(c) impurities produced by different methods  (d) different diameters of colloidal gold particles

5) Which of the following process is responsible for the formation of delta at a place where rivers meet the sea?

(a) Emulsification  (b) Colloid formation  (c) Coagulation  (d) Peptisation

6) On adding 1 mL of solution of 10% NaCl to 10 mL of gold sol in the presence of 0.25g of starch, the coagulation is just prevented. The gold number of starch is

(a) 0.25  (b) 0.025  (c) 25  (d) 250
7) Which property of colloidal solution is independent of charge on the colloidal particles?
   (a) Coagulation  (b) Electrophories  (c) Electro-osmosis  (d) Tyndall effect

8) The simplest way to check whether a system is colloidal is
   (a) electrodialysis  (b) finding out particle size  (c) Tyndall effect  (d) Brownian movement

9) Select correct statement(s)
   (a) Residual force-field o a surface is responsible for adsorption
   (b) Rate of adsorption is very rapid in the beginning but decreases until equilibrium is attained
   (c) Desorption and adsorption are two opposite terms
   (d) All of the above are correct statements

10) A catalyst accelerate the rate of reaction by
    (a) decreasing energy of activation  (b) increasing Arrhenius constant  (c) increasing both
        (d) decreasing both

11) Following are the events taking place to explain adsorption theory I. desorption II. diffusion of the reactants along the surface III : adsorption of the reactants IV : formation of the activated surface complex These events are taking place in the following order
    (a) I,II,III,IV  (b) III,II,IV,I  (c) III,IV,I,II  (d) IV,III,II,I

12) The void space in zeolites forms more than 50% of the total volume which is occupied by
    (a) silicates  (b) aluminates  (c) water molecules  (d) Na\(^+\), Mg\(^{2+}\) and Ca\(^{3+}\) ions

13) Silt in water is
    (a) gel  (b) sol  (c) aerosol  (d) foam

14) In question (49), select the properties which are true for lyophobic colloidal sols.
    (a) I,III  (b) I,II  (c) III,IV  (d) II,IV

15) Peptisation is
    (a) conversion of a colloidal into precipitate form  (b) conversion of precipitate into colloidal sol
        (c) conversion of metal into colloidal sol by passage of electric current
        (d) conversion of colloidal sol into macromolecules
16) In multimolecular colloidal sols, atoms or molecules are held together by 
   (a) H-bonding   (b) van der wall's forces   (c) ionic bonding   (d) polar covalent bonding

17) Potential difference of the electrical double layer formed in a colloidal sol is called 
   (a) EMF   (b) Zeta potential   (c) Brownian potential   (d) Nernst potential

18) Flocculation value of a coagulating electrolyte is expressed in 
   (a) millimol L\(^{-1}\)   (b) mol L\(^{-1}\)   (c) mg K\(^{-1}\)   (d) microgram mL\(^{-1}\)

19) An emulsion can be diluted with H2O (dispersion medium), then it is 
   (a) O/W type   (b) W/O type   (c) Both (a) and (b)   (d) None of these

20) Artificial smoke screens are made by 
   (a) aluminium oxide   (b) lead oxide   (c) sodium oxide   (d) titanium oxide

21) Aluminium hydroxide forms a positively charged sol. Which of the following ionic substances should 
    be most effective in coagulating the sol? 
   (a) NaCl   (b) CaCl\(_2\)   (c) Fe\(_2\)(SO\(_4\))\(_3\)   (d) K\(_3\)PO\(_4\)

22) The tyndall effect is not observed in 
   (a) suspension   (b) true solution   (c) emulsions   (d) colloidal solution

23) Adsorption is the phenomenon in which a substance 
   (a) accumulates on the surface of the other substance 
   (b) goes into the body of the other substance   (c) remains close to the other substances 
   (d) None of the above

24) Oil soluble dye is mixed with emulsion and emulsion remains colourless. Then it is 
   (a) O-in-W   (b) W-in-O   (c) O-in-O   (d) W-in-W

25) Which one of the following statements is false for hydrophilic sols? 
   (a) They do not require electrolytes for stability   (b) Their coagulation is reversible 
   (c) Their viscosity is of the order of that water   (d) Their surface tension is usually lower than that of dispersion medium
26) Which of the following is an example of zeolite?
   (a) ZSM-5  (b) AgNO₃  (c) Mg(OH)₃  (d) Co(OH)₃

27) Gold number of a lyophilic sol is such property that
   (a) the larger its value, the greater is the peptising power
   (b) the lower its value, the greater is the peptising power
   (c) the lower its value, the greater is the protecting power
   (d) the larger its value, the greater is the protecting power

28) In styrene foam, the dispersed phase is ....... and the dispersion medium is ..... 
   (a) gas, gas  (b) solid, solid  (c) gas, solid  (d) None of these

29) When a few typical solutes are separated by a particular selective membrane such as protein
    particles, blood corpuscles, this process is called
   (a) dialysis  (b) diffusion  (c) transpiration  (d) endosmosis

30) Which of the following sols is hydrophobic
   (a) Starch  (b) Gum  (c) Sulphur  (d) Gelatin

31) Which is/are correctly matched?
   (a) Aerosol - liquid dispersed in a gas  (b) Smoke - solid dispersed in a gas
   (c) Emulsion - liquid dispersed in liquid  (d) All of the above are correctly matched

32) Choose the incorrect statement in respect of physisorption
   (a) It is not specific in nature  (b) It arises because of van der Waals' forces
   (c) It is reversible in nature  (d) No appreciable activation energy is needed
   (e) Enthalpy of adsorption is in the range 80-240 kJ mol⁻¹

33) Pieces of wood burn faster a log of wood of the same mass because
   (a) Surface area of log of wood is larger and needs more time to burn
   (b) pieces of wood have large surface area  (c) all pieces of wood catch fire at the same time
   (d) block of wood has higher density than pieces of the same wood.
34) Gold number is associated with
   (a) electrophoresis  (b) purple of cassius  (c) protective colloid  (d) amount of pure gold

35) Rate of physical adsorption increases with
   (a) decrease in temperature  (b) decrease in pressure  (c) increase in temperature  
   (d) decrease surface area

36) The gas which is least adsorbed on charcoal (under identical condition) is
   (a) HCl  (b) O₂  (c) CO₂  (d) NH₃  (e) SO₂

37) The process of separation of colloids by passing through semipermeable is called
   (a) filtration  (b) electrophoresis  (c) dialysis  (d) ultrafiltration

38) Which of the following metal sols cannot be prepared by Bredig's arc method?
   (a) Copper  (b) Potassium  (c) Gold  (d) Platinum

39) Which one of the following is not correct as regards physisorption?
   (a) Adsorption on solids is reversible  (b) Adsorption increases with increase in temperature  
   (c) Adsorption is spontaneous  (d) Both enthalpy and entropy of adsorption are negative

40) Which of the following is an associated colloid
   (a) protein + water  (b) soap + water  (c) rubber + benzene  (d) milk

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