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**Max Time : 1 hr** **SURFACE CHEMISTRY Max Marks : 30**

**CODE : A**

1. (i) At the equilibrium position in the process of adsorption \_\_\_\_\_\_\_. [ 1 x 5 = 5 ]

|  |  |  |  |
| --- | --- | --- | --- |
| a) H > 0 | b) H = TS | c) H > TS | d) H < TS |

(ii) Which of the following is true in respect of adsorption ?

a) G < 0, S < 0, H > 0 b) G < 0, S > 0, H < 0

c) G < 0, S < 0, H < 0 d) G > 0, S > 0, H < 0

(iii) Which of the following is not a favorable condition for physical adsorption ?

a) High pressure b) Negative H

c) Higher critical temperature of adsorbate d) High temperature

(iv) 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

(v) In Freundlich isotherm, the intercept on y-axis is denoted by

|  |  |  |  |
| --- | --- | --- | --- |
| a) Log | b) Log K | c) | d) n |

1. Define “occlusion”? [ 1 ]
2. Why does physisorption decrease with increase in temperature ? [ 2 ]
3. Distinguish between the meaning of the term adsorption and absorption. Give one example of each. [ 2 ]
4. What is an adsorption isotherm ? Describe Freundlich adsorption isotherm. [ 2 ]
5. Define the following terms : [ 3 ]

a) Macromolecular colloids b) Peptization c) Multimolecular colloids

1. Write the differences between physisorption and chemisorption with respect of the following :

a) Specificity b) Temperature dependence [ 3 ]

c) Reversibility d) Enthalpy change

1. Explain the cleansing action of soap. Why do soaps not work in hard water ? [ 3 ]
2. What are lyophilic and lyophobic sols ? Give one example of each type. Why is hydrophobic sol easily coagulated ? [ 3 ]
3. Action of soap is due to emulsification and micelle formation. Comment. [ 3 ]
4. Define following : [ 3 ]

a) Adsorbate b) Adsorbent c) Desorption

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**Max Time : 1 hr** **SURFACE CHEMISTRY Max Marks : 20**

**CODE : B**

1. Adsorption is accompanied by

a) decrease in enthalpy and increase in entropy

b) increase in enthalpy and increase in entropy

c) decrease in enthalpy and decrease in entropy

d) no change in enthalpy and entropy.

1. Which of the following are the characteristics of chemisorption ?

1. High heat of adsorption 2. Irreversibility 3. Low activation energy

Select the correct answer using the code given below :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 & 2 only | b) 1 & 3 only | c) 2 & 3 only | d) 1, 2 & 3 |

1. An associated colloid among the following is

|  |  |  |  |
| --- | --- | --- | --- |
| a) enzymes | b) proteins | c) cellulose | d) sodium stearate |

1. Stability of lyophilic colloids is due to

a) same charge on all the colloidal particles

b) solvation of the colloidal particles

c) both (a) & (b)

d) the fact that they are organic substances

1. Gold sol is generally prepared by

|  |  |
| --- | --- |
| a) reduction | b) oxidation |
| c) hydrolysis | d) double decomposition |

1. Intensity of the scattered light depends upon the difference of which of the following property of the dispersed phase and the dispersion medium ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) densities | b) viscosities | c) surface tension | d) refractive indices |

1. Among the electrolytes Na2SO4 , CaCl2 , Al2(SO4)3 and NH4Cl , the most effective coagulating agent for Sb2S3 sol is.

|  |  |  |  |
| --- | --- | --- | --- |
| a) Na2SO4 | b) CaCl2 | c) Al2(SO4)3 | d) NH4Cl |

1. Ferric chloride is applied to stop bleeding due to a cut because :

a) Fe3+ ion coagulates blood which is negatively charged sol.

b) Fe3+ ion coagulates blood which is positively charged sol.

c) Cl – ion coagulates blood which is positively charged sol.

d) Cl – ion coagulates blood which is negatively charged sol.

1. Which one of the following has minimum gold number ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) starch | b) sodium oleate | c) gum Arabic | d) gelatin |

1. In coagulating the colloidal solution of As2S3, which has the minimum coagulating value ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) NaCl | b) KCl | c) BaCl2 | d) AlCl3 |

1. Gold numbers of protective colloids A, B, C and D are 0.5, 0.01, 0.1 and 0.005 respectively. The correct order of their protective powers is

|  |  |  |  |
| --- | --- | --- | --- |
| a) A < C < B < D | b) B < D < A < C | c) D < A < C < B | d) C < B < D < A |

1. Hardening of leather in tanning industry is based on

|  |  |  |  |
| --- | --- | --- | --- |
| a) electrophoresis | b) electro-osmosis | c) mutual coagulation | d) thermosetting |

1. Hydrolysis of protein in the stomach and intestines takes place due to the presence of the enzymes

|  |  |
| --- | --- |
| a) trypsin and pepsin respectively | b) pepsin and trypsin respectively |
| c) trypsin in both cases | d) pepsin in both cases |

1. Which one of the following does not involve coagulation ?

a) Formation of delta regions

b) Peptization

c) Treatment of drinking water by potash alum

d) Clotting of blood by the use of ferric chloride

1. Surface of the eye is protected from bacterial infection by the enzyme

|  |  |  |  |
| --- | --- | --- | --- |
| a) Pepsin | b) Trypsin | c) Lysozyme | d) Nitrogenase |

1. Which of the following relation is correct ?

1. x/m = constant at high pressure 2. x/m = constant x p1/n (at intermediate pressure)

3. x/m = constant x pn (at lower pressure)

|  |  |  |  |
| --- | --- | --- | --- |
| a) all are correct | b) all are wrong | c) 1 & 2 are correct | d) 3 is correct |

1. What is the equation form of Langmuir isotherm under high pressure ?

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) a.P | c) | d) |

1. At high concentration of soap in water, soap behaves as ………… .

|  |  |
| --- | --- |
| a) molecular colloid | b) associated colloid |
| c) macromolecular colloid | d) Lyophilic colloid |

1. Which of the following will show Tyndall effect ?

a) Aqueous solution of soap below critical micelle concentration

b) Aqueous solution of soap above critical micelle concentration

c) Aqueous solution of sodium chloride

d) Aqueous solution of sugar

1. Method by which lyophobic sol can be protected.

|  |  |
| --- | --- |
| a) by addition of oppositely charged sol | b) by addition of electrolyte |
| c) by addition of lyophilic sol | d) by boiling |

**Answers**

**SURFACE CHEMISTRY [CLASS = 12th ]**

**CODE : A**

1. c

2. a

3. d

4. c

5. a

6. d

7. c

8. a

9. d

10. d

11. a

12. c

13. b

14. b

15. c

16. c

17. a

18. b

19. b

20. c