

## SURFACE CHEMISTRY

1. If  $x$  is the amount of adsorbate and  $m$  is the amount of adsorbent, which of the following relations is not related to adsorption process? [CBSE AIPMT-2011]

1)  $\frac{x}{m} = p \times T$

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

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

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

2. Choose the incorrect statement in respect of physisorption. [Kerala CEE-2011]

- 1) It is not specific in nature
- 2) It arises because of Vander Waals' forces
- 3) It is reversible in nature
- 4) No appreciable activation energy is needed

3. Pieces of wood burn faster than a log of wood of the same mass because [RPMT-2010]

- 1) Surface area of log of wood is larger and needs more time to burn.
- 2) Pieces of wood have large surface area.
- 3) All pieces of wood catch fire at the same time.
- 4) Block of wood has higher density than pieces of the same wood.

4. Which of the following is a wrong statement for physisorption?

- 1) It is a reversible reaction
- 2) Reaction requires energy of activation
- 3) The value of adsorption enthalpy is low
- 4) It generally occurs at a low temperature.

### KEY

1) 1    2) 4    3) 2    4) 2

**CATALYSIS HOMOGENOUS AND HETEROGENEOUS ACTIVITY AND SELECTIVITY,  
ENZYME CATALYSIS**

**1. For the following reaction,  $C_6H_{12}O_6(aq) + H_2(g) \rightleftharpoons C_6H_{14}O_6(aq)$  Which one of the following is not affected by the addition of catalyst? [CPMT-2011]**

1. Rate of forward reaction
2. Rate of backward reaction
3. Time required to reach the equilibrium
4. Spontaneity

**2. Which one of the following is an example for homogenous catalyst? [KCET-2010]**

- 1) Manufacture of Sulphuric acid by Contact process.
- 2) Manufacture of ammonia by Haber's process.
- 3) Hydrolysis of sucrose in the presence of dilute hydrochloric acid.
- 4) Hydrogenation of oil.

**3. Catalytic poisons act by [Manipal 2010]**

- 1) Making the products chemically inactive
- 2) Increasing the rate of the backward reactions
- 3) Chemical combination with any one of the reactants
- 4) Preferential adsorption on the catalyst surface

**4. Which type of metal form effective catalyst? [Haryana PMT 2009]**

- |                         |                      |
|-------------------------|----------------------|
| 1) Alkali metal         | 2) Transition metal  |
| 3) Alkaline earth metal | 4) Radioactive metal |

**KEY**

- 1) 4    2) 3    3) 4    4) 2

**COLLOIDAL STATE : DISTINCTION BETWEEN TRUE SOLUTIONS, COLLOIDS AND SUSPENSIONS, LYOPHILIC, LYOPHOBIC, MULTIMOLECULAR, AND MACROMOLECULAR COLLOIDS**

**PREVIOUS COMPETATIVE QUESTIONS**

- 1. Which one of the following is most effective in  $As_2S_3$  causing the coagulation of an sol ? [E2009]**  
1) KCl                      2)  $AlCl_3$                       3)  $MgSO_4$                       4)  $K_3Fe(CN)_6$
- 2. Which of the following is not correct? [E 2007]**  
1) Milk is a naturally occurring emulsion  
2) Gold sol is a lyophilic sol  
3) Physical adsorption decreases with rise in temperature  
4) Chemical adsorption is unilayered
- 3. The dispersed phase, dispersion medium and nature of colloidal solution (lyophilic or lyophobic) of gold 'sol' respectively are (E-2006)**  
1) solid, solid, lyophobic  
2) liquid, liquid, lyophobic  
3) solid, liquid, lyophobic  
4) solid, liquid, lyophilic
- 4. Which of the following is a lyophobic colloidal solution (E -2004)**  
1) Aqueous starch solution  
2) Aqueous protein solution  
3) Gold sol  
4) Polymer solution in some organic solvents
- 5. Which one of the following is a lyophilic colloidal solution (E-2004)**  
1) smoke                      2) Gold sol  
3) Starch aqueous solution                      4) cloud
- 6. Colloidal solution of gold prepared by different methods are of different colours because of (E-2003)**  
1) Variable valency of gold  
2) Different concentration of gold particles  
3) Impurities produced by different methods  
4) different diameters of colloidal gold particles
- 7. Which one of the following salts forms a micelle? (E-2001)**  
1. Sodium formate                      2. Sodium acetate  
3. Sodium stearate                      4. Sodium Chloride

8. Gold numbers of protective colloids A, B, C and D are 0.50, 0.01, 0.10 and 0.005, respectively, the correct order of their protective powers is (A-2008)

- 1)  $D < A < C < B$     2)  $C < B < D < A$     3)  $A < C < B < D$     4)  $B < D < A < C$

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

[KCET-2011]

- 1) Clotting of blood by the use of ferric chloride
- 2) Formation of delta region
- 3) Treatment of drinking water by potash alum
- 4) Peptisation

**KEY**

1) 2    2) 2    3) 3    4) 3    5) 3

6) 4    7) 3    8) 4    9) 1