

# INDIAN SCHOOL MUSCAT

## CHEMISTRY DEPARTMENT

### QUESTION BANK

#### Surface Chemistry

1. What do you mean by the term –Adsorption? 1
2. Explain the terms – Adsorbate and Adsorbent? 1
3. Give two differences between adsorption and absorption? 1
4. Why do finely divided solids act as good adsorbents? 1
5. What is adsorption isotherm? 1
6. Give an equation showing variation of extent of adsorption with concentration of a solution? 1
7. What do you mean by the term promoter? Give an example. 1
8. What is the optimum temperature and pH for enzyme catalysed reactions? 1
9. What are colloids? 1
10. Give two examples of solid Sol and Gel? 1
11. Colloid is a state not a substance. Explain? 1
12. What are associated colloids? Give an example? 1
13. What is CMC and Kraft's temperature? 1
14. Define the term peptization? 1
15. What is observed when light is passed through a colloidal solution? 1
16. State Hardy- Schulze rule? 1
17. What is a protective colloid? 1

18. Alum is used for purification of water. Why? 1
19. What are the two types of emulsions? 1
20. Why does a gas mixed with another gas not form a colloidal system? 1
21. Explain the terms sorption and desorption. 1
22. "Chemisorption is highly specific." Illustrate with an example. 1
23. "Adsorbents in finely divided form are more effective." Why? 1
24. 'Generally high temperature is favourable for chemisorption.' Why? 1
25. Name the catalyst used in the following process : 1
  - (a) Haber's process for the manufacture of  $\text{NH}_3$  gas.
  - (b) Ostwald process for the manufacture of nitric acid.
26. Why gas masks are used by miners in coal mines while working? 1
27. Write the chemical reaction involved in the preparation of sulphur sol. 1
28. Name the enzyme which converts milk into curd. 1
29. What are the optimum temperature and pH at which enzymes are highly active. 1
30. What is the composition of colloidal solution? 1
31. Why do colloidal particles show Brownian movement? 1
32. Why does sky appear blue to us? 1
33. What happens when hydrated ferric oxide and arsenious sulphide sols are mixed in almost equal proportions? 1
34. Gelatin is generally added to ice-cream. Why? 1
35. Mention the two conditions for the formation of micelles. 1
36. How is Brownian movement responsible for the stability of sols? 1
37. Which of the following is more effective in coagulating positively charged 1

hydrated ferric oxide sol :

(i) KCl (ii) CaSO<sub>4</sub> (iii) K<sub>3</sub> [Fe(CN)<sub>6</sub>].

38. Mention one use of ZSM-5 catalyst. 1
39. Define the term – desorption? 2
40. Write the four differences between physisorption and chemisorption? 2
41. ‘Adsorption is an exothermic process’. Explain. 2
42. What is the sign of  $\Delta H$ ,  $\Delta S$  and  $\Delta G$  when a gas is adsorbed by an adsorbent? 2
43. (a) Which gas is adsorbed more readily on charcoal lump: 2  
ammonia or carbondioxide and why ?
- (b) Which adsorbs more of carbon monoxide:  
charcoal lump or charcoal powder& why?
44. Name the factors which influence the extent of adsorption of a gas on solid. 2
45. Explain Freundlich adsorption isotherm 2
46. Define the terms – catalysis and catalyst. 2
47. What is meant by activity and selectivity of a catalyst? 2
48. What is shape – selective catalysis? Give an example of shape selective catalyst. 2
49. Give two examples of enzyme catalysed reaction 2
50. Explain the mechanism of enzyme catalysis. 2
51. Differentiate between multimolecular and macromolecular colloid? 2
- 52 Write the equation for formation of 2
- (a) Sulphur sol.
- (b) Ferric hydroxide sol.
53. How is a colloidal solution purified by dialysis? 2

54. Define the terms – (a) Brownian movement (b) Electrophoresis? [ 2
55. How does an emulsifying agent work? Give an example of emulsifying agent. 2
56. Explain the effect of temperature on the extent of physical and chemical adsorption. 2
57. Define the term peptization and mention its cause. 2
58. In what way these are different : (a) a sol and a gel (b) a gel and an emulsion. 2
59. Define the terms : 2
- (a) Helmholtz electrical double layer.
  - (b) Zeta potential.
60. Mention the two necessary conditions for the observation of Tyndall Effect 2
61. Account for the following : 2
- (a) Artificial rain can be caused by spraying electrified sand on the clouds.
  - (b) Electrical precipitation of smoke.
62. Write chemical equations for the preparation of sols : 2
- (a) Gold sol by reduction.
  - (b) Hydrated ferric oxide sol by hydrolysis.