



# CHEMISTRY

## BOOKS - A N EXCEL PUBLICATION

### SURFACE CHEMISTRY

#### Question Bank

1. Why are substance like platinum and palladium often used for carrying out electrolysis of aqueous soltion?



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2. Why does physisorption decrease with increase of temperature ?



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3. Why are powdered substances more effective adsorbents than their crystalline forms?



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4. Why is it necessary to remove CO when ammonia is obtained by Haber process ?



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5. Why is the ester hydrolysis slow at the beginning and becomes faster after some time?



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6. What is the role of desorption in the process of catalysis?



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7. What modification can you suggest for Hardy-Schulze law?



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8. Why is it essential to wash the precipitate with water before estimating it quantitatively?



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**9.** Colloids exhibit certain special properties  
Name the property of colloid involved in the construction of ultramicroscope.



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**10.** Colloids exhibit certain special properties.  
Explain the above property.



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11. What are the conditions to be satisfied to exhibit Tyndall effect?



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12. In an attempt to prepare ferric hydroxide sol by adding small amount of ferric chloride to water, one person got a precipitate of ferric hydroxide. How can you help him to convert  $Fe(OH)_3$  precipitate to  $Fe(OH)_3$  sol?



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13. Name the phenomenon behind this.



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14. What happens when  $BaCl_2$  is added to  $Fe(OH)_3$  sol?



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**15.** Physisorption and chemisorption are two types of adsorption. What is the effect of temperature on physisorption and chemisorption?



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**16.** In certain cases, physisorption transfers into chemisorption as temperature is increased. Explain with an example.



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**17.** Explain how colloids get coagulated on addition of salts.



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**18.** Ferric hydroxide sol can be prepared from freshly prepared ferric hydroxide precipitate. It can also be prepared by adding ferric chloride solution to boiling water. In both cases the sol particles are positively charged. Name the

above two methods of preparation of ferric hydroxide sol.



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**19.** What happens when an electric is applied across two platinum electrodes dipping in ferric hydroxide sol? Explain.



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20. Colloids have many characteristic properties. Among these Tyndall effect is an optical property and coagulation is the process of setting of colloidal particles. What is Tyndall effect?



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21. State Hardy-Schulze rule which deals with the coagulation of colloids by the addition of an electrolyte.





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**22.** What is a protective colloid?



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**23.** Colloids are widely used in industry and in daily life. What are colloids?



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**24.** Colloids are widely used in industry and in daily life. Write any four applications of colloids.



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**25.** The accumulation of molecular species at the surface rather than in the bulk of a solid or liquid is termed adsorption. What is adsorption isotherm?



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**26.** The accumulation of molecular species at the surface rather than in the bulk of a solid or liquid is termed adsorption. Write the mathematical expression of Freundlich adsorption isotherm.



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**27.** Enzymes are known as biochemical catalysis. Write the two important characteristics of enzyme catalysis.



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**28.** There are mainly two types of adsorption of gases on solids. What are the two types of adsorption of gases?



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**29.** Write any two characteristics of each of the above two types of adsorption.



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**30.** Sols are colloidal systems in which dispersion medium is liquid and dispersed phase is solid, Write any four differences between lyophilic and lyophobic sols



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**31.** Peptisation is a method of preparation of sol. Write a general procedure for peptisation.



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**32.** Adsorption has many applications. Write any two applications of adsorption.



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**33.** Physisorption and chemisorption are the two types of adsorption. Write any four differences between them.



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34. Which of the following is Lyophobic colloid? Starch in water, Gum in water, Soap in water, Gold sol

A. Starch in water

B. Gum in water

C. Soap in water

D. Gold sol

**Answer: A**



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**35.** Colloids are widely used in industry and in daily life. Write any four applications of colloids.



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**36.** Which of the following is an example of absorption?

A. Water on silica gel

B. Water on  $CaCl_2$

C. Hydrogen on finely divided Nickel

D. Oxygen on metal surface

**Answer: A**



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**37.** Write any two differences between absorption and adsorption.



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**38.** Based on particles of dispersed phase, colloidal systems are classified into multimolecular, macro molecular and associated colloids. Which of the following colloidal system is an example for multimolecular colloidal system?

A. Starch in water

B. Soap solution

C. Ferric hydroxides in water

D. Polyvinyl alcohol in water

**Answer: C**



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**39.** Associated colloids are also known as micelles. How are they formed?



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**40.** Catalysis can be classified into two groups- homogeneous and heterogeneous. What do you mean by homogeneous catalysis?



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41. Write one example for heterogeneous catalysis.



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42. Which of the following is an emulsifying agent for O/W emulsion?

Milk, Butter, Gum, Lamp black

A. Milk

B. Butter

C. Gum

D. Lamp black

**Answer: D**



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**43.** Dispersed phase and dispersion medium are two phases of colloidal system. Name the colloid in which dispersed phase is liquid and dispersion medium is solid.



A. Sol

B. Foam

C. Emulsion

D. Gel

**Answer: A**



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**44.** Physisorption and chemisorption are the two types of adsorption. Write any four differences between them.



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**45.** Physisorption and chemisorption are two types of adsorption. What is the effect of temperature on physisorption and chemisorption?



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**46.** Adsorption has many applications. Write any two applications of adsorption.



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47. Which among the following is not an electrical property of colloids?

A. Electrophoresis

B. Electro osmosis

C. Coagulation

D. Tyndall effect

**Answer: A**



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**48.** Freundlich adsorption isotherm is

$$\frac{x}{m} = kp^{\frac{1}{n}} \text{ where } n > 1. \text{ Answer the following}$$

questions based on Freundlich adsorption

isotherm: What is adsorption isotherm?



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**49.** Explain the terms in the above equation.



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50. Raju and Ramu were asked to prepare a colloidal solution each. Raju added starch powder into water while Ramu added saturated  $FeCl_3$  solution into excess boiling water. What type of colloid did Raju and Ramu prepare?



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51. What are the methods usually adopted to make firewood burn faster ?



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52. How will these colloidal solutions respond to addition of small amount electrolyte solution into each?



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53. Which of the following will be the most effective in coagulating gold sol?

$K_4Fe(CN)_6$ ,  $MgCl_2$  or  $Na_3PO_4$



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55. Which of the following will be the most effective in coagulating gold sol?

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**56.** State Hardy-Schulze rule which deals with the coagulation of colloids by the addition of an electrolyte.



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**57.** Colloids are classified in different ways. Emulsions, gels, sols etc. are different types of colloidal systems. What are emulsions and emulsifiers?



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**58.** What are associated colloids or micelles?



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**59.** Cleansing action of soap/detergent is essentially an emulsification process. Why?



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**60.** Chemical industries make use of catalysed processes to improve the overall output of the process. What do you mean by 'activity' and 'selectivity' of catalysts?



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**61.** What is shape selective catalysis?



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**62.** What is the use of ZSM-5?



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**63.** Colloidal solution of gold is prepared by striking an electric arc between gold electrodes kept in water. What is this method called as? Why is it regarded as a dispersion method?



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64. What is the charge of gold sol? How do the particles acquire this charge?



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65. Which of the following will be the most effective in coagulating gold sol?

$K_4Fe(CN)_6$ ,  $MgCl_2$  or  $Na_3PO_4$



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