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CBSE 12th Chemistry
Chapter-5 (Surface Chemistry)
Unsolved Important Questions

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SECTION A

(Each question in this section carry 1 mark)

Q.1. What causes Brownian movement in a colloidal solution?

Q.2. What is an emulsion?

Q.3. Give the example each of 'oil of water' and 'water in oil' emulsion.

Q. 4. Write the main for reason for the stability of colloidal sols.

Q.5. Write one similarity between Physisorption and Chemisorption.

Q.6. Of physisorption and chemisorption which type of adsorption has a higher enthalpy of adsorption?

Q.7. What is the 'coagulation' process?

Q.8. What is meant by 'shape selective catalysis'.

Q.9. Define 'peptization'.

Q.10. What is the effect of temperature on chemisorption?

Q.11. What is the reason for the stability of colloidal sols?

Q.12. What type of colloid is formed when a liquid is dispersed in a solid? Give an example.

SECTION B

(Each question in this section carry 2 marks)

Q.13. Name the two group into which phenomenon of catalysis can be divided. Give an example of each group with the chemical equation involved.

Q.14. What is meant by coagulation of colloidal solution? Describe briefly and three methods by which coagulation of lyophobic sols can be carried out.

Q.15. Write the dispersed phase and dispersion medium of the following colloidal system:

(i) Smoke
(ii) Milk

Q.16. What are lyophobic and lyophobic colloids? Which of these sols can be easily coagulated on the addition of small amounts of electrolytes?

Q.17. Write the differences between physisorption and chemisorption with respect to the following:

(i) Specificity
(ii) Temperature dependence
(iii) Reversibility and
(iv) Enthalpy change

Q.18. What is meant by coagulation of a colloidal solution? Name any method by which coagulation of lyophobic sols can be carried out.

Q.19. Describe the following:

(i) Tyndall effect
(ii) Shape-selective catalysis

Q.20. Define the following terms:

(i) Lyophilic colloid
(ii) Zeta potential
(iii) Associated colloids

SECTION C

(Each question in this section carry 3 marks)

Q.21. What are lyophilic and lyophobic sols? Give one example of each type. Which one of these two types of sols is easily coagulated and why?

Q.22. How are the following colloids different from each other in respect of dispersion medium and dispersed phase? Give one example of each type.

(i) An aerosol

(ii) A hydrosol

(iii) An emulsion

Q. 23. What is the difference between multimolecular and macromolecular colloids? Give one example of each type. How are associated colloids different from these two types of colloids?

Q.24. Explain how the phenomenon of adsorption finds application in each of the following processes:

(i) Production of vacuum

(ii) Heterogeneous catalysis

(iii) Froth Floatation process

Q.25. (a) In reference to freundlich adsorption isotherm write the expression for adsorption of gases on solids in the form of an equation.

(b) Write an important characteristic of lyophilic sols.

Q.26. Give reasons for the following observations:

(i) Leather gets hardened after tanning.

(ii) Lyophilic sol is more stable than lyophobic soil.

(iii) It is necessary to remove CO when ammonia is prepared by Haber's process.

Q.27. Write one difference in each of the following:

(i) Lyophobic sol and Lyophilic sol

(ii) Solution and Colloid

(iii) Homogeneous catalysis and Heterogeneous catalysis

Q.28. Explain the following terms giving a suitable example for each:
(i) Aerosol
(ii) Emulsion
(iii) Micelle

Q.29. What are the characteristics of the following colloids? Give one example of each.
(i) Multimolecular colloids
(ii) Lyophobic sols
(iii) Emulsions

Q.30. What are emulsions? What are there different types? Give one example of each type.

Q.31. Write any three difference between physisorption and chemisorption.

Q.32. Write one difference in each of the following :
(a) Multimolecular colloid and Associated colloid
(b) Coagulation and Peptization
(c) Homogeneous catalysis and Heterogeneous catalysis.

Q.33. (a) Write the dispersed phase and dispersion medium of milk.
(b) Write one similarity between physisorption and chemisorption.
(c) Write the chemical method by which $Fe(OH)_3$ sol is prepared from $FeCl_3$.

Q.34. Classify colloids where the dispersion medium is water. State their characteristics and write an example of each of these classes.

SECTION D

(Each question in this section carry 5 marks)

Q.35. (a) Explain the following terms:
(i) Rate of a reaction
(ii) Activation energy of a reaction

(b) The decomposition of phosphine, PH3, proceeds according to the following equation:

$$4\,PH_3(g) \longrightarrow P_4(g) + 6\,H_2(g)$$

It is found that the reaction follows the following rate equation:

$$Rate = k[PH_3].$$

The half-life of PH_3 is 37.9 s at 120^0C.

(i) How much time is required for $3/4th$ of PH_3 to decompose?

(ii) What fraction of the original sample of PH_3 remains behind after 1 minute?

Q.36 (a)Explain the following terms:

(i) Order of a reaction

(ii) Molecularity of a reaction

(b) The rate of a reaction increases four times when the temperature changes from 300 K to 320 K. Calculate the energy of activation of the reaction, assuming that it does not change with temperature. ($R = 8.314$ J K^{-1} mol^{-1})