Surface Chemistry Viva Questions With Answers

Question.1. What is a true solution? Give an example.
Answer. A homogeneous mixture of two substances, in which particles of both possess molecular dimensions (i.e., 10^{-10} to 10^{-9} m). For example, a solution of common salt in water.

Question.2. What is a colloidal solution? Give an example.
Answer. A colloidal solution is a "two-phase heterogenous system in which a substance is distributed in colloidal state (particles having diameter between 1 to 1000 nm) in a medium". The particles of the dispersed substance (of colloidal size) are called dispersed phase', while the medium in which they are dispersed, is called dispersion medium. For example, milk, butter, smoke, etc.

Question.3. What are lyophilic and lyophobic sols?
Answer. Colloidal particles having considerable affinity for the dispersion medium are termed as lyophilic sols, and colloidal particles having very little or no affinity for the dispersion medium are termed as lyophobic sols. For example, starch sol is a lyophilic sol whereas sulphur sol is a lyophobic sol.

Question.4. What is the size of colloidal particles?
Answer. Between 1—100 nm.

Question.5. What is a sol and what is a gel?
Answer. When a colloidal solution appears as a fluid, it is called a sol but if it has a semi-solid appearance, it is known as a gel. In sol liquid is the dispersion medium and solid the disperse phase whereas in gel solid is the dispersion medium and liquid the disperse phase.

Question.6. Give two examples of positively charged sols.
Answer. Ferric hydroxide sol and aluminium hydroxide sol.

Question.7. Give an example of negatively charged sol.
Answer. Arsenious sulphide sol.

Question.8. Why can't we prepare a colloidal solution of a gas in a gas?
Answer. The mixture of any two gases is always a homogeneous mixture and therefore does not satisfy the condition for the formation of a colloidal solution.

Question.9. What is meant by the term dialysis?
Answer. The process of separating electrolytes from a colloid by means of diffusion of the former through an animal or vegetable membrane, is called dialysis.

Question.10. What is the use of dialysis?
Answer. Dialysis is used for purifying colloidal solution. In the presence of excess of electrolytes, the colloidal solutions get coagulated. When a colloidal sol containing impurities is kept in a parch-ment bag, the electrolytes pass through the membrane while colloidal particles are retained by parchment bag.

Question.11. How can we make dialysis fast?
Answer. By circulating hot water instead of cold water, in the container or by applying electric field across the dialyser.

Question.12. How can a colloidal solution and a true solution of the same colour be distinguished from each other?
Answer. When a powerful beam of light is passed through true and colloidal solutions, each kept in glass vessel, then only colloidal solution exhibits Tyndall effect whereas true solution does not.

Question.13. What is peptization?
Answer. The method of breaking down a precipitate into colloidal form by shaking with the dispersion medium in the presence of an electrolyte, is called peptization. The electrolyte used for this purpose, is called peptizing agent.

Question.14. What is coagulation?
Answer. Coagulation is a process of changing the colloidal state into an insoluble precipitate, by in-ducing aggregation of colloidal particles.

Question.15. Name a few methods of coagulating lyophillic colloids.
Answer. (a) Addition of electrolyte.
(b) Addition of a liquid in which the dispersion medium is soluble.

Question.16. What is the reason for the coagulation of a lyophillic sol?
Answer. Addition of excess of an electrolyte neutralizes the charge on colloidal particles which therefore unite to form bigger particles and get precipitated.

Question.17. Name a few methods of coagulating lyophobic sols.
Answer. (a) By adding electrolytes.
(b) By boiling. ,
(c) Electrophoresis.

Question.18. What do you understand by coagulation value?
Answer. The minimum amount of the electrolyte in millimoles per litre of the combined solution required to cause coagulation is called the coagulation value of the electrolyte for a particular sol.

Question.19. What is Hardy-Schulze rule?
Answer. Hardy and Schulze rule states that the coagulating power of an electrolyte depends upon the valency of ion carrying opposite charge to that of the dispersed phase.

Question.20. Which one of the following electrolytes bring about the coagulation of As_2S_3 sol quickest and in the least concentration?
(a)NaCl (b) $MgS0_4$ (C)$AlP0_4$.
Answer. $AlP0_4$. AS_2S_3 sol is negatively charged and is coagulated by adding positively charged ions. Al^{3+}has the greatest positive valence of all the electrolytes given. Hence it is most effective in causing coagulation.

Question.21. What is the characteristic of dialysing membrane?
Answer. It allows only the electrolytes to pass through it, but does not allow the sol particles to pass through.

Question.22. Give names of the two substances which are used for the preparation of dialysing membranes.
Answer. Cellophane and parchment.

Question.23. What is an emulsion?
Answer. An emulsion is a colloidal system in which the dispersion medium as well as the dispersed phase are liquids.

Question.24. How many types of emulsions are known?
Answer. Two, oil-in-water emulsion and water-in-oil emulsion.

Question.25. What is oil-in-water emulsion? Give two examples.
Answer. Oil-in-water emulsion is that in which oil forms the dispersed phase and water the dispersion medium. For example, milk and vanishing cream.

Question.26. What is water-in-oil emulsion? Give two examples.
Answer. Water-in-oil emulsion is that in which water forms the dispersed phase and oil forms the dispersion medium. For example, cold cream and cod-liver oil.

Question.27. Differentiate between a solution and an emulsion.
Answer. A solution is a homogeneous mixture of two liquids whereas an emulsion is a heterogeneous mixture of two liquids.

Question.28. What is an emulsifier?
Answer. Any substance used to stabilize an emulsion is known as emulsifier.

Question.29. What is the role played by an emulsifier in the stability of emulsions?
Answer. An emulsifier lowers the interfacial tension between the two immiscible liquids. It envelopes the droplets of the dispersed phase and therefore they do not coalesce.

Question.30. Is it possible to get an emulsion by mixing two miscible liquids?
Answer. No; it will lead to the formation of solution.

Question.31. Mention a few uses of emulsions.
Answer. They are used in medicines, cosmetics, beverages etc.

Question.32. Which of the following is emulsifying agent?
(a) Glycerine (b) Soap (c) Wax (d) Alcohol.
Answer. Soap.

Question.33. What is emulsification?
Answer. It is the process of getting an emulsion from its components.

Question.34. What is demulsification?
Answer. It is the process of splitting an emulsion into its constituent liquids.

Question.35. Why is emulsifying agent called stabilizer?
Answer. Because it stabilizes the emulsion.

Question.36. How would you differentiate between oil-in-water and water-in-oil emulsion?
Answer. (i) By dye test. To the emulsion add water soluble dye. If the droplets become coloured the emulsion is oil-in-water type and if the medium becomes coloured the emulsion is water-in-oil type.
(ii) By dilution test. To the emulsion add a few drops of oil. If the oil forms a separate layer, the emulsion is oil-in-water type, otherwise it is water-in-oil type.

Question.37. Out of lyophilic and lyophobic sols, which can be easily converted into a gel and why?
Answer. Lyophilic sols can be more easily converted into gels because in them there is great affinity between dispersed phase and dispersion medium.

Question.38. Differentiate between a gel and a sol.
Answer. In a sol solid is the dispersed phase and liquid is dispersion medium whereas in a gel liquid is dispersed in solid medium.