Chemistry Practical Class 12 Lyophobic Sol: Aluminium Hydroxide, Ferric Hydroxide, Arsenious Sulphide Viva Questions with Answers

Q1: What do you mean by lyophobic sols? Give examples.

Answer:

Lyophobic sols aren't easily made by mixing the chemicals with the dispersion medium. These sols are not stable, as they easily coagulate when a small amount of electrolyte is introduced to them, or when they are heated or disturbed. The adsorption of ions by the scattered particles helps stabilise lyophobic sols. They are inherently irreversible.

Example: Ferric hydroxide or Aluminium Hydroxide dissolved in water.

Q2: What is coagulation?

Answer:

Coagulation is the precipitation of colloids by removal of the charge linked with colloidal particles. On their surfaces, colloidal particles have the same charge. A colloidal solution is stable due to charge.

Q3: How to prepare 2% ferric chloride solution?

Answer:

Mix 2g of ferric chloride in 100 mL of distilled water.

Q4: Hydrolysis of Aluminium chloride results in _____.

Answer:

Hydrochloric acid.

Q5: The particles in Arsenious sulphide colloidal solution are surrounded by _____.

Answer:

HS ions.

Q6: Why is it important to clean the apparatus used to prepare As_2S_3 sol by steaming out process?

Answer:

The presence of ionic contaminants in arsenious sulphide sol causes it to be impacted. As a result, before the experiment, the apparatus is steam cleaned.

Q7: How will you prepare a lyophobic colloidal solution?

Answer:

To make hydrophilic or lyophobic colloidal solutions, different chemical processes can be applied, such as the Double Decomposition Technique: When hydrogen sulphide is passed through an arsenic oxide solution in distilled water, we get a colloidal solution of arsenic chloride.

Q8: Boil the mixture of ferric chloride solution and distilled water until it attains _____ or _____ colour.

Answer:

Deep red or brown colour.

Q9: Why is Arsenious sol negatively charged?

Answer:

In the experiment, the arsenic sulphide sol has a negative charge against it. The Hardy-Schulze law states that the higher the coagulating strength, the higher the valence of the flocculating ion (ion carrying the opposite charge to the sol). "Thus, in K_2SO_4, K is the cation, and it has a +1 charge."

Q10: What are the precautions to be taken during the preparation of Aluminium hydroxide sol?

Answer:

- Because of the presence of contaminants, $Al(OH)_3$ sol is affected. To avoid this, the conical flask is cleaned using a steaming method.
- Drop by drop, the $AlCl_3$ solution is added.
- Heat the distilled water and aluminium chloride solution until it turns a brown or deep red colour.
- To avoid destabilisation of the sol, the hydrochloric acid (HCl) produced is removed by the dialysis procedure.

Q11: Boil the mixture of Aluminium chloride solution and distilled water until it attains _____ colour.

Answer:

White colour.

Q12: Is ferric hydroxide sol Lyophilic?

Answer:

A lyophobic sol is formed by ferric hydroxide. Lyophobic colloids are insoluble compounds that do not readily give colloidal solutions when treated with water, such as metal hydroxides or sulphides.

Q13: Give the chemical equation for the preparation of Ferric Hydroxide sol.

Answer:

The hydrolysis of ferric chloride with boiling distilled water produces ferric hydroxide sol. The hydrolysis reaction creates insoluble ferric hydroxide particles, which clump together to form larger colloidal particles.

$$FeCl_3(aq) + 3H_2O(l) \xrightarrow{Boil} Fe(OH)_3(s)[Red] + 3HCl(aq)$$
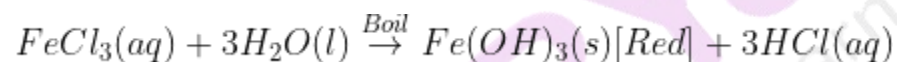
Q14: How will you obtain a colloidal sol of Arsenious sulphide?

Answer:

It's produced by hydrolyzing arsenious oxide in boiling distilled water and then passing H_2S gas through the resulting solution. Every particle in an arsenious sulphide colloidal solution is surrounded by HS- ions produced by the dissociation of H_2S.

Q15: Preparation of Lyophobic sols by chemical method involves _____.

Answer:

Double decomposition, Oxidation and reduction, and Hydrolysis.

Q16: What is the size of colloidal particles?

Answer:

Between 1—100 nm.

Q17: What is the Hardy-Schulze rule?

Answer:

According to the Hardy and Schulze rule, the coagulating power of an electrolyte is determined by the valency of an ion carrying the opposite charge to that of the dispersed phase.