Intermediate Quiz in Colloid Chemistry

1. The concept of a double electric layer. electrocapillary phenomena.
2. Rheological properties of disperse systems and structure formation in them
3. Find the total and relative surfaces of a cube with a volume of 2 cm3. If each of its sides is divided by 10, how many will the total and relative surfaces have?

1. Lipman 's equation . Theories of the structure of the double electric layer.

2. Anomalous and structural viscosity of dispersed systems and their causes.

3. Calculate the relative surface of a cube whose edge is equal to l.

1. electrokinetic phenomena. Electrophoresis and electroosmosis .
2. Structures of coagulation and crystallization.
3. Find the relative surface of a sphere with radius r.
4. Micellar theory of the structure of colloidal particles. Significance of electrokinetic phenomena in nature, technology and biological processes.
5. Formation of gels and jellies and their properties.
6. 3 g of platinum was crushed into regular cubes with an edge length of 10-6 cm. Considering that the specific gravity of platinum is 21.4 g/cm3, find the total surface area.

Aggregative and sedimentation stability of dispersed systems. Factors affecting the phenomena of coagulation, flocculation .

1. Thixotropy and Its Significance . with ineresis . Swelling and swelling kinetics.
2. An acid solution with a concentration of 100 mg/l of composition C8H17COOH is given. The surface tension of this solution at 20 °C is 37.0×10-3 N/m. Find the amount of excess acid on the surface of the solution, i.e. G (in mol/m2).

1. Coagulation under the action of electrolytes. Coagulation threshold (concentration).

2. The phenomenon of diffusion occurring in gels.

3. 0.4 cm3 of mercury is divided into cubes with an edge length of 8×10-6 cm. Considering that the density of mercury is 13.546 g/cm3, find the number of particles in this mercury.

1. Recharging colloidal particles. Schulze-Hardy rule. Smoluchowski 's Theory .

2. Preparation, composition and stability of emulsions. Types of emulsions and methods for their analysis.

3. To obtain a sol, 25 cm3 of a 0.02 N solution are mixed with 125 cm3 of a 0.005 N solution to form a colloidal solution of silver chloride. Write the formulas for the core, granules and micelles of the resulting sol.

mutual coagulation. Peptization. Coagulation under the action of a mixture of electrolytes. Phenomena of sensitization, additivity and antagonism.

1. Aerosols, their formation and methods of obtaining, Destruction of aerosols.
2. The electrokinetic potential of clay hydrosol particles is 48.8 mV. The external potential difference applied to the electrodes is 220 V. The distance between the electrodes is 22 cm. The viscosity of the floor is 10-3 Pa ⋅s, the dielectric constant is 81. The particles have a spherical shape. Find the rate of electrophoresis.
3. Wedging pressure. The use of coagulation in the treatment of natural and industrial wastewater.
4. Phase exchange in emulsions. Production, structure and stability of foams.
5. As2S3 sol particles passed 28.72 times in 20 minutes. External potential difference 240 V. The particles have a cylindrical shape. The distance between the electrodes is 30 cm. The dielectric constant of the medium is 81; suspension viscosity 1.005 ⋅10-3 Pa ⋅s ; find the zeta potential.
6. Foam life time. The use and importance of concentrated emulsions and foams.
7. The concept of a double electric layer. electrocapillary phenomena.
8. 0.01 ml of a solution of silver chloride [ AgCl ] was poured into the flask. Added to coagulate sols in flasks. Find the limits of sol coagulation under the action of electrolytes. Determine the sign of the charge of zoll particles.
9. Preparation, composition and stability of suspensions. sedimentation analysis.
10. Lipman 's equation . Theories of the structure of the double electric layer.
11. Find the total and relative surfaces of a cube with a volume of 3 cm3. If each of its sides is divided by 10, how many will be the total and comparative surfaces?
12. Aerosols, their formation and methods of obtaining, Destruction of aerosols.
13. electrokinetic phenomena. Electrophoresis and electroosmosis .
14. Calculate the relative surface of a cube with an edge equal to 2.
15. The impact of aerosols and suspensions on the environment and their importance in their production. soil colloids.
16. Micellar theory of the structure of colloidal particles.
17. Find the specific surface area of a sphere with radius 3.

1. Classification and property of surfactants .

2. Significance of electrokinetic phenomena in nature, technology and biological processes.

3.3 g of platinum was crushed into regular cubes with an edge length of 10-6 cm. Assuming that the specific gravity of platinum is 20.5 g/cm3, find the total surface area.

1. Critical surfactant concentration for micellization . solubilization process .
2. Aggregative and sedimentation stability of dispersed systems.

3. Give an acid solution of the composition C8H17COOH at a concentration of 90 mg / l. The surface tension of this solution at 20 °C is 37.0×10-3 N/m. Find the amount of excess acid on the surface of the solution, i.e. G (in mol/m2).

1. Properties of polyelectrolyte solutions. The use of polyelectrolytes as a stabilizer, flocculator and structurant .
2. Factors influencing the phenomena of coagulation, flocculation. Coagulation under the influence of electrolytes.
3. Divide 3.0.3 cm3 of mercury into cubes with an edge length of 8×10-6 cm. Given that the density of mercury is 13.546 g/cm3, find the number of particles in this mercury.

water-soluble polyelectrolytes. isoelectric state.

1. Recharging colloidal particles. Schulze-Hardy rule. Smoluchowski 's Theory .
2. Mix 20 cm3 0.02 N. solution with 120 cm3 0.005 n. solution to form a colloidal solution of silver chloride. Write the formulas for the core, granules and micelles of the resulting sol.
3. Dispersed systems discovered during the production process. The role of disperse systems in the production process and nature protection.
4. mutual coagulation. Peptization. Coagulation under the action of a mixture of electrolytes.

3. The electrokinetic potential of clay hydrosol particles is 48.8 mV. The external potential difference applied to the electrodes is 220 V. The distance between the electrodes is 20 cm. The viscosity of the floor is 10-3 Pas , the dielectric constant is 71. The particles have a spherical shape. Find the rate of electrophoresis.

1. Rheological properties of disperse systems and structure formation in them.
2. Syneresis . Swelling and swelling kinetics. Diffusion phenomenon occurring in gels.

3. As2S3 sol particles traveled 28.72 miles in 19 minutes. External potential difference 240 V. The particles have a cylindrical shape. The distance between the electrodes is 30 cm. The dielectric constant of the medium is 81; suspension viscosity 1.00510-3 Pas; find the zeta potential.

1. Anomalous and structural viscosity of disperse systems and the reasons for their formation. Structures of coagulation and crystallization.
2. Formation of gels and clots and their properties. Thixotropy and its meaning.

3. 0.03 ml of a solution of silver chloride [AgCl] was poured into the flask. Added to coagulate sols in flasks. Find the limits of sol coagulation under the action of electrolytes. Determine the sign of the charge of solp particles.

1. Colloidal systems and their classification. Preparation of colloidal systems. Lyophilic and lyophobic colloidal systems.
2. adsorption on the surface of a solid. Freundlich formula. Langmuir theory of monomolecular adsorption.

3. The concentration gradient in the aqueous solution "Congo Red" is 0.8 kg/m3. 5.910-7 kg of substance passed through the surface of 35•10-4 m in 3 hours. Find the diffusion coefficient. Compiled by:

1. Obtaining colloidal systems by condensation and dispersive methods.
2. The value of nephelometry and ultramicroscopy in the study of colloidal solutions ..

3. Diffusion coefficient in silver iodide solution: D=1.3•10-10 m/s; solution viscosity coefficient; find the radius of a particle of silver iodide at a temperature of 298°K.

1. Electron microscopy. X-ray and electronography
2. Laws related to molecular-kinetic properties. Brownian motion. Diffusion of colloids.

3. If the radius of the particle in the aerosol is 10-7 m, and the viscosity of the medium is 2.710-7 Gs/m, find the average displacement of the particle in 25 s at 298° K.

1. Influence of high-molecular and low-molecular surfactants on the formation of dispersed systems.
2. Osmotic pressure of colloidal systems, its role in medicine, biology and natural phenomena. Sedimentation.
3. Give a colloidal solution of gold. Particle radius r = 10-9 m, solution viscosity 10-8 Gs/m. Find the diffusion coefficient of the particles in this solution at 20°C.
4. The value of the dispersion method in nature, technology and chemical production.
5. Gibbs equation and its meaning. Ion adsorption.

3. Every 2 seconds, the Brownian motion of a gold particle in a colloidal solution was determined and the following displacements in microns (ie 10-6 m) were observed: 1; 2; 2; 3; 1; 1; 2; 2; 1; 2; 3; 2; 1; 2; 3. Calculate the diffusion coefficient of the gold particle.

1. Chemical adsorption. Reduction in solid strength due to adsorption

2.Colloidal cleaning : dialysis, electrodialysis, ultrafiltration.

3. 0.5 l of gold sol contains 20 grams of gold; Find the osmotic pressure of this colloidal solution at 27°C. Assume that the specific gravity of the sol is 2, and that each edge of the gold particles is a cube with a side of 20 nanometers.