CHEMICAL REACTIONS AND THEIR CHARACTERISTICS

Bobonazarov Diyorbek Husniddin ugli
QarMII - a student of the "Chemical technology production types" course

Annotation: The article discusses the current attention to the classification of chemical reactions, their unique characteristics, the order of utilization, and the types of reactions. It covers chemical substances, reactions, types of reactions, and their properties.

Keywords: Chemical substances, reactions, types of reactions, properties of reactions.

Introduction: Nowadays, the attention and interest in the melting of chemical substances have significantly increased in Uzbekistan. The melting of chemical substances is considered essential in various fields such as industry, medicine, and daily life. A solid or liquid homogenous system consisting of two or more components is called a mixture or solution. A substance capable of undergoing a change in its aggregate state is referred to as a melting substance.

When the aggregate state of a substance is the same, it is usually referred to as a solvent in most of the acquired substance. The substance that is dissolved in it is called the solute.

Some substances can dissolve to a limited extent in a solvent. The size and type of particles in solutions are referred to as the dispersion system. A system in which two or more substances are mixed in such a way that one of them is distributed evenly in the volume of the other is called a dispersed system.

In nature, the most common dispersed systems have liquid dispersion medium and solid dispersed phase. The main characteristic of solutions is their ability to change their composition. They can be separated into their constituent parts using simple physical and chemical methods.

Dissolution is a physical-chemical process, and solutions represent a type of system, while dissolving and solutions are the dissolving substances and their hydrates, respectively.

Types of Concentrated Solutions:

Just as in this quantity, you can add various amounts of dissolved elements, we encounter different concentrations of dissolved solutions in practice. Let's consider the main ones:

1. Concentrated solutions are characterized by the constant value of the component dissolved under the influence of temperature and pressure. Concentrated solutions can be divided into those that can be compared with the solute and those that can be compared to the solvent.

2. Unsaturated solutions are solutions in which the dissolved substance can still be precipitated by small grains.

3. Supersaturated solutions are obtained when the parameters of the effecting factors change. As a result, the process of dissolving the substance continues, and it is much more than in normal conditions.

When a solid substance is dissolved in a solvent, its ions or molecules are attracted to the poles of the solvent molecules, starting the dissolution process. During dissolution, a reverse crystallization process also occurs. The solute that goes to the solid body during the dissolution process forms crystals again. Thus, there are two opposing processes here. Firstly, the dissolution process accelerates. After a certain time, both processes equalize each other, meaning that as many molecules as dissolve in one second, the same number of molecules return to solid form. At that time, the dynamic equilibrium between the dissolving substance and the dissolved substance is reached, and the solution becomes saturated. Consequently, a solution with a dissolving substance and an infinitely long time together is called a saturated solution.

In theory, there are no completely dissolvable substances. Even gold and silver, although they are highly soluble, dissolve in water. The solubility of gases in liquids is expressed by Henry's law. According to this law, at a constant temperature, the weight of a certain volume of a dissolvable gas in a certain liquid is directly proportional to the pressure of this gas.

$m = k.p$

m - the weight of the dissolvable gas in a certain volume

p - gas pressure

k - the proportionality coefficient

When gases are mixed together in a solution, any gas is completely dissolvable independently, i.e., other gases do not give it any harm, and the dissolving gas is directly proportional to the partial pressure of the dissolving gas. According to the Henry-Dalton laws, they lower the pressure of those gases that do not enter into a chemical reaction with the solvent in low pressure and high temperatures, i.e., the volume of the dissolved gas can be obtained at a constant pressure and temperature. The dissolving process in gases decreases with an increase in temperature, as the dissolution of gases in the liquid occurs with the heat release.

In the dissolution of liquids in liquids, there are three conditions:

1. Liquids dissolve each other to any extent, water with alcohol.

2. Liquids dissolve each other to a certain limit, water with phenol.

3. Liquids do not dissolve each other, water with grease. The dissolution of the solution in the solution increases with an increase in temperature, but the pressure remains almost unchanged. Finally, at very high pressure (1000 atm), the volume of gas starts to increase.

The solubility of a solid substance in liquid invariable pressure and temperature increases, but when a solid substance melts, if heat is released, the solubility of the substance decreases with increasing temperature. Changes in the composition of the solution indicate its dissolution in chemical mixtures. Furthermore, the melting brings solutions closer to mechanical mixtures; the same solutions are accepted as substances in their chemical mixtures.

Melting occurs when individual molecules of the substance melt and the components of the solution interact with each other. Melt begins to spread evenly throughout the entire volume of the solvent due to the diffusion of molecules separated from the surface of the crystal. The departure of the molecule from the solid surface is due to the force of interaction of the molecules of the solvent. This process can continue until the entire crystal has melted, but the initiation of crystallization begins at the same time—melting increases the concentration. After a certain period, the speed of melting is equal to the speed of re-melting; that is, as many molecules as reach the melting in one second, the same number of molecules separate from the melting. In the meantime, dynamic equilibrium between the melting substance and the remaining substance is established, and the solution is said to be saturated. Consequently, a solution in which the dissolving substance and the remaining substance coexist for an infinitely long time is called a saturated solution.

The unique characteristics of cold solutions are studied through osmosis, the decline of the clean melting substance's vapor pressure, the change of cryoscopic and ebullioscopic points. The structure of the solution is determined by the characteristics of the components that make up the solution. If the components have the same chemical structure, the size of molecules and others are close, the structure does not differ much from that of the pure liquid. The interaction of the molecules of the solvent with each other in most solutions (electrolytes) is related to the dissociation, as a result of which the number of molecules of water increases. If the components have different chemical structures, the structure is determined by them; it is difficult to identify the special characteristics of chemical mixtures. The structure of the solutions is studied in connection with the mechanical mixtures of the solutions.

References:

1. Solutions of chemical substances and their types
2. J.O. Faizullayev.‖ Analytical chemistry ―T. New century generation. 2006.
3. Khakimov H.H., Tatarskaya A.Z., Olimkhojaeva N.T. "Practical exercises in general chemistry"
4. Theoretical foundations of properties of solutions.