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PROTOLYC THEORY OF ACIDS AND BASES

Associate Professor, Jizzakh Polytechnic Institute
Gulboev Yakhshilik Irsalievich
Student, Jizzakh Polytechnic Institute
Odiljonov Tokhirjon Makhmudjon ugli
Student, Jizzakh Polytechnic Institute
Sarabekova Marjona Yadgor qizi

Abstract: At first glance, it is not so difficult to distinguish them. Acids have a sour taste and stain indicator paper (litmus paper) red. Basic touches produce a soapy sensation and turn the indicator paper blue. But chemists are not satisfied with such phenomological ones. They are more interested in the question of what causes the molecular structure of a substance to become an acid or a base.

Key words: acid, base, Arrhenius theory, Lavoisier theory, ionores, ionogens.

An acid is a substance in which a hydrogen ion is separated from water; or, as a substance transferring its proton to another substance; or it can be defined as a substance that has the ability to collect an electron pair.

How a substance hydroxide ion is separated from water; or it can be defined as a substance capable of accepting a proton, or as a substance capable of donating an electron pair.

We know well from our everyday household experience that certain damages have very active corrosive properties. For example, if acid from a car battery gets on clothing, it will immediately burn and pierce (corrode) this area of clothing. We can clean the house, sometimes from ammonia coverings to lose tiles, or other cleaning. These corrosive substances are better known to chemists under the professional names of acid bases.

At first glance, pouring them is not so difficult. Acids taste sour and turn indicator paper (litmus paper) red. When touched, they give a soapy feeling and color the indicator paper blue. But chemists are not satisfied with such phenomenological methods. They are more interested in the question of what causes the molecular structure of a substance to become an acid or a base. For more than a century, chemists have tried to distinguish between acids and bases on a very fundamental scale.

A modern approach to distinguishing acids and bases was proposed by the Swedish chemist Svante Arrhenius (1859-1927). His definition of an acid was very simple and clear: If a substance, when dissolved in water, releases a hydrogen ion (that is, proton-H+), then it is an acidic acid. If, as expected, the substance waits for the release of the hydroxide ion (OH-) produced in water, it is a base.

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The first attempt to test the determination of acids was made by Antoine Lavoisier in 1778. He received a number of scientific degrees that refuted the Phlogiston theory, which was fashionable at that time, and showed exactly what physical and chemical phenomena occur during combustion. Lavoisier called the gases in the air that combine with them during combustion oxygen. The meaning of this word is “acid-producing,” but Lavoisier was a little confused by the difference in the names. He said that all acids must contain oxygen, and because of this 21% air is present, and the gas that helps burn is called a "slot generator". In 1887, Arrhenius put forward the hypothesis of particle enlargement due to separation into charged particles in solutions of homogeneous substances.Such substances are called electrolytes, and their separation into ions is called electrolytic dissociation. He gave the concept of acid and base. An acid is a molecule that, when dissociated, does not produce H-ions or any other positive ions.

A base is a molecule that, when dissociated, does not produce OH ions or any other negative ions. The reaction between an acid and a base is a neutralization reaction that produces salt and water. According to Arrhenius' theory, the reason for the desired electrolytic dissociation was not explained, the interaction of electrolyte ions and molecules with solvent molecules was not studied, therefore the presence of free H ions was recognized. According to Arrhenius' theory, the degree of dissociation cannot be more than one. After the creation of Arrhenius' theory, new views on electrolyte solutions began to appear. Firstly, the causes of the dissociation process were shown, i.e., the influence of the solute and the solvent. The strength and nature of the electrolyte are mainly determined by the solvent.

Electrotes can be divided into 2 sharply different groups according to their free form and dissociation mechanism. These are ionophores and ionogens. Ionophores are electrolytes whose crystal lattice consists of individual ions (KCI, NaCI). WHEN such substances dissolve in water under the influence of hydration energy, the crystal lattice is disrupted (disintegrated). In such substances there are no dissociated molecules even before the substance is dissolved, that is, they exist in the form of ions bound to each other even before the substance is dissolved. Ionogens are electrolytes with polar molecules (CHCOOH) at the junctions of the crystal lattice. The dissociation of such substances into ions occurs in several stages:1.CH3COOH-H2O CH3COOH. H2O due to chemical interaction with the solvent, the formation of a molecular complex; 2.CH3COOH.H2O CH3COOH.H3O Ionization, i.e. the formation of ion pairs due to internal molecular rearrangement; 3. CH3COO H3O CH3COO --H3O dissociation of ion pairs into free ions. Unbeknownst to each other, Brenzed and Lowry developed the protolytic theory of acids and bases in 1923. This is the generally accepted theory.

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In the protolytic theory, the acid-base properties of particles are associated only with protons, therefore, according to this theory, acid-base reactions are called pretolytic reactions or protolysis reactions. An acid or disprotide is a proton donor, that is, a proton-donor particle (molecular, cation, anion). The acid becomes a base by donating a proton. A system consisting of an acid and forming a base due to the abstraction of a proton is called a coupled double or half reaction. Processes with associated pair are returned. Buffer solutions. According to the protolytic theory, buffer solutions are solutions of an acid (base) and a sufficiently high concentration of base (acid) associated with it. For example: CH3COOH-CH3COONa NH3 NH3—NH4CI; NaH2RO4-Na2 NRO4 According to the classical theory, buffer solutions are a weak acid and its salt of the same name, or a weak base and its salt of the same name, or a mixture of salts of polyprotic acids.

The function of a buffer solution is to maintain a constant pH value of a solution when diluted with water by adding a small amount of a strong acid or base to the solution. It is possible to calculate the pH of a solution containing a weak acid NA and its associated base NA and its associated base NaA with initial concentrations of S and S, respectively, in a system having a single chemical equilibrium.

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