

## Chemical Composition and Physical Properties of Protoplast

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**Abstract:** Chemical composition of the protoplast, physical properties of the cell, about hydrolytic enzymes, desmolytic enzymes.

**Keywords:** proteins, nucleic acids, lipids, carbohydrates, mineral substances.

Protoplasts are skinless cells found in plants, surrounded only by a cell membrane. The cell membrane surrounds the cytoplasm. The term protoplast was coined by Hanstein in 1880. The first protoplast was isolated by mechanical method by Kleiker (1892).

The chemical composition of the protoplast includes: proteins, nucleic acids, lipids, carbohydrates, minerals and water. Proteins are the most important and necessary component of the cell, and make up the structure and properties of living matter. Of the 40 amino acids currently identified, 20 are monomers of proteins. Chemically, proteins are composed of simple or protein and complex or proteids. These are combined with other substances in the cell and form complex substances, i.e. combined with fats - lipoproteins, glycoproteins with carbohydrates, nucleoproteins with nucleic acids.

According to their effect, enzymes are divided into 2 groups (hydrolytic and desmolytic). Hydrolytic enzymes hydrolyze sugars, fats, glucosides and other organic substances, but do not release energy. Enzymes of this group include protease, which breaks down protein, lipase, which breaks down fats, amylase, which converts starch into sugar, and other enzymes. Desmolytic enzymes break the bonds between carbon atoms, and as a result, a lot of heat energy is released. A number of life processes; enzymes such as catalase and peroxidase perform respiration and digestion. Enzymes were first discovered by the Russian scientist K.C. Kiregov (1814) discovered that starch in germinating seeds turns into sugar.

Although nucleic acids - DNA and RNA are found very little in the composition of the protoplast, they form a group of biopolymers. Nucleins are involved in the synthesis of proteins in the protoplast. DNA is found in the nucleus, mitochondria and chloroplasts in the cell, while RNA is found in both the nucleus and the protoplast. Chemically, each chain of DNA is a polymer, whose monomers consist of nucleosides (pyrimidines and purines) with 2 different nitrogenous bases. There are several types of RNA, named according to the function they perform. For example: transport carrier (TERNK), information information (I-RNA), ribosome (R-RNA), RNA monomers consist of nucleotides with nitrogenous and phosphoric acid residues. Lipids are the most important substances found in the protoplast. According to their structure, they are composed of fatty acids and glycerin combined with complex ether. Although its chemical composition is not similar to carbohydrates, it differs from them in that it has less oxygen. Vegetable oil, ether, glycerin and fatty acids are composed of olenin, palmetine, steazine.

One of the main properties of lipids is that they are hydrophobic (afraid of water) - they do not dissolve in water, but they are soluble in some organic solutions. The protoplast of plants contains simple fats and complex lipids. Lipids include phospho and glycolipids and some pigments. Carbohydrates are also found in protoplast. Carbohydrates consist of simple or monosaccharides and complex polysaccharides. Monosaccharides - (fructose, sucrose) substances that dissolve well in water. Polysaccharides- (starch grains, cellulose, cellulose). Carbohydrates form important substances such as glycosides and glycoproteins by connecting with active biological substances in the cell. ATF is very important in cell life. It participates in the absorption of energy in the cell, synthesis of biological

macromolecular substances. A living cell contains 60-90% water, and chemical substances are dissolved in it.

The size and elasticity of the physical properties of the cell depend on water. In its normal state, the cell has a density, that is, an elastic property. This property depends on the pressure exerted on the walls of the cell fluid. Such a state of the cell is called -turgor (tugore- overflowing). There are many different mineral salts in the form of solutions in water. The cell contains the following mineral salts: cations - potassium, sodium, calcium, magnesium; from anions - weak phosphorus, chlorine, carbonic acid residues and many other salts. These salts are necessary for physical and chemical processes in the cell.

**Conclusion:** The plant cell protoplast is colorless, but its component plastids (chloroplasts, chromoplasts) are green, red or pink-red in color. In terms of its physical and chemical state, protoplast is a multiphase hydrozoic colloid, i.e. it consists of a sticky and slimy substance, its density corresponds to: 1.03 - 1.1.

#### **References:**

1. Botanika. Morfologiya va anatomiya, "Просвещение" nashriyoti, 1998 y.
2. Zokirov Q.Z., Jamolxonov X.A. Botanokadan ruscha – o'zbekcha ensiklopedik lug'at. "O'qituvchi" nashriyoti, Toshkent, 1973y.
3. Kursanov L. I., Komarniskiy K.I., Meyer V.F., Razdoriskiy A.A. Uranov. Botanika, 1-tom. "O'qituvchi" nashriyoti, Toshkent 1972y.
4. M.I. Ikromov, X.N. Normurodov, A.S. Yuldashev Botanika O'simliklar morfologiyasi va anatomiyasi. 2002y.
5. Yakovlev G.P., Chelembitko V.A. Botanika. "Вышая школа" nashriyoti, Moskva, 1990y.