PROPERTIES OF POLYMERS AND THEIR MECHANISMS OF ACTION

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Annotation: Obtaining the required solution and choosing a solvent is determined in most cases by the physico-chemical properties of the macromolecule. In most cases, the solvent and their mixture are selected empirically, which in turn does not give the desired optimal result all the time.

Key words: a huge number, plastic waste, has been collected in the media, radio and television, and articles, broadcasts are often published

INTRODUCTION

In recent times, a huge number of plastic waste has been collected in the media (media) and radio and television, and articles and broadcasts are often published and broadcast and shown that they have a huge negative impact on environmental ecology and soil structure. The results of research by scientists show that in the seas and oceans, tons of plastic products (various dishes and Taras) are collected, which have increased a lot per year. If things go in this phase by 2050 in the seas and oceans, it is estimated that the number of plastic containers that will not be exposed to external influences for centuries will exceed the number of fish in the water.

At the same time, scientists also say joyful reports that substances that eat plastics are produced. But there is practically no information about the mass launch of this technology and its justification.

Therefore, in many countries of the world, the transition from disposable plastic containers to natural ones from paper and trees began to take place in their place, and this is gaining mass.

Hence, the creation, development of natural decomposing and environmentally friendly, cheap polymers is one of the pressing problems.

Of the main tasks in front of us, the most relevant is to find solvents for these proteins.

Obtaining the required solution and choosing a solvent is determined in most cases by the physico-chemical properties of the macromolecule. In most cases, the solvent and their mixture are selected empirically, which in turn does not give the desired optimal result all the time.

The process of the beginning of melting occurs due to the diffusion of the solvent into the polymer, and later double diffusion occurs, that is, the diffusion of the polymer and the solvent. Such a state of the system is called Infinite swelling. Polymer melting occurs when the energy of the "polymer-solvent" interaction in

the case of the magnitude of the interaction energy in the macromolecule chain. The melting of the polymer is carried out by the melting of lower molecular compounds in the polymer – the solvent, in other words –by the process of the polymer bonding.

The solubility of the solvent in relation to the polymer is assessed by the viscosity(viscosity) of the solution. The highest solubility capacity of the solvent at the same concentration of the polymer is realized if the viscosity of the solution is small.

METHOD AND RESULTS

Alcohol is used in most cases as a diluent. Sometimes they are between solvents and thinners in terms of solubility. Some alcohols behave like Hidden solvents, which disclose their solubility in the presence of real solvents. The dilution capacity of solvents is very high in the presence of alcohol, sometimes even exceeding the volume of the primary polymer solution. When complex Ether and ketones alcohol(ethanol) is added, the ability to dissolve polymers increases compared to other solvents.

Until now, the exact legality of the connection between the nature of the solvent and its ability to dissolve high-molecule substances has not been established. Therefore, it is usually limited to the empirical rule that it dissolves in a similar – like. In other words, non-polar polymers dissolve in non-polar solvents, and polar polymers dissolve in polar solvents.

The uniqueness of the polymer melting lies in the fact that the components of molecules that differ from each other in size thousands of times interfere with each other. The mobility of the molecules of the liquid with the bottomimolecule will be very large. With polymers, when the polyimolecular fluids touch each other, their molecules begin to rapidly enter the polymer phase, while the higher chromolecules cannot penetrate the solvent phase during this time resulting in the higher, which will go through the humic phase until the molecular polymer dissolves.

Swelling is the absorption or sorption of lower molecular fluids(or their vapors) by the polymer.

In the case of swelling, the molecules of the downstream fluids(or vapors of them) enter between the structures of the polymer elements, in which there is an inter-structural bulge, or move the macromolecules and penetrate the structure, in which a bulge occurs inside the structure.

From these, the swelling process is the sorption (absorption) of lower – molecule substances by polymers, which certainly goes with an increase in its mass and volume and a change in its structure.

Endless swelling is a transition to spontaneous melting. It will be similar to the endless mixing of liquids, for example, water and ethyl alcohol or water and sulfuric acid.

Limited bonding is a process in which polymers interact with lower-molecule liquids; in this case, the spontaneous dissolution of polymers does not occur that is, the polymer chains do not completely separate from each other.

The degree of swelling can be determined by weight or volumetric techniques.

Weight method for determining the degree of swelling: by weighing the weight of the sample before and after swelling, the swelling is determined using the following formula here-the initial mass of the polymer, the mass after the chalk.

Volumetric method for determining the degree of swelling: measuring the size of a polymer before and after swelling, it is found using the following formula here-the initial size of the polymer, the size after the chalk.

When polymers interact with lower-molecule liquids, real solution, colloidal system and hard-soluble fragments are formed.

Like any spontaneous process at constant pressure and temperature, the division or melting into small particles goes at the expense of the reduction of Gibbs ' free energy that is, it is characteristic of any stable thermodynamic system. In this case, a single-phase system is formed that does not have a separating surface.

The specificity of polymer melting is due to the practical methods and rules for the preparation of their solutions. Therefore, it should not be forgotten that the entire solution should not be introduced immediately, chunky, in this case, a flaky layer forms around the polymer lump, which in turn makes it difficult for the polymer to penetrate the solvent. The transition of macromolecules from this olfactory layer to the solvent also slows down, in general, the process of formation of a homogenous solution is much slower. For this reason, at the beginning, it is necessary to apply the solution in such an amount that the solution covers the polymer face in a very thin layer. In this case, the formation of a transparent layer is carried out faster than spontaneous thawing. After this, the solvent remaining in the mixing process can be added so that the solution is delivered to the desired concentration, in which the swelling goes into a spontaneous melting process [1].

The specificity of polymer melting. The first stage in the melting of an optional polymer is its immersion, as described above. The swelling process is an increase in the volume of polymers absorbing lower moloecular liquids and a change in the geometric shape as well as the location of their molecules. Large molecules are characterized by a small value of the diffusion coefficient. Because of this, the range goes very slowly and it will be easy to note the intermediate stages. In this case, due to the ability of macromolecules to change their shape, the solvent not only fills the space between individual zvenos (the process is similar to capillary condensation in solid hollow bodies), but also enlarges the effective radii of polymer and the intervals between the center of masses. In these processes, the integrity of the polymer body does not change. The volume of the polymer phase in this case will be much larger than the initial volume. A polymers really looks like a solution of a lower-molecule liquid in a polymer [2].

The melting of polymers, as noted above, goes through the transition phase. From the outside, this process is evident in the change in size and weight due to the absorption of solvents by the sample. The swelling can be viewed as a one-way shift, that is, the penetration of the solvent into the polymer. The mobility of macromolecules is small enough, the binding force with each other is very large, due to which polymer macromolecules at the beginning are not diffused into the solvent. The molecules of the solvent are diffused into the polymer at the beginning, filling the intermolecular space, which later begins to shift the macromolecules with an increase in the volume of the solvent in the polymer. The rate of diffusion of a solvent into a polymer depends on the solvent properties and the structure of the polymer. With an increase in the amount of solvent diffused into the polymer, the space between the macromolecules increases continuously, which leads to a proportional increase in the size of the sample. Thus, swelling is the entry of solvent molecules between polymer macromolecules, as a result of which the space between the polymer individual fragments(segments) and later polymer chains increases [3].

It is also worth noting that the melting process of polymers increases depending on time: the penetration of solvent molecules into the polymer substrate occurs continuously. This process goes as fast as the greater the elasticity of the macromolecules and the smaller the density of the location. The diffusion of the solvent into the polymer causes an increase in their mobility by slowly breaking the intermolecular contact between the chains [4].

CONSULTION

Despite the size of the molecular weight of polymers and, in most cases, the high polarity of their macromolecules, most higher-molecular substances dissolve very quickly in most solvents, the melting heat of polymers is close to the melting heat of the lower-molecular compounds. This is explained by their elasticity at the expense of the elasticity of molecules, and this in turn gives polymers a structure characteristic of large intermolecular space and softness. When polymers dissolve, a solvent diffuses into the formed cavities. The more elastic the macromolecule chain, the more free intermolecular space in polymers, and the faster the polymer melting takes place

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