EURASIAN JOURNAL OF TECHNOLOGY AND INNOVATION
Innovative Academy Research Support Center
Open access journal www.in-academy.uz

THE STUDY OF MOLECULAR COMPOUNDS IN THE COURSE OF CONDUCTING RESEARCH IN THE FIELD OF CHEMISTRY

Matsalaeva Sayera Zaripbaevna
Samarkand State Veterinary Medicine, University of Animal Husbandry and Biotechnology Nukus branch. Assistant teacher,
Karlibayeva Shaxida Kuanishbay Qizi
Student Samarkand State Veterinary Medicine, University of Animal Husbandry and Biotechnology Nukus branch
Elubaeva Raya Orazbay Qizi
Student Samarkand State Veterinary Medicine, University of Animal Husbandry and Biotechnology Nukus branch

ARTICLE INFO
Received: 20th July 2023
Accepted: 27th July 2023
Online: 28th July 2023
KEY WORDS
Chromatography, polymer, copolymer, spectroscopy, identification, microscopy.

ABSTRACT
The article describes methods for the study of polymer compounds, new, modern methods, their features. It also describes the most appropriate, cost-effective and time-saving methods, as well as the most common ways of teaching students comprehension.

INTRODUCTION

Recently, high molecular weight compounds are widely used in the modern world due to their unique properties. In this regard, such materials serve as the main raw material in various sectors of the economy, for example, in complex architecture, microelectronics, technical processes. The chemistry of high molecular weight compounds (HMCs) is mainly related to physicochemical methods. Such methods are actively involved in the various stages of obtaining polymeric materials, in which usually only chemical methods predominate.

The purpose of the YMB course is to engage students in general secondary school in connection with life processes, to form the intellectual abilities of students studying in the field of chemistry in all areas of students studying in pedagogical institutes. consists of in-depth training of penetrating polymers and plastics.

Today is a period of development of technical means, methods previously unknown to us are being developed. Throughout the article, we will look at the methods available and draw conclusions. Sometimes the consumer of the finished product may want to verify that it is responsible for the type of polymer identified, in which case the simplest identification of the material can be made. Creating new materials also requires the development of identification methods.

LITERATURE ANALYSIS AND METHODOLOGY

There are two approaches to identifying polymeric materials. The first is a very simple, fast and adhan method. This is a very simple tool and requires very little knowledge about polymers. The second method is based on regular chemical and thermal analysis. In this case, a complex experimental method is used. This approach is very time consuming and costly, and the interpretation of the results obtained can only be obtained by a specialist familiar with the

polymers. Most polymeric materials are modified by copolymers, compounds, and their properties using various additives or components such as flammable regulating additives, lubricants, and stabilizers. In such cases, the simplest methods of identification do not give satisfactory results. The only way to get accurate results is to use complex chemical and thermal analysis methods.

First of all, we need to know what physical research methods are available in the chemistry course, not physical research methods in polymer substances. Chromatography method, mass spectroscopy analysis method, X-ray method, optical spectroscopy, infrared spectroscopy, ultraviolet spectroscopy, nuclear magnetic resonance spectroscopy and others.

Based on the topic, we list the so-called "new" methods:

- Modern method of UMP;
- modern method of identification [1].

UMP is a modern method. The purpose of UMP is a brief method to introduce students to the study of polymers using the most well-known physico-chemical methods. This development does not cover the theoretical foundations of all physical research methods, as they will be discussed in the “Physical Research Methods” course. He teaches chemistry. The basics of the methods used to study polymers (light scattering) are related to dumping methods, continuous development and improvement of analytical equipment, as well as increasing requirements for the quality of polymer materials.

The main tasks of UMP:

- to get acquainted with the peculiarities of the use of physicochemical methods for the study of forms of radical polymerization and active polycondensation;
- to determine the capabilities of various physicochemical methods for the determination of polymeric materials, the study of the structure of polymers and their chemical composition;

Getting acquainted with the process of gas transfer in polymers through polymeric materials and methods of studying vapors and determining the amount of free charge (acquaintance with the method of gas chromatography and positron destruction of polymers) is an urgent task of modern material science [2,12].

Modern methods of identification. Complete and reliable identification of polymer material is a time-consuming and complex task based on analytical chemistry, experience of modern equipment and a deep understanding of their use. Polymeric materials often contain copolymers and additives. The following analytical methods are used to identify polymers and additives using modern analytical methods: - infrared spectroscopy in the near region of the spectrum (F-X, B-X); - differential scan calorie (DSC); - thermomechanical analysis; - nuclear magnetic resonance spectroscopy; -chromatography; - mass spectra; - X-ray analysis; - microscopy [3,13,14,15].

List of modern methods used to identify polymers and add additives:

Liquid chromatography is used to make a polymer relatively simple in cases where the polymer under study is very complex [8].

Gel-input chromatography is used to measure the molecular weight distribution of GPC polymers (polyethylene, polypropylene) [9].

Gas chromatography This is an instrumental analytical method used to separate and analyze the components of a mixture [10].

Thermal Analysis Thermal analysis involves the detection and formation of various polymers, including processing [11].

X-ray structural analysis is based on the diffraction of X-rays in a crystal of a substance. It provides information about the location of molecules and the distances between atoms and the angles between chemical bonds [4].

Nuclear magnetic resonance This method is one of the main methods for determining the chemical structure of a polymer and studies the spatial structure and change dynamics of the molecule [5].

Chemical analysis Chemical analysis 2 types: qualitative analysis and quantitative analysis. Quantitative analysis determines the quantitative ratios of any group of elements in a quality polymer [6].

The chromatographic method is based on the different distribution of substances between the moving (liquid or gas) and immobile (solid or liquid) phases. Substances are divided into gas, gas-liquid and liquid chromatography according to the phase in which the separation is carried out [7,16,17]. The modern methods given to us use Gel-Introduction chromatography to identify polymers. Gel - Input chromatography is a dimensional exclusive chromatography in which we use an aqueous solution in a mobile phase sieve.

The main application of this technique is to remove proteins and other water-soluble macromolecular materials is arranged according to size. The technique works by trapping small molecules in the holes of the stationary phase. Therefore, the first fraction contains large molecules. Then we can use another solvent that removes small molecules from the holes. Then our second fraction contains small molecules [8,18,19].

Another specific method of polymers is the method of thermal analysis. For example, polyethylene terephthalate has been adopted as a lightweight and flexible polymer for the manufacture of household appliances, including furniture and beverage containers. In the laboratory, by heating this type of polymer, its properties are determined, its qualities are developed, and it is understood how to produce it.

The most common thermal analysis methods for polymers can be listed as follows:

- differential scanning calorimeter;
- thermogravimetric analysis;
- thermomechanical analysis; -dynamic mechanical analysis [9,20,21,22];

In the chemistry course at the institutes, the textbook of polymer chemistry is studied in depth. This information can be communicated to students and demonstrated in practice. However, in schools, it is passed more simply to students. Because the data makes it difficult for students. Even in the school laboratory, it is difficult to find relevant tools - equipment, hardware, equipment. In Grade 9, the basic concepts of high molecular weight compounds are given.

Conclusion

The article is devoted to what physical research methods can be used in the study of polymeric substances. After all, the polymer is included in the course of organic substances, and the same methods are introduced in the study of organic chemistry, as in polymers. The school also shows the teacher how to convey this topic to the student and the student in a way

that makes it easy for them to understand what methods need to be conveyed. Our task is to promote new, modern methods.

Physical and chemical methods are used separately and in combination to obtain polymers. Based on the results obtained by these methods, the polymer structure is determined. Based on the determination of the structure of the polymer, it is possible to know which group, which atom is included in them, their order of interaction and spatial location. The methods we have seen provide unique conveniences in the study of polymers.

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