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ELEMENT COMPOSITION OF CABBAGE JUICE ICP - DETERMINATION BY AES METHOD

1Khozhimatov Maksadbek Muydinovich,
2Karimov Islombek Jumaboy o'g'li
1ASU Associate Professor of Chemistry Department, DSc
2AMBI Materials Science and Technology of New Materials Department Assistant,
andmi.kimyo94@gmail.com. +998999867866

Abstract:

The processes taking place in the modern biosphere affect the human body, for example, the imbalance, deficiency and excess of micronutrients cause pathological changes, and among them there are synergistic and antagonistic conditions. Our food additive made from cabbage leaves is the main source of macro and micronutrients.

Keywords:

cabbage juice, biogenic element, food, macro, micro.

Introduction

According to the theory of V. V. Kovalsky, minerals contained in food products connect people and the environment with each other. European scientists on biogenic elements (A. S. Prasad, A. L. Page, J. F. Hodson, R. L. Mitchell, H. J. M. Bowen, D. Oberlis) and in the 20s of the 20th century, the famous Russian scientist V. I. Vernadsky later, V. V. Kovalsky, A. P. Vinogradov, A. P. Avtsin, G. A. Babenko A. A. Javoronkov, A. V. Skalniy, V. L. Suslikov and others are considered the founders of this field. Studying the connection of biogenic elements between nature and man has become one of the topical topics of life sciences for half a century. Year by year, the number of scientific research on biogenic elements is increasing. In recent years, the database on the beneficial aspects of chemical elements distributed on the earth for the human body has been developing rapidly [1].

The role of biogenic elements is necessary for every living organism. In many countries, the most important of the nutritional problems is the growing shortage of macro and micronutrients in the majority of the population. Lack or imbalance of these elements causes various pathological changes in the human body. As a result of the data and research conducted in different countries in recent years, first of all, biogenic elements are important in regulating the metabolic process and the functions of individual organs and systems. The amount of minerals in the composition of modern synthetic food products is not high, it is almost absent [2].

To date, the number of methods for determining the elements of the studied sample is very large. Almost all methods require pre-mineralization of the sample by dry or wet methods. Most of them are standardized. These are chemical (weighing, volumetric) and physical-chemical (electrochemical, chromatographic and spectrometric) methods. Although such separation is relative, for example, spectral methods require the preparation of a solution to

be analyzed using chemical methods, while photometric methods are based on measurements using spectral instruments [3].

Among the many methods (ICP - AES), the advantages of the inductively coupled plasma atomic emission spectrometry method are the ability to detect 20 - 40 elements at the same time when one element is detected, very low detection with a detection range of 1-100 mg / L has limits, the matrix has enough interference of a spectral nature, its multi-element nature, short analysis time, small volume of analyzed samples, with the possibility of determining the composition of very low concentration elements while maintaining the possibility of analyzing medium and high concentrations differs from other methods [4].

It is approved according to the updated version of the guidelines of the international conference for the analysis of minerals in medicinal products. The limit of detection is carried out in the permitted manner. A lot of attention is also paid to method revalidation to ensure the validity of the obtained data. For some types of samples, the differences between the results of parallel determination and the determinations in the experiments conducted under different conditions are compared to the expression reflected in the approved regulatory and technical documents [5].

The purpose of the study: consists of studying the composition of macro-microelements in cabbage juice.

Research object: Cabbage juice made from cabbage leaves is a food sample.

Experimental part:

Today, Agilent MP - AES 4200, manufactured in March 2014, has a unique solution as a new tool for research centers to work on the next generation of microwave plasma spectrometers. The identification of biogenic elements in the studied sample is increasing day by day. Inductively coupled plasma atomic emission spectrometry method (ICP-AES) was used to determine the macro and microelements in our food additive created by us. 5 - 10 ml of food samples were taken and analyzed. In dry mineralization, the sample was burned and then transferred to the solution. Wet mineralization was carried out under the influence of concentrated sulfuric or nitric acids with the addition of an oxidizing agent, catalysts and heating to 450 ºC. A sample containing 100 mg/l was analyzed for 2 minutes by ICP-AES method. (ICP - AES) Elements were determined through the optical emission spectra of sample atoms by the method of inductively coupled plasma atomic emission spectroscopy.

Discussion:

The relatively low temperature of the Agilent MP-AES 4200 nitrogen plasma (up to 8000 oC compared to 6000 oC for the ICP-AES) gives a simpler emission spectrum. First, it allows the manufacturer to offer ready-made solutions in the spectrometer software for the analysis of food samples. Second, it is particularly user-friendly and makes the

spectrometer easier to use than AAS. The Agilent MP - AES 4200 outperforms flame AAS in terms of sensitivity, linear range, detection limits, and speed.

At present, it is necessary to take into account the eating habits of the population, and this can be divided into three. Also, first of all, this method is considered the most natural method that has been used for thousands of years, and it is necessary to eat only natural products. Secondly, the chemical composition of food products consists of constantly enriching them with natural mineral nutrients. Thirdly, it consists in adding, producing and introducing necessary complexes as biologically active supplements to the daily food composition.

Result:

Based on the research results of nutritionists, the amount of biogenic elements in the cabbage leaf is considered sufficient and very useful for the human body. The amount of macro-microelements in the studied object (cabbage juice) was studied. The composition of the studied object was compared with the chemical composition of cabbage. The biogenic elements in the food additive replace them to maintain the health of the human body.

Conclusion:

Thus, as a result of analysis and comparison of the obtained data, it was found that the content of the object studied by us is significantly high in useful minerals.

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