ELEMENTAL ANALYSIS OF BIS-CARBAMATE MEE-1

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ABSTRACT

This article is devoted to the elemental analysis of bis-carbamate MEE-1 using scanning electron microscopy. As a result, it was revealed that the results of the Sam analysis correspond to the data of practical and theoretical calculations.

Key words: *Bis-carbamate, element, scan, microscopy, calculation, detect, analysis, morphologic, structure, organic.*

АННОТАЦИЯ

Данная статья посвящена элементному анализу бис-карбамата МЕЭ-1 методом сканирующей электронной микроскопии. В результате выяснилось, что результаты анализа Сэма соответствуют данным практических и теоретических расчетов.

Ключевые слова: *Бис-карбамат, элемент, сканирование, микроскопия, расчет, обнаружение, анализ, морфологический, строение, органический.*

INTRODUCTION

Particular interest in polyfunctional aromatic and heterocyclic N-substituted carbamates is due to a wide range of practically useful properties. The availability of carbamates, their versatile biological action, along with the wide synthetic capabilities of both the carbamate function and the aromatic and heterocyclic nucleus, creates a real prerequisite for their use in various directions. Many examples of the use of these compounds and their derivatives for agricultural needs make it possible to identify carbamate preparations as valuable intermediate products for the synthesis of herbicides, rodenticides, fungicides, natural and synthetic biologically active substances [1,2].

In industry, carbamates and their derivatives are used as additives for lubricating oils, intermediates in the synthesis of carbamate oligomers, adhesives in rubber-cord mixtures, and model compounds in studying the structure, processes of formation and photodestruction of polyurethanes. Attention to carbamates from the standpoint of theoretical and experimental organic chemistry is determined by the analogy in

chemical behavior with phenol ethers and amides, as well as the wide possibilities of using these compounds in the synthesis of natural heterocyclic biologically active substances. The presence of several reaction centers, along with the carbamate function, which itself is an ambident nucleophile, makes them valuable intermediates in the synthesis of various complex aromatic and heterocyclic systems [3].

Therefore, the development of this branch of organic chemistry is the most urgent task, requiring new developments in synthesis, technology and scientifically based approaches. In this regard, we synthesized N,N'-hexamethylene-bis[(ortho-cresolyl)-carbamate], i.e. MEE-1 and its derivatives [4-7,]. Their chemical properties were studied by reaction centers [8-14]. MEE-1 was studied in chemical databases, spectra and biological activities [15-20]. Used in various industries [21-24]. The purpose of this work is to continue the study of this molecule by conducting elemental analysis.

Materials and Methods. To determine the elemental composition of N,N'-hexamethylene bis(ortho-cresolyl)-carbamate i.e. MEE-1 a scanning electron microscope of the EVO MA 10 brand was used under vacuum conditions.

Results and Discussions. Sample analysis using an electron microscope was carried out at the Center of Advanced Technologies. Figure 1 shows a drawing of the morphological structure of the synthesized organic substance of the MEE-1 brand, taken in a scanning electron microscope SEM. In Figure 2, the spectra of the MEE-1 substance show and prove the presence of elements C, O, N, but, unfortunately, element H is not detected in an electron microscope.

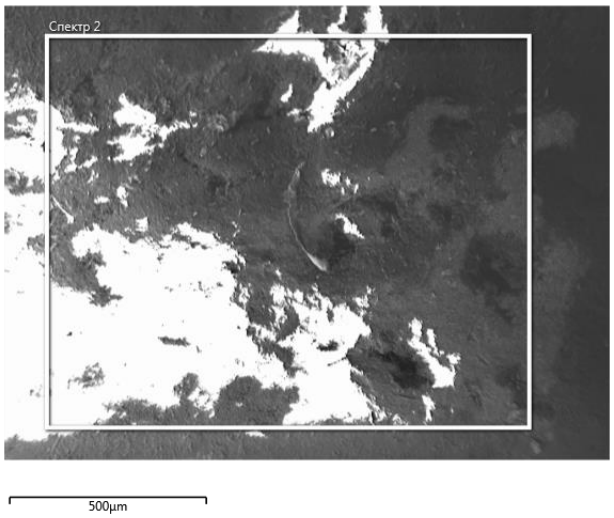

Figure 1. SEM image of synthesized organic substance of MEE-1 grade

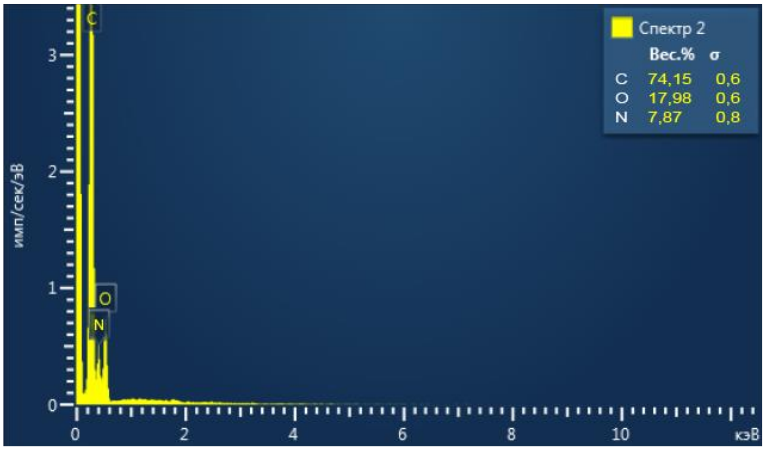

Figure 2. SEM image of synthesized organic substance of MEE-1 grade

After receiving the results of the SEM analysis, we compared the values of theoretical and practical calculations with the results of the SEM analysis (Table 1).

Table 1

Theoretical and practical elemental analysis of MEE-1 bis-carbamate

Element analysis,%					
Calculated		Found		SEM analysis	
C	68,75	C	68,63	C	74,15
H	7,29	H	7,17	O	17,98
N	7,29	N	7,19	N	7,87

CONCLUSION.

SEM images clearly show the morphological structure of the synthesized organic matter. It also proves the elemental composition of bis-carbamate MEE-1. In Table 1 you can see how close the calculations and analysis results are.

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