OPINION

By Associate Professor Dr. Anife Ismailova Ahmedova,

SU "St. Kliment Ohridski" - Faculty of Chemistry and Pharmacy, member of the scientific jury according to the Order of the Rector of SU "St. Kliment Ohridski" No. RD-38-85/12.02.2024

Regarding the dissertation work of **VALENTIN GEORGIEV GEORGIEV**

On the topic "Methods for the determination of uranium in water and food"

for obtaining the educational and scientific degree "doctor" - Professional field: 4.2 "Chemical sciences", Scientific specialty "Analytical chemistry"

The PhD candidate Valentin Georgiev Georgiev developed the presented work as a full-time doctoral student at the Department of Analytical Chemistry of the FHF of the SU under the supervision of Prof. Dr. Irina Karadjova and Assoc. Prof. Dr. Ivanka Dakova in the period February 2020 - February 2023, when he was awarded with right of defense. The dissertation covers 117 pages, including 28 tables, 18 figures and 129 cited literary sources. It is organized in a standard way into three main parts – Literature Review, Experimental Part, Results and Discussion, accompanied by Introduction, Aims and Objectives, Conclusions and References. The literature review comprehensively describes the available analytical methods used for the analysis of uranium in its various forms in samples of different types and origins. An attempt was made to compare the main characteristics, advantages and disadvantages of the described methods with a view to defining the goals and tasks of the dissertation. Thus, the focus is reduced to two main objectives, namely 1. Application of ICP-MS for the determination of uranium in potable, bottled, groundwater and surface water intended for drinking; and 2. Development of an analytical procedure for the selective concentration of uranium with subsequent instrumental determination by ICP-MS, ICP-OES. The clearly defined specific tasks for implementation have enabled the successful attainment of the set goals. The experimental part describes in detail the materials and apparatus used, as well as all the steps of the analytical procedures. The description of the results is adequate, which allows highlighting the main

contributions of the work. The results are summarized in 6 conclusions, and are described in 2 scientific publications in specialized international journals with an impact factor. This fulfills the minimum national requirements. For one of the publications, 2 independent citations have already been noticed, which can be taken as an indication of the topic's importance. The results of the dissertation have been reported at 7 scientific conferences and seminars.

As a significant contribution to the work, I evaluated the synthesized new U(VI) ion-imprinted polymer, which was used as a sorbent for solid-phase extraction of U(VI) ions, and based on it, an analytical procedure was developed to determine the uranium content in different types of waters, wines, as well as in various monofloral honeys, with subsequent ICP-OES measurement.

I have no questions or criticisms for the dissertation, but rather recommendations related to the way the results are presented, tables and figures captions, and similar technical details that do not detract from the quality of the results achieved.

CONCLUSION The dissertation is built on extensive experimental data, contains contributions to the development and evaluation of an analytical method for the direct determination of uranium in natural waters by ICP-MS, synthesis and physicochemical characterization of a new U(VI) ion-imprinted polymer and its use in developing analytical procedures for determining the uranium content of various types of food and beverages. The presented dissertation results correspond to the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of the ZRASRB and the relevant Requirements of the FChPh of SU. The abstract clearly and concisely reflects the results described in the dissertation. There are no plagiarism alerts.

What has been said gives me reason to express a **positive opinion** on the presented dissertation work and I propose to the honorable scientific jury **to award the educational and scientific degree "doctor" to Valentin Georgiev Georgiev.**

17/05/2024 Opinion Prepared by: .....

associate professor Dr. A. Ahmedova