Appendix 12d

REPORT
to occupy the academic position:

"Professor"	
"Associate Professor"	**X**
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	**Assistant Professor**	**PhD**	**Temenuzhka**	**Hristova**	**Radoykova**	**UCTM - Sofia**
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

4	Natural sciences, mathematics and informatics
code	name

Professional area:

4.2.	Chemical Sciences
code	name

Scientific specialty:

Analytical chemistry

The competition has been announced:

64	05.08.2025	**Analytical chemistry**	Chemical Technology
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Professor	**PhD**	**Petar**	**Todorov**	**Todorov**	**UCTM - Sofia**
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Assistant Professor	PhD	Temenuzhka	Hristova	Radoykova
academic position	scientific degree	name	middle name	last name

1.1. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	**X**
B) The candidate doesn't meet the minimum requirements	0 points	
		one of the answers given is marked with the sign "X"

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.
Assistant Professor PhD Temenuzhka Radoykova participated in the competition for the academic position of "Associate Professor" with a total of 28 publications, 19 of which are refereed and indexed in the international databases Web of Science and/or Scopus, having an impact factor or SJR. The remaining 9 publications are: with impact rank (Scopus) 4 issues; 3 in proceedings of scientific conferences, presented in Conference Proceeding in Scopus and Web of Science and 2 in Conference Proceeding with ISSN number. She is a co-author of one textbook. The candidate has presented a list of 58 citations of her works /according to Scopus data >200 citations/ and 30 participations in national and international scientific forums, including poster and oral reports. Within the framework of the competition, Assistant Prof. Radoykova has participated in 23 research projects, 5 of which are funded by the Scientific Research Fund. Under her leadership, 6 diploma theses for the Master's degree in Applied Analytics were prepared and successfully defended.

1.2. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	8 points	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	**X**
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	4 points	
D) The smaller part of the research is relevant	2 points	
E) Research is not relevant	0 points	

		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.
The publications with which Assistant Professor PhD Temenuzhka Radoykova participates in the competition for the academic position of "Associate Professor" present results of research with a clearly expressed scientific and scientific-applied focus. They are focused on current problems in the field of instrumental methods of analytical chemistry, demonstrating depth in theoretical research and applicability of the results obtained. The research conducted covers the application of a wide range of chemical and instrumental methods aimed at solving problems of fundamental and ecological importance. They use a variety of analytical approaches and techniques for the characterization, utilization and evaluation of waste products originating from biomass, metallurgical production and other sources. A significant emphasis in her scientific activity is the application of gas chromatography (GC-MS, GC-FID) for identification and quantitative analysis of low-molecular phenolic compounds. These studies reveal the potential of the compounds to be used as antioxidants, which highlights the significance of the results, both from a fundamental and an applied perspective.

1.3. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	**X**
B) Realistic, but not of scientific and / or applied interest	4 points	
C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectives must be specified. The type of the set objectives must be justified
The goals that PhD Radoykova sets for herself in the development of her scientific works have both theoretical and applied orientations and can be divided into three main thematic areas. The first area is dedicated to the study of the processes of obtaining and characterizing low-molecular phenolic compounds from lignocellulosic materials with potential application as inhibitors of oxidative processes. The conducted studies are aimed at developing effective approaches for extracting phenolic compounds with antioxidant activity from various waste materials. The possibility of using these materials as a source of valuable biologically active substances has been proven, which represents an important contribution both to increasing the economic efficiency of biotechnological processes and to reducing the ecological footprint of industrial production.

The second area is dedicated to the characterization and study of the possibilities for utilizing biomass waste products as adsorbents. The conducted systematic studies are aimed at assessing the potential of various waste biomaterials for application as economically advantageous and effective adsorbents. The main attention is focused on hydrolysed lignocellulosic materials, plant bark and agricultural waste, which are characterized in detail in terms of their chemical composition, morphological features and textural parameters. The third direction concerns the study, characterization and utilization of waste and secondary industrial products, with the aim of their inclusion in sustainable technological processes.

1.4. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	**X**
C) They are of scientific and / or applied interest	12 points	
D) Lack of significant contributions	8 points	
E) Lack of contributions	0 points	
		one of the answers given is marked with the sign "X"

Contributions must be specified. The type of results achieved must be justified.
The main scientific contributions of Assistant Professor Temenuzhka Radoykova presented for participation in the competition can be summarized as follows: 1. Preparation and characterization of low molecular weight phenolic compounds from lignocellulosic materials, with potential application as oxidation inhibitors (publications No. 1, 2, 3, 4, 5, 6, 25) - Within this direction, research has been conducted aimed at developing approaches for obtaining low molecular weight phenolic compounds with antioxidant activity from various waste hydrolysed lignocellulosic materials. The possibility of utilizing these materials as a source of valuable biologically active substances has been proven, which contributes both to increasing the economic efficiency of biotechnological processes and to reducing the environmental footprint of production activities. - For the first time, it has been established and experimentally proven that low molecular weight phenolic compounds obtained from lignin can be used as additives to increase the chemical stability of automotive gasolines. This represents a significant scientific and applied contribution with the potential for implementation in industrial practices related to improving fuel quality. - A first-of-its-kind study of low-molecular-weight products obtained during the alkaline treatment of technical hydrolysed lignin, used for its activation, has also been carried out. The conditions for the extraction of target phenolic compounds from various types of waste

biomass have been optimized, which creates prerequisites for their effective industrial application and development of sustainable technologies for the utilization of lignocellulosic resources.

2. Characterization and study of the possibilities for utilization of biomass waste products (hydrolysed lignocellulosic materials, bark, agricultural waste) as adsorbents (publications No. 7, 8, 9, 10, 11, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28) - In this direction, systematic studies have been conducted aimed at assessing the potential of various waste biomaterials for application as cheap and effective adsorbents. The main attention is focused on hydrolysed lignocellulosic materials, bark and agricultural waste, which are characterized in terms of their chemical composition, morphological and textural properties.

- The possibilities of using these materials as adsorbents of heavy metals (Mn^{2+}, Cu^{2+}, Ag^{+}) have been studied, the sorption mechanisms have been investigated, the adsorption isotherms and the main textural parameters have been determined. The results obtained show a high adsorption capacity and good selectivity of the materials towards the studied metal ions.
- It has been proven that waste lignocellulosic materials, modified with silver, exhibit pronounced antimicrobial properties towards pathogenic microorganisms, which opens up possibilities for their application in water purification systems and antibacterial filters.
- In addition, various types of waste biomass have been evaluated as potential energy raw materials. It has been established that they have a high calorific value and good combustion characteristics, which makes them promising for use as a renewable energy source.
- Methods for obtaining activated carbon from hydrolysed lignin have been developed, with the synthesized materials being distinguished by excellent textural characteristics and high adsorption capacity towards heavy and rare metals. These results are of significant importance both for environmental protection and for the development of sustainable technologies for the management and utilization of biomass waste.

3. Characterization and utilization of waste and secondary industrial products. /Publications No. 13, 14, 15, 16, 17/ - The possibility of obtaining catalysts from metallurgical slag for waste gas purification has been studied. Mining waste (tailings) and fly ash (from coal-fired power plants) have also been characterized as raw materials for the production of geopolymers. Methods for the analysis of these precursors for geopolymer materials have also been validated.

1.5. Participation of the candidate in the achievement of the presented results:

A) The candidate has at least an equal participation in the submitted papers	8 points	
B) The candidate has at least an equal participation in most of the submitted papers	7 points	**X**
C) The candidate has a secondary participation in most of the submitted papers	4 points	
D) The candidate participation is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items C or D is marked. From the review of the materials submitted by Assistant Professor Temenuzhka Radoykova in connection with her participation in the competition for an academic position, it is clear that she has an active participation in both the development and the conceptual design of a significant part of the scientific works presented. In most of the publications, Assistant Professor Radoykova is the first or second author, which testifies to her significant contribution to scientific research and reflects her high commitment to the creation of new scientific knowledge.

1.6 Pedagogical activity:

A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level.	8 points	**X**
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	
C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.

1.7. Critical notes:

A) Lack of critical notes	8 points	**X**
B) Critical notes of a technical nature	7 points	
C) Critical notes that would partially improve the results achieved in a small part of the research	5 points	
D) Critical notes that would partially improve the results achieved in most of the research	3 points	
E) Significant critical notes	0 points	

		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the answers C, D or E is marked.
I have no critical remarks.

1.8. Conclusion

A) The evaluation of the candidate's activity is **POSITIVE**	This evaluation is assigned to a total number of at least 50 points	**X** **(73 points)**
B) The evaluation of the candidate's activity is **NEGATIVE**	This evaluation is assigned to a total number below 50 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the member of the scientific jury
Based on the above, with conviction, I propose Assistant Professor PhD Temenuzhka Radoykova to be appointed as an Associate Professor in the scientific specialty 4.2. Chemical Sciences (Analytical Chemistry).

14.11.2025	The report was written by:	
date	**Prof. PhD Petar Todorov**	signature