

**Appendix 12c****REVIEW**

to occupy the academic position:

"Professor"	<b>X</b>
"Associate Professor"	
	one of the academic positions indicated shall be marked with the sign "X"

**Candidates to occupy the position:**

1	<b>Associate professor</b>	<b>PhD</b>	<b>Lachezar</b>	<b>Nikolaev</b>	<b>Radev</b>	<b>UCTM</b>
Nº	academic position	scientific degree	name	middle name	last name	workplace
2						
Nº	academic position	scientific degree	name	middle name	last name	workplace
3						
Nº	academic position	scientific degree	name	middle name	last name	workplace

**Scientific area:**

<b>5</b>	<b>Technical sciences</b>
code	name

**Professional area:**

<b>5.10</b>	<b>Chemical technologies</b>
code	name

**Scientific specialty:**

<b>Technology of inorganic substances</b>
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**The competition has been announced:**

<b>101</b>	<b>27.12.2019</b>	<b>Basics of chemical technologies</b>	<b>FCT</b>
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

<b>Professor</b>	<b>PhD</b>	<b>Daniela</b>	<b>Georgieva</b>	<b>Kovacheva</b>	<b>IGIC-BAS</b>
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

<b>Associate professor</b>	<b>PhD</b>	<b>Lachezar</b>	<b>Nikolaev</b>	<b>Radev</b>
academic position	scientific degree	name	middle name	last name

1.1. Completion of the provided documents:

A) The competition documents are in full compliance with the Regulations	3 points	<b>X</b>
B) The documents are complete but do not fully comply with the requirements of the Regulations	2 points	
C) The documents are not completed in accordance with the requirements of the Regulations	0 points	
		one of the answers given is marked with the sign "X"

Missing documents and violated requirements must be described if response C is marked.

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1.2. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	<b>X</b>
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

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analyzed. The response of the results achieved (quoted) is analyzed.

### 1.3. 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)	7 points	X
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	5 points	
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	3 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 scientific contributions of Assoc. Prof. L. Radev may be referred to novelty for science (discovery of new facts and links between phenomena) and enrichment of existing knowledge. They can be classified in the following areas:

1. Development of a multistage sol-gel method for the synthesis of glass ceramics and glasses with various composition [3, 7, 9, 14-16, 19, 24, 30, 33]. (
2. Synthesis of novel glass-ceramics with high bioactivity *in vitro*, with potential application for bone regeneration [3, 9, 14-16, 30, 33].
3. Purposeful synthesis of *in situ* formed bioactive phases in new sol-gel glasses. This approach results in high *in vitro* bioactivity of the obtained materials [7, 24].
4. Synthesis by modified sol-gel method of complex oxide catalysts with applications in oxidation reactions [8, 23].
5. Development of new organic-inorganic composite materials based on various synthetic and natural polymers. The composites exhibit good *in vitro* bioactivity and could be applied as extracellular matrices in medical practice [4, 6, 10-13, 25, 29, 34].
6. Complex compounds with transition metals as complexing agents and ligands - nitrogen-containing heterocyclic molecules have been investigated. The methods of theoretical

chemistry (density functional theory, DFT) have been used to evaluate the stability of complexes, their electronic structure, vibrational characteristics, etc. Studies have provided an opportunity to evaluate the reactivity of these complexes [17, 18, 22, 28].

The numbering is after the list of the candidate - scientific papers for the occupation of the academic position "Professor"

#### 1.4. Knowledge of the problems subject of research:

A) The candidate knows in detail the achievements of other authors on the researched topics and/or applications	6 points	X
B) The candidate is partially familiar with the achieved results on the researched topics and / or applications	4 points	
C) The candidate has no prior knowledge of the status of the researched problems	0 points	
		one of the answers given is marked with the sign "X"

The evaluation must be substantiated if answer C is marked.

#### 1.5. Type of research:

A) Theoretical	4 points	
B) Applied	4 points	
C) Theoretical with application elements	4 points	X
D) It does not correspond to the level specified in the Act for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations	0 points	
		one of the answers given is marked with

		the sign "X"
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The level of research must be substantiated if answer D is marked.

**1.6. Objectives of the research:**

A) Realistic and of scientific and / or applied interest	8 points	<b>X</b>
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.
<p>In nature, the formation and growth of minerals in living organisms is controlled by organic macromolecules such as proteins and polysaccharides. Mammalian bones and teeth contain an organic matrix that manipulates the formation of various microstructures suitable for the mechanical and elastic loads for which they are intended. A great challenge for scientists all over the world is to create material with similar structure and physicochemical characteristics. In this regard, the objectives of the overwhelming number of candidates' works are extremely relevant. The most important goals concern the development of new glass, glass-ceramic, ceramic and composite materials with potential applications for bone regeneration and bone engineering. From this point of view, the objectives are of scientific and / or applied interest.</p>

**1.7. Methods of research:**

A) Adequate to research and set scientific objectives and /or applications	8 points	<b>X</b>
B) Partially appropriate, enabling part of the scientific objectives and / or applications to be achieved	4 points	
C) Inappropriate methods	0 points	

		one of the answers given is marked with the sign "X"
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Methods must be specified. The type of methods used is justified.
<p>The methods applied in the candidate's work can be divided into three main categories:</p> <ul style="list-style-type: none"> <li>• Methods for physico-chemical characterization of the materials obtained - an appropriate set of classical and well-developed methods, recognized and widely used in scientific fields such as X-ray powder diffraction, SEM and TEM electron microscopy, elemental analysis methods EDS, ICP-OES, infrared and NMR spectroscopy.</li> <li>• Methods for determining the biological activity of materials - bio-mimetic methods (ie simulating conditions in living organisms) have been applied.</li> <li>• Theoretical methods for evaluation of structural stability, electronic structure, vibrational and other characteristics related to the reactivity of complex compounds.</li> </ul> <p>The methods are adequate to the objectives and appropriately selected.</p>

#### 1.8. 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 quoted citations on the articles submitted for participation in the competition are 148 indicating that the candidate's research is of interest to the international scientific community.

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**1.9. 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	X
B) The candidate has at least an equal participation in most of the submitted papers	7 points	
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.

**1.10. 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.

The applicant reads the following courses:

1. Fundamentals of Chemical and Metallurgical Technologies - for undergraduate students of all disciplines, except biotechnology and metallurgy.
2. Chemical production - for the specialty "Chemical Engineering" in German.
3. Theory and Practice of Rational Technologies - for undergraduate students, majoring in Industrial Safety.

The applicant has a textbook issued:

1. Rumen Dimitrov, Lachezar Radev, THE BASICS OF CHEMICAL AND METALLURGICAL TECHNOLOGIES: PART I (Inorganic Chemical, Metallurgical and Silicate Technologies), Second Edition, Es Print Ltd., Sofia, 2014

The candidate was the tutor and co-tutor of three PhD students with successfully defended theses.

**1.11. Critical notes:**

A) Lack of critical notes	8 points	
B) Critical notes of a technical nature	7 points	<b>X</b>
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.



### 1.12. Conclusion

A) The evaluation of the candidate's activity is <b>POSITIVE</b>	This evaluation is assigned to a total number of at least 65 points	<b>X</b>
B) The evaluation of the candidate's activity is <b>NEGATIVE</b>	This evaluation is assigned to a total number below 65 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the reviewer

The total number of 2096.01 points for the materials submitted by Associate Professor Dr. Radev repeatedly exceeds the national minimum requirements (650) and the requirements of the Regulations for the acquisition of academic degrees and occupation of academic positions at the UCTM, for obtaining the academic position "professor" in the scientific specialty 5.10. Chemical technology.

The sum of the points for the indicators included in the review (1.1 to 1.11) is 95 and also significantly exceeds the required minimum of 65 points.

In my opinion, Associate Professor Dr. L. Radev is an established and reputable specialist in the field of synthesis and characterization of materials with potential biological and medical applications.

That is why I recommend that the members of the Scientific Jury to give a positive assessment of the candidate's activity and to vote for the award of the academic position "Professor" to Assoc. Prof. Lachezar Nikolaev Radev in the specialty 5.10. Chemical technology.

### 2. Review for the candidate:

academic position	scientific degree	name	middle name	last name

The structure of the review under the previous point 1 shall be respected.

### 3. Review for the candidate:

academic	scientific	name	middle name	last name

position	degree			
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The structure of the review under the previous point 1 shall be respected.

**Candidate ranking (in case of more than one candidate who has received a positive evaluation to occupy the academic position):**

Based on the assigned points, the candidates who have received a **positive** evaluation are ranked as follows:

<b>1</b>	<b>Associate professor</b>	<b>PhD</b>	<b>Lachezar</b>	<b>Nikolaev</b>	<b>Radev</b>	<b>95</b>
place	academic position	scientific degree	name	middle name	last name	points
2						
place	academic position	scientific degree	name	middle name	last name	points
3						
place	academic position	scientific degree	name	middle name	last name	points

<b>22.04.2020</b>	<b>Prof. PhD Daniela Georgieva Kovacheva:</b>	
date		signature