Appendix 12c

REVIEW

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	Assist. Prof.	PhD	Lilia	Nikolaeva	Aljihmani	UCTM-Sofia
№	academic position	scientific degree	name	middle name	last name	workplace
2						
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical sciences
code	name

Professional area:

5.6	Materials and Material science
code	name

Scientific specialty:

Technology of semiconductor materials and electronic elements

The competition has been announced:

111	31.12.2021	Metallurgical Technologies, electrotechnics and electronics	FMMS
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Professor	Doctor	Emil	Georgiev	Mihailov	UCTM, Sofia
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Assist. Prof.	PhD	Lilia	Nikolaeva	Aljihmani
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	X
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.

1.2. 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.
The candidate, Assist. Prof. Ph.D. eng. Lilia Aljihmani satisfies the minimum requirements for holding the academic position of "Associate Professor" according to the university and national regulations in the scientific field 5. Technical sciences. The indicators of the candidate for the academic position of "Associate Professor" at UCTM are as follows: • A (50 points) - Dissertation. • B (156 points) - 10 publications in journals, referred and indexed in world-famous databases. •G (270,95 points at a required minimum of 200 points) – 10 scientific publications in journals referred and indexed in world-famous databases of scientific information (132,74 points) and 25 publications in non-refereed journals and collective proceedings with a scientific review (138,21 points). • D (465 at a required minimum of 50 points) - 430 points by citations and reviews in scientific journals, referenced and indexed in world-famous databases with scientific information, 9 by citations in monographs and other editions, and 26 points by non-referred journals with scientific peer-review. • E (20 points). 20 points were formed as a result of an author's published university textbook.

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	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	5 points	X

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 research presented in the papers is related to the synthesis and study of the properties of new semiconductor materials. Devices of great practical value are constructed on their basis. The topic is relevant with a certain scientific and applied value.

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.
The candidate analyzes, interprets, cites and creatively applies the results achieved by other researchers, applied and publishing activity. Additionally he contributes to the enrichment of theoretical knowledge and information in different areas of research.

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"

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	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 objectives of the research are realistic. They are achieved via complex and adequate modern research methods. The research of the candidate has a scientific and scientific-applied character with predominance in the scientific field. The scientific interests of Assist. Prof. Dr. Lilia Aljihmani are in the field of materials science, amorphous and crystalline semiconductors, research of chemical, physicochemical and physical properties, phase equilibria, ion-selective electrodes, sensors, and biomedical engineering. The main directions of the research are on the synthesis, characterization, and possibilities for application of new semiconductor materials, as well as analysis of motion biodata.

1.7. Methods of research:

A) Adequate to research and set scientific objectives and /or applications	8 points	X
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"

Methods must be specified. The type of methods used is justified.
The research aims are realistic and have been achieved with the adequate application of modern research methods. Engineering and research techniques and software products have been mastered and actively used for conducting the research.

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 research activity of the candidate is developed in the following main directions: • Phase diagrams in binary systems • Areas of glass formation in multicomponent systems and properties of the obtained glasses • Sensors for registration of harmful substances in the liquid phase • Publications in the field of biomedical engineering • The most important scientific and applied scientific contributions can be summarized as follows: • With the help of differential-thermal, X-ray phase and microstructural analyzes, as well as measurement of microhardness and density, the phase equilibria were studied and the DS of 8 systems was built for the first time. • The existence of 9 new compounds in the studied systems, obtained as a result of various physicochemical interactions in solid and liquid state, was established. • Chalcogenide glasses from 14 complex multicomponent systems containing one or two glass former have been synthesized for the first time. On the basis of the conducted syntheses and analyzes, as well as by studying the glass-forming ability, the regions of glass-forming in 14 multicomponent chalcogenide systems based on As- or Ge-chalcogenides were determined for the first time. • The physicochemical properties of 139 glasses from 16 systems were determined experimentally. A correlation has been established between the studied properties and the composition of the glasses, as the characteristic changes in the composition-property dependences are related to the stable existence of the respective structural units in a certain concentration range. • Two constructions of ion-selective electrodes (ICE) have been developed: with a composite membrane (with internal liquid connection) and ICE - type "layered wire". • From the calibration curves it was found that Ag (I) - and Sn (II)-ion-selective membranes guarantee reproducibility of analytical characteristics with very good selectivity for ion detection and show no signs of aging or destruction of layer activity due to processes such as crystallization, oxidation or reduction of the glass, destruction of the polymer, etc. • The amplitude and frequency changes of hand tremor during rest, posture and palm’s maximum voluntary contraction were studied.

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.
It is assumed that the candidate has at least equal participation in the submitted works due to the lack of distribution protocols between the authors.

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.

1.11. 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.

1.12. Conclusion

A) The evaluation of the candidate's activity is **POSITIVE**	This evaluation is assigned to a total number of at least 65 points	X
B) The evaluation of the candidate's activity is **NEGATIVE**	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
I give a positive assessment and propose to the scientific jury to accept and evaluate positively the candidacy of Assist. Prof. Dr. Lilia Aljihmani for the academic position "Associate Professor" in the scientific specialty " Technology of semiconductor materials and electronic components", professional area 5.6. Materials and Material science, scientific area 5. Technical Sciences.

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:

1	Assist.Prof.	PhD	Lilia	Nikolaeva	Aljihmani	94
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

	The review was written by:	
05.04.2022	Emil Georgiev Mihailov	signature