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	**Chief assistant**	**PhD**	**Ani**	**Angelova**	**Stoilova**	**UCTM**
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

	Natural sciences
code	name

Professional area:

4.1	**Physical science**
code	name

Scientific specialty:

Electrical, magnetic and optical properties of the condensed matter

The competition has been announced:

№ 14	**18.02.2022**	**Physics**	**Chemical technoogies**
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Prof.	**D.Sc.**	**Doriana**	**Ivanova**	**Malinovska**	**Prof. emeritus at CL SENES-BAS**
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Chief assistent	**PhD**	**Ani**	**Angelova**	**Stoilova**
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, **Ch. assistent Ph D. Ani Angelova Stoilova** has presented for the competition **21 scientific publications**, **13** of which are in journals with impact factor **(IF-23,22)** and **8 in publications** referenced in world-famous database with scientific information without impact factor. She is a co-author of textbook in the field of Physics for the for bachelors students at UCMT - specialization "Chemishe verharenstechnik" in german language. **9** of the publications have been reflected in the international scientific community **as 37 publications** of foreign authors have cited the published results of the candidate, one publication has been cited 14 times, one – 7, one - 6 times, one- 3 times, two – 2 times and three - 1 time, respectively. According to the categories established by PPNSZAD, the candidate has obtained the following points:i) **on indicator 4 "Habilitation work**"-**123 points**;ii) on indicators **from 5 to 11** (for participation with **publications in referenced and indexed** in Scopus and Web of Sci)-**201 points**;iii) on indicators **12-14 (Citation)** - **78 points**,iv)on indicator **12-14** (referee reports)-**2 points** v)on indicators **22-25 (textbooks)**- **10 points**. The points on all indicators exceed the requirements in PPNSZAD for holding the academic position of "Associate Professor" in the scientific field of the announced competition.

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 results obtained from the conducted research, in which **Ch. Assistant Dr. Ani Angelova Stoilova** are innovative and have a fundamental character with potential for practical applications. in the field of technologies of new optical materials based on chalcogenide glasses or azobenzenes. The developed polarization method is applicable for observation of the pathomorphological changes in human tissues due to various diseases.

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 review of the scientific literature presented in the publications of **Ch. Assistant Dr. Ani Angelova Stoilova** clearly demonstrate that she is very familiar with the current state of the art in the field of her research activities. This has contributed to conducting high-level research and obtaining new results published in the scientific articles and dissertation of the candidate, which are of fundamental importance and potential for application.

1.5. Type of research:

A) Theoretical	4 points	
B) Applied	4 points	**X**
C) Theoretical with application elements	4 points	
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.
Research activities can be characterized as applyed researchs manly in two areas: 1) Obtaining new, polarization-sensitive materials and studying their structure and properties, which can be qualified as research of fundamental nature with the potential for application in the field of

technologies of new optical materials based on chalcogenide glasses or azobenzenes. (2) Polarization methods for visualization of changes in biological tissues The results have a fundamental contribution to obtaining information about the change in polarized light during its propagation in histological specimens, on the basis of which new, non-invasive methods for medical diagnosis are developed. These results also have an applied character for visualization with improved contrast when applying appropriate reconstruction of images obtained with polarized light of pathomorphological changes in human tissues due to various diseases.

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 characterized by high scientific and applied potential- synthesis of bulky chalcogenide materials from the systems Ge-Se-In, Ge-Se-B and Ge-Te-Cu with composition as these results were obtained and published in the scientific literature for the first time. The published results and the number of citations from other researchers are proof of the realistic of the set goals and the significance of the results.

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 applied research methods are properly selected and have contributed to the successful achievement of the set goals. Synthetic methods have been applied to obtain bulk chalcogenide materials and new thin film materials for use in optoelectronics from newly synthesized chalcogenide bulk samples as well as composite materials based on new azo dyes crosslinked in a polymer matrix. Various methods have been applied to obtain the thin layers - vacuum thermal evaporation, centrifugal application and electrospray. The structure of the obtained materials with composition was studied $(Ge_{0.2}Se_{0.8})_{100-x}In_x$, $(Ge_{0.17}Se_{0.83})$ $100_{-x}In_x$ (x = 0, 5, 10, 15 mol.%) and $(Ge_{0.2}Se_{0.8})_{85}B_{15}$, by different methods: - X-Ray Diffraction, Neutron Diffraction, Extended X-Ray Absorption Spectroscopy. Applied and simulation method - Reverse Monte Carlo. The optical parameters of the materials were determined by optical methods of research. Polarization methods have been proposed to visualize changes in biological tissues. A new minimization procedure for calculating the complex refractive index of thin layers of azo polymers has been proposed.

1.8. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	**X**
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	
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 scientific contributions of Chief Assistant Dr. Ani Angelova Stoilova can be qualified as:

1. Development of new method:

Volumetric chalcogenide materials from the Ge-Se-In, Ge-Se-B and Ge-Te-Cu systems with a composition not reported in the scientific literature were synthesized.

2. Obtaining new data:

New thin-film materials for use in optoelectronics from newly synthesized chalcogenide volumetric samples have been obtained. New thin-film materials for use in optoelectronics have been obtained from newly synthesized chalcogenide bulk samples as well as composite materials based on new azo dyes crosslinked in a polymer matrix. Evaporation and condensation energies have been determined as a function of the chalcogenide content and are an important parameter for optimizing the conditions for obtaining thin layers with predetermined properties. Optical parameters such as refractive index, extinction coefficient, absorption coefficient, band gap width of new chalcogenide thin-film materials and composite layers based on the azo polymer PAZO, doped with particles of newly synthesized chalcogenide metal or bulk complexes. For the first time, the results of a study of the kinetics of photoinduced birefringence in Schiff-based layers characterized by tautomeric transformations have been reported. A relationship has been established between the magnitude of photoinduced birefringence in the thin film materials listed above and the type and number of chromophore groups in their molecule, the presence of donor or acceptor substituents, matrix crosslinking, or azo polymer doping.

The diffraction efficiency in thin amorphous chalcogenide layers of the Ge-Se double system and the Ge-Se-Ga (In) triple systems was determined. It has been found that the addition of a third component to the dual Ge-Se system leads to an increase in diffraction efficiency. Higher diffraction efficiencies were measured for indium-containing layers than for gallium-containing ones. As a result of application of polarization methods for visualization of changes in biological tissues, statistics have been accumulated on the change of polarized light during its propagation in histological preparations of lung and liver with pathomorphological findings due to various diseases.

Repeated optical recording in thin-layer materials based on new azo dyes was performed. Polarization diffraction gratings in composite layers based on the azo polymer PAZO doped with particles of new metal complexes of hydantoin have been recorded. Polarization images were obtained visualizing pathomorphological changes in histological specimens of the human lung and liver with higher contrast compared to images obtained with unpolarized light or before reconstruction, aimed at limiting the contribution to the final image of depth-scattered photons by biological specimens.

3. Hypotheses proposition

Based on the analysis of the results of the recorded polarization diffraction gratings in composite layers based on the azo polymer PAZO doped with particles of new metal complexes of hydantoin, it was concluded that at the particle concentration at which maximum birefringence is achieved, and the highest relief, and that along with the anisotropic lattice in the volume of the medium a surface relief is formed.

The contributions can be idefinited as scientific and applied and are the basis for future activities in innovative areas, research and applications.

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.
There is no doubt that the candidate, **Ch.assistant Professor Dr. Ani Angelova Stoilova**, has equal participation in the presented publications. My personal impressions of her presentations at scientific conferences and forums are positive.

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.
Ch. Assistant Dr. Ani Angelova Stoilova has impeccable and sufficient pedagogical activity at UCTM, which is in accordance with the requirements of the Regulations. She has conducted lecture courses taught in the last three academic years in "Classical Physics Part II" in French, winter semester of the academic year 2020/2021, with a schedule of 30 teaching hours, for students majoring in "Chemical and Biochemical Engineering" (teaching French language) in full-time form - for Master's degree, in the second year and "Introduction to Chemical Engineering" in German, winter semester of the academic year 2016/2017; 2018/2019 and 2020/2021, with a schedule of 30 teaching hours, for first-year students of the first semester, in full-time education, specialty "Chemical Engineering" (with teaching in German), with a bachelor's degree. She led exercises with physics students. Ch. Assistant Dr. Ani Angelova Stoilova is a co-author of a textbook for students studying in German in the specialty "Engineering Chemistry", published in German.

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
The contributions in the presented scientific publications of **Ch. Assistant Dr. Ani Angelova Stoilova** can be defined as such of a fundamental nature, as well as important in terms of application of materials. The candidate has sufficient pedagogical activity in UCTM, which is in accordance with the requirements of the Regulations. The materials presented for the competition meet the requirements of Art. 29, para. (1), item 5 of PPNSZAD and the recommended requirements for holding the academic position "Associate Professor" and defined in the Regulations on the terms and conditions for obtaining scientific degrees and for holding academic positions in UCTM. Based on the presented scientific publications, the research activity and the pedagogical experience of **Ch. Assistant Dr. Ani Angelova Stoilova** in the field of physics, I am convinced and propose to the scientific jury of the competition to recommend to the Faculty Council of the Faculty of Chemical Technology at UCTM to vote **"YES"** for the academic position of "Associate Professor" in professional fields 4.1 "Physical Sciences" (specialty "Electrical, magnetic and optical properties of condensed matter") at UCTM of the candidate-**Ch.assistant Dr. Ani Angelova Stoilova.**

05.06.2022	**Prof. D.Sc. Doriana Ivanova Malinovska** :	
date	The review was written b	signature