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	**Senior Assist.-Professor**	**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 Technologies**
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Assoc. Prof.	**Dr.**	**Ruzha**	**Georgieva**	**Harizanova**	**UCTM**
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Senior Assist.-Professor	**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	
	3 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	
	20 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.
Only one candidate, **Senior Assistant-Professor Dr. eng. Ani Angelova Stoilova** applies for the announced competition for the "Associate Professor" position with 21 publications in total: 13 in IF journals with a total IF=23.22, 8 - in referred and indexed scientific magazines. In 7 of the articles Dr. Stoilova is the first author. In the overall List of publications Dr. Stoilova has also submitted two publications with which she has applied for the defense of her dissertation for the educationional and scientific degree "Doctor". Senior Assist.-Prof. Ani Stoilova is a co-author of 1 study aid textbook "Practical exercises in Physics" for the students from the specialty "Chemical Engineering taught in German" at the UCTM. At the time of application, 39 citations of 9 from her publications have been notices – one of the publications has 15 citations, and two other have 8 and 6 citations respectively. According to the indicators imposed by the PPNSZAD, the candidate obtains the following score: 1) **Indicator 1 – 50 points**, 2) **Indicator 4** "Habilitation thesis" – **123 points**; **Indicators 5 – 10** (publications in referred and indexed in Scopus and WoS magazines) – **201 points**, 3) **Indicators 12-14** (citations) – **78 points**. The total score is **452 points** from **400 points as a minimum requirement**. The points for all criteria either correspond or even exceed the requirements of PPNSZAD for the occupation of the academic position "Associate Professor" in the respective Professional field of the announced by UCTM 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	5 points	

each of the topics and / or applications studied.		
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	
	7 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 from the performed investigations submitted by Dr. Ani Stoilova for the competition are up-to-date and could be described as theoretical with application elements. Two main research directions could be outlined: 1) Application of technologies for the synthesis of new optical materials based on chalcogenide glasses and azobenzene-based polymers and composites of these two types of materials and their physico-chemical and structural characterization. 2) Development of techniques for polarization investigation and visualization of pathomorphological changes in human tissues.

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

The evaluation must be substantiated if answer C is marked.
The survey of the references in the publications of Dr. Stoilova submitted for the competition show that she is well-acquainted to the current state of the art of the research in her field. The survey of the submitted articles witnesses that the candidate possesses deep knowledge of the used experimental techniques and skills for analysis and interpretation of the obtained new results.

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	0 points	

Development of the Academic Staff in the Republic of Bulgaria and the Regulations		
	4 points	one of the answers given is marked with the sign "X"

The level of research must be substantiated if answer D is marked.
The work presented in the competition for the occupation of the academic position “Assoc. Prof.” Is theoretical with application elements. The following two directions of investigation could be pointed out: 1) Synthesis of new materials based on chalcogenide glasses and azopolymers with potential for application in optics and opto-electronics and the characterization of their phase composition, structure and optical properties. 2) Utilization of polarization techniques as an innovative, non-invasive method for the visualization of the changes in biological tissues occurring as a result of different diseases and their application in medical diagnostics.

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	
	8 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 submitted research encompass the design of new compositions and the synthesis of bulk and thin film chancogenide materials in the systems Ge-Se-In, Ge-Se-B and Ge-Te-Cu, as well as characterization of the resulting structures and construction of models describing these structures. Further goal is the synthesis of advanced azopolymer-based thin films with high birefringence and applicability in biomedicine. The number and content of the scientific publications submitted for the competition as well as the response they find in scientific literature, according to the number of citations, are an evidence that the goals of the work are realistic and relevant.

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

Methods must be specified. The type of methods used is justified.
The methods utilized for the achievement of the goals of the work are well-chosen and include both traditional investigation techniques (methods for chalcogenide and azopolymer materials synthesis, methods for their phase composition, structure and optical properties investigation – VTE, centrifugal deposition, electrospraying, X-Ray diffraction, IR-spectroscopy, neutron diffraction, scanning electron microscopy) as well as relatively new techniques mainly aiming the study of the structure and elemental composition (different X-ray absorption techniques for elemental and structural characterization) and concern the investigation of the application potential of azopolymer materials in biomedicine. Results from the structure simulation of various chalcogenide glasses by means of reverse Monte Carlo method are reported. A new procedure for determining of the complex refractive index of thin azopolymer films is 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	
	20 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 Dr. Stoilova are theoretical with application elements and within the two scientific research directions could be summarized as follows: 1. **Design of new compositions for the synthesis of:** - Bulk chalcogenide materials in the systems Ge-Se-In, Ge-Se-B and Ge-Te-Cu; - Thin film composite materials on the basis of azo-dyes embedded in a polymer matrix. **2. Acquisition of new data:** - The evaporation and condensation energies are determined in dependence of the chalcogenide concentration and the procedure for thin films preparation is optimized. - The optical parameters (refractive index, extinction coefficient, absorption coefficient, band-gap width) are determined for the new compositions of chalcogenide thin films and for the composite films prepared by embedding chalcogenide particles or particles of metallic complexes in azopolymers. - New results are reported concerning the photoinduced birefringence in thin films based on Shiff bases characterized by tautomeric transformations and the relationship between the magnitude of the photoinduced birefringence and the type and number of the chromophore groups in the molecule as well as the presence of donors/acceptors and the doping of the azopolymer is studied. - The diffraction efficiency is determined for the thin amorphous chalcogenide films in the systems Ge-Se, Ge-Se-Ga (In) and it has been established that the addition of Ga (In) results in the increase of the diffraction efficiency as well as that the addition of In leads to the highest diffraction efficiency. - New data have been accumulated concerning the applicability of the polarization methods utilized for the visualization of the changes occurring in biological tissues and the quality of the images obtained by this method and the currently available techniques using non-polarized light has been compared. - It has been proved that numerous cycles of optical recording in thin films based on the newly

developed azo-dyes are possible.

3. Development of hypotheses for the structures of the synthesized new materials

- Hypotheses have been raised for the structure of the obtained chalcogenide glasses which are in accordance with the results from other authors, citing the work of Dr. Stoilova.
- The evaporation and condensation kinetics of thin amorphous films in the system Ge-Se-In prepared by VTE have been investigated and the energies of evaporation and condensation have been determined as a function of the chalcogenide elements concentrations.
- Based on the results from the optical gratings recording in composite azopolymer-based thin films, the relationship between the maximum concentration of the fillers and the maximum difference in the refractive indices of the ordinary and extraordinary rays, as well as the dependence on the morphology of the obtained thin films is investigated and established.

The contributions in the publications submitted for the competition are theoretical with application elements and can serve as a base for the future scientific work of the candidate.

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	
	8 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.
The materials submitted for the competition show that proved beyond doubt, Senior Assist-Prof. Stoilova has an equivalent contribution for the acquiring of the reported results and the preparation of the respective publications. Her contributions to the presented research consist mainly in the synthesis of the chalcogenide glasses, the investigation of their structure and optical properties. In the second field of investigations, the personal contributions of Dr. Stoilova could be summarized as such corresponding to the synthesis of thin azopolymer films by applying various physical methods and characterization of their thermal and optical characteristics. My personal impressions of Dr. Stoilova as a co-worker teacher and a scientist, as well as a person are entirely 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	
	8 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.
Senior Assist. – Prof. Dr. Ani Stoilova has a pedagogic activity at the UCTM which is in accordance to the Regulations. In the last 3 years she has delivered lectures in Classical Physics part II in French for the students from the specialty “Chemical and Biochemical Engineering” (taught in French), regular tuition form of the Master educational and qualification degree and Introduction to the Chemical Engineering in German in the winter semester of the academic years 2016/2017; 2018/2019 and 2020/2021 for the students from the specialty “Chemical Engineering” (taught in German), regular tuition form, Bachelor educational and qualification degree. She has supervised seminars and practical exercises in Bulgarian, French and German. Dr. Stoilova has co-authored 1 studying aid textbook in German language for the students from the specialty “Chemical Engineering” (taught 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	
	8 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 materials presented for the competition and the outlined theoretical with application elements contributions as well as the teaching activity of Senior Assistant - Professor Dr. eng. Ani Angelova Stoilova correspond to the requirements of Article 29, Paragraph 1, Item 5 of PPNSZAD and to the recommended requirements for the occupation of the academic position “Associate Professor”, according to the Regulation for the conditions and order for the acquiring of scientific degrees and occupation of academic positions at the UCTM. Based on the submitted publications, the research activity and teaching experience of Dr. Ani Stoilova, I convincedly suggest the esteemed Scientific Jury to recommend the Faculty Council of the Faculty of Chemical Technologies at the UCTM to vote **“YES”** for awarding the academic position “Associate Professor” in the Professional area 4.1 Physical Science (specialty “Electrical, magnetic and optical properties of the condensed matter”) to the candidate – Senior Assist. - Prof. Dr. eng Ani Angelova Stoilova.

10.06.2022	**Ruzha Georgieva Harizanova**	
date	The review was written by	signature