

REPORT

to occupy the academic position:

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

Candidates to occupy the position:

1	Associate Professor	PhD	Desislava	Staneva	Grabcheva	UCTM-Sofia
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical Sciences
code	name

Professional area:

5.10	Chemical Technologies
code	name

Scientific specialty:

Chemical Technology of Fibrous Materials
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The competition has been announced:

23	19.03.2024	"Textile, Leather and Fuels"	Faculty of Chemical Technologies
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Professor	PhD	Ivaylo	Vladimitrov	Dimitrov	Institute of Polymers, Bulgarian Academy of Sciences
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Associate Professor	PhD	Desislava	Staneva	Grabcheva
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.

The requirements for **indicator 1** are fulfilled, as the candidate holds the educational and scientific degree "Doctor" since 2008 (**50 points**).

Regarding **indicator 4**, the candidate has presented ten scientific publications, referred and indexed in world-renowned databases with scientific information (Scopus and/or Web of Science), thus collecting **112.1 points** (with a minimum of 100 points required).

Regarding the **indicators 5-11**, the candidate has presented 31 scientific publications, referred and indexed in Scopus and/or Web of Science (indicator 7), four publications in non-referred peer-reviewed journals (indicator 8) and two chapters in collective monographs (indicator 9), thus collecting a total of **326.5 points** (with a minimum of 200 points required).

Regarding the **indicators 12-15**, the candidate has presented 62 citations of the publications from indicator 4 in journals, referred and indexed in world-renowned databases with scientific information, collecting **620 points** (with a minimum of 100 points required).

According to **indicators 16-27**, proofs are presented for: the supervision of two PhD students who defended their theses: attracted funds from two national scientific projects coordinated by the candidate; participation in 5 national scientific projects, as well as a university textbook published by the candidate in co-authorship, collecting **182 points** (with a minimum of 100 points required).

Associate Professor Desislava Grabcheva has collected a total score of **1290.6 points**, significantly exceeding the minimum of 550 points required by the Regulations for acquiring scientific degrees and holding academic positions at UCTM for the academic position of "Professor".

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	X
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	

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 research in the scientific papers presented by Assoc. Prof. Grabcheva in the competition for filling the academic position of "Professor" is relevant. The research is related to the modification of textile materials with various functional low-molar-mass compounds and polymers of different architecture. Thus, the fibrous materials are given specific properties that make them suitable for biomedical and sensing applications, as well as for wastewater treatment. The presented research covers the synthesis and characterization of a variety of new functional compounds, their complexes with metal ions or embedded nanoparticles and other biologically active substances. Their properties in solution have been evaluated, with efforts aimed at preserving their specific activity and properties after deposition onto the textile material.

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 objectives set in the presented research are realistic and are of both scientific and scientific-applied interest.

In the research related to obtaining textile materials with biomedical application, the goal is to obtain functional textile materials with antimicrobial and virucidal activity, as well as "smart" textile materials capable of responding to small changes in environmental conditions for controlled release of biologically active substances and manifestation of other biological activities.

In the research related to obtaining textile materials for wastewater treatment, the aim is to produce composite materials based on various types of modified textiles, containing polymers and additives resulting in materials with sorption and catalytic properties.

Another goal of Assoc. Prof. Grabcheva's research is to obtain functional textile materials possessing optical sensor properties with potential applications in clinical medical analysis and for the detection of amino compounds and metal ions in aqueous media.

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 contributions of the candidate's research presented for participation in the competition which are of scientific and applied interest can be summarized as follows:

- Novel modified textile materials with potential biomedical application were obtained and evaluated.** Textile materials (cotton fabric or viscose silk) were modified with polyamidoamine (PAMAM) dendrimers, polypropyleneimine (PPI) dendrimers or hyperbranched polymers that are surface functionalized with various substituents, and also with low molecular weight compounds and their metal complexes. A good antimicrobial activity of the functional compounds was established, which is preserved even after their deposition on textiles. In addition, treated textile materials prevent the formation of bacterial biofilms. By incorporating photosensitizers, the modified textile materials exhibit antimicrobial photodynamic activity. By chemically linking newly obtained hybrid peptide compounds to functionalized cotton fabric, the virucidal activity of the composite materials was also successfully achieved. Cotton fabric treated with different polymers (linear and cross-linked) and functional PAMAM-dendrimers has been evaluated as a carrier of biologically active substances with potential application as wound dressings releasing the therapeutic substance.
- Novel textile materials with potential application for the purification of polluted water were obtained and evaluated.** A composite material was obtained by treating cotton fabric with chitosan containing ZnO particles and the subsequent polymer cross-linking. The optimal conditions for obtaining the material have been established. Its sorption properties towards oil and water-soluble textile reactive dyes were evaluated. Consequently, a dependence of the sorption properties on the composition of the material was established. Composite materials based on polyamide fabric containing polyacrylamide hydrogel and zinc

or iron oxide particles were obtained. The materials were evaluated as a photocatalyst or heterogeneous Fenton catalyst for the decolorization of dye solutions.

- **Contributions to the preparation of textile materials with sensor properties.** A surface-modified with benzanthrone functionalities PPI-dendrimer was synthesized and deposited on viscose silk fabric as a result of the formation of hydrogen bonds. The ability of the material for detection of amino compounds, copper and zinc ions in aqueous medium was established by monitoring the fluorescence quenching. A flexible heterogeneous sensor for the detection of metal ions in an aqueous medium, representing a cotton fabric modified with covalently linked N,N-dimethylaminoethylamino-1,8-naphthalimide units, was also obtained and evaluated.

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.

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"
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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	
B) Critical notes of a technical nature	7 points	X
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.
<p>In Appendix 6a of the candidate's documents, one article is duplicated (No. 12 and No. 14), whereas article No. 24 from the List of scientific works published after acquiring the academic position of "Associate Professor" and submitted for participation in the competition is omitted. This leads to a minor change in the number of points related to Indicator 7.</p> <p>In the candidate's Reference of scientific contributions, star polymers are referred to as identical to dendrimers (...'star-shaped (dendrimer) polymers'...). In fact, these are separate types of polymer architectures, differing both in the methods for preparation and in the density distribution in their macromolecules.</p>

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 (74 points)
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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
<p>The research results presented by Associate Professor Dr. Desislava Staneva Grabcheva and her teaching activities significantly exceed the National minimum requirements for filling the academic position of "Professor" according to the <i>Development of Academic Staff in the Republic of Bulgaria Act (DASRBA)</i>, the <i>Regulations on the Implementation of the DASRBA</i> and the <i>Regulations for acquiring scientific degrees and holding academic positions at UCTM</i>. Therefore, I give my positive assessment and I recommend Associate Professor Dr. Desislava Staneva Grabcheva to be elected as a "Professor" in the professional field 5.10. Chemical Technologies (Chemical Technology of Fibrous Materials), according to a competition announced by UCTM in SG, issue 23 from 19.03.2024.</p>

25.06.2024	The report was written by:	
date	Prof. Ivaylo Dimitrov, PhD	signature