

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	Dimitrina	Atanasova	Todorova	UCTM
№	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:

Technology, mechanization and automation of the pulp and paper industry

The competition has been announced:

67	13.08.2021	Pulp, paper and printing arts	Chemical Technology
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Prof.	DSc	Sanchi	Konstantinova	Nenkova	UCTM
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Assist. Prof.	PhD	Dimitrina	Atanasova	Todorova
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.

All the necessary documents for the competition for “associate professor” are presented, which fully meet the requirements of the Regulation for the implementation of the law for the development of the academic staff.

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.

Assis. Prof. Dimitrina Atanasova Todorova, PhD participates in the competition for “associate professor” with a total of 50 scientific publications and reports from scientific conferences, published in full text, of which 21 are referenced and indexed in the global database with IF or SJR.

According to indicator 4 - presence of habilitation work, Assis. Prof. Dimitrina Todorova, PhD presents 10 scientific publications in publications that are referenced and indexed in the global database with IF or SJR. In addition to them, Assis. Prof. D. Todorova has 11 other publications in publications that are also referenced and indexed in the world database. The candidate presents another 29 publications in specialized editions or printed reports in full text in conference proceedings. In addition, there are 10 other participations in scientific conferences with reports and posters. All publications are on the topic of the competition. A total of 29 citations were noted, 16 of which were in scientific journals, referenced and indexed in a world databases.

In the competition for associate professor, assistant professor Dimitrina Todorova presents a Guide for exercises: Assoc. Prof. Dr. Eng. Nadezhda Mincheva Ivanova, Assoc. Prof. Dr. Eng. Siyka Petkova Bencheva, Dr. Eng. Dimitrina Atanasova Todorova, MANUAL FOR EXERCISES IN CHEMISTRY, TECHNOLOGY AND PROPERTIES OF THE PAPER, 2009, UCTM, Sofia, ISBN 978-954-465-030.

Assis. Prof. Dimitrina Todorova presented her participation in 7 scientific contracts, 2 under the European COST program, 1 under the European program Science and Education for Smart Growth, 2 under the ERA program of the German Ministry of Education and Science, EUROSTARS contract. The last 3 contracts are joint with the University of Applied Technical Sciences in Wildau, Germany. She was project manager of 12 contracts financed by CRS at UCTM.

Assis. Prof. Dimitrina Todorova, PhD fully satisfies the accepted national requirements for holding the academic position of “associate professor”. According to the Regulations for

application of the law for the development of the academic staff of the Republic of Bulgaria, with a required minimum of 400 points, the candidate has 1007 points.

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.

All scientific materials with which Assis. Prof. Dimitrina Todorova PhD participates in the competition for “associate professor” are in the field of paper production and paper materials for packaging production:

1. In order to optimize the energy-intensive process of beating of fiber raw materials, a study was conducted to determine the influence of a constant magnetic field (0.1T) on the behavior of the paper suspension and the strength of the obtained paper samples of bleached softwood and broadleaf pulp. The magnetic treatment of cellulose suspensions before beating improves the structure of the paper sheet, causes rearrangement of the fibers, which leads to increased strength of the obtained paper samples.
2. The interdependencies between the type of the initial fiber materials, the processing methods and the properties of the papers obtained from them are studied.
3. The processes of recycling of fiber materials and improvement of their sheet-forming properties are optimized.
4. The interdependencies between the chemical additives in the paper production and their influence on the properties of the paper are studied. The processes of dyeing, sizing and retention of wet-end chemical additives are optimized.
5. The multifunctional properties of different types of packaging materials have been studied and optimized.
6. The relationship between the type of the source fiber material in the paper and the appropriate printing and finishing techniques are defined.
7. The properties of corrugated cardboard have been studied.

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	4 points	

researched topics and / or applications		
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 Assis. Prof. Dimitrina Todorova, PhD is acquainted with the scientific achievements in the field of technologies for obtaining and properties of paper, which can be seen both from the extensive literature references for each scientific manuscript and from the topics of her publications. Mostly, they address current and actual issues in the field of studying the relationships between the type and quantity of paper components, recycling of paper waste, printability of the paper, studying the properties of packaging paper materials.

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.

Most of the research of Assis. Prof. Dimitrina Todorova, PhD are theoretical with indicated possibilities for application. Different in nature primary and secondary fibrous materials, fillers and various chemical additives were studied in order to optimize their influence on the properties of the paper suspension, improve the technological processes and optimize the consumption of chemical additives to obtain the necessary technological and consumer properties of paper, paperboard and packaging produced from them.

For the information of the producers of packaging and labels, the specific properties of these papers are conducted, influencing the possibility of printing on them, allowing the correct choice of printing technology and finishing processes.

In order to study the aging kinetics of refined coated paper, accelerated thermal aging is performed at three different temperatures - 90, 105 and 120 ° C for 48 hours. The kinetics of the process best is described by an exponential kinetic equation valid for a heterogeneous process occurring on uniformly inhomogeneous surfaces. The initial and current speed of the process are determined. They have been found to decrease with increasing process rate. The rate constant of the reaction is also calculated. The temperature dependence of the velocity is also described and the values of the activation energy and the pre-exponential

factor in the Arrhenius equation were calculated.

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 goals set by Assis. Prof. Dimitrina Todorova, PhD in the development of scientific papers are of scientific and applied interest and are related to optimizing and improving the processes in the field of paper production and the quality of materials for this production.

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 methods used in the scientific developments of Assis. Prof. Dimitrina Todorova are scientifically substantiated and applied in practice for this type of research. Modern equipment is used, on which the cited methods of analysis are performed. All this makes the results reliable.

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 contributions from the scientific developments of Assis. Prof. Dimitrina Todorova, PhD could be summarized as follows:

1. By studying the interdependencies between the type of fiber raw materials, processing methods and the properties of the obtained papers, the following positive guidelines have been proved:

-When applying magnetic treatment of fiber materials, the beating time of the material is shortened and the structure of the paper sheet is improved.

-The relationship between the type of the original wood pulp species, which are part of the paper, the properties of the paper and its printability is defined.

-Researches have been conducted describing the kinetic laws of aging of coated printing paper. The current rate of the process of accelerated thermal aging decreases with increasing degree of the process and increases with increasing temperature. Research is important for controlling the aging process of books.

- The effect of the application of the enzymes cellulase, lipase, amylase and xylanase on the drainage and deinking of waste paper during flotation and on the strength properties of the obtained paper samples has been established.

- The possibility to use the sludge from the wastewater treatment systems has been studied. Their positive influence on certain parameters of the produced paper has been established, especially in the cases of using long-fiber pulp.

2. Investigation of the interdependencies between the chemical additives in paper production and their influence on the properties of the paper:

-The possibility of using reactive dyes for dyeing paper has been studied. Colored paper samples have a stable and even color.

-The effect of the sizing agent AKD on the properties of the paper suspension and the obtained paper has been established. In addition to the sizing effect, the substance also has a retention effect on the paper filler.

3. Optimization of the processes of retention and drainage in the paper production has been carried out. The action of an anionic coagulant without and with magnetic treatment was monitored. This treatment has been shown to increase the effectiveness of the coagulants used.

3. Research on optimizing the multifunctional properties of different types of packaging materials:

-Additives from chitosan and rice starch lead to an increase in the hydrophobicity, oil resistance and strength of the paper.

-New packaging materials with antibacterial properties have been developed by using plant extracts of Bulgarian herbs and silver nanoparticles and their resistance to bacteria and microorganisms has been proven.

- Modification of poplar wood with various substances - maleic anhydride, copper sulfide, alkaline-activated hydrolysis lignin was carried out and the resistance to water absorption and microorganisms was studied.

4. The properties of corrugated cardboard have been studied in order to optimize the

processes of obtaining and their processing.

5. A large number of software products have been used for the purpose of designing various packages. The application of these developments is for the purpose of educating students

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.

The review of the materials presented by the Assis. Prof. Dimitrina Todorova, PhD for participation in the competition shows that she has an active participation in setting the goals and the development of all submitted scientific papers.

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 work of Assis. Prof. D. Todorova with the students is at a high professional level. Assis. Prof. Dimitrina Todorova gives lectures in 4 disciplines for Bachelor's degree and 4 for Master's degree, full-time and part-time education of students in the specialties "Pulp, Paper and Packaging" - bachelors and masters, "Printing Technology" - bachelors, "Printing arts" - masters, "Restoration and conservation of paper and books" - masters. Assis. Prof. Dimitrina Todorova has issued a Student Guide: Assoc. Prof. Dr. Eng. Nadezhda

Mincheva Ivanova, Assoc. Prof. Dr. Eng. Sijka Petkova Bencheva, Dr. Eng. Dimitrina Atanasova Todorova, MANUAL FOR EXERCISES IN CHEMISTRY, TECHNOLOGY AND PROPERTIES OF THE PAPER, 2009, UCTM, Sofia, ISBN 978-954-465-030

Assis. Prof. Dimitrina Todorova was the scientific supervisor of 23 graduates, bachelors and masters.

She is actively involved in the ERAZMUS program together with the University of Applied Sciences in Wildau, Germany, lecturing to students and research associates and developing joint research topics.

From 2012 to 2016 she was responsible for credits and quality of education at the Faculty of Chemical Technologies.

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.

I have no critical notes.

I recommend Assis. Prof. Dimitrina Todorova, PhD to publish more articles in magazines with Impact Factor.

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 research of Assis. Prof. Dimitrina Atanasova Todorova, PhD are in a topical field from a scientific and applied point of view, have both fundamental and applied nature, and are of interest to specialists in the field of paper production technology. She has a long-term

cooperation with the University of Applied Sciences in Wildau, Germany, as a result of which joint research projects have been developed and joint diploma theses have been defended. Assis. Prof. Dimitrina Atanasova Todorova, PhD has a very well-defined teaching activity. The overall scientific and teaching activity of the candidate gives me a reason to propose Assis. Prof. Dimitrina Atanasova Todorova, PhD to be elected associate professor in the scientific specialty 5.10. Chemical technologies, Technology of pulp and paper production.

Total number of points - 100 points.

30.11.2021	The review was written by: Prof. DSc Sanchi Nenkova	
date		signature