

## REPORT

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
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**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 report was written by:**

Assoc. Prof.	PhD	Anna	Lyubeno	Georgieva	retired
academic position	scientific degree	name	middle name	last name	workplace

**1. Report for the candidate:**

Assist. Prof.	PhD	Dimitrina	Atanasova	Todorova
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.

**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 relevance of the research presented in the scientific works of the candidate is unquestionable. The development of the pulp and paper industry in recent years is associated with solving a number of environmental, energy and raw material problems. Let us mention the possibility of obtaining recycled waste paper, which represents 50% of the fiber raw materials used in the production of paper and cardboard. The research conducted by the candidate addresses each of these problems. In-depth study of the relationship between the type of fibrous raw materials, processing methods, chemical additives used in paper production and the properties of papers, as well as process optimization allows to improve technology and achieve various desired results. Some specific examples are:

Actuality of the conducted extensive research on the effect of enzymatic treatment (a modern method) of secondary fiber material and the use of production sludge in the composition of papers; Enriching the research limited so far on optimizing the sizing

processes to improve the barrier properties of the papers that give them the appropriate sizing agents; The preparation of packaging papers with antibacterial properties through the use of plant extracts of various Bulgarian herbs.

### 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 main objectives of the research in the scientific works of the candidate can be summarized as follows: Research on the interdependencies between the type of the fiber raw materials, the processing methods and the properties of the papers obtained by them; Study on the interdependencies between chemical additives and their influence on the properties of the paper; Study on the multifunctional properties of different types of packaging materials; Investigation of the properties of corrugated cardboard.

These studies have a clear purpose. According to their specifics, they aim to optimize the processes of recycling of fiber materials and to improve their sheet-forming properties; optimization of the processes of dyeing, sizing and retention; optimization of the multifunctional properties of different types of packaging materials, as well as the processes of production and processing of corrugated cardboard.

The goals are realistic. They are dictated both by research interest and a desire to seek opportunities to increase the technology level in the paper industry.

### 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"
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Contributions must be specified. The type of results achieved must be justified.

The influence of a constant magnetic field on the energy-intensive process of beating of fiber materials in the paper suspension of bleached softwood and hardwood cellulose has been established. As a result of the processing, acceleration of the beating time and higher strength of the paper is achieved. The interdependencies between the type of the fiber raw materials, the magnetic treatment before their beating and the properties of the obtained papers have been established. These researches have a scientifically applied character.

Studies have been conducted to establish the relationship between the type of the original wood species of cellulose included in the composition of the paper and its printability. Extensive analyzes have also been carried out, the results of which enrich such analyzes, which are extremely rare in the specialized literature. They have not only an applied character, but are also of scientific interest.

A scientific approach is used - a study of the kinetic laws of aging of refined printing paper, which in addition to scientific contribution has practical significance, as it allows to control the aging processes of books.

Extensive research has been conducted on the effect of enzymatic treatment of secondary fiber material and the use of production sludge in the composition of papers, which is innovative and has a proven scientific and applied contribution.

The research of the interdependencies of the chemical additives and the improvement of the properties of the papers are also a contribution. In particular, the dyeing processes with reactive dyes synthesized by the candidate and the processes of sizing and retention, as well as drainage in paper production, have been optimized. For the first time, the consumption limits of the reactive dyes for paper production were determined and their color coordinates were measured; The conducted study on the sizing is comprehensive. It should be noted that there are currently a limited number of such studies, especially as regards the ratio of emulsification rate to emulsification ratio of sizing additive and starch; Author's methods for determining the sedimentation rate of particles in paper suspensions and the flocculation capacity of chemical additives in paper production are proposed, published in a co-authored handbook.

The properties of packaging materials with the addition of the biopolymers chitosan and rice starch have been studied and optimized. Due to the complex anisotropic nature of the paper, such a study in the field of viscoelastic properties of papers is extremely rare. It represents a significant scientific contribution to the analysis of the dynamic mechanical properties of different types of paper.

Last but not least, it should be noted the significant scientific and applied nature of the conducted experiments for characterization and optimization of the antibacterial properties of packaging materials by adding plant extracts, silver nanoparticles, maleic anhydride, etc., allowing optimal choice of type and application of antimicrobial agent for active wrapping papers, cardboards, wood composites, etc..

**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	x
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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.

In the competition for the academic position of "Associate Professor" the candidate participates with 21 scientific publications in referenced and indexed in world databases with scientific information publications from a total of 50 publications. In the ten of them on the habilitation work, which are referenced and indexed in world databases with scientific information, in seven she is first as a co-author and second in the other three issues. Out of these ten publications alone, it collects 310 points, which is three times more than required by the Regulations for these publications and more than six times the required total number of point assets - a minimum of 50 points to give a positive assessment of the candidate.

The candidate presents a total of 29 citations from 21 scientific papers. In 15 of the citations D. Todorova is in the first place in the cited works, i.e. in more than half. This means that the interest shown in these works is largely due to her significant participation.

Everything noted so far gives me reason to believe that the participation of the candidate in achieving the results is essential.

**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	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.

**1.8. Conclusion**

A) The evaluation of the candidate's activity is <b>POSITIVE</b>	This evaluation is assigned to a total number of at least 50 points	x
B) The evaluation of the candidate's activity is <b>NEGATIVE</b>	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
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My assessment, according to the various required indicators, considered in the opinion, as well as the points calculated according to the requirements of the Regulations, which significantly exceed the required minimum of 50 points, give me complete foundation to give a positive assessment of the scientific works of Assistant. Prof. Dimitrina Todorova and with the conviction I recommend that she could be awarded the academic position of "Associate Professor"!

17.11.2021	The report was written by:	
date		signature