

OPINION

on the merits of a candidate for filling in an academic position

Professor	
Associate Professor	X
	The indicated academic position is marked with the sign "X"

Candidates for the position :

1	Assistant Professor	PhD	Petrunka	Atanasova	Malinova	HTMU
no	Academic position.	Academic degree	Name	middle name	surname	workplace

Scientific field :

5	Technical Sciences
cipher	name

Professional direction :

5.10	Chemical Technologies
cipher	name

Scientific specialty :

Rubber and Rubber Technology

The competition is announced:

56	19.07.2022	Polymer Engineering	Faculty of Chemical Technologies
in SG No	Issued on date	Department announcing the position	Faculty

Author of the opinion:

Professor	DSc	Sanchi	Konstantinova	Nenkova	HTMU
Academic position	Academic degree	name	middle name	surname	workplace

1. Opinion about the candidate:

Assistant Professor	PhD	Petrunka	Atanasova	Malinova
Academic position	Academic degree	name	middle name	surname

1.1. Meeting the minimum requirements, according to the Regulations:

A) The candidate meets the minimum requirements	20 points	X
B) The applicant does not meet the minimum requirements	0 points	
		one of the given answers is marked with the sign "X".

It must be filled in if the answer is marked.

B. Analysis of the publication activity of the candidate. Analysis of the impact that the achieved results (citations) have.

Assistant Professor Petrunka Malinova, Ph.D., meet completely the adopted National Requirements for Holding the academic position of an Associate Professor. Her score is **2071** points according to the Regulations for the Implementation of the Law on the Development of the Academic Staff of the Republic of Bulgaria **against the required minimum of 400 points**.

According to indicator 4 – availability of a habilitation work, Assist. Prof. Petrunka Malinova, PhD has presented 10 scientific publications in editions referenced and indexed in the world databases with IF or with SJR. Apart from them, Dr. Petrunka Malinova has 20 more articles in editions that are also referenced and indexed in the world's databases. The candidate has presented 8 more publications in specialized issues or full text communications printed in conference proceedings. The subject of publications deals with the field of the competition for filling in the academic position.

Assist. Prof. Petrunka Malinova has **10** protected patents and one utility model.

The scientific publications of the candidate are cited **100** times; and one of her publications has **60** citations. According to the indicator Citations or Reviews in Scientific Editions Indexed in World-famous Databases, requiring **50** points, the candidate has **1012** points. Hirsch index of the candidate according to data from Scopus is **5**.

Assist. Prof. Petrunka Malinova has published Guidelines for Students for Laboratory Practicums on "Transfer Phenomena Occurring in Elastomers", HTMU Publishing House, 2022, ISBN 978-954-465-143-5.

1.2. Relevance of scientific and/or applied research:

A) The research is actual. Some of the research is pioneering (There are results on the subject that are not known to be achieved by other authors)	8 points	x
B) The research is actual. Regarding each of the topics and/or applications studied; there are results on the subject that are not known to be achieved by other authors	6 points	
C) Most of the research is up-to-date, but results that have no scientific and/or applied value are also presented	4 points	
D) The smaller part of the research is up-to-date	2 points	
E) Research is not actual	0 points	
		one of the given answers is marked with the sign "X".

Arguments regarding the assessment of the research relevance

The scientific publications Dr. Petrunka Malinova has submitted for participating the competition for filling in the position of an Associate Professor are in the fields of:

- Synthesis and characterization of two-phase hybrid elastomer fillers and the properties of composites containing them.
- Characterization of filled composites and their application.
- Utilization of elastomeric products
- Elastomeric composites with application in antennas for wireless communication
- Biogenic fillers
- Application of sol-gel bioglasses and glass-ceramic fillers for substrates and insulating layers in flexible antennas

There are elements of novelty in a significant part of the publications, what explains the fact that, Assist. Prof. Petrunka Malinova is a co-author of 10 patents and 1 utility model.

1.3. Research objectives:

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 given answers is marked with the sign "X".

The goals must be noted. Arguments about the type of goals set.

The goals that Assist. Prof. Petrunka Malinova, PhD, has set when undertaking her investigations are of scientific and applied interest and concern problems related to the synthesis and characterization of hybrid elastomer fillers; application of biogenic elastomer fillers; glass-ceramic fillers obtained by the sol-gel method for application as a substrate and insulating layers in flexible antennas; utilization of waste elastomer products.

1.4. Contributions of candidate's research:

A) With lasting scientific and/or applied impact, are a basis for new trends of research and applications	20 points	X
B) Are of significant scientific and/or applied interest, complement and/or summarize previous research	16 points	
C) Are of scientific and/or applied interest	12 points	
D) Lack of substantial contributions	8 points	
E) Lack of contributions	0 points	
		one of the given answers is marked with the sign "X".

The contributions should be specified via arguments about the type of the results achieved.

All materials presented by Dr. Petrunka Malinova are in the field of the competition.

The main contributions of the research carried out can be summarized as follows:

1. Synthesis and characterization of two-phase hybrid fillers for elastomers and investigations on the properties of the composites that contain them. The topic is covered in 16 publications. Diffuse hybrid fillers of the type carbon black-silica, carbon black-magnetite and activated carbon-magnetite have been developed using the impregnation method. The composites may find application in the production of elastomeric microwave adsorbers. The composites reinforced with the two-phase hybrid fillers based on carbon black-silica improve significantly the physicomechanical parameters of the rubber composites
2. Electrical, microwave and dynamic properties of filled composites and their applications. It has been established that, the properties of composites based on butadiene acrylonitrile rubber filled with carbon black and nickel powder are influenced to the greatest extent by the characteristics of the fillers.
3. Research has been carried out on methods for the utilization of elastomeric waste products. The methods one can apply are: pyrolysis; obtaining reusable rubber regenerate, grounding elastomeric waste for production of isolation materials.
4. Elastomeric composites with application in antennas for wireless communications. Conductive elastomeric composites filled at a different degree and possessing specific properties have been developed, which are applicable for producing flexible wearable antennas. Conductive carbon black, calcined kaolin, SiO₂, TiO₂ were used as fillers. The most suitable filler was found to be TiO₂.
5. Application of biogenic fillers for elastomeric composites based on natural rubber. The possibilities of using two types of ash from rice husks as fillers in elastomeric composites based on natural rubber have been investigated. The conditions for obtaining SiO₂ with the necessary properties of a filler for elastomers have

been established.

6. Sol-gel bioglasses and glass ceramics. For many applications in electronics and biomedicine, soft substrates are required for mounting on them flexible antennas for wireless communication. Elastomer composites containing a glass-ceramic filler are suitable for this purpose. Glass ceramics belonging to the CaO-P₂O₅-SiO₂ system were synthesized. A number of properties of the composite, based on natural rubber, filled at 20-50 phr, were investigated and compared, and their applicability was evaluated.

7. The influence of compositions of wax mixtures containing paraffin and microcrystalline waxes on a number of properties of elastomeric composites based on natural rubber was studied. Optimization of the compounds composition can lead to the production of rubber products with improved properties.

1.5. Participation of the candidate in obtaining the results presented:

A) The candidate has at least equal participation in the works presented	8 points	X
B) The candidate has at least equal participation in the majority of the works presented	7 points	
C) The candidate has a secondary involvement in the majority of the works presented	4 points	
D) The applicant's participation is unremarkable	0 points	
		one of the given answers is marked with the sign "X".

Critical notes must be submitted if one of the answers is section C or D marked

The review of the materials Dr. Petrunka Malinova submitted for her participation in the competition shows that, she has been actively involved in reaching the set goals and the in the investigations reported in all presented scientific works.

1.6. Pedagogical activity:

A) The candidate has impeccable and sufficient pedagogical activity at a university. The published handbooks are modern and useful (meeting the requirements of the Regulations). Her work with the students –BSc, MSc and PhD - is at a high professional level.	8 points	
B) The candidate has sufficient pedagogical activity at a higher education institution. The handbooks she has published meet the requirements of the Regulations	6 points	X
C) Pedagogical activities and/or issued teaching aids are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the given answers is marked with the sign "X".

The announcement of a competition for filling in the position of an Associate Professor was necessary and had firm grounds since due to objective reasons - the retirement of most of the professors from the Department in the recent years. Assistant Professor Petrunka Malinova, PhD, gives lectures on disciplines to BSc full-time and part-time studies, to students from the specialties Polymer Engineering and Engineering Materials and Materials Science and to students in pursuit of MSc degree in Elastic Cross-Linked Polymers, Recycling of Polymers and High-Energy Materials.

In 2022 Assist. Prof. Petrunka Malinova published Guidelines for Students for Laboratory Practicums on "Transfer Phenomena Occurring in Elastomers", HTMU Publishing House.

1.7. Critical notes:

A) Lack of critical notes	8 points	X
B) Critical remarks that are of a technical nature	7 points	
C) Critical remarks that would partially improve the results achieved in a small part of the studies	5 points	
D) Critical notes that would partially improve the results achieved in the majority of studies	3 points	
E) Significant critical remarks	0 points	
		one of the given answers is marked with the sign "X".

Critical notes must be submitted if one of the answers is section C or D marked

I have no critical notes

1.8. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	The rating is given in case of gaining a total point asset of least 50 points	78
B) The evaluation of the candidate's activity is NEGATIVE	The assessment is made at a total point asset below 50 points	
		one of the given answers is marked with the sign "X".

To be completed by the jury member - optional

From a scientific and applied point of view the research done by Dr. Petrunka Malinova is in a vanguard area, being of both fundamental and applied nature, and relishes the interest of specialists in the field of rubber and rubber technology. The key publications appeared in prestigious journals and are available to researchers worldwide. Proof of the relevance and quality of the scientific work of Assist. Prof. Petrunka Malinova is its being cited **100** times. She has **10** inventions protected by patents, of which 3 are protected in the USA, 1 in Saudi Arabia and 6 in Bulgaria. There is also 1 protected utility model.

Dr. Petrunka Malinova, PhD, has a very well-established tutoring activity, she lectures to full-time and part-time students majoring in Polymer Engineering, within the Bachelor and Master Programmes. She published Guidelines for Students for Laboratory Practicums on "Transfer Phenomena Occurring in Elastomers", HTMU

Publishing House, 2022.

The overall scientific and tutoring activities of the candidate give me the reason to nominate Assistant Professor Petrunka Atanasova Malinova, PhD, to be elected as a successful candidate for filling in the position of an Associate Professor in the scientific specialty 5. Technical Sciences, 5.10. Chemical Technologies, Rubber and Rubber Technology.

Total score - **78 points**

07.11.2022	The opinion was prepared by: Prof. Eng. Sanchi Konstantinova Nenkova, DSc	
date		signature