

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 assistant	PhD	Vesislava	Borislavova	Toteva	University of Chemical Technology and Metallurgy, Sofia
No	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 of natural and synthetic fuels

The competition has been announced:

67/2021	13.08.2021	Textile, Leather and Fuels	Chemical Technologies
in SG issue	date	for the needs of the Department	Faculty

The review was written by:

Assoc. Prof.	PhD	Boyko	Georgiev	Tsyntsarski	Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences
academic position	scientific degree	name	middle name	last name	workplace

1. Review for the candidate:

Senior Assistant	PhD	Vesislava	Borislavova	Toteva
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.

The set of materials presented on paper and electronic media by Dr. Toteva is in accordance with the Law for Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for application of ZRASRB, and the Regulations for acquiring scientific degrees and holding academic positions in University of Chemical Technology and Metallurgy, and meets the criteria of UCTM for holding the academic position of "Associate Professor". The publishing activity of Dr. Vesislava Toteva includes 38 scientific papers - 28 of them have been published in journals, referenced and indexed in world databases Scopus, Web of Sciences (25 papers in journals with impact factor and 3 reports from participation in conferences); 10 papers in unreferred scientific journals, 9 of them are printed in conference reports; 1 book.

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.

The candidate exceeds the requirements for holding an associate professor in the professional field "Chemical Technology" / scientific field "Technical Sciences" /. Dr. Eng. Vesislava Borislavova Toteva presented a total of 38 publications, 12 of the are main publications / indicator 3 / for 126 points from minimum of 100 points, i.e. 26 points more, and according to indicators 7 and 8 / respectively 16 publications for 164.7 points and 10 publications for 63.7 points / - a total of 28 points more.

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.

The leading role of PhD Velislava Toteva in the relevant fundamental and practical investigations is following:

1. Obtaining of the petroleum fuels with low and ultra-low content of sulfur by using of alternative hydrodesulphurising methods: oxidative desulfurization and adsorptive desulphurization of petroleum fuels and model mixtures with biosorbents; Desulphurisation of a liquid product from pyrolysis of used tires.
2. Laboratory and industrial conditions of the influence of technical factors on the yield and quality of hydrocracking; reactivity of heavy oils catalytic and thermal cracking;
3. Investigations of commercial additives to reduce of sediment formation in the ebullated vacuum residue H-oil hydrocracking.
4. Preparation, characterization and application of activated carbons from various sources ligninocellulosic biomass, coffee, algae obtained from biodiesel, etc.
5. Preparation and application of biosorbents (activated carbon) based on the base of waste biomass. The preparation of adsorbents from rice husks and their application towards removal of oil spills and different coatings in metallurgy. Preparation and application of modified nanocomposite materials in water purification.
6. Investigation on catalyst conditions of sedimentation and conversion in ebullated bed vacuum residue H-Oil hydrocracking; Effect of technical factors on the parameters of catalytic and thermal cracking; Investigation of the influence of technical parameters on the yield and quality of the bitumens
7. Resolving of the problems in oil refining reducing coal emissions

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

The evaluation must be substantiated if answer C is marked.

Thorough examination of the publications shows that the candidate is aware in detail of the achievements of other authors on the research topics.

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.

The type of the presented investigations is mixed – partly theoretical, whereas some research results find successful practical application.

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 main aims of the performed investigations are connected with release of various processes of liquid oil industry, decrease of the emissions at exploitation of the coals, change of the traditional energy sources with different waste materials from biomass for preparing of high effective carbon materials. The results of the performed investigations are promising and give possibility for resolving various ecological problems.

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 methods used are modern, adequate, and meet the planned objectives and possible applications. For chemical analysis of the obtained compounds and identification of their composition a complex of instrumental methods is applied - IR, NMR, UV, GC-MS, etc. In the production of low and ultra-low sulfur fuels, the conventional method used in oil refining to remove sulfur compounds from petroleum fractions is the hydrodesulfurization process. As an alternative, new methods for desulfurization without the use of hydrogen have been proposed. The oxidative desulfurization of diesel fractions is combined with the extraction and adsorption processes, and in parallel biosorbents have been developed for the extraction of sulfur compounds from oxidized model mixtures. A standard X-ray fluorescence method was used to determine the sulfur in the samples. The applied oxidative desulfurization method is suitable for the removal of the most difficult alkyl derivatives of dibenzothiophenes in hydrotreating.

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.

A significant contribution in the work of Dr. Toteva is connected with participation in scientific and applied developments. The influence of the composition of the raw material for hydrocracking in the H-Oil installation was studied, as well as the efficiency of additives for reduction of sedimentation in the processing of heavy oil fractions. The influence of various factors on the parameters of catalytic and thermal cracking has also been studied in depth. The influence of additives to improve the properties of lubricants has also been studied. In addition, various environmental issues are addressed, such as environmental issues in oil refining, water purification with carbon nanocomposites, and reduction of sulfur content in coal combustion emissions. Desulphurization of a liquid product from pyrolysis of used car tires has been also carried out. Activated carbon was obtained from different biomass, thus achieving recovery of different waste products. A method has been developed to reduce emissions from lignite combustion in Maritza East 2 and Maritza East 3 power plants, which is based on the conversion of pyrite sulfur to sulphate by oxidizing it with air at high temperature before burning coal. Dr. Toteva has outlined the directions of her professional development in several areas, whereas her research continues and she builds further on what has been achieved so far. In my opinion, her scientific plans are in current areas that fit into the scientific strategy of Bulgaria and University of Chemical Technology and Metallurgy.

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	
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.

In collective and interdisciplinary investigations, the issue of the candidate's personal contribution is very important. The candidate is a leader in most of the submitted works. There are both scientific and applied contributions in them. Dr. Toteva in the most publications is on 1st to 3rd place. After reading the materials submitted for review, I believe that Dr. Toteva demonstrates personal development and increasing contribution in obtained the results (taking into account the chronology of publications and described results), which give me a reason to appreciate personal participation in published scientific results.

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.

For the last three years, the candidate has had an impressive teaching career: In the academic year 2018/2019 - 7 lecture courses, in 2019/2020 - 9, and in 2020/2021 - as many as 15 lecture courses. In addition, through Dr. Vesislava Toteva she has published a book: Vesislava Toteva, "Oil and Gas Technology - Laboratory and Seminar Exercises".

1.11. 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.

There are some technical errors and inaccuracies that do not at the least affect the excellent performance of the Summary of Key Results and Scientific Contributions.

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

Vesislava Borislavova Toteva has 98 points out of 100 possible. The candidate exceeds the requirements for holding an associate professor in the professional field "Chemical Technology" / scientific field "Technical Sciences" /. Dr. Eng. Vesislava Borislavova Toteva presented a total of 38 publications, 12 of them - main publications / indicator 3 / for 126 points out of a minimum of 100 points, i.e. 26 points more, and according to indicators 7 and 8 / respectively 16 publications for 164.7 points and 10 publications for 63.7 points / - a total of 28 points more. The documents submitted by Ch. Assist. Prof. Dr. Eng. Vesislava Borislavova Toteva for participation in the competition meet the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, and University of Chemical Technology and Metallurgy, Sofia. Dr. Toteva participates in the competition with a sufficient number and high scientific quality of works published after the materials used in the PhD defense'. After getting acquainted with the materials presented in the competition, I give my positive assessment and recommend the Scientific Jury to prepare a report-proposal to the Faculty Council for selection of Dr. Vesislava Borislavova Toteva for the academic position of "Associate Professor" in "Technology of natural and synthetic fuels", In the scientific field 5.1. Technical Sciences", professional field "Chemical Technologies".

25.11.2021	The review was written by:	
date		signature