

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. professor	PhD	Dimka	Ivanova	Ivanova	University of chemical technology and metallurgy
№	academic position	scientific degree	name	middle name	last name	workplace
2						
№	academic position	scientific degree	name	middle name	last name	workplace
3						
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical Science
code	name

Professional area:

5.1	Chemical Technologies
code	name

Scientific specialty:

Chemical resistance of materials and corrosion protection

The competition has been announced:

No. 61	2/08/2019	<i>Inorganic and electrochemical productions</i>	<i>Faculty of chemical technologies</i>
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

<i>Professor</i>	<i>PhD</i>	<i>Stoyan</i>	<i>Petrov</i>	<i>Djambazov</i>	<i>University of chemical technology and metallurgy</i>
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

<i>Assist. Professor</i>	<i>PhD</i>	<i>Dimka</i>	<i>Ivanova</i>	<i>Ivanova</i>
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 candidate for nomination of academic degree “associated professor”, assist. Professor Dimka Ivanova Ivanova, PhD is eligible according the requirements, defined in academic Rules for Acquisition of Academic Degrees and Occupation of Academic Positions (RAADOAP Attachment 2a and 2b) of University of Chemical Technology and Metallurgy.

The Dissertation thesis for the PhD educational and scientific degree. *Total score by Indicator 1: **50***

Scientific publications in journals that have been referenced and indexed in world-renowned scientific information databases (n is the number of co-authors in the respective publication) – overall number 10. *Total score by Indicator 4: **102.85** (60 / n).*

Scientific publications (articles and reports) – overall number 9, published in journals that have been referenced and indexed in world-renowned scientific information databases. *Total score by Indicator 7: **176.65** (40 / n).*

Scientific publications (articles and reports), published and not referenced in journals with scientific review or in edited collective volumes. *Total score by Indicator 8: **32.52** (20 / n).*

Study Book “Corrosion of the Materials” with authors: L. Fachikov, D. Ivanova, 2019 (under publishing). *Total score by Indicator 22: **20***

Overall number of **42 citations** of the studies of the applicant are found, according to the requirements of (RAADOAP) are assessed accordingly: *by Indicator 12 – **290 points**; by Indicator 13 – **9 points** and by indicator 14 – **20 points**.*

The following studies of the applicant are referenced with high degree of frequency:
L. Fachikov, D. Ivanova, “Surface treatment of zinc coatings by molybdate solutions”, Applied Surface Science, vol. 258, p. 10160-10167, 2012. - 10 times (Indicator 12) and 7 times in non-referenced journals (Indicator 14).

D. Ivanova, L. Fachikov, Phosphating of zinc surfaces in zinc-calcium solutions, Bulgarian Chemical Communications, 43 (1), 2011, p. 54-59. - 3 times in journals (Indicator 12) and once in collective volume (Indicator 13).

Y. Tumbaleva, D. Ivanova, L. Fachikov, Effect of the P2O5:NO3-ratio on the zinc phosphate coating formation, Journal of the University of Chemical Technology and Metallurgy, 46 (4), 2011, p. 357-362 - 4 times in journals (Indicator 12), once in collective volume (Indicator 13) and 3 times in non-referenced journals.

The applicant participating in the current competition, after the receiving his PhD degree, not only continues her research work on the topic of the applicant’s thesis, but also extends it to other fields - corrosion and nanotechnologies.

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	
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B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	X
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.
<p>The phosphate conversion coatings have long been known and, despite their wide practical application, have not lost the scientific and practical interest today. One of the most important reasons for that is the fact that they are the most reliable replacement for the very harmful and forbidden chromium (Cr^{6+}) conversion coatings today. The topic and the performed studies present the results obtained in the development of new multicomponent compositions, determination of the optimal conditions (concentration, temperature, duration, pre-activation, etc.) for the formation of amorphous and crystal phosphate coatings on steel, zinc, aluminum and their alloys, surfaces. Modern chemical, electrochemical and physical methods have been used to study the formation and growth of coatings, their composition and structure, their corrosion resistance and protective ability. Technologies for the phosphating of galvanized products and other metal surfaces have been developed and successfully implemented.</p> <p>Studies have also been carried out aimed at the practical application of newly developed metal systems for the mining industry, for biocompatible implants, for the synthesis of intermetallic nanoparticles for various purposes.</p> <p>In conclusion, I believe that the research is up-to-date and with fundamentally-applied characteristics.</p>

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"
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Objectives must be specified. The type of the set objectives must be justified
<p>The research objectives are realistic and of scientific and interest in practice:</p> <ul style="list-style-type: none"> - Design of new (taking into account modern achievements and demands) phosphating activities for amorphous and crystalline phosphating of metal surfaces. The optimization of the composition and conditions for the production of coatings with specific requirements - as a sublayer for polymeric organic coatings, for drawing and calibration, for conservation, etc. Investigation of the chemical and phase composition and stability of coatings. Investigation of the behavior of newly developed metal systems for industrial applications, for biocompatible implants, for the transfer of new functional properties.

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.
<p>The inputs of the candidate participating in the competition are mainly in the professional fields Chemical Technology, Materials, and Material Science, which I arrange and rank as follows:</p> <ul style="list-style-type: none"> - Phosphating of low carbon steels in zinc and modified phosphating products (Works: Indicator 7 - No 1, 2, 7, 9; Indicator 8 - No 10). <p>The formation of crystalline phosphate coatings on low carbon steel with newly developed preparations containing zinc and modified with nickel, calcium or manganese in various ratios has been investigated;</p> <p>Results of high practical value have been obtained for the influence of the ratio of P_2O_5 and NO_3^- on the thickness of the coatings, the phase composition and their structure.</p>

- Amorphous phosphating of steel, zinc and aluminum surfaces (Works: Indicator 7 - No 3, 5; Indicator 8 - No 11).

New results have been obtained for the influence of various factors, especially the density of the cathode electricity, on the formation of coatings on surfaces of zinc, aluminum and low carbon steels - rate of formation, composition, morphology, etc.

- Corrosion of various materials (Works: Indicator 4 - No 1, 3; Indicator 7 - No 4, 6, 8; Indicator 8 - No 12).

The results obtained from the study of the corrosion behavior of various steels are presented: - intended as structural materials for the mining industry; - the formation of spinel film films has been shown to increase the resistance of low carbon steels to corrosion cracking; - two types of austenitic stainless steels were examined as medical implants and a comparison was made for their biocompatibility.

- Synthesis of intermetallic nanoparticles (Works: Indicator 4 - No 4, 5, 6, 9, 10; Indicator 8 - No 13, 14, 15).

A "template" technique, using a carbon carrier (substrate), was used to obtain "in situ" nanocomposite materials containing Co, Ni, and Sn. New results have been obtained using intermetallic nanoparticles as catalysts, electrode materials in lithium-ion batteries and as magnetic materials for biomedical applications.

Corrosion resistance of hybrid nanostructured sol-gel coatings and their effect on the anodic dissolution of the substrate were obtained.

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"

The analysis of scientific production by which Sr. Assistant Professor D. Ivanova presents herself in the competition, clearly showing her equal participation in most works. Over time, her contributions have increased and she has become a leading contractor and leader of new research projects and tasks. She has developed new labs and co-authored a textbook on corrosion.

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	
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	X
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.
<p>The pedagogical activity of Assist. Professor Ivanova is predominantly in the Department of Inorganic and Electrochemical Productions - Department of Electrochemical Technologies and Corrosion Protection. Its contribution to the preparation of engineers and technologists for work in the electrochemical industries is in the field of corrosion and protection of metals, in surface technologies and more. In addition, she participates in the training of specialists in material science in (Bulgarian and English language), metallurgy, silicate technologies and more. The applicant's activity fully corresponds to the Rules for Acquisition of Academic Degrees and Occupation of Academic Positions of University of chemical Technology and metallurgy.</p>

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"
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Critical notes must be provided if one of the answers C, D or E is marked.
I have introduced the candidate to some technical inaccuracies that do not change my overall impression.

1.8. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 70 points	X
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
I recommend with conviction to the Distinguished Jury conducting the competition, Assist. Professor Dimka Ivanova Ivanova, PhD to be elected as Assoc. Professor" in the scientific specialty 5.10. Chemical technologies (Chemical resistance of materials and corrosion protection), according to the competition announced by University of chemical Technology and metallurgy in State Gazette No. 61 of 02.08.2019.

2. Report for the candidate:

academic position	scientific degree	name	middle name	last name

The structure of the report under the previous point 1 shall be respected.

3. Report for the candidate:

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academic position	scientific degree	name	middle name	last name
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The structure of the report under the previous point 1 shall be respected.

Candidate ranking (in case of more than one candidate who has received a positive evaluation to occupy the academic position):

Based on the assigned points, the candidates who have received a **positive** evaluation are ranked as follows:

1	<i>Assist. professor</i>	<i>PhD</i>	<i>Dimka</i>	<i>Ivanova</i>	<i>Ivanova</i>	<i>71</i>
place	academic position	scientific degree	name	middle name	last name	points
2						
place	academic position	scientific degree	name	middle name	last name	points
3						
place	academic position	scientific degree	name	middle name	last name	points

26.11.2019	The report was written by: <i>Professor Stoyan Djambazov</i>	
date		signature