Appendix 12d

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	**Chief Asisstant Professor**	**Dr. Eng.**	**Maria**	**Atanasova**	**Petrova**	**UCTM - Sofia**
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

4	Natural sciences, mathematics and informatics
code	name

Professional area:

4.2.	Chemical Sciences
code	name

Scientific specialty:

Inorganic chemistry

The competition has been announced:

101	27.12.2019	General and Inorganic Chemistry	Metallurgy and Material Science
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Assoc. Prof.	Dr.	Diana	Todorova	Rabadjieva	IGIC-BAS
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Chief Asisstant Professor	**Dr. Eng.**	**Maria**	**Atanasova**	**Petrova**
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.

Chief Assistant Professor Dr. Eng.Maria AtanasovaPetro vaparticipates in the competition with 51 scientific publications. In accordance with the requirements of the Rules for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB) and UCTM-Sofia of 2019, they are divided by metrics:

Metric 4 - scientific publications in editions that have been refereed and indexed in world-renowned databases of scientific information (Web of Science and/or Scopus) – **10 articles, 202 credits (according SJR metrics)**, covering the required minimum of 100 credits

Metric 7 - publications in editions that have been refereed and indexed in world-renowned databases of scientific information (Web of Science and/or Scopus), outside the habilitation work – 16 articles, 215 credits **(according SJR metrics)** According to me publications in the journal Chemistry: Bulgarian Journal of Science Education must be counted by 10 points, ie. as publications in a journal with SJR without IF and without quarters Q1 - Q4.

Metric 8 - Published chapter of a book or a collective monograph - 2 pcs, 30 credits **Total indicators 7 and 8 - 245 credits** at minimum 200 credits

The 26 publications included in indicators 4 and 7 are listed in the SCOPUS database.

Metric 11 - The number of citations of the candidate is 192. More than 100 of which are indexed in the SCOPUS database. This gives Ch. Assistant Professor Atanasova more than the required 50 points.

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	
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.		
A major part of the research published by Ch. Assistant Professor Maria Atanasova deals with the synergistic extraction of metals from the lanthanide group into various systems of organic solvents, and is a continuation of the research contained in her PhD thesis. Lanthanides are increasingly used in electric vehicle batteries, electronics, wind turbines, fluorescent lamps, petroleum catalysts, and more. All of these applications require the preparation of an element in its pure form, which is a difficult task since lanthanides have very similar chemical and physical properties. Liquid extraction is the method that has been used in recent years to be technologically most advantageous for the separation and purification of lanthanides. The requirements for more yield on the one hand and for the environment on the other hand raises the question of the search for new effective extractants, which also determines the relevance of Dr. Atanasova Another part of the publications of Dr. Atanasova are related to her pedagogical activity and are concerned with finding new approaches for equalization of chemical equations expressing redox processes.		

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 goals set by Dr. Atanasova in her basic research on the extraction processes of lanthanides are related to: • finding and studying the behavior of new extraction systems; • clarifying the mechanism of the process and determining the composition of the extracted metal complexes in the organic phase; • calculation of equilibrium extraction constants, synergistic coefficients and distribution coefficients of the investigated lanthanides. The research goals are realistic and definitely have a scientific and applied interest.

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.
The extraction behavior of a number of two- and three-component organic solvent systems on the extraction and separation of lanthanides has been studied. The studies are systematic and cover the whole lanthanide group of elements. A number of regularities have been established and trends observed in the replacement of one of the components in the studied systems, in particular, in the replacement of the synergistic additive are summarized. The effec of crown ethers, 1-(2-pyridilazo)-2-naphthol, 4-(2-pyridilazo)-resorcinol, diphenylsulfoxide, organo-phosphorus compounds etc, has been shown. It was started and interesting results were obtained for the possibility of using ionic liquids in extraction systems. A modified form of the material balance method is proposed for equilibrium redox equations having two degrees of freedom, as well as an algorithm and a software product allowing equalization of redox reactions with any number of degrees of freedom.

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**

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 38 of the 51 publications presented, Dr. Atanasova is the first author to indicate that he has not only an equal but also a leading role in the research presented.		

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"	

1.7. Critical notes:

A) Lack of critical notes	8 points	
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**	**X**

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.

- ✓ In the documents submitted for participation, Dr. Atanasova provided a list of 27 publications in international journals with an impact factor that will be used in subsequent competitions, while at the same time she has included publications for the competition that may rather are more popular than scientific publications (Chemistry: Bulgarian Journal of Science and Education 19, 5 (2010), 336-349; 20 (3) (2011) 183-190; 23 (2), 2014, 275- 290).
- ✓ In the summary of the main results and scientific contributions, Dr. Atanasova also gave the main conclusions and contributions, which were included in her PhD Thesis, which is unnecessary and incorrect. Without them, Dr. Atanasova's scientific achievements on the synergistic extraction of lanthanide group metals into various systems of organic solvents are impressive and sufficient to hold the position of Associate Professor.
- ✓ I also consider the points C) and Д) included in the summary of the main results and scientific contributions for unnecessary.
- ✓ The documents contain a number of technical errors and inaccuracies that make it difficult to investigate.

1.8. Conclusion

A) The evaluation of the candidate's activity is **POSITIVE**	**This evaluation is assigned to a total number of at least 50 points**	**X** **71 credits**
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

The scientific production and pedagogical activity of Ch. Professor Assistant Maria Atanasova Petrova reaches and exceeds the national minimum requirements and those of the UCTM-Sofia for the occupation of the academic position "Associate Professor". Based on the evaluation of the materials provided, I can confirm that Ch. Assiss. Prof. Dr. Maria Atanasova Petrova is a scientist who is able to work and develop the scientific topics that he deals with. On the basis of all the above, I give my positive assessment and recommend it to the Scientific Jury to be selected to occupy the academic position of "Associate Professor" in Professional Degree 4.2 Chemical Sciences.

	The report was written by:	
date	**Assoc. Prof. Dr. Diana Rabadjieva**	signature