Appendix 12d

REPORT

to occupy the academic position:

''Professor''	x
''Associate Professor''	
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	Assoc. Prof.	Dr.	Anna	Dyakova	Staneva	University of Chemical Technology and Metallurgy
№	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 silicates, binders and refractory non-metallic materials

The competition has been announced:

36	13.05.2022	Silicate technology	Faculty of Metallurgy and Metal Science
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Prof.	Dr.	Mara	Krumova	Kandeva-Ivanova	Technical university of Sofia
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Assoc. Prof.	Dr.	Anna	Dyakova	Staneva
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.

Assoc. Prof. Dr. Anna Staneva participated in the current competition for a professorship as the only candidate. She has submitted all the necessary materials, according to the requirements of the Bulgarian Civil Code and the Rules for its implementation of the HTMU-Sofia.

The scientific works submitted for participation in the competition are a total of 45 pieces, of which 36 are included in the Scopus and Web of Science databases with an impact factor (12 pieces) and an impact-rank (24 pieces). The remaining 9 issues were published in non-refereed editions with scientific review. A total of 187 citations of 41 scientific works were noted, of which 164 citations - in journals that are referenced in the global database Web of Science or Scopus and 23 citations - in non-refereed publications with scientific review. The Hirsch index (h-index) is 8 according to the information presented in the world scientific database Scopus.

The correspondence of the data submitted by the applicant to the minimum scientometric indicators is as follows:

Indicators group B: B/4 (Habilitation work in the form of no less than 10 publications in journals, referenced and indexed in global databases: Scopus or Web of Science) minimum requirements - 100 points. Completed - **132.07 points**.

Indicators group D: D/7 (Publications in journals referenced in Scopus or Web of Science) has 209.39 points and indicator D/8 (published book chapter or collective monograph) – 30.04 points, a total of **239.43 points** with a required minimum of 200 points.
Indicators group D: D/12 (Citations and/or reviews in scientific publications, referenced and indexed in world-famous databases with scientific information - Web of Science and Scopus) - 1640 items D/13 (Citations in monographs and collective volumes with scientific review) – 69 points. The total number of points according to indicators group D - **1709 points**, with a required 100 points.

Indicators group E: E/17 (Management of a successfully defended doctoral student) - 100 points. E/18 (Participation in a national scientific or educational project) 8 projects are presented with a total number of 80 points, of which 5 nos. on national co-financing for participation in COST-ACTION. E/20 (Management of a national scientific or educational project) – 20 items. E/22 (Attracted funds for projects managed by the candidate) – BGN 120,000 is shown with a number of points 124. E/23 (Published university textbook or a

textbook that is used in the school network) one textbook is presented in a printed and electronic edition with a single author, Anna Staneva, from which 40 points are obtained. The total number of points according to the indicators in group E is **364 points** with the required 150 points.

From the comparative quantitative analysis, it is obvious that according to each of the indicators, the candidate Assoc. Dr. Anna Staneva exceeds the minimum requirements for the academic position "professor".

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 scientific developments of Assoc. Prof. Dr. A. Staneva are mainly related to the synthesis and research of innovative materials with application in various fields of industry.

According to the object of research, they could be summarized in the following main groups:

1. Synthesis and research of graphene materials and composites with their participation.
2. Preparation and examination of glass, foam glass, glass-ceramic and ceramic materials.
3. Preparation and research of superconducting ceramic materials and composites based on them.

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 goals of the developments are of a fundamental nature with a defined practical orientation, namely improvement of existing and development of new methods for obtaining innovative materials, research of the relationship between the composition, structural characteristics, methods of synthesis, physical and biological properties of the obtained materials. The set goals have been achieved, i.e. they are realistic. The great interest in the researched issues and the obtained results is confirmed by the high level of citation of the candidate's publications.

1.4. 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.
I accept the scientific and scientific-applied contributions formulated by the candidate, which I briefly allow myself to summarize as follows: • Synthesis and characterization of graphene materials and composites with their participation [3, 7, 8, 10, 15, 16, 17, 21, 22, 23, 24, 26, 27, 29, 30, 31, 32, 33, 34 , 35, 37, 39, 40, 41, 42]. - The possibility of using L-ascorbic acid instead of the highly toxic sodium borohydride for the reduction of graphene oxide (GO) in the synthesis of reduced graphene oxide (RGO) has been demonstrated. It has been unequivocally demonstrated using transmission electron microscopy (HRTEM) that the resulting RGO has the interplanar spacing typical of graphene. - A technological scheme has been developed for the synthesis of graphene composites in the RGO-SiO_2 system by using tetraethylorthosilicate (TEOS) with thermal stability up to 600^{o}C, which is significantly higher than that of pure reduced graphene oxide (200^{o}C). - New composite materials in the RGO/glass system (glass - PbO-ZnO-B_2O_3) with thermal stability up to 600^{o}C have been obtained and it has been shown that in the RGO/glass composites the graphene sheets are embedded in the amorphous glassy matrix, which protects them from reduction when heated. - A new method for obtaining graphene nanocomposites with the participation of copper and

silver nanoparticles (RGO-Ag and RGO-Cu) has been developed. Their homogeneous distribution on the surface of the graphene sheets and their high antimicrobial activity have been experimentally proven.

- Single-phase nanosized powders of ZnO and $ZnTiO_3$ were obtained, with which original compositions of graphene nanocomposites were developed and characterized: GO-ZnO; RGO-ZnO; RGO-$ZnTiO_3$; RGO-Cu; GO-ZnO-Cu; GO-ZnO-Ag. A composite (80GO/20ZnO) with the most suitable properties for application in energy storage devices has been determined.

• Preparation and characterization of glasses, foam glasses, glass-ceramic and ceramic materials [2, 13, 14, 18,19, 20, 26, 29, 37, 38, 43, 44]

- It has been proven that a glass-ceramic material containing phase $(La_{1-x}Gd_x)_{1-y}Pb_yMnO_3$ can be obtained directly from a supercooled melt in the form of small crystals embedded in the amorphous matrix. It has been established that glass-ceramic materials can be obtained by this method, without the application of additional heat treatment.
- The area of glass formation in the ZnO-WO_3-La_2O_3-Al_2O_3 system was determined in the area around compositions with the general formula $90(xZnO.yWO_3 .zLa_2O_3).10Al_2O_3$ with a constant content of Al_2O_3 - 10 mol % and different contents of WO_3, ZnO and Nd_2O_3 by supercooling melts. The amorphous network was found to be mainly composed of [WO6] octahedra connected by W-O-W bridges and terminal tungsten-oxygen bonds by analogy with $Bi_2W_2O_9$ structures.
- An original study of glass formation in the WO_3-ZnO-Nd_2O_3-Al_2O_3 system by high-speed cooling of melts was made. The addition of Al_2O_3 (from 5 to 30 mol %) was found to facilitate the transition to the amorphous state. It has been proven that in the studied system ZnO and Nd_2O_3 play the role of modifiers.
- Through the low-temperature sol-gel method, amorphous and polycrystalline samples with a model composition of $90SiO_2{:}10Bi_2O_3$ were obtained by heating at different temperatures from 200 to 800°C.

• Preparation and research of superconducting ceramic materials and composites based on them [1, 5, 11, 12, 28].

- The influence of heat treatment on the phase transformation and magnetic properties of superconducting composites with the participation of $Bi_{1.6}Pb_{0.4}Sr_2Ca_2Cu_3O_z$ and $La_{0.6}Pb_{0.4}MnO_3$ phases was investigated and it was proved that part of the ferromagnetic phase $La_{0.6}Pb_{0.4}MnO_3$ transforms into a more complex solid solution with general formula $La_{(1-x-y)}Pb_x(Sr,Ca)_yMn_{1-z}Cu_zO_3$. The resulting composites have been shown to possess superconducting properties below the critical temperature of the superconducting transition and transition to a ferromagnetic state above the Curie temperature (TK).
- A technology has been developed for the production of a continuous strip of foam glass by utilizing waste glass crumb.
- The possibility of obtaining colored foam glass from waste glass for insulation and for building architectural and artistic elements with the help of different dyes (green color from Cr_2O_3, red color from Fe_2O_3, blue color from $3CoCO_3.2Co(OH)_2.H_2O$) has been proven). It has been proven that colored foam glasses have very good strength and thermophysical properties.

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.

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"

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 **POSITIVE**	This evaluation is assigned to a total number of at least 50 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
The scientometric indicators of the candidate's work significantly exceed the minimum national requirements for scientific and teaching activities for the field 5. Technical sciences, professional direction 5.10 Chemical technologies for the occupation of the academic position "Professor" at HTMU-Sofia. On this basis, I strongly recommend the election of Assoc. Prof. Dr. Anna Dyakova Staneva to the academic position of "Professor" in the Department of "Silicate Technology" at the Faculty of Metallurgy and Metal Science in HTMU-Sofia.

10.08.2022 г.	The report was written by:	
date		signature