

OPINION

by Prof. Lian Lyubenov Nedelchev

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for competition for the academic position "**Professor**" in professional field 4.2. Chemical sciences, scientific specialty "Physicochemistry", announced in the State Gazette, no. 79 from 04.10.2022 with a single candidate, **Assoc. Prof. Daniela Bogdanova Karashanova**

I have been appointed as a member of the Scientific Jury (SJ) for the present competition by order No. RD-15-716/01.12.2022 of the Director of IOMT-BAS. The opinion prepared by me is in accordance with the decision under item 3 of the agenda of the 1st meeting of the Scientific Jury on December 13-14, 2022.

1. General presentation of the candidate

The candidate in the competition, Assoc. Prof. Daniela Karashanova, was born on October 4, 1968. She completed her secondary education in 1987 at the 9th French language high school "Alphonse de Lamartine" and in the same year was accepted as a student at the Faculty of Physics of Sofia University "St. Kl. Ohridski". In 1994, she obtained a Master's degree in physics, specializing in meteorology and also in pedagogy.

In 1995, Daniela Karashanova started working as a physicist in the Central Laboratory of Photoprocesses "Acad. Yordan Malinovski" (CLAPHOP) - BAS (now IOMT - BAS). In the period 1996-1999, she was a full-time doctoral student at CLAPHOP. Her doctoral research is in the field of vacuum technology, the use of analytical equipment to determine the structure of materials and direct current measurement of conductivity. In October 2005, she defended her dissertation before the HAC on the topic "Physicochemical properties of vacuum-deposited thin layers of silver sulfide: Epitaxial growth and surface electrical properties" and in 2006 she obtained a PhD degree in the field of "Physicochemistry". In 2007-2008, Dr. Karashanova completed a one-year postdoc specialization at the Interdisciplinary Center for Nanosciences of Marseille.

Since 2010, she holds the academic position of "Associate Professor" in the "Electron Microscopy" laboratory at the Institute of Optical Materials and Technologies "Acad. Yordan Malinovski" - BAS, being the head of the same laboratory. Since 2019, Assoc. Prof. Karashanova has been elected as the Chair of the Scientific Council of IOMT. Also, since 2016 she is a member of the Scientific Council of the Institute of Polymers - BAS, and since 2021 of the Scientific Council of the Institute of Physical Chemistry - BAS.

2. General characteristics of the materials presented in the competition

The materials presented by Associate Professor Daniela Karashanova are in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations on the Terms and Procedures for Acquiring Scientific Degrees and for Occupying Academic Positions at IOMT-BAS.

According to the presented autobiographical data, the candidate is a co-author of 126 publications, 103 of which are indexed in Web of Science. Over 590 independent citations to her publications and h-index = 13 in Web of Science have been noted. For the period 2012-2020, Assoc. Prof. Karashanova has 12 invited, 26 oral and 67 poster reports at international and national scientific forums, of which 12 were presented personally, and the rest - by a co-author.

In the competition, Assoc. Prof. Daniela Karashanova participates with 18 articles in scientific journals with an impact factor, of which 13 were published in journals with quartile Q1, 4 with

quartile Q2 and 1 with quartile Q3. In the documents presented in the competition, she indicated that she was project manager of 2 national projects and a participant in 12 national and 5 international projects. She also has a registered patent. 84 citations of her publications are included in the competition.

The documents presented by Associate Professor Daniela Karashanova show that her scientific activity fulfills and exceeds the minimum national requirements for the groups of indicators, respectively:

Group A – 50 (out of a minimum of 50)

Daniela Karashanova obtained a PhD in 2006 with a dissertation entitled "Physicochemical properties of vacuum-deposited thin layers of silver sulfide: Epitaxial growth and surface electrical properties".

Group B – 140 (out of a minimum of 100)

Six publications equivalent to habilitation work are presented, which were published in refereed scientific journals, indexed in the established databases Scopus and Web of Science. Four of these publications are in Q1 journals and two in Q2 journals, indicating the high level of research conducted. Clarification should be made regarding publication A3 (2021), which according to Scopus and Web of Science's "Journal Impact Factor" is quartile Q2. However, according to Web of Science's "Journal Citation Indicator", the same publication has a Q1 quartile, which in my opinion allows to retain its score of 25 points.

Group Γ – 280 (from a minimum of 220)

According to this group of indicators, 12 publications are presented in established international journals with an impact factor, indexed in Web of Science and Scopus. Of these, 9 are with quartile Q1, 2 with Q2 and 1 with Q3. According to indicator Γ.9, a patent is included, with priority from 24.09.2019 and date of issue/registration 21.11.2022.

Group Δ – 168 (from a minimum of 120)

84 citations are presented in refereed publications, indexed in Web of Science and Scopus. 66 citations are from the last 5 years (2018-2022), which shows the relevance of the scientific works published by the candidate.

Group E – 260 (from a minimum of 150)

E-14. Participation in national scientific or educational projects – 120 points;

E-15. Participation in international scientific or educational projects – 100 points;

E-16. Management of national scientific or educational projects – 40 points;

3. Evaluation of the candidate's research activity

The scientific and scientific-applied contributions of Associate Professor Daniela Karashanova are related to the planning and conducting of transmission-microscopic studies of materials and systems of different nature, structure and properties, as well as the analysis of data on their morphology, microstructure and phase composition.

The candidate's scientific contributions can be grouped into several main areas:

1. Transmission electron microscopy of materials with catalytic applications: metal catalysts in the form of nanoparticles, as well as oxides on porous supports;
2. Transmission electron microscopy of graphene and thin-film systems: thin graphene layers on a substrate as well as graphene flakes suspended in a liquid;
3. Transmission electron microscopy of metal and composite nanoparticles obtained by laser ablation in different media: single metals, combinations of metals, as well as combinations of metals with oxide compounds.

Each of these main areas covers important, new results, presented in articles in renowned international scientific journals.

4. Teaching and expert activity of the candidate

According to the provided reference, Associate Professor Daniela Karashanova leads a specialized course for PhD students at the Training Center of BAS: "Topic 3.3.6. Electron Microscopy and Electron Diffraction in the Structural and Phase Analysis of Materials". She was also the supervisor of 3 diploma theses - 1 for the Bachelor's degree and 2 for the Master's degree. In the period 2008-2022, she was the Chairman of the organizing committee of 15 consecutive editions of the national forum Spring Seminar of doctoral students and young scientists from BAS "Interdisciplinary Chemistry".

It should also be noted her expert activity as a member, and later vice-chairman of the permanent scientific-expert committee on Chemical Sciences at the Bulgarian National Science Fund for the period from 2019 until now, as well as her activity as a representative in the Program Committee of the Program Horizon 2020 in the field of nanotechnologies and advanced materials in the period 2014-2020.

In the period 2017-2022, Assoc. Prof. Karashanova prepared over 30 reviews for renowned journals such as Applied Surface Science, Optical Materials, Nanomaterials, Polymers, Materials, etc.

CONCLUSION

The scientific data and indicators of the materials presented for the competition by Associate Professor Daniela Karashanova exceed the minimum national requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, as well as the additional requirements of the Regulations on the Terms and Procedures for the Acquisition of Scientific Degrees and the Occupancy of Academic positions in IOMT-BAS. The candidate's scientific works contain original scientific and scientific-applied contributions, evidence of which is their publication in established international journals, as well as the significant number of citations, incl. in the last five years.

Based on everything written so far, I express my **positive opinion** and **strongly recommend** to the respected members of the Scientific Council of IOMT - BAS to **elect Assoc. Prof. Daniela Bogdanova Karashanova to the academic position of "Professor"** in professional field 4.2. Chemical sciences, scientific specialty "Physicochemistry".

Sofia, 27.01.2023

Prepared by:

/ Prof. Lian Nedelchev /