

OPINION

on the competition for the academic position "Assoc. Prof." in professional direction 4.1 "Physical sciences", scientific specialty "Electrical, magnetic and optical properties of condensed matter", announced in the Newspaper of State No. 35/10.05.2022 by the Institute of Optical Materials and Technologies (IOMT) "Acad. J. Malinovski", Bulgarian Academy of Sciences (BAS),

Candidate: Assist. prof. Velichka Strijkova – Kenderova, PH.D.

Member of the scientific jury: Prof. Snejanka Milanova Kitova, Ph.D. – IOMT, BAS

1. General characteristics of the presented materials.

The entire scientific production of the only candidate for the competition assist. prof. Velichka Strijkova includes 67 scientific papers, 41 of which are in journals with impact factors and impact rank. She participated in the competition with 19 publications, all co-authored, which are different from the works included in the Ph.D. thesis. They were published in the period 2017-2022 mostly in peer-refereed and indexed scientific journals occupying leading positions (according to JCR or SJR) in the field of materials science, which is a very good attestation of the relevance and level of its research.

The scientific papers for participation in the competition are grouped into two groups: 6 publications are presented as equivalent to a habilitation work, 3 of which were published in Q1 ranked journals, and 3 – in Q2 ranked journals. According to the Implementing Regulations of the DASRB and the Regulations of the IOMT - BAS, these publications collect a total of 135 points with a required minimum of 100 points under the respective group of indicators B, indicator "4".

Outside the papers substituting the habilitation thesis, 13 articles were presented in refereed and indexed in Web of Science and Scopus publications, of which 6 have been published in journals with rank Q1, 4 – in journals with rank Q2, and 3 – in journals with rank Q4. They collect a total of 266 points with the required minimum of 220 points under indicator group D, indicator "7".

A list of 50 citations of the candidate's works in journals with impact factor and impact rank is also attached, which is also a very good certificate for the level of scientific research and the relevance of the thematic areas in which she works. According to this group of indicators "D", indicator "11", a total of 100 points were collected with a required minimum of 60 points according to the Rules of the IOMT - BAS.

The analysis of the scientometric indicators achieved by the candidate shows full compliance with and exceeding the requirements for occupying the academic position of Associate Professor set out in the Rules of IOMT-BAS for applying DASRB.

In the period after the defense of the doctoral dissertation assist. prof. Velichka Strijkova participated in 26 international and national scientific forums, where she presented a total of 38 oral reports and posters. During this period, she also participated in the implementation of 10 projects, financed by the Bulgarian Scientific Research Fund.

Her active pedagogical activity makes an excellent impression, as is evident from the attached information. She was a lecturer at the EUROOPTIK Center for Professional Training in Optics and Optical Devices (2015 - 2019), as well as she trained 17 students, doctoral students, and specialists in working with a ZETA optical profilometer and getting to know the working principle of an atomic force microscope (AFM), and also conducted numerous teaching practices for pupils and students at IOMT.

2. Evaluation of the candidate's research activity.

The scientific activity of Velichka Strijkova after obtaining the scientific and educational degree "doctor" is mainly focused on the study of surface properties of nanomaterials in the form of bulk samples or thin layers, as well as the characterization of biological objects using atomic force microscopy (AFM).

One part of scientific contributions in the publications substituting the habilitation thesis can be described as the application of AFM methods to study the morphometric and nanomechanical characteristics of red blood cells (RBCs) in normal and pathological conditions. The obtained results for the study of RBCs in women in high-risk pregnancies and patients with neurodegenerative diseases (NDDs) complement important aspects of the mechanism of the aging process of CCC, which are of utmost importance for the prevention of certain pathologies and/or the adequate treatment of still incurable diseases, such as neurodegenerative diseases. In the other part of the publications, substituting the habilitation thesis, the conditions of holographic recording of gratings with tunable polarization and surface relief realized in azopolymer and azopolymer nanocomposites were investigated. In them, AFM was used as the main tool to establish the parameters of the recorded relief gratings in the azopolymer layers and their dependence on the type of sample or recording conditions.

The scientific contributions achieved in the scientific publications outside the habilitation thesis can be grouped thematically in several different areas of research – transparent conductive doped zinc oxide layers as transparent electrodes and devices for "trapping" instantaneous energy; atomically deposited AlN layers for surface acoustic wave devices; two-dimensional (2D) dichalcogenides of transition metals, as materials with application in optoelectronics; – polymer dye medium as an active medium for lasers; – biosensors based on surface plasmon resonance.

I would characterize the contributions as enriching existing knowledge on the problems the candidate is working on by using AFM methods to study the properties of known materials and structures, as well as to create new ones. I believe that these studies are important for the practical use of the studied materials and structures.

CONCLUSION

The publications presented by the candidate assist. prof. Velichka Strijkova, are on the topic of the competition and represent original scientific studies with a contribution to the field of condensed matter physics. The obtained results are innovative and belong to the category of novelties in scientific research. The overall scientific research activity of Dr. Velichka Strijkova - Kenderova shows that she is a researcher with in-depth knowledge and practical skills in the application of modern experimental approaches for obtaining and characterizing various chemical and biological objects and reactions at the microscopic level. Based on the review of the

competition documents, taking into account the evaluation of the presented publications and the significance of scientific contributions, as well as my impressions of the candidate's qualities and her contribution to the results obtained, I express a positive opinion and recommend the honorable Scientific Council of IOMT-BAS to make a decision Velichka Strijkova to take the academic position of "associate professor" in professional direction 4.1 "Physical sciences", scientific specialty "Electrical, magnetic and optical properties of condensed matter" at IOMT-BAS

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Opinion prepared by:
/Prof. Sn. Kitova/