

OPINION OF REVIEWER

according to a competition in State Gazette no. 46 of 26.05.2023, for the acquisition of an academic position "professor" for the needs of the laboratory "Electron Spectroscopy of Solid Surfaces" at the Institute of General and Inorganic Chemistry at the BAS, in professional direction 4.2. Chemical Sciences (Solid State Chemistry) and decision of the Scientific Council on General and Inorganic Chemistry (Protocol No. 8 /11.07.2023).

Reviewer: Assoc. Prof. Hristo Gospodinov Kolev, PhD, Institute of Catalysis, BAS

Participant: The only candidate Assoc. Prof. Ivalina Avramova Avramova, PhD, from the Institute of General and Inorganic Chemistry at the Bulgarian Academy of Sciences.

Associate Professor Dr. Ivalina Avramova is a long-term employee of the Institute of General and Inorganic Chemistry. She began her career at the same institute as a physicist from 2001 to 2004. After successfully defending her PhD thesis on "Electronic properties and thermoelectric efficiency of $\text{Ge}_{1-x}\text{Ag}_{x/2}\text{Bi}_{x/2}\text{Te}$ solid solutions" in 2003, she held consecutive positions as an assistant (2004 - 2006), assistant professor (2006 - 2012), and associate professor (2012 to the present) at IGIC-BAS. In this way, Assoc. prof. Avramova formally fulfills the requirements for participation in the competition. The candidate consistently exceeds the necessary criteria outlined in Article 4 of the Regulations on the terms and conditions for the acquisition of scientific degrees and for the occupation of academic positions at IGIC - BAS. She is a co-author of 125 publications and holds one patent, with 95 of the publications in journals with impact factors. Assoc. Prof. Dr. Ivalina Avramova has submitted 10 publications for the current competition, distributed across different Q categories, with 3 indexed as Q1, 2 as Q2, and 4 as Q3, while the remaining publication is in a refereed journal with an SJR index. Over 850 citations have been observed on all the candidate's publications, with citations of the publications used for the competition totaling over 340. The candidate's Hirsch index is 16, indicating the high significance and relevance of her publications. Based on these parameters, Assoc. Prof. Dr. Ivalina Avramova consistently exceeds the required threshold for participation in the competition for the academic position of "professor." Assoc. Prof.

Dr. Avramova is an active participant in 13 research projects with different sources of funding. The candidate is also the co-supervisor of one PhD student. Her scientific activity is recognized through her involvement in editorial boards (Current Smart Materials and Recent Patents on Materials Science), as well as her review activity in scientific journals such as Diamond and Related Materials, Nanomaterials, Chemosensors, Current Materials Science, Carbon Trends, Coatings, Sensors, Chemical Physics Letters, Materials Today Communications, etc.

Associate Professor Dr. Avramova's scientific activity is focused on the development and utilization of X-ray photoelectron spectroscopy of materials with potential applications in catalysis, photocatalysis, protective anti-corrosion coatings, microelectronics, medicine, and other fields.

In the works included in the habilitation report, Assoc. Prof. Dr. Avramova is engaged in X-ray photoelectron spectroscopic research of graphene and graphene-like phases, graphite, and carbon soot, along with their modifications. It is evident that Assoc. Prof. Dr. Avramova is well acquainted with the published scientific literature related to graphene and graphene-like modifications, as well as the methods and techniques for their synthesis and the unresolved challenges in this field of science. A systematic approach is applied in the investigation of carbon layer synthesis on various substrates using different techniques for their formation.

With the aid of X-ray photoelectron spectroscopy, data regarding the elemental composition, concentration, degree of oxidation, and forms of carbon are obtained, as well as the ratio between sp^2 and sp^3 hybridization. Based on this information, conclusions are drawn regarding the quality of the layers, their homogeneity, mono- or multilayer nature, defects, and/or stability, depending on the synthesis method, the influence of alloying elements, and/or the substrate.

I do not have critical comments on the materials provided for the competition.

Conclusion:

Associate Professor Dr. Ivalina Avramova's research aligns perfectly with the theme of the announced competition for the academic position of "professor." She is a highly proficient specialist in the field of solid-state chemistry and the utilization of X-ray Photoelectron

Spectroscopy to elucidate the nature of surfaces and carbon layers. The publishing activity after its habilitation, citations on her published results, active engagement in scientific, teaching, and organizational activities, as well as her participation in projects, fully satisfy all the requirements outlined in the Law on the Development of Academic Staff and the Regulations on the conditions and procedures for acquiring scientific degrees and occupying academic positions at the Institute of General and Inorganic Chemistry of the Bulgarian Academy of Sciences.

Therefore, I confidently recommend to the members of the esteemed Scientific Jury and the respected Scientific Council of the Institute of General and Inorganic Chemistry to award Assoc. Prof. Dr. Ivalina Avramova Avramova with the academic position of "professor" in the field of 4.2. Chemical Sciences (Solid-State Chemistry).

14.09.2023

Sofia

Reviewer:

/Assoc. Prof. Dr. Hristo Kolev/