REPORT

by competition for the occupation of the academic position "Associate Professor" by professional direction 4.4. Earth Sciences (Mineralogy and Crystallography – experimental mineralogy) for the needs of department "Structural Crystallography and Materials Science" at the Institute of Mineralogy and Crystallography - BAS, announced in State Gazette No. №36/29.04.2025.
Candidate: Assistant professor Dr. Hristina Ilieva Lazarova - IMC-BAS

Member of the scientific jury: Assoc. Prof. Dr. Nadia Lubomirova Petrova - IMC-BAS

This report was prepared on the basis of the order of the Director of IMC-BAS No. № 379 РД-09/01.07.2025 according to the decision of the Scientific Council of IMC-BAS (Protocol No. 19/20.06.2025) and the decision of the meeting of the scientific jury of 04.07.2025. The opinion is in accordance with the requirements of the Law on the Development of the Academic Staff in Republic of Bulgaria (LDASRB), the Regulations for the terms and conditions for acquiring scientific degrees and for occupying academic positions at the BAS and the Regulations of IMC on the terms and conditions for acquiring scientific degrees and holding academic positions.

General presentation of the candidate

Assistant Professor Dr. Hristina Lazarova graduated with a Master's degree in Medical Chemistry in the Faculty of Chemistry of Sofia University - "St. Kliment Ohridski" in 2008. Since 2009, she has been working at the Institute of Organic Chemistry with the Center for Phytochemistry at the Bulgarian Academy of Sciences, where in 2021 she defended her doctoral dissertation in the field of organic chemistry on the topic "Development of ecological catalysts for the production of valuable chemicals and fuels for biomass utilization". Since June 2022, she has held the position of "assistant professor" at the IMC- BAS, where she continues to apply and improve her skills in the field of synthesis of micro and mesoporous materials, physicochemical characterization and catalytic properties of modified materials. In the first half of 2023, he specialized in the "Laboratory of Catalysis and Spectrochemistry (LCS), Ecole Nationale Superieure d'Ingenieurs de Caen (ENSICAEN) in Caen, France, a leading laboratory in the world in the field of catalysis, where he mastered new approaches in the synthesis of porous materials with catalytic applicability.

General characteristics of the submitted materials

For participation in the competition, Dr. Lazarova has complied with the Regulations on the terms and conditions for acquiring scientific degrees and holding academic positions at the Institute of Mineralogy and Crystallography - BAS, adopted on 21.10.2021 and amended on 15.05.2025, taking into account the minimum requirements for professional field 4.4. Earth Sciences, published in the State Gazette 23/18.03.2025. As information for the articles and citations, Dr. Lazarova has used both Web of Science and Scopus databases. The total number of scientific publications in the competition for "associate professor" which she has applied is **18**, and the number of citations of publications (excluding self-citations) used for the competition is **27**. According to the candidate, publications are in categories as follows ***Q1*- 9**; ***Q2*- 8**, ***Q4*-1**. Dr. Hr. Lazarova is the first author in two of the submitted works and the second or subsequent author in the others. I did not find any evidence of plagiarism in the scientific works submitted for participation in this competition. In the detailed reference of the candidate, I found a duplication

with a publication submitted for the acquisition of the educational and scientific degree "doctor" (NACID, https://ras.nacid.bg/dissertation-preview/65512): publication from group Г -7.2 At the same time, this publication is not included in the list of publications submitted in the abstract of the dissertation work. These discrepancies should be corrected when submitting data to NACID. To be correct, I will not use this work when calculating the total number of points for the competition. According to the available Scopus database to date 28. 08. 2025, there are 36 author documents in her name with *h-index* 13. For the period 2017-2024, the candidate in the competition was the head of 4 and a participant in another 5 scientific research projects funded by the National Science Foundation or the Ministry of Education and Science. For the period 2014-2024, she participated in 21 conferences or other scientific events (most of which were held in Bulgaria) with oral or poster presentations. The documents submitted by the candidate for participation in the competition show that she meets and significantly exceeds the minimum national requirements for holding the academic position of "associate professor" in the professional field 4.4 Earth Sciences. For group A (indicator 1) **50 points** are included with a contribution from a dissertation work for the award of an educational and scientific degree of "doctor". For group B (indicator 4) **6 works** are included, referenced and indexed in world-renowned databases of scientific information (Web of Science and Scopus): 2*Q1*, 3*Q2* and 1*Q4* with a contribution of 122 points (For publication 4.5, group B, I take into account the higher quartile Q1 according to SJR for 2024) and the contribution of **points becomes 127**. For group Г, 12 works are included, referenced and indexed in Web of Science and Scopus: 7Q1 and 5Q2 with a contribution of 275 points. I do not take into account publication 7.2 with Q2 according to SJR. Publication 7.8 in this group is referenced with Q1 according to SJR for 2020, which contributes another 5 points to the total. The points in this group after the correction, in my opinion, are **260**. For group Д (indicator 11), 27 citations are presented with a contribution of **135 points**. The total number of points presented for participation in the competition is 582, taking into account the considerations I have outlined, the **total number of points is 572**, with the distribution of publications as follows: ***Q1*- 11; *Q2*-5, *Q4*-1**.

Characteristics of scientific and applied scientific activities, main scientific and applied scientific contributions

The publications that the candidate presents are related to the topic of the competition **"Mineralogy and Crystallography - Experimental Mineralogy"** as they are in the field of materials science, crystallography and catalysis through the synthesis of new functional materials and the development of technologies that combine innovation, sustainability and applicability in the modern circular economy. Until June 2022, Dr. Lazarova is part of the group of Prof. Margarita Popova at the Institute of Organic Chemistry, where she is actively involved in the development of catalyst systems for the transformation of waste materials and biomass into valuable chemicals and energy sources, for example, different types of zeolites - Beta, Faujasite, Mordenite and ZSM-5 - impregnated with nickel, successfully catalyze the thermal degradation of polyethylene; another emphasis in the work with this group is related to the use of industrial waste, "fly" ash from thermal power plants for the synthesis of functional zeolite-like materials (catalysts and sorbents) as well as biological and catalytic application of nanomaterials based on silver-modified porous silicates. From the author's reference of Dr. Lazarova, it is clear that her work has been related to the synthesis and modification of various porous materials with catalytic applicability and the detailed characterization with physicochemical methods such as UV-VIS spectroscopy, thermally programmed reduction and catalytic apparatus for catalytic conversions and productivity.

My personal impressions of the candidate in the competition are after she started working as a "assistant professor" at the IMC-BAS, where she established herself as a scientist who well plans synthesis and analytical activities, interprets results and is able to work in a team. In just 3 years, she has already led 3 externally funded projects, 2 of which have been successfully completed, and is actively involved in the scientific research activities of the IMC. During this period, she has been a co-author in 5 publications, in two of which she is the first author. A series of new photocatalysts based on zeolite-like materials of the ETS-4 and ETS-10 types has been developed, as some of the Ti centers being replaced with Zr in order to increase the structural stability and photocatalytic activity of the modified materials. The conceptualization of these two works, a large part of the analyses and the original drafting of the text are the work of Dr. Lazarova. A new material - zinc-based metal-organic framework (MOF) with high adsorption capacity for various organic dyes has also been synthesized. The results obtained have a wide range of applications in modern technologies for water purification and wastewater treatment. Dr. Lazarova has mastered in a short time the analytical capabilities of IMC - powder X-ray analysis, nitrogen physisorption, UV-VIS spectroscopy, DSC-TG, X-ray fluorescence analysis, etc., applying them in her research activities. She willingly shares her skills and knowledge with young colleagues at the institute.

In conclusion: The materials submitted for participation in the competition exceed the requirements of the regulatory documents for occupying the academic position of "associate professor". Dr. Lazarova is an established specialist in the field of materials science and heterogeneous catalysis, with a focus on the creation of new functional materials with a porous type of structure - synthesis, physicochemical characteristics and catalytic properties. Dr. Lazarova is a candidate for "associate professor" for the needs of the department "Structural crystallography and materials science" at IMC and her scientific profile fully corresponds to that part of the subject matter of the direction relating to the "phase-chemical composition and properties of synthetic and modified porous materials for the needs of ecology and catalysis". The above review and findings in relation to the materials for the competition give me reason to recommend to the members of the Scientific Jury to propose to the Scientific Council of IMC, assistant professor Dr. Christina Lazarova, to be elected to the academic position of "associate professor" in a professional direction 4.4. Earth Sciences (Mineralogy and Crystallography - Experimental Mineralogy) by voting **FOR** her choice.

29. 08. 2025

Prepared the report:

Assoc. Professor Dr. Nadia Petrova