

## R E P O R T

**on the competition** for occupying the academic position Professor in the professional field 4.2. Chemical sciences, scientific specialty Physical chemistry (Electron microscopy and simulation studies of phase formation processes in condensed matter), for the needs of the laboratory "Electron Microscopy and Microanalysis" of Institute of Physical Chemistry(IPC), BAS.

**announced** in the State Newspaper 20, from 10.03.2020.

**applicant** Assoc. Prof. Dr. Bogdan Stavrev Ranguelov

**member of the academic jury** prof. Rositsa Nikolova

The following report has been prepared on the basis of Order No. 59 / 25.06.2020 issued by the Director of the Institute of Physical Chemistry " Acad. Rostislav Kaischew", Bulgarian Academy of Sciences and the decision of the scientific jury from 24.07.2020. The report is in compliance with *Development of Academy Staff in the Republic of Bulgaria Act, the Rules for the Application of the Development of Academy Staff in the Republic of Bulgaria Act, the Rules of BAS and with the Rulers set at IPC for applying the Development of Academy Staff in the Republic of Bulgaria.*

Associate Professor Ranguelov participate in the competition for occupying the academic position "Professor" with 23 scientific articles published in the period 2009-2020. All of the publications are co-authored, and the candidate is first author of six of them. Fifteen of the publications have been published in the last five years. According to the information available in the SCOPUS database as of 17.08.2020 Assoc. Prof. Ranguelov is a co-author of 45 scientific publications, cited 212 times (without self-citations of all co-authors) and has an *h-index* 8. The candidate took participation in 13 scientific conferences, presenting his research results in 40 posters and 8 oral presentations. Assoc. Prof. Ranguelov is a head of one research project and he has been also a member of the scientific teams of another 13 research projects, financially supported by BAS (3), NSF (5), MES (4) and the EU (1). Assoc. Prof. Ranguelov is a member of the team that registered a utility model with reg.№ 64118 / 03.02.2004, "Method for synthesis and growth of diamonds under metastable conditions". He participates in the training of young researchers – members of the laboratory "Electron Microscopy and Microanalysis" and PhD students. Assoc. Prof. Ranguelov is a supervisor of one successful PhD student. He also actively participates in the bodies of management of Institute of Physical Chemistry. He is a head of the Laboratory of Electron Microscopy and Microanalysis since 2010, chairman of the attestation commission in the period 2014-2017, member of the scientific council, and director of the institute and its representative in the general assembly of BAS since 2020.

Assoc. Prof. Ranguelov meets the requirements for occupying the academic position "Professor", published in LDASRB (Chapter 3, Section IV) and in the Regulations for its implementation namely: Dr. Ranguelov has been registered in the Nacional Center for Information and Documentation - NACID (<https://ras.nacid.bg/dissertation-preview/28364>), where his doctoral degree and academic rank (associate professor) are recognized; According to the data published in NACID Dr. Ranguelov gained the academic position Associate Professor in 2011 and have occupied the academic position Associated Professor for more than five years - the period required by the normative documents; The publications and citations submitted for the competition do not repeat the ones presented for the PhD degree and the competition for the academic position "Associate Professor"; There is no evidence of plagiarism in the scientific

works, presented by Dr. Ranguelov for participation in the current competition; Dr. Ranguelov has submitted for participation in the competition detailed information about his scientific activities.

The eight publications presented for evaluation within the indicator **4, Group (B)** gave a total of **160 points**, with a minimum of 100 points as a requirement. For **Group (Г)** the candidate presented fifteen publications in indexed journals giving **302 points** in total. In the competition the candidate participates with 113 citations, giving **226 points for Group (Д)** with a minimum of 120 points required. The materials presented for the **Group (E)** indicators collect a total of **185 points** with a minimum of 150 points required. **The total number of points, for the scientific production presented by the applicant for the current competition is 923**, which exceeds the minimum number of points required for filling the position of "Professor" in accordance with the Rules for Acquisition of Academic Degrees (600 points) and for Occupation of Academic Positions in the Bulgarian Academy of Sciences (640 points).

**The main scientific and applied contributions of the applicant are related to two main scientific fields.** The first is related to one of the traditional topics for IPC, namely theoretical and experimental study of the mechanisms of crystal growth. New knowledge about the processes of phase formation in condensed matter has been gained on the base of theoretical calculations, simulation and electron microscopic studies. A new type of vicinal surface instability during crystal growth has been theoretically predicted and experimentally proven and define. Processes of controlled crystal growth and thermal stability are simulated. **The publications forming the habilitation work of the candidate are also connected with this research direction.** Another part of the scientific contributions of the candidate are connected with application of the electron microscopic methods for solving problems related to characterization and improvement of synthesis of new materials, including ones obtained by processing of waste. Undoubtedly an expert in the field of electron microscopy, Assoc. Prof. Ranguelov modifies and appropriately adapts to the type of materials and the task set, the standard techniques and methods for preparation of samples and conducting electron microscopy experiment.

*In conclusion*, I can confirm that, the materials submitted by Assoc. Prof. Dr. Bogdan Ranguelov show that he corresponds to all the requirements of the normative documents for taking up the academic position "Professor". ***The research interests of the applicant are an important part of the scientific activities*** of laboratory "Electron Microscopy and Microanalysis" for whose needs the competition was announced. The participation of the candidate in different research teams carrying out national and international projects and his responsibility on the young scientist's training, implies that he will continue to be in help for his colleagues by developing of new scientific topics and as an expert in the field of electron microscopy. I, therefore, convincingly propose to the honorable members of the Scientific Jury to recommend Assoc, Prof. Dr. Georgi Jeleв to be given the academic position Professor in the professional field 4.2. "Chemical sciences", scientific specialty "Physical chemistry" (Electron microscopy and simulation studies of phase formation processes in condensed matter).

On the basis of the said-above, I would like to recommend to the Scientific Council of Institute of Physical Chemistry, BAS to support the election of Assoc. Prof. Bogdan Ranguelov, PhD at

the academic position of a “Professor” in the laboratory “Electron Microscopy and Microanalysis” of Institute of Physical Chemistry(IPC), BAS.

Дата: 24.08.2020 Member of the academic Jury: Prof. Rositsa Nikolova