OPINION

on the competition for the academic position "Professor"
in a professional field 4.2. "Chemical Sciences", specialty "Physical Chemistry",
announced in the State Gazette No. 41/20.05.2025, for the needs of the Department
"Interfaces and Colloids" at the Institute of Physical Chemistry "Acad. R. Kaischew" – BAS

with candidate: **Assoc. Prof. Viktoria Milkova Nakova, PhD**

by Prof. Anelia G. Dobrikova, PhD
Institute of Biophysics and Biomedical Engineering - BAS,
Member of the Scientific Jury according to Order No. 84-RD-05/19.06.2025 of the
Director of the Institute of Physical Chemistry (IPC) - BAS

For participation in the announced competition for the academic position "Professor", only one candidate has submitted documents: Assoc. Prof. Viktoria Milkova Nakova, PhD. The documents presented by the applicant for participation in the competition are in full accordance with the requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and the Regulations for its implementation at IPC-BAS.

1. General characteristics of the candidate's scientific research and applied scientific activities

Victoria Milkova Nakova graduated from the Faculty of Chemistry of Sofia University "St. Kl. Ohridski" in 1998 and then pursued a specialization in "Engineering Chemical Physics" for 2 years. In 2006, she defended her PhD thesis in the scientific specialty "Physical Chemistry" at the IPC-BAS. From 2006 to 2014, Dr. Victoria M. Nakova was a research associate (senior assistant) at the same institute. In 2010-2011, she was a post-doctoral fellow at the Laboratory of Physical Chemistry and Colloid Science, Wageningen University and Research Center, Wageningen, Netherlands, then in 2014-2015, she was a visiting scientist at the Institut für Biology und Biotechnologie der Pflanzen, Westfälische Wilhems-Universität Münster, Germany, and in 2025, she visited the Department of Clinical Microbiology, Umeå Universitet, Sweden, with an Erasmus+ mobility grant. Since January 2015, she has been appointed to the academic position of "Associate Professor" in the department "Interfaces and Colloids" at the IPC-BAS, and since 2021 she has been the head of the same department.

For the announced competition, Assoc. Prof. Victoria Milkova Nakova has presented a list of 16 publications, 14 of which are in reputable peer-reviewed Journals with a high impact factor, 1 with SJR (Q1) and 1 is a book chapter (IGI Global Scientific Publishing); 8 of them are with rank Q1, 6 with Q2, 1 with Q3 (according to www.scimagojr.com). It should be noted that Viktoria Milkova is a single author in 5 publications (4 of which are in Q1 and 1 is a book chapter) and the first or corresponding author in 9 of the publications. The results included in these publications have been presented at 25 scientific forums. A list of 61 citations after 2017 is also presented for the current competition. According to the submitted documents, Dr. V. Milkova Nakova has a total of 41 publications, 37 of which are referred in Scopus. All this demonstrates the high quality of scientific research and the significant personal contribution of the candidate to these scientific publications. An essential part of the scientific work is participation in research projects. Dr. V. Nakova has participated in a total of 14 research projects (6 current and 8 completed), 10 of which are international, as she has been a leader of 3 projects sponsored by the Bulgarian National Science Fund. According to the presented documents, Assoc. Prof. V. Milkova Nakova is a scientific consultant of one part-time PhD

student at the Institute of Microbiology, BAS. She was also a supervisor of a diploma thesis of a student from the Faculty of Physics of Sofia University, as well as a mentor and consultant to several students. Assoc. Prof. Dr. V. Nakova leads 2 PhD courses at the Training Center of BAS.

These scientific activities fully meet the requirements of the ADASRB and the Regulations for its implementation at IPC-BAS for the academic position "Professor", and fulfil the minimum requirements for all groups of indicators as follows: **C- 110, D- 225, E- 122 and F- 369.**

2. Mein scientific and applied scientific contributions

Based on the publications presented in the competition and the author's reference, the scientific research of Dr. V. Milkova Nakova is mainly on the topic "Adsorption of biopolymers on model surfaces" and is related to the application of physicochemical and electrokinetic methods for studying the polyelectrolyte adsorption on model particles and for analysis of the surface electrical properties and stability of the produced colloid-polymer suspensions. in accordance with the possibilities for application in the fields of nanotechnology, medicine, pharmacy and electronics. I accept the original scientific contributions formulated in the extended author's reference, which can be summarized in three main research topics:

2.1. Investigation of the correlation between the physicochemical characteristics of polysaccharides (chitosan and alginate) and their ability to stabilise model colloid-polymer suspensions (publications No.1, 3, 9, 11, 16). For the first time, the statement about the dominant contribution of hydrophobic and electrostatic interactions between chitosan monomers and the charged surface is experimentally confirmed. For the first time, it is experimentally proven that an electrokinetic model for analysing the change in the electrical properties of a dispersion in the presence of chitosan oligosaccharides (COS) is a useful approach for distinguishing the contribution of electrostatic and hydrophobic interactions responsible for the achievement of electrosteric stabilisation of the studied systems.

2.2. Formation and characterisation of multilayer films of polysaccharides and carbon nanomaterials (carbon dots) on non-spherical particles (publication No.2); The electric field light scattering method is applied for the first time for the investigation of the electrical properties and stability of carbon-polymer colloidal structures.

2.3. Development and characterisation of model polysaccharide-based systems for delivery and controlled release of active components (publications No.4-8, 10, 12-15). For the first time, the aggregation of amyloid peptides in the presence of composite structures loaded with an anti-amyloid agent is studied. For the first time, stable liposomes loaded with a multicomponent aqueous extract of some medicinal Bulgarian plants are successfully produced and characterized, and their effect on human coronavirus HCoV-OC43 is analyzed, as well. For the first time, the medicine Veklury® (USA, a drug against COVID-19) is encapsulated in polymer capsules. Stable "oil-core" nanocapsules suitable for encapsulation of active molecules and drugs (indomethacin, Veklury®, curcumin, and caffeine) are produced. A new procedure is developed for the formation of films on emulsion droplets by using a low concentration of droplets and polysaccharides at a low ionic strength of the medium.

The scientific results and original contributions in the presented publications are of great interest from both a fundamental science and an applied perspective (2.3.).

3. Reflection of the candidate's scientific publications in Bulgarian and foreign literature.

All publications presented for the competition reflect significant scientific research in the fields of physical chemistry, chemical engineering, nanomaterials, pharmacology and others. They have received recognition from the wider scientific community, which is evident from the citations received. A total of 244 citations for all 41 publications of Dr. V. Nakova have been

noted. According to Scopus, a total of 37 publications have been cited 209 times with *h* index= 10 (after excluding all self-citations). The publications presented for this competition (published mainly in the last 5 years) have been cited about 50 times (in Scopus).

4. Recommendations

Since, according to Appendix No. 1 of the ADASRB, indicator E refers to citations referenced and indexed in Web of Science and Scopus, the citation list should be provided with links to WoS/Scopus or generated from these databases.

Conclusion

The materials presented in the current competition and the scientometric indicators of Assoc. Prof. V. Milkova Nakova meet all the requirements and fulfill the minimum required points for all groups of indicators of the ADASRB and the regulations for its implementation at IPC-BAS. I confidently believe that she is an established, internationally recognized scientist, who, with her competence and scientific output, is a very suitable candidate for the academic position "Professor" in the Department "Interfaces and Colloids" at IPC-BAS.

Everything mentioned above gives me reason with deep conviction to give my positive assessment and strongly recommend to the respected members of the Scientific Jury to propose to the Scientific Council of IPC-BAS to award **Assoc. Prof. Victoria Milkova Nakova** the academic position "Professor" in the professional field 4.2. "Chemical Sciences", specialty "Physical Chemistry".

18.09.2025

Member of the Scientific Jury:
/Prof. Anelia Dobrikova/