Институт по ФИЗИКОХИМИЯ при БАН
Вх. №..218
Дата: 23.09.2025

STATEMENT

on the competition for the academic position of "Professor"
in the professional field of 4.2. Chemical Sciences,
scientific specialty "Physical Chemistry,"
for the needs of the "Surfaces and Colloids" section,
announced in the State Gazette, issue 41 of May 20, 2025

with candidate Assoc. Prof. Dr. Victoria Milkova Nakova

by Prof. Dr. Slavka Stoyanova Tcholakova
member of the scientific jury, appointed by Order 84-RD-09 of June 19, 2025, of the Director of the Institute of Physical Chemistry - Bulgarian Academy of Sciences

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

Victoria Nakova has a PhD, which she acquired in 2006 from the Higher Attestation Commission after defending her dissertation on "Electro-optical investigation of the structure and electrical properties of polyelectrolyte multilayers on colloidal particles." She has held the academic position of "Associate Professor" for more than 10 years at the Institute of Physical Chemistry - Bulgarian Academy of Sciences. Assoc. Prof. Dr. Victoria Nakova has a clearly defined scientific theme, "Adsorption of Biopolymers on Model Surfaces," in which she is a leading researcher. This is evident from the five scientific publications, which are equivalent to a habilitation thesis. In four of these, she is the sole author, and in one, she is the first author. All five articles are published in prestigious scientific journals with a high impact factor, placing them in the Q1 quartile.

For participation in the competition, Assoc. Prof. Dr. Nakova has submitted, in addition to her habilitation thesis, 11 more scientific publications. These do not overlap with those submitted for her doctoral degree or for the position of "Associate Professor." She is the sole author of one publication, the first author of seven, and the corresponding author of five. Of these 11 publications, three are published in Q1 journals, six are in Q2 journals, one is in a Q3 journal, and one is a book chapter. The total number of points is 225, which exceeds the required 220 points according to the minimum requirements of the IFH-BAS under indicator "G" by 5 points. The total number of citations provided by the candidate is 61, which is sufficient to meet the criterion under indicator "D." Assoc. Prof. Dr. Nakova has participated as a management committee member in five COST Actions and as a working group member in four more COST Actions. This demonstrates that she has established numerous contacts with foreign scientific groups in various scientific fields where biopolymers are used for the development of new materials. She has been the leader of two completed projects and one ongoing project funded by the National Science Fund, related to her participation in international COST Actions. She is also the leader of two other scientific projects funded by the National Science Fund. Projects led by Assoc. Prof. Dr. Nakova have attracted 495 000 BGN in funding. The total number of points under indicator "E"

is 369, which significantly exceeds the required minimum of 150 points.

In conclusion, Assoc. Prof. Dr. Nakova meets all the requirements of the Institute of Physical Chemistry - Bulgarian Academy of Sciences for the academic position of "Professor."

2. Main Scientific and Applied Scientific Contributions

Assoc. Prof. Nakova's publications are in a field of colloid science with significant fundamental and applied importance: the adsorption of biopolymers on various model surfaces such as solid colloidal particles, liposomes, and emulsion droplets. Understanding this field is crucial for the development of new technologies in pharmacy, medicine, environmental protection, and other areas. In the personal statement on the contributory nature of her work, Assoc. Prof. Nakova has outlined three main research topics: (1) investigation of the correlation between the physicochemical characteristics of polysaccharides (chitosan and alginate) and their ability to stabilise model colloid-polymer suspensions;; (2) formation and characterisation of multilayer films of polysaccharides and carbon nanomaterials (carbon dots) on non-spherical particles; and (3) development and characterisation of model polysaccharide-based systems for delivery and controlled release of active components.

In the first research topic, five scientific publications are presented. Two are in Q1 journals, two are in Q2 journals, and one is a book chapter. Assoc. Prof. Nakova is the sole author of three of these, which clearly shows that the contributions formulated in this area are largely her own work. The main contributions in this topic are related to: (1) The experimental determination of the relative role of electrostatic and hydrophobic interactions between chitosan monomers and lecithin-stabilized droplets, depending on the degree of chitosan acetylation; and (2) The established correlation between the electro-optical effect and the increase in the fraction of guluronate (G) residues at very low concentrations of calcium ions, which is explained by the strong interaction between the divalent ions and alginate molecules.

The second topic includes one publication, of which Assoc. Prof. Nakova is the sole author. In this work, the electric field light scattering method was used for the first time to study the properties and stability of carbon-containing structures. Based on this method, the hypothesis was confirmed that the electrical properties of the component adsorbed in the final adsorption step define the electro-optical behavior of suspensions of particles coated with multi-component films.

Ten scientific articles have been published in the third research topic, with Assoc. Prof. Nakova as the sole author of two. The main contributions from this area are: (1) The development of a methodology for producing biocompatible liposomes that preserve the properties of encapsulated substances and ensure their targeted transport and controlled release; and (2) The developed procedure for producing nano-capsules with an oil core. The procedures developed have been used for encapsulating aqueous extracts from Bulgarian plants as well as various drug molecules.

3. **Reflection of the Candidate's Scientific Publications in Bulgarian and Foreign Literature.**

Assoc. Prof. Dr. Nakova is a co-author of a total of 41 scientific publications. Of these, 21 are published in Q1 scientific journals, and 13 are in Q2 journals. Based on the list provided by the candidate, her publications have a total of 244 citations. According to SCOPUS, there are 209 citations, with all co-author self-citations excluded. Of the citations provided by the candidate, 13 are from Bulgarian research teams, which shows that the candidate's work is well-received by both Bulgarian and international scientists.

4. **Critical Remarks and Recommendations for the Candidate's Scientific Works**

I recommend that in future scientific papers, the candidate more clearly outlines the main scientific contribution and how it builds upon existing knowledge at the time of publication. It would also be beneficial to specify how this contribution can be used in future research. This will help young researchers utilize the methods and procedures developed by the candidate in their own studies.

Conclusion

Based on the above, I conclude that Assoc. Prof. Dr. Victoria Milkova Nakova meets all the requirements for the academic position of "Professor" in the professional field of 4.2. Chemical Sciences, scientific specialty "Physical Chemistry." I will vote for her to be elected to this position.

Date: 21 September 2025 г.

Member of the scientific committee

SLAVKA
TCHOLAKO

Prof. Slavka Stoyanova Tcholakova