OPINION

on the competition for the academic position of "Associate professor"

in the field of higher education: 4. Natural sciences, mathematics and informatics, professional direction 4.2. Chemical Sciences, specialty "Physicochemistry", promulgated in the State Newspaper, No. 51/13.06.2023.

With only one candidate: Ch. Plamen Hristov Chukov, Ph.D

Prepared the opinion: Prof. Dr. Nadia Mladenova Antonova – Miteva - Institute of Mechanics at the Bulgarian Academy of Sciences

1.General notes

By Order No. 88-RD-09/20.07.23 of the Director of the Institute of Physical Chemistry at the BAS and based on a decision of the Scientific Council of the Institute of Physical Chemistry at the BAS - protocol No. 72-RD-18-03/19.07.2023 I was appointed as a member of the Scientific Jury in the procedure for selecting an "associate professor" in the scientific specialty "Physicochemistry" in the field of higher education: 4. Natural sciences, mathematics and informatics, professional direction 4.2. Chemical Sciences, specialty "Physicochemistry". At the first meeting of the scientific jury, I was selected to review the submitted materials in the competition and to prepare and submit an opinion.

2.General and biographical data

Chief assistant Dr. Plamen Hristov Chukov completed his higher education - a master's program with a professional qualification as a physicist with a specialization in "Optics and Spectroscopy", second major: Physics Teacher, Additional second major: Manager, at Sofia University "St. Kliment Ohridski", Faculty of Physics during the period 1989 - 1995. In the period 1998-2006, the candidate completed his doctoral studies at the Institute of Physical Chemistry at the BAS, where he developed and defended a thesis for the ONS "doctor" in the scientific specialty "Physicochemistry" on the topic: "Experimental study of self-organized amphiphilic structures in foam films". He worked as a physicist at the Institute of Physical Chemistry from 2001-2006, and in 2006 he was elected as the main assistant in the "Surfaces and Colloids" department, where he works until now. For 25 years - from January 2008 to March 2023, Chief Assistant Dr. Plamen Chukov specializes and conducts research and development activities in Canada by winning a scholarship for a guest post-doctoral fellow, realizing a post-doctoral specialization for 1 year, working as a research and development manager, chief research scientist and founder successively in The University of Alberta, Canada, as well as companies such as Natural Resources Canada, CanmetENERGY, Devon, Alberta, University of Alberta, Chemical & Materials Engineering, Edmonton, Natural Resources Canada, CanmetENERGY, Devon, Guardian Chemicals Inc., Sturgeon Industrial Park, TCH NanoSolutions , Edmonton, Epsilon Chemicals Ltd., 1926 94 St NW, Edmonton. As of 01.08.2023 ch. Associate Professor Dr. Plamen Chukov has 25 years and 5 months of total work research experience at the Institute of Physical Chemistry at the BAS. His

skills and expertise are in the design and manufacture of unique scientific instrumentation; thin liquid films; electro-impedance spectroscopy of thin liquid films; tensiometry with profile analysis; electrochemical impedance spectroscopy; microscopy; spectroscopes; bulk and surface rheology; image analysis; LabVIEW; as well as computer and database skills: Web of Science, Scopus, others. He participated in 5 contracts of the Institute of Physicochemistry at the BAS (1 is ongoing) and led and coordinated a total of 5 projects abroad, of which two were industrial projects for new products for polymer stabilization of roads and anti-adhesive coatings for the production of pressed wood panels particles. The candidate is a guest editor of a special issue of the journal Colloids and Interfaces, as well as on the editorial board of the specialized journals Colloids and Interfaces and Coatings. He is a reviewer for more than 10 specialized scientific journals.

3.General description of the submitted materials for the competition

The reference of ch. Associate Professor Dr. Plamen Chukov for fulfilling the minimum requirements of the Institute of Physical Chemistry of the Bulgarian Academy of Sciences includes 22 out-of-print scientific publications in prestigious indexed international journals and 1 patent, 12 of which are in Q1 journals, 9 articles are in Q2 journals and 1 journal article with Q4. The candidate has also submitted a list of 6 publications equivalent to a habilitation thesis, of which 4 are in Q1 journals and 2 are in Q2 journals; in two of them the candidate is the first author. The total number of points from the observed citations is 2398. The reference to the scientometric indicators of ch. Assistant Professor Dr. Plamen Hristov Chukov shows that he has a total of 2803 points, which exceeds the minimum requirements for an "associate professor" in the Law on the Development of the Academic Staff (ZRASRB) and the Regulations for its application for occupying the academic position of "associate professor" in the Institute in physical chemistry "Acad. R. Kaishev" - BAS.

4.General characteristics of the research and scientific the applied activity of the candidate ch. Plamen Hristov Chukov, Ph.D

This summary of contributions is based on 36 peer reviewed (indexed in Scopus database) publications, including one book chapter, and 5 contributions in conference series. In Scopus, these papers have 1199 citations (excluding self-citations of all authors) with a corresponding Hirsch index of 17. These works are based on scientific research conducted mainly in the Institute of Physical Chemistry – Bulgarian Academy of Sciences (IPC-BAN), CanmetENERGY -Natural Resources Canada and the University of Alberta. The contributions can be grouped into the following research areas:

1.Mechanisms of stabilization of W/O petroleum emulsions and effect of different crude oil fractions.

2.Design of unique scientific instrumentation for studying thin liquid films.

3.Drainage kinetics and interactions in thin liquid films formed between a flat solid surface and approaching drop/bubble.

4.Impact of adsorption layer properties on thin liquid films behaviour.

All these research areas are traditional for IPC-BAN. The main contributions in each area of scientific interest are summarized below, with references to the relevant publications following numbering in the document "List of all publications".

1.Mechanisms of stabilization of W/O petroleum emulsions and effectof different crude oil fractions.[6, 10, 11, 12, 14, 15, 17, 18, 19, 20, 22, 23, 25, 26, 31, 33, 35]

The results of research in this group, published in 17 articles on the competition [6, 10-12, 14, 15, 17-20, 22, 23, 25, 26, 31, 33, 35] contribute to a better understanding of the mechanisms of stabilization of water/oil petroleum emulsions and elucidate the influence of several factors that determine the stability of petroleum emulsions.

2.Design of unique scientific instrumentation for studying thin liquid[6, 16, 22, 26, 32]

The results of this group are summarized in 4 publications [6, 16, 22, 26], divided into the subgroups:

Thin liquid film instrument for combined microinterferometric and electrochemical studies.
Integrated Thin Liquid Film Force Apparatus (ITLFFA). [16]
Modified Scheludko-Exerowa cell with dosing system.

3.Drainage kinetics and interactions in thin liquid films formed between a flat solid surface and approaching drop/bubble. [16, 21, 24, 28], that includes results about:

Effect of approach velocity on TLF drainage between and air bubble and flat solid surface and Probing Boundary Conditions at Hydrophobic Solid–Water Interfaces by Dynamic Film Drainage Measurement

4.Impact of adsorption layer properties on thin liquid films behaviour.[1, 2, 3, 4, 5, 7, 8, 9, 13, 29]

In a series of works, the influence of the properties of the adsorption layer on the behavior of foam films was investigated. [1-5, 8, 36, 37].

5. Timeliness of the developed problems. Possibilities for practical use of the results

The developed problems and tasks in the publications submitted by the candidate for the competition are current and have important implications for both fundamental research and industry and applied research.

CONCLUSION

The candidate Ch. Associate Professor Plamen Hristov Chukov, Ph.D., presents himself in this competition with scientific production of the necessary quality and with contributions to the development of physical chemistry. From the presented summarized scientometric report, the indicators in group (A (102 items), (B (140 items), D (250 items), D (2398 items)) were exceeded. Thus, the total number of points of the candidate in the competition are 2803, which exceeds the minimum requirements of 470 points of the Institute of Physical Chemistry - BAS for the academic position "docent". From the above, he also meets the requirements of the Law on the Development of the Academic Staff (ZRASRB) and the Regulations for its application for occupying the academic position of "docent" at the Institute of Physical Chemistry "Acad. R. Kaishev" - BAS. Bearing in mind the above, I believe that the candidate for this competition is a well-built and promising scientist, therefore I propose to the honorable members of the Scientific Jury to vote ch.

Dr. Plamen Hristov Chukov, assistant professor, to take the academic position of "associate professor" in the field of higher education: 4. Natural sciences, mathematics and informatics, professional direction 4.2. Chemical Sciences, specialty "Physicochemistry", for the needs of the "Surfaces and Colloids" section at the Institute of Physical Chemistry "Acad. R. Kaishev" - BAS.

12.10.2023 г. Prepared the opinion:.....

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