

REVIEW

for a competition for holding the academic position "Professor" in the professional field 4.2. Chemical Sciences, specialty "Processes and apparatus in chemical and biochemical technology" announced in SG no.37 (21/04/2026)

with candidate: Elisaveta Georgieva Kirilova-Shopova, PhD, Associate Professor

Reviewer: ILIA KRASTEV ILIEV, Ph.D., Professor

1. General information and biographical data

Assoc. Prof. Dr. Eng. Elisaveta Georgieva Kirilova (Shopova), the only candidate in the competition for "Professor", was born on 20.11.1977 in Sofia. She graduated in 2000 from the University of Chemical Technology and Metallurgy, Sofia, majoring in "Processes and Apparatus in Chemical and Biochemical Technology" with a Master's degree. The topic of the Master's degree is: "Influence of Vibration on the Properties of a Titanium Dioxide Flow", which was developed and defended at the Otto von Görricke University, Magdeburg, Germany under the Erasmus program in 2000. In the period 2007-2011 she was a full-time doctoral student at the Institute of Chemical Engineering - Bulgarian Academy of Sciences, Sofia. On 15.09.2011 she acquired the educational and scientific degree "Doctor" in PN 4.2. Chemical Sciences, specialty "Processes and Devices in Chemical and Biochemical Technology", with a dissertation on the topic "System-oriented approach for environmentally friendly management of multipurpose chemical and/or biochemical production systems". From 2001 to 2011 she worked as a research associate at the Institute of Chemical Engineering of the Bulgarian Academy of Sciences, Sofia. Assoc. Prof. Kirilova participates in the preparation and implementation of national and international scientific projects, publishes research results in scientific journals and presents her scientific work at conferences and professional forums. In the period 2011-2018 she was a chief assistant, and on 11.06. 2018 she was awarded the academic position of "Associate Professor". From 2018 to the present she is the Head of the Laboratory "Innovative Processes and Systems Engineering" of IIH-BAS, and from 2022 to the present she is the Scientific Secretary of IIH-BAS, coordinating and organizing the scientific activity of the institute. Assists management in administrative processes, ensures communication with the administration of the Bulgarian Academy of Sciences, partner organizations and guarantees compliance with institutional and regulatory requirements. Organizes scientific events, maintains documentation and archiving, assists in quality control and popularization of the institute's scientific achievements. Fluent in English, German and Russian.

2. General description of the submitted materials

The candidate in the competition for the academic position "Professor" Assoc. Prof. Dr. Eng. Elisaveta Georgieva Kirilova (Shopova) has submitted all the necessary documents, according to the Regulations on the conditions and procedure for holding academic positions at the Bulgarian Academy of Sciences and the Regulations for the implementation of the Act on the Development of the Academic Staff in the Republic of Bulgaria.

The coverage of the minimum national requirements for candidates for AD "Professor" by groups of indicators is as follows:

Indicator A: Received diploma for ONS "Doctor" №000003/15.09.2011, (50 points)

Indicator B: Habilitation work - scientific publications in publications that are referenced and indexed in world-renowned databases with scientific information (Web of Science and Scopus). 7 scientific publications are presented, of which Q1 (6 issues) and Q2 (1 issue) (170 points);

Indicators G: Scientific publications in publications that are referenced and indexed in world-renowned databases of scientific information (Web of Science and Scopus), outside the habilitation thesis (min. 220 points)

18 papers are presented, articles in journals falling into quartiles Q3(12) and Q4(6) and a published chapter of a book or collective monograph 2 issues total 30 points;

Total for indicator D: 282 points (from min. 220 points)

Indicators D: Citations or reviews in scientific publications, referenced and indexed in world-renowned databases with scientific information or in monographs and collective volumes (Web of Science and Scopus) (min 120 points)

209 citations of 48 works are presented (418 points). The evidentiary part includes bibliographic data for the citing publication and a reference to the relevant database.

Indicators E:

- E14 Participation in a national scientific or educational project

2 participations are presented (20 points);

- E15 Participation in an international scientific or educational project

6 participations are presented (120 points);

- E17 Management of a national scientific or educational project

2 projects are presented (40 points).

- E18 Funds raised for projects led by the candidate - one point for every 5,000 leva

118,531.53 leva/5,000=(23.7 points).

When comparing the submitted materials with the minimum requirements (Table 1) for taking up the position of Professor in professional fields according to the PPZRASRB and PURZAD of the Bulgarian Academy of Sciences, it follows that the minimum requirements for taking up the position of Professor have been met and significantly exceeded.

Table 1. Indicator group Minimum number of points Number of points of the candidate

Group of Indicators	Minimum points	Points of the candidate
A	50	50
B	-	-
B	100	170
Г	220	282
Д	120	418
E	150	203.7
Total	640	1123.7

The candidate has presented evidence that he meets the additional criteria of the Institute of Engineering Chemistry at BAS, which is well illustrated in Table 2.

Table 2. Additional criteria of the Institute of Chemical Engineering (ICE)

	Criterion, normative document	Requirement (minimum)	Submitted by the candidate
1	Educational and scientific degree "Doctor", ZRAS of the Republic of Bulgaria	yes	yes
2	Internship for the academic position of "Chief Assistant Professor", ZRAS of the Republic of Bulgaria		8 years
3	Number of publications for participation in the competition, which should not repeat those submitted for acquiring the educational and scientific degree "doctor" and for occupying the academic position "associate professor"	20	25

4	Number of publications for participation in the competition in journals with ISI Impact Factor or SJR, which should not repeat those submitted for acquiring the educational and scientific degree "doctor" and for occupying the academic position "associate professor"	7	25
5	Total number of publications	40	88 & 8 book chapters
6	Number of publications in journals with ISI Impact Factor or SJR out of the total number of publications	12	61
7	Total number of noticed citations on all works	50	594
8	Recommended Hirsch index	8	8*

3. General characteristics of the research and applied research activities of the candidate

The research and applied research activities of Assoc. Prof. Kirilova, reflected in the publications, projects and other activities in which she has participated, are primarily focused on the problems of improving the sustainability and energy efficiency of production systems; energy efficiency and sustainability of intermittent production systems; Optimal design of sustainable resource supply chains for the production and distribution of biofuels using various bioresources; Optimal design of sustainable resource supply chains for the production and distribution of dairy products and mechanical behavior and delamination of layered nanocomposites - analytical methods and optimization. Taking into account that all the presented works have been published in reputable international journals, I assume that the anonymous reviews accurately reflect the high professional and scientific level of the candidate. The main areas of scientific research can be presented as follows:

Area 1: Improving the sustainability and energy efficiency of production systems with batch processes on the example of conventional industrial systems for domestic wastewater treatment, applying the process of autothermal thermophilic aerobic sludge degradation (ATAD). (1,2,3,4,5,6) A total of 7 items are presented: the presented publications are in refereed publications (papers 1,2), are published in Bulgarian Chemical Communications (2018), SJR 0.137 Q4, (Scopus); paper (3 and 4) in Chemical engineering transactions (2019), SJR (Scopus):0.316 Q3.; papers (5) in Journal of Ecological Engineering, SJR(Scopus):0.312 (Q2), and paper (6) in Energy Journal JCR-IF (Web of Science):7.147 (Q1) and Springer International Publishing Book Series: Heat and Mass Transfer, 2022.

Area 2: Optimal design of sustainable resource supply chains for biofuel production and distribution using different bioresources. (8, 9, 10, 14, 15) A total of 5 items are presented: Article (9) is published in Energies, JCR-IF (Web of Science):3.085, SJR(Scopus):0.653 (Q1), Articles (8), (10), (14) are published in Chemical Engineering Transactions, SJR(Scopus):0.274 (Q3); Article (15) was published in the journal Computers & Chemical Engineering with JCR-IF (Web of Science): SJR (Scopus):0.897 (Q1).

Area 3: Optimal design of sustainable resource-supply chains for the production and distribution of dairy products. A total of 8 positions are presented (7, 11, 12, 13, 21, 22, 23, 24): Articles (7, 11, 13, 21, 22, 23) were published in the journal Chemical Engineering Transactions, SJR(Scopus):0.274 (Q3); Article (12) were published respectively in the journal Clean Technologies and Environmental Policy, JCR-IF (Web of Science):3.49, SJR(Scopus):0.862 (Q1); Article (24) was published in Bulgarian Chemical Communications (2018), SJR 0.137 Q4, (Scopus).

Area 4: Mechanical behaviour and delamination of layered nanocomposites - analytical methods and optimization. 6 items are presented (16, 17, 18, 19, 20, 25): Article (16) was published in the journal Chemical Engineering Transactions, SJR(Scopus): 0.274 (Q3); Article (17) was published in the journal of Applied Mathematics and Mechanics, JCR-IF (Web of Science):2.3 (Q1); Article (18) was published in the Journal of Theoretical and Applied Mechanics, SJR (Scopus):0.187 (Q4); Article (19) in the Journal of Applied and Computational Mechanics, JCR-IF (Web of Science):3.1 (Q1); Article (20) respectively in Journal of Engineering, SJR (Scopus): 0.148 (Q4) and article (25) in Bulgarian Chemical Communications, SJR (Scopus): 0.148 (Q4).

The publications in order of the authors are distributed as follows:

- Independent articles – 1 publication, book chapter – (Book 2);
- First place in the list of authors – 7 publications – (1); (6); (7); (11); (12); (13); (Book 1);
- Second place in the list of authors – 9 publications – (2); (14); (16); (17); (18); (19); (20); (22); (25);
- Third place in the list of authors – 7 publications – (3); (4); (5); (10); (15); (21); (24).
- After third place in the list of authors – 3 publications – (8); (9); (23).

The presented data convincingly show that Assoc. Prof. Kirilova has the ability to develop and present scientific works on her own, as well as to actively participate in collective developments.

4. Evaluation of the submitted materials.

I appreciate the presented scientific works at a high scientific level. Assoc. Prof. Dr. Eng. E. Kirilova is a well-known scientist with an international reputation. She has actively participated in 6 international scientific projects with the Technical University of Darmstadt in the period 2015-2022:

- 1) Project "Health assessment of smart patches on hygrothermalpiezoelectric lightweight structures", № BE 1090/40-1, financed by DFG - Deutsche Forschungsgemeinschaft, Germany. Project leader: Prof. DSc. Wilfried Becker, Technical University - Darmstadt. Project duration 2015.
- 2) Project "Dynamic time-harmonic behavior of smart patches on hygrothermalpiezoelectric substrates", № BE 1090/42-1, financed by DFG - Deutsche Forschungsgemeinschaft, Germany. Project leader: Prof. DSc. Wilfried Becker, Technical University - Darmstadt. Project duration 2016.
- 3) Project "Shear lag analysis of dynamically loaded smart patch/substrate structures with interface defect", No. BE 1090/45-1, financed by DFG - Deutsche Forschungsgemeinschaft. Project leader: Prof. DSc. Wilfried Becker, Technical University - Darmstadt. Germany, Project duration 2017.
- 4) Project "Shear lag analysis by a cohesive bilinear model for interface stress transfer in a grapheme monolayer nanocomposites", No. BE 1090/46-1, financed by DFG - Deutsche Forschungsgemeinschaft, Germany. Project leader: Prof. DSc. Wilfried Becker, Technical University - Darmstadt. Project duration 2018.
- 5) Project "2D analytical method for the interface stress transfer in a graphene monolayer nanocomposite", BE 1090/47-1, financed by DFG - Deutsche Forschungsgemeinschaft, Germany. Project leader: Prof. DSc. Wilfried Becker, Technical University - Darmstadt. Project duration 2019.
- 6) Project "Some industrial applications for nanocomposites under mechanical and environmental loading", BE 1090/48-1, financed by DFG - Deutsche Forschungsgemeinschaft, Germany. Project leader: Prof. DSc. Wilfried Becker, Technical University - Darmstadt. Project duration 2022.

Assoc. Prof. Kirilova actively participates in two national scientific or educational projects:

- 1) Project "Sustainable systems, sustainable processes, sustainable environment", Contract No. DN-07/14 of 15.12.2016, financed under the competition "Fundamental scientific research" - 2016 of the FNI-MES. Leader: Prof. Dr. Natasha Vaklieva-Bancheva, IIH-BAS. Project duration: 2016-2020.
- 2) Project "Optimal safe loading and geometry of layered nanocomposites under thermo-mechanical loading". Contract No. KP-06-N57/3 dated 15.11.2021, funded under the competition "Fundamental Scientific Research" - 2021 of the FNI-MES. Project leader: Prof. Dr. Tatyana Petrova, IIH-BAS. Project duration: 2021-2025.

Assoc. Prof. Kirilova has led two national scientific projects:

- 1) Project leader "Sustainable Resource Supply Chains in terms of environmental, economic and social criteria", Contract No. KP06-N37/5 dated 06.12.2019, funded under the competition "Fundamental Scientific Research" - 2019 of the FNI-MES. Project duration: 2019-2023.
- 2) Project Manager "Resource and supply chains for sustainable production and distribution of hydrogen from various raw materials", Contract No. KP-06-89/6 dated 09.12.2024, funded under the competition "Fundamental Scientific Research" - 2024 of the FNI-MES. Project duration: 2024-2028.

5. Key scientific, applied-scientific and applied contributions.

I accept the candidate's report on the main contributions in the submitted works, which are of a scientific and scientifically applied nature. The main contributions according to the attached publications are presented in several thematic areas, as follows:

I. Improving the sustainability and energy efficiency of production systems with batch processes on the example of conventional industrial systems for domestic wastewater treatment, applying the process of autothermal thermophilic aerobic decomposition of sludge (ATAD).

1. SCIENTIFIC CONTRIBUTIONS

□ A stochastic optimization approach has been developed for the reconstruction of thermally integrated bioreactor ATAD systems for domestic wastewater treatment with uncertainty in the parameters of the input-output flows. The approach combines in a common superstructure two models of thermal integration - with one and with two tanks for accumulating heat, used for preheating the incoming raw sludge. The models are reformulated and included in a two-stage stochastic optimization problem, which is decomposed into a multi-scenario deterministic problem. The scenarios represent probabilistically generated combinations of values of the uncertain parameters, providing an approximation of the initial stochastic space. (Publication No. 5, Chapter of Book No. 1, Project No. DN-07/14/15.12.2016).

□ An approach has been developed to reduce the computational complexity of a two-stage stochastic optimization problem, applied to limit the influence of uncertain parameters on a conventional ATAD system. The reduction of computational complexity has been achieved by formulating and solving a deterministic optimization problem at each vertex of the scenario space. (Publication No. 2, Project No. DN-07/14/15.12.2016).

□ A method has been developed to estimate the flexibility index of solutions obtained through multi-scenario stochastic optimization. The index is defined as the ratio between the volume of the inscribed hyperrectangle and the volume of the hypercube covering the entire scaled stochastic space. (Publication No. 4, Project No. DN-07/14/15.12.2016).

2. SCIENTIFIC AND APPLIED CONTRIBUTIONS

□ An approach has been developed for modeling a two-stage bioreactor ATAD system using static artificial neural networks (ANN), designed to describe the bioreactors of the first and second stages and for integration into an energy integration framework operating under uncertainty. Twelve ANN architectures (with one or two hidden layers and a different number of neurons) have been created, taking into account the interconnections both between individual batches and between the two bioreactors through correct transfer of computational data. (Publication No. 1, Chapter of Book No. 2, Project No. DN-07/14/15.12.2016).

□ An integration superstructure has been developed, uniting two alternative models for indirect energy integration – with one and two heat reservoirs. The mathematical model describes the capture, storage and utilization of waste low-potential heat from the outgoing hot sludge for preheating the incoming raw sludge. (Publication No. 5, Project No. DN-07/14/15.12.2016).

□ Computer simulations of a thermally integrated ATAD system during summer and winter were conducted to assess the impact of the integration on the operating temperatures in the bioreactors. The models predict the thermal shock when a new portion of raw sludge is introduced, the temperature at the end of the process and the degree of reduction of volatile solids. (Publications No. 3 and No. 6, Project No. DN-07/14/15.12.2016).

□ The obtained results demonstrate the applicability of the methodology as an effective tool for making engineering decisions in the design and modernization of wastewater treatment plants, taking into account variations in the characteristics of the incoming sludge and ensuring a sustainable operating mode. (Publications No. 5 and No. 6, Project No. DN-07/14/15.12.2016).

II. Optimal design of sustainable supply chains for biofuel production and distribution using different bioresources

1. SCIENTIFIC CONTRIBUTIONS

□ A deterministic mixed-integer linear programming (MILP) model has been developed for the strategic design of a sustainable integrated supply chain (SISC) for the production and distribution of biodiesel/diesel from first-generation (sunflower and rapeseed) and second-generation (waste vegetable oils and animal fats) bioresources. The model integrates environmental, economic and social aspects of sustainability through developed mathematical models for their assessment. The environmental model takes into account 12 sources of greenhouse gas emissions (GHG), including production and transport of raw materials and products, use of waste vegetable oils and fuel combustion, applying the principles of life cycle analysis (LCA) and the Eco-Indicator 99 method. The social model assesses the jobs created in the cultivation of bioresources and the operation of production facilities. (Publications No. 8 and No. 9, Project No. KP-06-H37/5/06.12.2019).

□ A MILP approach has been developed for the optimal design of a sustainable combined dairy and biodiesel production plant, in which waste dairy sludge (DWS), generated within the dairy DWS itself, is used as a raw material for biodiesel production. The approach is based on the simultaneous optimization of two interconnected chains - dairy and biodiesel - through a single MILP model. The main novelty is that the amount of generated DWS directly depends on the product portfolio of dairy enterprises, determined within the optimization process. The developed superstructure includes farms, dairy enterprises, dairy consumers, DWS processing facilities and biorefineries, connected by a transport network. (Publications No. 10 and No. 15, Project No. KP-06-H37/5/06.12.2019).

2. SCIENTIFIC AND APPLIED CONTRIBUTIONS

□ An approach for optimal design of a combined biodiesel/diesel production and distribution plant has been implemented on a Bulgarian scale. (Publication No. 9, Project No. KP-06-N37/5/06.12.2019).

□ An approach for optimal design of a combined biodiesel/diesel production and distribution plant has been implemented using environmental and economic criteria in two scenarios with 27 mixing centers and one mixing center on a Bulgarian scale. (Publication No. 14, Project No. KP-06-N37/5/06.12.2019).

□ An approach for optimal design of a combined biodiesel production and distribution plant has been implemented on a Bulgarian scale with data for dairy farms, dairy enterprises and biorefineries. (Publications No. 10 and No. 15, Project No. KP-06-N37/5/06.12.2019).

III. Optimal design of sustainable resource supply chains for the production and distribution of dairy products

1. SCIENTIFIC CONTRIBUTIONS

□ A deterministic optimization model has been developed for the design of a sustainable three-echelon supply chain, including multi-objective batch productions from the dairy industry, in order to determine the optimal production portfolio. The approach integrates four interrelated models: (i) a technological model of dairy product production recipes; (ii) a model for planning activities in the chain; (iii) an environmental impact model; and (iv) a social impact model. (Publications No. 7, No. 11 and No. 12, Project No. KP-06-N37/5/06.12.2019).

□ A stochastic/robust optimization approach has been developed as an extension of the deterministic model from item III.1, including Robust Counterpart for managing uncertainties in demand, prices of raw materials and products, as well as environmental and social costs. Optimization tasks have been formulated for different random realizations and different levels of uncertainty. The nominal demand values are generated through uniform distributions in predefined variation intervals. The evaluation of the solutions is carried out through the mean value and standard deviation of the objective function. (Publications No. 13, No. 21, No. 22, No. 23 and No. 24, Project No. KP-06-N37/5/06.12.2019).

2. SCIENTIFIC AND APPLIED CONTRIBUTIONS

□ A deterministic approach has been implemented for optimal design of resource-supply chains for the production and distribution of dairy products according to different recipes with the criterion of satisfying the preferences of all participants in the chain. (Publication No. 11, Project No. KP-06-N37/5/06.12.2019).

□ A deterministic approach has been implemented for optimal design of resource-supply chains for production and distribution of dairy products according to different recipes while satisfying environmental, economic and social criteria. (Publication No. 12, Project No. KP-06-N37/5/06.12.2019).

□ A stochastic/robust approach has been implemented for optimal design of resource-supply chains for production and distribution of dairy products, produced according to different technologies (recipes) on a real case study from Bulgaria. (Publications No. 13, No. 21, No. 22, No. 23 and No. 24, Project No. KP-06-N37/5/06.12.2019).

IV. Mechanical behavior and delamination of layered nanocomposites - analytical methods and optimization

1. SCIENTIFIC CONTRIBUTIONS

□ A two-dimensional stress function method in combination with minimization of additional deformation energy for three-layer nanocomposite structures (graphene/SU-8/PMMA, hBN/interface/PMMA, WS₂/SU-8/PMMA) was developed and validated. Analytical solutions for the axial stress in the nanolayer were obtained in two different cases - real and complex roots of the characteristic equation, determined by the geometry and material properties of the structure. Based on the obtained solution in the nanolayer, the stresses and strains (axial, normal and shear) were also derived for the remaining layers in the nanocomposite structure (Publications No. 16, No. 19, No. 20 and No. 25, Project No. KP-06-H57/3/15.11.2021).

□ A theoretical nonlinear criterion for the occurrence of delamination at the interface of a three-layer nanocomposite has been formulated, based on the model interface shear stress and the ultimate shear strength of the adhesive layer. The criterion has been applied to predict the debond length under different mechanical loads and geometries, with the results showing good agreement with experimental data from the literature. (Publications No. 16, No. 17, No. 19, and No. 25, Project No. BE 1090/48-1, Project No. KP-06 H57/3/15.11.2021).

□ An analytical solution has been derived using a 2D variational method to describe the behavior of a graphene/PMMA nanocomposite under combined hygro-thermo-mechanical loading. It was found that mechanical loading is the leading factor for the occurrence of delamination (critical value 350 MPa), while temperature and humidity effects have a weaker but measurable influence. (Publication No. 17, Project No. BE 1090/48-1, Project No. KP-06 H57/3/15.11.2021).

□ An analytical method was applied to study the influence of three different types of adhesives on the interface shear stress and debond length in the BaTiO₃/epoxy structure under quasi-static harmonic mechanical loading and electric field. Analytical equations for resonance frequencies were obtained for both types of solutions and for the three adhesives studied. (Publication No. 18, Project No. KP-06 H57/3/15.11.2021).

2. SCIENTIFIC AND APPLIED CONTRIBUTIONS

□ The method has been extended and validated for deformations in a three-layer nanocomposite with new classes of 2D nanomaterials - tungsten disulfide (WS₂) and hexagonal boron nitride (hBN) - in a polymer matrix. The obtained solutions for the axial deformation show good agreement with experimental data from Raman spectroscopy in the elastic loading range. (Publications No. 20 and No. 25, Project No. KP-06 H57/3/15.11.2021).

□ The limit values of the mechanical load and the geometric parameters at which delamination does not occur in graphene-based and hBN-based nanocomposite structures have been determined. The obtained results constitute a basis for the development and improvement of nanocomposite devices for applications in sensors, nano- and optoelectronics, and energy systems, where interfacial integrity is a key factor for operational reliability. (Publications No. 16, No. 17 and No. 25, Project No. BE 1090/48-1, Project No. KP-06 H57/3/15.11.2021).

□ An integrated multiparametric approach for optimization of nanocomposite structures is proposed, combining analytical modeling and genetic algorithms (BASIC GA) to determine areas of safe operation without delamination. (Publication No. 25, Project No. KP-06 H57/3/15.11.2021).

□ The axial deformations predicted by the 2D method in graphene and WS₂ monolayers are compared with experimental data from Raman spectroscopy and results from a shear-lag model. An average relative error

below 10–20% in the elastic region is found, which confirms the validity and applicability of the method. (Publications #19 and #20, Project #KP-06 H57/3/15.11.2021).

6. Reflection of the scientific publications of the candidate in the Bulgarian and foreign literature

According to the attached reference B6, 65 works are presented, of which 4 chapters in books of prestigious publishing houses and 35 publications in the world databases WoS and Scopus; A reference is presented for citations in publications referenced in Scopus and WoS (172 citations in total); A significant number of scientific publications have a solid number of citations in prestigious international journals, such as:

Publication (B4) was cited 30 times; (D13) -13 times, (36) -11 times, etc. etc.

The habilitation thesis B includes **8 publications** in prestigious publications, which have been cited **56 times**.

The "Professor" candidate has an **h-index of 8** (with a total of citations in Scopus 172, for only 2022-47 citations) (<https://www.scopus.com/authid/detail.uri?authorId=23666803200>), which shows a lot high reflection of her scientific publications, especially in foreign literature.

7. Critical remarks and recommendations

The publication activity presented in the competition is impressive, and the works have been presented in the most renowned world publications. Under these circumstances, it would be difficult to find serious gaps in the quality of the articles due to the fact that these publications go through several levels of review by world-renowned specialists in the field. My recommendation is that Assoc. Prof. Dr. Eng. Kirilova continue to publish her scientific results in the most prestigious world publications. The candidate for "professor" has two profiles in Scopus, one is related to her maiden name Shopova, Elisaveta Georgieva <https://www.scopus.com/authid/detail.uri?authorId=56087091600>, and the second Kirilova, Elisaveta Georgieva <https://www.scopus.com/authid/detail.uri?authorId=36091327400>, probably related to the change in her marital status. Different Hirsch indices are indicated in the two profiles, they also differ in the number of citations. This creates a problem when evaluating the candidate. My advice is to merge the two profiles into one at the appropriate time - there is such an opportunity, let him realize it.

8. Personal impressions and opinion of the reviewer

I do not personally know the candidate Assoc. Prof. Dr. Eng. Elisaveta Georgieva Kirilova (Shopova). The reference shows that she is fluent in English, German and Russian, which gives her the opportunity to monitor scientific exchange, work on important international projects, participate in international scientific events and create a modern educational base. She has high competence, which is why she maintains solid international contacts. She knows how to work in a team and convey her experience. She is highly responsible in her professional activities as a researcher and teacher.

CONCLUSION

The presented materials meet the requirements of ZRASRB, the Regulations for its application, and the internal Regulations for the terms and conditions for holding academic positions at the Institute of Chemical Engineering, BAS. Based on my acquaintance with the presented scientific publications, their significance, and the contributions contained in them, I find it reasonable to propose Associate Professor Dr. Eng. Elisaveta Georgieva Kirilova-Shopova to take the academic position "Professor" in the professional field 5.2. Chemical Sciences, specialty "Processes and apparatus in chemical and biochemical technology".

Date: *23.07.2026*

MEMBER OF THE JURY:


(Prof. Iliya Iliev, PhD)