

## OPINION

Related to a competition for the Academic position of “Professor”,  
in the field of higher education 4. “Natural Sciences, Mathematics and Informatics”,  
professional field 4.6. “Informatics and Computer Science”, scientific specialty “Informatics”,  
for the needs of the Department “Bioinformatics and Mathematical Modelling”  
at the Institute of Biophysics and Biomedical Engineering – BAS

Prepared by Prof. Olympia Nikolaeva Roeva  
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Member of the Scientific Jury according to the Order № 673 / 30.11.2021  
of the Director of the Institute of Biophysics and Biomedical Engineering – BAS  
Prof. Tania Koleva Pencheva

The competition for the Academic position of “Professor”, in the field of higher education 4. “Natural Sciences, Mathematics and Informatics”, professional field 4.6. “Informatics and Computer Science”, scientific specialty “Informatics”, for the needs of the Department “Bioinformatics and Mathematical Modelling” at the Institute of Biophysics and Biomedical Engineering (IBPhBME) – BAS was announced in State Gazette Vol. 84/08.10.2021 according to the requirements in the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and the Regulations of ADASRB – IBPhBME.

Documents for participation in the competition were submitted by one candidate – Eng. Dicho Stoyanov Stratiev, D.Sc. The documents for the competition are presented in accordance with the Regulations of ADASRB – IBPhBME.

Eng. Dicho Stoyanov Stratiev, D.Sc. meets the requirements, respectively:

- Ph.D. Degree, scientific specialty 02.10.23 Technology of natural and synthetic fuels (Diploma № 27886 / 03.01.2002);

- D.Sc. Degree, scientific specialty 02.10.23 Technology of natural and synthetic fuels (Diploma № 34762 / 13.05.2011);

- Presented evidence that Eng. Dicho Stoyanov Stratiev, D.Sc. meets the minimum and specific requirements set out in Annexes 1 and 2 of the Regulations of IBPhBME – BAS for “Associate Professor”;

- Presented lists of publications for the acquisition of Ph.D. Degree, D.Sc. Degree and Academic position “Associate Professor”;

- Presented list and full text of publications for the Academic position “Professor”, which do not repeat the submitted publications for the acquisition of Ph.D. Degree, D.Sc. Degree and the Academic position “Associate Professor”.

### **General description of the submitted materials regarding the research activity of the candidate**

Eng. Dicho Stoyanov Stratiev, D.Sc., participates in the competition with the following materials:

1. 41 scientific papers. From them:
  - a. 37 papers in impact factor journals;
  - b. 4 papers with SJR.

A monograph is presented, which is not included in the list of publications.

The presented scientific publications significantly exceed the requirements for holding the Academic position "Professor".

2. A list of 1074 citations of the candidate's scientific publications is presented.
3. A list of 10 defended Theses for obtaining the Ph.D. Degree with supervisor or co-supervisor Dicho Stratiev is presented.
4. 1 patent is presented.

Eng. Dicho Stoyanov Stratiev, D.Sc., fulfils all conditions under item 6 of the Regulations for the implementation of the law on the development of Academic staff in the Republic of Bulgaria in IBPhBME – BAS, as well as the recommended scientific indicators from Table 1 (page 20) of the same regulations.

He is a member of the Union of Bulgarian Catalysts, the American Chemical Society, and the Union of Scientists in Bulgaria.

### **Teaching activity**

Eng. Dicho Stoyanov Stratiev, D.Sc., is the research supervisor / co-supervisor of 10 successfully defended Ph.D. students.

### **Scientific contributions**

Scientific and scientific-applied contributions of Eng. Dicho Stoyanov Stratiev, D.Sc., in the competition can be summarized as follows:

1. Contributions from the application of InterCriteria analysis for modelling the properties of oil and its derivatives.  
13 specific contributions have been formulated related to established relationships between key characteristics and / or values, such as:
  - a. The relationships between the properties of 22 types of oil belonging to all known groups of oil worldwide.
  - b. Evaluation of data for characterization of oil vacuum residues.
  - c. Evaluation of 30 oils, characterized by 27 properties.
  - d. Relationships between the properties of raw materials for catalytic cracking, and the conversion and yields of products and their quality and others.
2. Contributions from the application of generalized nets, artificial neural networks and the nonlinear least squares method for modelling processes and properties in petroleum chemistry and technology.  
9 specific contributions related to the construction of new models based on generalized nets have been formulated; the development of new procedures that achieve much better accuracy in predicting the cetane number of easily accessible physical properties, etc.

Undoubtedly, as a result of the presented scientific investigations many contributions can be formulated, but in my opinion the contributions had to be summarized and given much more generally.

The candidate formulates two practical contributions:

The improved efficiency of the studied processes (primary oil refining, catalytic cracking, visbreaking, hydrocracking in fluidized bed H-Oil, compounding (blending)) in the production of gasoline and diesel fuels expressed in financial units amounts to over 70 million USD for a period of 9 years.

The application of the InterCriteria analysis for selection of suitable for refining types of oil in the refinery of LUKOIL Neftohim Burgas has led to the realization of an economic effect of 62 million USD for a period of 5 years.

### **Citations**

A list of citations of Eng. Dicho Stoyanov Stratiev, D.Sc. publications is presented. At the time of providing the materials, 1 074 citations have been found. This number significantly exceeds the recommended scientific and merit indicators for the implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria in IBPhBME – BAS cited by the Regulations.

### **Plans for future research and development in the field**

Eng. Dicho Stoyanov Stratiev, D.Sc. is preparing two monographs:

“The Synergy between Ebullated Bed Vacuum Residue Hydrocracking and Fluid Catalytic Cracking Processes in Modern Refining – Commercial Experience”, and

“The Role of Petroleum Characterization in Modern Refining – An Application of InterCriteria Analysis”

with generalizations of research performed using InterCriteria analysis and mathematical modelling on petroleum chemistry and pseudo-fluidized bed catalytic hydrocracking and catalytic cracking technologies.

There are 4 Ph.D. theses with supervisor Eng. Dicho Stratiev, D.Sc. in process of development.

### **Conclusion**

Based on the above, I evaluate highly the scientific and scientific-applied work of Eng. Dicho Stratiev, D.Sc.

All requirements, conditions and criteria of ADASRB, the Regulations for the implementation of ADASRB adopted by Council of Ministers, and the Regulations for the implementation of ADASRB in IBPhBME – BAS are met and I give a positive conclusion for the election of Eng. Dicho Stoyanov Stratiev, D.Sc. in the competition for the Academic position “Professor” in the field of higher education 4. “Natural Sciences, Mathematics and Informatics”, professional field 4.6. “Informatics and Computer Science”, scientific specialty “Informatics”, for the needs of the Department “Bioinformatics and Mathematical Modelling” at IBPhBME – BAS.

I propose to the esteemed Scientific Jury to vote a proposal to the Scientific Council of IBPhBME – BAS to elect Eng. Dicho Stoyanov Stratiev, D.Sc., for the Academic position “Professor” in the field of higher education 4. “Natural Sciences, Mathematics and Informatics”, professional field 4.6. “Informatics and Computer Science”, scientific specialty “Informatics”.

14.02.2022

Scientific Jury member: .....  
/Prof. Olympia Roeva/