



## SCIENTIFIC OPINION

On the competition for the academic position "Associate Professor" at IChE- BAS, specialty "Processes and devices in chemical and biochemical technology", professional direction 4.2. Chemical sciens, announced in SG no. 17, 21.02.2023 , with candidate Assistant Professor, Boyan Christov Boyadjiev, Ph.D

The Opinion was prepared by: Assoc. Prof. Ph.D. Svetoslav Tsankov Nakov, IChE- BAS

The candidate, Assistant Professor Dr. Boyan Hristov Boyadzhiev, was born on February 10, 1972. He completed his secondary education at NPMG "Acad. Lyubomir Chakalov" in Sofia, majoring in Mathematics. In 1995, he obtained a master's degree in Computer Science at the Technical University – Sofia. He started working at IChE-BAS in 2019 as a technologist and has been serving as an "assistant professor" since 2021. He obtained his Ph.D degree in 2020 with a dissertation titled "Computer Modeling of Processes in Column Apparatus."

The candidate's scientific interests lie in the field of mathematical modeling, computer simulation, and the application of appropriate numerical methods in chemical engineering processes. In pursuit of these interests, the candidate has participated in four externally funded projects as a member of the research team. One of the projects is international, while the remaining three are funded by the Ministry of Education and Science. The candidate has also received two awards for his involvement in developments: a Gold Medal for the presentation of the development "Absorption-Adsorption Apparatus and Method for Gas Cleaning from Sulfur Dioxide" at the X National Exhibition "Inventions, Technology Transfer, Innovation" - ITI2017, and 3rd place in the category "Best Innovative Project" for 2017 awarded by the Innovation Council of the Bulgarian Chamber of Commerce and Industry (BCCI) for the project "New Absorption-Adsorption Method and Apparatus for Waste Gas Cleaning from Sulfur

Dioxide." In terms of organizational activities, it is worth noting his membership in the organizing committees of four scientific events, two of which he served as the organizing secretary.

In the announced competition, Dr. Boyan Hristov Boyadzhiev participates with 24 scientific publications, 9 of which are within the scope of his dissertation work. Out of the remaining 15 publications, 8 have an impact factor, with 3 of them belonging to the Q1 category with an impact factor above 5, and one in the Q2 category. He has co-authored a monograph and two book chapters. The publications have received 65 citations (excluding self-citations).

Based on the presented materials, which meet the minimum requirements for the position of "Associate Professor" in the field of Chemical Sciences, the candidate's achievements can be summarized as follows: Indicator A - covered; the other indicators exceed the respective requirements - Indicator B: 107 points (required: 100 points); Indicator C: 226 points (required: 200 points); Indicator D: 104 points (required: 100 points). The additional criteria of IChE-BAS for the appointment to the position of "Associate Professor" are also fully covered or exceeded.

In my opinion, the candidate's main scientific contributions lie in the development of new algorithms and programs for solving equations in the mathematical model of column apparatus, which allow the determination of the influence of radial velocity non-uniformity and tangential flow on process efficiency. Various specific models have been proposed for different processes in industrial column apparatus. Programs for parameter identification of these models have been created. The candidate's applied scientific contributions include proposed models for various types of column apparatus for the absorption of highly and weakly soluble gases, column apparatus for gas cleaning from sulfur dioxide, and for intensive mass transfer in three-phase systems, as well as a column reactor for conducting chemical processes. The applied aspect of the candidate's research is reflected in one granted patent and three published utility models.

The candidate's personal contribution to the discussed topic, considering the purely mathematical aspect of the problem and the fact that he is the first author in 2/3 of the presented publications, is undeniable and significant. Expanding and further developing the obtained

results presents a challenge and opens up a wide field for future work. I find that the recognition of the publications in the scientific community, based on the number of observed citations, is undeniable.

Conclusion: I believe that the scientific output of Dr. Boyadzhiev, in terms of volume and contributory results, meets all the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulation for the Implementation of the Law on the Development of Academic Staff in BAS, and the corresponding Regulation of IChE. His appointment as "Associate Professor" would be beneficial for IChE-BAS and for his further scientific development.

Therefore, I give my positive assessment and recommend to the esteemed Scientific Council of IEES to appoint Assistant Professor Dr. Boyan Hristov Boyadzhiev as "Associate Professor" in the professional field of Chemical Sciences, scientific specialty "Processes and Apparatuses in Chemical and Biochemical Technology" for the needs of the Institute of Chemical Engineering at BAS.

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Sofia

Prepared the Opinion:

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