

REPORT

On the competition for the academic position "Associate Professor " in professional field 4.2. Chemical sciences, specialty "Processes and apparatus in chemical and biochemical technology", announced in SG No. 96 (December 2, 2022)

with candidate assistant prof. Petya Georgieva Popova-Krumova, Ph. D.

Member of the scientific jury: Elena Razkazova-Velkova, Assoc. Prof. PhD Eng.
from the Institute of Chemical Engineering, Bulgarian Academy of Sciences (ICHE-BAS)

1. Brief biographical data and description of the applicant's scientific interests

Assistant professor Petya Popova-Krumova was born on 11.04. 1975 in the city of Burgas, where she completed her secondary education. In the period 1996-2000, she studied and graduated with a bachelor's degree "Ecology and Protection of the Environment and Man" at the University "Prof. Dr. Asen Zlatarov" and between 1999-2004 a master's degree in "Chemical Engineering" at the same University. The candidate's scientific interests date back to before the completion of the master's degree, when in 2004 she started as a full-time doctoral student at the Institute of Chemical Engineering - BAS, after completing a semesterly her master's degree. Thanks to this, in the period 2004-2008, she was a full-time doctoral student at the Institute of Chemical Engineering - BAS and successfully defended her Ph. D thesis on: "Parameters identification in models of chemical engineering processes". This predetermines the candidate's scientific interests in the mathematical modeling of chemical engineering processes.

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

The candidate's scientific research interests are focused on solving incorrect parameter identification problems of multiparameter models, using a polynomial approximations of the experimental data for the parameter estimation. Creation the mathematical models for describing chemical engineering processes based on convection-diffusion and average-concentration models.

Participation in projects: assistant professor Petya Popova-Krumova participated in 8 projects, of which 5 were international (4 with Israel and one with Russia). The national projects are financed by the National Scientific Fund. She was the head of a youth project financed by the "Scientific

Research" Fund, as well as a task financed by the budget subsidy of the BAS. She is the co-author of 3 patents and two utility models.

Organizational activity: She was the organizer as organizational secretary of 3 scientific events and is a participant in the organizing committee of one more.

The candidate also has a Gold Medal award for the presentation of the developments "Absorption-adsorption apparatus and method for purifying gases from sulfur dioxide", X national exhibition "Inventions, Transfer, Innovations"-ITI'2017

Total number of scientific publications: 27

of them with an impact factor (IF) and/or an impact rank (SJR): 12

Number of scientific publications not included in the Ph.D thesis :18

of them with an impact factor (ISI I F) and/or an impact rank (SJR): 10

Co-authorship in monographs. She is the co-author of two monographs and a book chapter

3. Evaluation of the submitted materials

The presented materials (Except those from the Ph.D. Thesis) include 18 publications, of which:

- Eight with impact rank
- Two with an impact factor above 2, falling into category Q1 and Q2;

Total number of citations 41,

A pleasant impression is made by the presence of two useful models and three patents, as well as the co-authorship of 2 monographs and a book chapter.

The materials presented in this way correspond in volume and content and exceed those required by the regulations of the BAS and that of IIH-BAS for holding the academic position of "Associate Professor", namely:

18 for the required 15 publications, other than those presented for the acquisition of "Ph.D.";

- Total number of publications 27 against the required 20;
- Number of publications in refereed journals 20 if necessary out of 15
- Number of publications in journals with an ISI Impact Factor or an impact rank of 12 with an immovability of 5;
- Total number of noticed citations on all works 41 if necessary from 20;

4. Basic scientific and scientific-applied contributions

I accept the scientific and scientific-applied contributions presented by the candidate, as formulated by herself.

Scientific contributions:

- A regularization method of the incorrect parameter identification problems
- Hierarchical approach for parameter identification of multiparameter models, using the polynomial approximation of the experimental data
- Mathematical models and algorithms for describing the processes in column apparatuses, as well as for the specific case of absorption-adsorption process in a bubble tray column;

Scientific applied contributions

- Mathematical models for waste free decontamination of gases from SO₂ in two consecutive absorption-adsorption apparatuses and integration of processes in one apparatus

5. *Reflection of the candidate's scientific publications in Bulgarian and foreign literature*

The candidate's publications have been widely reflected in the specialized scientific literature.

6. *Critical notes and recommendations.*

From the materials provided, the vision for work in the next 5 years is not clearly visible.

7. *Personal impressions of the reviewer about the candidate*

In my personal opinion, Petya Popova-Krumova is a person with original scientific thinking, organizational and team skills.

CONCLUSION All quantitative indicators for evaluating the candidate's research and academic activity correspond to and exceed the requirements for holding the academic position "Associate Professor". On this basis, I support the candidacy of Assistant. Professor Petya Popova-Krumova and I recommend to the scientific jury to award her the academic position " Associate Professor ".

Date: 13.03.2023

Member of the scientific jury:
(Assoc. Prof. E. Razkazova-Velkova)

