

REVIEW REPORT

on a competition for the academic position ASSOCIATE PROFESSOR in professional field 4.2. Chemical Sciences (Biophysicochemistry), announced in SG issue 63 of date 30.07.2021, with the sole candidate Assistant professor Dr. Nikolay Aleksandrov Grozev

Member of a scientific jury: Academician Alexander Georgiev Petrov, DSc

1. General characteristics of the materials presented. Monographies, articles and reports, textbooks, certificates and patents, research projects, etc. Assess whether the quantitative indicators of the requirements of the FCF-SU to occupy the academic position have been complied with. Specify the knowledge-related indicators (total number of articles, articles with impact factor, citations), reduction of articles, etc.

Assistant professor Dr. Nikolay Grozev is a co-author of 32 publications, of these, 28 were referenced and indexed in Scopus. In the competition for associate professor he participates with 18 publications, all referenced and peer-reviewed, of which 15 are in journals [2-11, 13-17], 2 are in conference proceedings [12, 18] and 1 is a chapter in series [1]. The total number of citations of these articles is 88.

Articles with [numbers from the list of papers]

quartile Q1 are 7 pcs. [2, 3, 4, 6, 7, 11, 13].

quartile Q2 are 4 pcs. [5, 8, 10, 17].

quartile Q3 are 4 pcs. [1, 14, 15, 16].

quartile Q4 are 1 pc. [18].

SJR are 2 pcs. [9, 12].

His PhD thesis (2003) includes 5 papers.

Thus, the requirements are met and Dr. Nikolay Grozev has been allowed to participate in the competition.

Under this competition, according to the requirements of the law, a separate habilitation work with included publications in referenced international editions with impact factor (Web of Science and Scopus) is presented. Habilitation work is based on 5 articles [1, 3, 4, 13, 14]. Citations of these articles are 53.

The articles outside the habilitation work are 13 [2, 5-12, 15-18]. Citations: 35.

The total number of citations was 171, h index = 9; No autocitations – 163, h index = 8; No autocitations of all co-authors – 115, h index = 6. Results were reported at more than 15 international and national scientific forums, such as oral reports, or poster sessions.

All these articles are accepted for review. Reducing articles is not necessary.

The applicant has led 1 scientific project with the FNI-MON and participated in 11 projects funded by local funds (FNI-MON) and by the European Community under 7 Framework Program and under Horizon 2020.

His scientific indicators demonstrate the various scientific abilities of the candidate and fully satisfy the requirements of FCP-SU for the academic position "associate professor".

2. General characteristic of the scientific, applied and pedagogical activities of the applicant (*scientific fields and problems; prepared PhD students and graduates*).

The entire work experience of Nikolay Grozev is at the Chemical Faculty of Sofia University (now Faculty of Chemistry and Pharmacy), Department of Physical Chemistry.

His main scientific field includes experimental studies of phenomena occurring at interfaces and surfactant adsorption. In 2003 N. Grozev successfully defended the dissertation work for the award of educational and scientific degree "Doctor" on the topic: "Mechanical, electrical and chemical properties of layers of linear polyester and cross-cut lignite-like polymers on the water-air interface".

His scientific contributions are in the field of physical chemistry of interfaces and colloidal chemistry. The techniques used with are: optical microscopy (OM), atomic-force microscopy (AFM), Bruster angle microscopy (BAM), ellipsometry, Sheludko-Exerova cell, Langmuir trough with Wilhelmi method, Langmuir-Blodgett films (LB films), sitting bubble method, contact angles measurements. The field of study is subdivided into:

I. Water/air interface:

Adsorption of inorganic ions [8] and monolayer approach in Langmuir trough [7, 9, 12, 13 and 14] for the study of pharmaceutical products, for synthesis of Pt nanoparticles and for the characterization of twin surfactants;

II. Thin films:

1. Solid films on a rigid substrate – polymeric (crystallization of polymers) [1, 3, 4] and sol-gel films [2, 18];

2. Liquid films on solid and liquid substrates – wetting, foaming and wetting films [5, 6, 10, 11, 15 -17].

It is obvious that Dr. Grozev works in a well-defined scientific field, in which he is a prospective researcher.

He has prepared and read the new course Physicochemistry I and II part for the specialties: Chemistry and English, Biology and Chemistry, Chemistry and Informatics. He has one graduated Master student.

3. Basic scientific and/or applied contributions with an assessment to the what extent they are the personal work of the applicant.

The main scientific contributions are reflected in the works equivalent to habilitation work **I** (5 in number) and in those outside the habilitation work **II** (18 in **number**). These are grouped into two thematic sub-areas. Scientific contributions belonging to the first thematic area (sub-area **I**), Phenomena at the water/air interface are 6 in number. Those in the second thematic area (sub-area **II**), Solid and liquid thin films) are 18 in number (see above).

The results are systematized in an author's account included in the competition materials. In a special opinion at the beginning of his author's account, the applicant very clearly distinguished his contributions under the present procedure from those of his co-authors (which in some cases are quite a number) including also graduates in the process of training by Dr. Grozev. Specifically, his own contributions include:

Measurement of surface tension of electrolyte solutions by different methods. Commissioning a new sensor for measuring surface tension and finding optimal conditions for working with it. Experiments with Langmuir balance in different modes. Interpretation of the results obtained and the supply of a suitable kinetic model. Conducting some of the experiments, as well as processing the experimental results. Participation in the discussion of the material. Characterization of the structures formed after the evaporation of drops of solution using optical microscopy. Conducting crystallization experiments in thin polymer films (monitoring processes in real time by optical microscopy and then by AFM). Measurement of contact angles and interpretation of the results obtained. Participation in the conduct of part of

the measurement of adsorption isotherms of three surfactants, the processing of these data and the discussion of the overall concept. Theoretical interpretation of results.

A convincing conclusion is drawn that Dr. Grozev appears in this competition with a sufficient number of contributions in several new directions of physicochemistry of surfaces and colloidal chemistry.

The candidate is the lead author of a number of publications. There are active collaborations with leading specialists from abroad. He has been invited to deliver reports at prestigious conferences in Bulgaria and abroad and has earned a well-deserved international authority.

This reviewer supports these new contributions obtained and considers that they have the character of:

- *Formulation or justification of a new theory or hypothesis:*

Contribution I. 1; Contribution II. 3;

- *Enrichment of existing knowledge and theories:*

Contributions I.1 and 1.4; Contributions II. 2 and II. 3;

- *Getting new facts:*

Contributions I. 2 and I. 3; Contributions I.1 and 1.4

- *Creation of new classifications, methods, constructions, technologies;*

Contribution II. 3;

- *Possibilities for the implementation of physicochemical achievements in industrial and medical practice:*

Contribution I. 3; Contribution II.2.

4. Critical notes and recommendations on the works submitted.

I don't have any special notes.

5. Personal impressions of the applicant.

I don't have any personal impressions.

6. Reasoned and clearly formulated conclusion (if a candidate meets the requirements of the Rules of Procedure of the FCP-SU for the academic position).

The scientometric data of Dr. Nikolay Grozev, PhD, cover separately and in total the requirements of FCP-SU for the academic position "Associate Professor".

The presented scientific works characterize the candidate in this competition Dr. Nikolay Grozev as a formed Bulgarian scientist-physicochemist who credibly represents the Bulgarian physicochemical science to the world.

Given the relevance, importance and recognition of his scientific contributions, I strongly propose that Dr. Nikolay Grozev take up the academic position ASSOCIATE PROFESSOR of Professional Direction 4.2. Chemical Sciences (Biophysicochemistry).

Produced: acad. Alexander Georgiev Petrov

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7.12.2021