



OPINION

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of the materials submitted for participation in the competition
to occupy the academic position "professor"
at the University "Prof. Dr. Asen Zlatarov" - Burgas
by field of higher education 4. Natural sciences, mathematics and informatics;
professional direction 4.2. Chemical sciences, scientific specialty "Chemistry",

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

The set of electronic materials presented by Prof. Dr. Romyana Zlatinova Yankova-Avramova is in accordance with ЗРАСРБ, the Regulations for the development of the academic staff at the University "Prof. Dr. Asen Zlatarov" - the city of Burgas and includes all the necessary documents for participation in the competition for the academic position of "professor". The materials include a total of 119 scientific publications, of which: 57 in Scopus and Web of Science; 61 publications referenced and indexed in world literary sources and one monograph; Hirsch index, h-index=14, eight manuals, of which 5 are independent and 3 with a collective of authors. Part of the publications (35) were not used in competitions, and 54 were used to acquire the academic position "docent" and to award the ONS "doctor".

For participation in the competition, 30 scientific publications are submitted, which are indexed and referenced in the world-famous scientific information databases Web of Science and Scopus, which are the result of the candidate's scientific activity after holding the academic position of "docent".

The presented scientific activities fully cover the national criteria for occupying the academic position "professor-" in professional direction 4.2. Chemical Sciences as follows:

Group of indicators "A" (required 50 points) - in 2015 Associate Professor Yankova-Avramova defended her doctoral dissertation on the topic "Methodical system for applying the physicochemical experiment in the preparation of students for the formation of natural science literacy of students" (50 points);

Group of indicators "B" (100 points according to national requirements and 200 points according to PRAS in UAZ, Burgas) - 9 scientific publications (5 in categories Q1 and 4 in Q2) are included in publications that are referenced and indexed in world-renowned databases with scientific information Web of Science and Scopus (205 points);

Group of indicators "D" (200 points according to the national requirements and 350 points according to PRAS in UAZ, Burgas) - 21 scientific publications are presented in publications that are referenced and indexed in world-famous databases with scientific information (Web of Science and Scopus), outside the habilitation work. Of these, 3 are in the Q1 category, 4 are in Q2 and 14 in Q3 – a total of 365 points.

Group of indicators "D" (100 points according to the national requirements and 200 points according to PRAS in UAZ, Burgas) - 150 citations in scientific publications, referenced and indexed in world-famous scientific information databases Web of Science and Scopus have been declared, which corresponds to 300 points;

Group of indicators "E" (120 points according to the national requirements and 200 points according to PRAS in UAZ, Burgas) - Assoc. Prof. d-r. Romyana Yankova-Avramova is the supervisor of two successfully defended doctoral students, participates in two national scientific projects and in a team of an international educational project. She has published 8 study aids, five of which are stand-alone. Total - 226.8 points.

From the attached report on the fulfillment of the requirements of the Regulations for the Development of the Academic Staff at the University "Prof. d-r Asen Zlatarov" - Burgas for occupying the academic position of "Ass. Professor" and the attached evidentiary materials show that Associate Professor d-r Romyana Yankova-Avramova fully meets the criteria for teaching experience, research activity, educational activity, professional and expert activity.

2. Evaluation of the pedagogical preparation and activity of the candidate

Ass. Prof. Romyana Yankova-Avramova is 33 years old (assistant, senior assistant, chief assistant, associate professor; developed 25 study programs; two successfully defended doctoral students; eight defended diploma students; created a teaching laboratory on "Methodology and technique of chemical demonstrations in inorganic chemistry" and in "Chemistry" majoring in "Medicine"; participation in 36 international and national scientific conferences Prof. Yankova is the author of 5 and co-author of 3 manuals for practical exercises, which support the theoretical preparation in the relevant disciplines and the formation of methodological skills when conducting experimental work in the education of students and doctoral students. I would also like to note the active work of Prof. Yankova with students, doctoral students and postdoctoral students on scientific tasks in the implementation of scientific research projects. On 22/11/2023 she was elected dean of the Faculty of Medicine "Prof. Dr. As. Zlatarov" University, and in the term 2019 - 2023 she was deputy dean of the Faculty of Medicine and head of the department "Physiology, Pathophysiology, chemistry and biochemistry".

3. Main contributions

Publications declared for participation in the competition can be structured in the following thematic areas:

- Preparation and characterization of new ionic liquids.
- Analysis of surface phenomena occurring in heterogeneous ionic liquids.
- Research the kinetics of thermal decomposition of ionic liquids.
- Application of ionic liquids as effective catalysts for esterification.
- Characterization of compounds for the purpose of their application.
- Preparation and characterization of coordination compounds. Study of their reactivity.

Main contributions in the thematic direction

I. "Preparation and Characterization of New Ionic Liquids"

- New ionic liquids have been synthesized: pyridine dihydrogen phosphate, imidazole hydrogen sulfate, imidazole hydrogen selenate.
 - Aromaticity of an inorganic anion in the structure of ionic liquids has been documented.
 - Pyridine hydrogen sulfate, pyridine dihydrogen phosphate, and imidazole hydrogen sulfate have been found to possess nonlinear optical properties.

II. "Analysis of surface phenomena occurring in heterogeneous ionic liquids"

- The nature of the surface interactions in the investigated heterogeneous systems as a function of the nature of the carrier is clarified.
 - The spatial arrangement of the immobilized active phase on the surface of the carrier in heterogeneous systems pyridine hydrogen sulfate/ α -Al₂O₃, pyridine hydrogen sulfate/ash from rice husks was established.

III. Studying the kinetics of thermal decomposition of ionic liquids

- The thermal behavior of the ionic liquids pyridine hydrogen sulfate, pyridine dihydrogen phosphate, pyridine nitrate and the heterogeneous systems obtained on their basis

(pyridine hydrogen sulfate/ α -Al₂O₃ and pyridine hydrogen sulfate/ash from rice husks) were studied, as well as the kinetics of thermal decomposition of pyridine nitrate.

- The melting and decomposition mechanisms of the samples were established as a function of the degree of intramolecular hydrogen bonding and the nature of the carrier.

IV. Application of ionic liquids as efficient esterification catalysts

- The catalytic activity of the following ionic liquids was investigated: pyridine hydrogen sulfate, 4-amino-1H-1,2,4-triazole nitrate, 2-amino-1,3-thiazole hydrogen sulfate sulfate monohydrate, pyridine nitrate, pyridine dihydrogen phosphate, the heterogeneous systems of pyridine hydrogen sulfate/ α -Al₂O₃ and pyridine hydrogen sulfate/rice husk ash.

- A mechanism for obtaining butyl acetate by forming an active complex with the participation of ionic liquid pyridine hydrogen sulfate as a catalyst is presented, and the optimal conditions for obtaining butyl acetate and methyl oleate in the presence of pyridine hydrogen sulfate, 4-amino-1H-1,2, 4-triazole nitrate and pyridine nitrate.

V. Characterization of compounds for the purpose of their application

- A new derivative of quinoxaline-2,3-dione was synthesized, namely 1,4-diallyl-6-chloroquinoxaline-2,3(1H,4H)-dione and its reactivity was investigated.

- A new synthetic block co-polymer, homogeneous PDMS-b-PAA (polydimethylsiloxane-block-polyacrylic acid) with different PAA chain lengths was created.

- Chitosan nanoparticles have been found to affect the ordering and organization of lipids in biomimetic membranes by increasing the degree of lipid ordering in a concentration-dependent manner.

VI. Preparation and characterization of coordination compounds. Study of their reactivity

- The coordination compounds were experimentally and theoretically characterized: dioxo-molybdenum(VI) complex with glycylglycine; bis(2-aminothiazole)dibromozinc (II); bis(2-aminobenzothiazole-N)dichlorocobalt(II); [Pt(3-amino-1,2,4-triazole)2Cl₂] and bis(benz-imidazole)silver(I) nitrate.

- The cytotoxicity of the platinum(II) complex with 3-amino-1,2,4-triazole was evaluated, it was found to be a suitable nanomaterial for various biomedical applications, including anticancer therapy.

- The antibacterial effect of the silver(I) complex with benzimidazole was evaluated against Gram-negative *E. coli* ATCC25922 and Gram-positive *Staphylococcus aureus* ATCC 25923.

Ass.Prof. Yankova is the lead author in 13 and second author in 9 of the presented scientific publications. He has participated in one international scientific project, one national scientific project and one national educational project. She participated in 13 intra-university projects at the Research Institute of the University "Prof. Dr. Asen Zlatarov" (he is the head of three of the projects). These facts clearly prove the candidate's personal contribution to the development and publication of the scientific results. The scientific works of Ass.Prof. d-r. Rumyana Yankova-Avramova have been cited 150 times in scientific publications, referenced and indexed in world-famous databases with scientific information (Web of Science and Scopus), which shows the great scientific interest and recognition of the published results.

4. Significance of contributions for science and practice

The presented scientific works, containing original scientific scientific-applied and applied contributions, received international recognition when they were published in journals of international scientific publishing houses. The citations of Prof. Yankova-Avramova's scientific publications in scientific publications, referenced and indexed in world-renowned databases with scientific information, are an indicator of her recognition among the scientific circles at home and abroad. The scientometric data of the candidate fully cover the criteria for

occupying the academic position "professor" in direction 4.2. Chemical Sciences, with national minimum requirements being exceeded.

5. Critical notes and recommendations

My recommendation to Prof. Dr. Romyana Yankova-Avramova is to limit her scientific interests to 2-3 thematic areas.

Conclusion

The documents and materials presented by Prof. Dr. Romyana Yankova-Avramova meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the regulations for its implementation and the relevant Regulations for the Development of the Academic Staff of the University "Prof. Dr. Asen Zlatarov" - Burgas.

The candidate in the competition has submitted a sufficient number of scientific works published after the materials used in the defense of the ONS "Doctor". The candidate's works contain original scientific and applied contributions that have received international recognition, a representative part of which has been published in journals and scientific collections issued by international academic publishing houses. The theoretical developments have practical applicability, and some of them are directly oriented to the academic work. The scientific and teaching qualifications of Prof. Dr. Romyana Yankova-Avramova are unquestionable.

The results achieved by Associate Professor Dr. Romyana Yankova-Avramova in the educational and research activities fully correspond to the specific requirements of the Regulations for the Development of the Academic Staff of the University "Prof. Dr. Asen Zlatarov" - Burgas.

After getting acquainted with the materials and scientific works presented in the competition, analyzing their significance and the scientific, scientific-applied and applied contributions contained in them, I find it reasonable to give my positive assessment and recommend the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Medicine for the election of Assoc. Dr. Romyana Yankova-Avramova to the academic position of "Professor" at the University "Prof. Dr. Asen Zlatarov" - Burgas in the field of higher education 4. Natural sciences, mathematics and informatics, by professional direction 4.2. Chemical Sciences, scientific specialty "Chemistry", announced for the needs of the department "Physiology, Pathophysiology, Chemistry and Biochemistry".

Prof. D.Sc. Panteley Denev

