

## REPORT

by Assoc. Prof. Meglena Ilieva Kandinska-Vasileva, PhD  
Faculty of Chemistry and Pharmacy, Sofia University "St. Kl. Ohridski "

on the materials presented for participation in a competition for the academic position of "Associate Professor" in the Department of Organic Chemistry and Pharmacognosy, Faculty of Chemistry and Pharmacy, Sofia University "St. Kl. Ohridski", professional field 4.2. Chemical Sciences, scientific specialty Organic Chemistry-Chemistry of Heterocyclic Compounds

The only candidate in the competition for "Associate Professor", announced in the State Gazette, issue 105, p. 137/11.12.2020, is Head Assistant Professor Nikola Tomov Burdzhiev, PhD from the Department of Organic Chemistry and Pharmacognosy, Faculty of Chemistry and Pharmacy, Sofia University "St. Kl. Ohridski".

The materials presented by Dr. Nikola Burdzhiev on the competition are in accordance with the Regulations for the Implementation of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), Regulations for the Development of the Academic Staff of the Sofia University, meet and exceed the requirements of the Faculty of Chemistry and Pharmacy for the academic post "Associate Professor".

Nikola Burdzhiev graduated with honors as a Bachelor of Chemistry at the Faculty of Chemistry, Sofia University "St. Kl. Ohridski" in 2002. During the period 2003-2007 he was a full-time PhD student at the Department of Organic Chemistry, Faculty of Chemistry, Sofia University "St. Kliment Ohridski". He defended his PhD Thesis entitled: "Polyfunctional piperidinones and pyrrolidinones – synthetic and chromatographic studies" in 2007 under the supervision of Assoc. Prof. Dr. Elena Stanoeva. Dr. Burdzhiev was appointed as a Senior Assistant at the Department of Organic Chemistry, Faculty of Chemistry, Sofia University "St. Kliment Ohridski" in 2008 and he was promoted to the position of Head Assistant Professor two years later.

The candidate has submitted 19 publications in the competition's research domain published in the period 2008-2020, which are not included in his PhD Thesis. 16 of them have been published in journals with impact factor (IF), 3 – in referred and indexed editions with SJR, distributed between the quartiles as follows: 4 - in Q1 journals, 7 - in Q2 journals, 1 - in Q3 journals, 7 - in Q4 journals.

In the reference for fulfillment of the minimum national requirements under art. 2b of ADASRB within the criterion B, 6 articles are included (1 in Q1, 3 in Q2, 2 in Q4 journals). Within the criterion D, 13 publications are included (3 in Q1, 4 in Q2, 1 in Q3, 5 in Q4 journals). In addition, in the reference the minimum requirements the following information is provided: 54 citations (Scopus), participation in 8 research projects (the candidate is a leader of one of them) and h-index 7. Three short-term specializations at the University of Oxford, Oxford, UK, Max-Planck-Institut für Polymerforschung, Mainz, Germany, Universitat de Barcelona, Barcelona, Spain are mentioned.

Dr. Burdzhiev is a co-author of a total of 24 scientific papers and 3 textbooks. Most of the publications of the candidate submitted for participation in the competition (11 in total) and out of the competition (5 in total) have been published in Q1 and Q2 journals, which is a certificate of

the quality of the research conducted with the participation of the candidate. Nikola Burdzhiev's publishing activity after acquiring the scientific and educational degree "Doctor" makes an extremely good impression – 22 of the presented publications have been published since 2008 in renowned scientific journals such as *Nature Methods*, *European Journal of Medicinal Chemistry*, *Comptes Rendus Chemistry*, *Organic Preparations and Procedures International*, *Chemical Papers* et al.

The scientific works of Dr. Burdzhiev applied for participation in the competition cover research in the field of Organic Chemistry. The main contributions of the candidate to each of the scientific developments are clearly outlined in the relevant reference and in the Habilitation Thesis, as they are divided into three directions.

The scientific work of the candidate in the area 1. *Synthesis of heterocyclic compounds by reactions of cyclic anhydrides and subsequent modifications to obtain compounds with potential biological activity* is focused on the synthesis of new heterocyclic ring systems by interaction of cyclic anhydrides with imines; examination of the stereochemical course of the reactions; increasing their stereoselectivity; studying and improving the synthetic approaches for further transformations of the isolated acids in order to obtain appropriately functionalized products with certain biological properties; detailed structural characterization of the newly synthesized compounds by spectral methods and determination of the ACE inhibitory, antihistamine and antiaromatase activity of the most of them.

A part of the research activity of Dr. Burdzhiev, summarized in the field 2. *Synthesis and spectral characterization of heterocyclic compounds with potential application in practice*, is dedicated to the preparation of heterocyclic compounds whose optical properties are changed under the complexing with metal ions and such characteristics make them potential sensors for metal ions or molecular switches. With this purpose, derivatives of 2-acetyl-1,3-indandione were synthesized, and its reaction with aromatic aldehydes without or containing a crown ether fragment was studied in detail. Deacylation of the starting 2-acetylindanedione was observed for the first time in two of the cases investigated during the condensation in an acidic medium, and a mechanism of the ongoing reaction was proposed. The complexing properties of the synthesized 2-acetyl-1,3-indandione derivatives and of tautomeric imines with crown ether part were studied.

Research of Nikola Burdzhiev in direction 2 demonstrates his interest in another actual synthetic field, namely the preparation of functional dyes with the potential for inclusion in systems for the conversion and storage of the solar energy. Environmentally friendly approaches with the participation of the candidate have been developed for the synthesis of squaraine dye and organic quaternary salts – precursors for the production of cyanine dyes.

The candidate's research included in direction 3. *Spectral properties of heterocycles used in practice* reveal opportunities for the application of NMR spectroscopy in the search for novel approaches to increase the solubility of low soluble drugs, as well as for the reliable identification of heterocyclic narcotic substances with known or unknown structure.

The Habilitation Thesis entitled "Polyfunctional heterocyclic compounds – synthetic and spectral studies" summarizes the research of Dr. Burdzhiev mainly in scientific area 1, which are presented to the scientific community through 6 scientific papers. It is written on 33 pages in excellent scientific language and undoubtedly convinces in the relevance, significance and usefulness of the candidate's scientific achievements.

The materials applied to present the pedagogical activity of Dr. Burdzhiev prove his commitment to the teaching activity of the Department of Organic Chemistry and Pharmacognosy. The candidate is a lecturer of 3 compulsory courses for the specialty "Chemistry" and 2 elective courses for all chemical specialties. He supervises seminars and laboratory exercises in 5 disciplines for students-chemists, pharmacists and biologists. All courses assigned to Dr. Burdzhiev are in the field and professional area of the announced competition.

For three consecutive years the candidate has been awarded by students graduating the Faculty of Chemistry and Pharmacy for The Best Assistant of the Year, which undoubtedly convinces in the excellent teaching skills of Nikola Burdzhiev.

Nine diploma theses of students from different chemical specialties in Bachelor's and Master's degree are defended and highly evaluated under the supervision of Head Assistant Professor Burdzhiev.

Dr. Burdzhiev has been a member of the National Commissions for the National Chemistry Competition and the National Chemistry Olympiad since 2012. He is involved in the practical and theoretical training of the Extended Team and the Team of Bulgaria for participation in the International Chemistry Olympiad. For this activity Nikola Burdzhiev was awarded with a Sign of Honor of Sofia University "St. Kl. Ohridski"

## CONCLUSION

The documents and materials presented by Head Assistant Professor Nikola Tomov Burdzhiev meet the requirements for holding the position of "Associate Professor", according to the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Regulations for the Implementation of ADASRB, the Regulations for the Implementation of ADASRB of Sofia University and the specific criteria of Faculty of Chemistry and Pharmacy.

The scientific achievements presented by Dr. Burdzhiev correspond to the professional and scientific area of the competition and confirm the high scientific level of his research work. Based on the results achieved by the candidate during his research and teaching work and based on my personal opinion about Dr. Burdzhiev as an erudite chemist, lecturer and colleague, I confidently give my positive assessment, recommending the Scientific Jury to prepare a proposal to The Scientific Council of Faculty of Chemistry and Pharmacy for election of Head Assistant Professor Dr. Nikola Tomov Burdzhiev for the academic position of "Associate Professor" in the professional field 4.2. Chemical sciences, scientific specialty Organic Chemistry-Chemistry of Heterocyclic Compounds, Department of Organic Chemistry and Pharmacognosy, Faculty of Chemistry and Pharmacy, Sofia University "St. Kl. Ohridski".



Sofia,  
14 April 2021

/Assoc. Prof. M. Kandinska, PhD/