

REPORT

by Prof. Dr. Dragomir Simeonov Yankov
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regarding the materials submitted for participation in the competition to occupy the academic position of "professor" at the Institute of Organic Chemistry with Centre for Phytochemistry (IOCCP), BAS

in the field of higher education **4. Natural sciences, mathematics, and informatics**
professional field **4.2. Chemical Sciences**, scientific specialty **"Organic Chemistry"**

In the competition for the academic position "professor", announced in the State Gazette, No. 89 of 08.11.2022 and on the website of IOCCP, BAS, Reader Svilen Plamenov Simeonov, Ph.D. from laboratory "Organic Synthesis and Stereochemistry" of IOCCP is the only candidate.

1. General presentation of the procedure and the candidate

The set of materials presented by Reader Svilen Simeonov, Ph.D. is in accordance with the Regulations for the Development of the Academic Staff of the IOCCP, and meets the criteria of the IOCCP -BAS for occupying the academic position of "professor".

The candidate, Reader Svilen Simeonov, submitted a total of 17 scientific papers, and a list of 8 research projects, which were not included in his Ph.D. Thesis and in the competition for the academic position "Reader". All 17 scientific works that are outside the dissertation and 8 research projects are accepted for review. 9 scientific papers on the Ph.D. dissertation and 12 scientific papers not presented in the materials for the competition are not reviewed. The distribution of scientific works according to the relevant Q factors is as follows: Q1 - 16 and Q4 - 1. The *Hirsch* index of Reader Simeonov is 17 (Scopus).

Reader Svilen Simeonov, Ph.D. graduated from higher education with a bachelor's degree at the Faculty of Chemistry and Pharmacy of SU "St. Kl. Ohridski" in 2002, where in 2004 he obtained a master's degree in organic chemistry. Reader Simeonov defended his thesis for the educational and scientific degree "doctor" at the Faculty of Pharmacy of the University of Lisbon in 2014. During the period 2004-2005, Svilen Simeonov worked as an analytical chemist at Unipharm AD, Sofia, from 2006 to 2010 and from 2014 to 2017 at IOCCP-BAS as an assistant. Since 2017, he has held the position of "Reader" at the IOCCP. Reader Sv. Simeonov specialized in the Instituto Superior Technico, Lisbon, Portugal, in the Faculty of Chemistry of the University of Vienna, and in the Institute of Applied Synthetic Chemistry of the Technical University of Vienna. Svilen Simonov is the winner of the award for young researchers of UNESCO, PHOSAGRO, IUPAC, "Green Chemistry for Life", 2015 and the award "Acad. Bogdan Kurtev" 2017-2019 for achievements in the field of organic chemistry.

2. General description of the activity of the candidate/s

Evaluation of the candidate's scientific and scientific-applied activity

The scientific papers presented by Reader Simeonov for the competition were published exclusively in renowned international journals with a high impact factor (from 2.94 to 54.3), belonging to the Q1 quartile.

Contributions (scientific, scientific-applied, applied) and citations

The main scientific contributions in the presented materials can be divided into two groups:

- Development of new methods for biorefinery based on biorenewable furan derivatives;
- Synthetic modifications of natural products;

On the first topic, research is focused on furfural and 5-hydroxymethyl furfural as a base for obtaining pentane-1,2,5-triol. The proposed concept is based on the Akhmatovich rearrangement and subsequent hydrogenation of the reactive intermediate. The synthesis was realized both in liquid (publ. 3C) and in the gas phase (publ. 4C) using different catalysts. The resulting pentane-1,2,5-triol was used for preparing a nano gel as a slow-release carrier for doxorubicin (publ. 10D).

The isomerization of 6-hydroxy-(2H)-pyran-3(6H)-one under the action of ruthenium catalysts was investigated (publ. 5C). Isomerization proceeds with reduction of the alkene leading to 4-keto- δ -valerolactones. Using isotopic labeling and DFT calculations, the reaction mechanism was studied in detail.

In publ. 1C a methodology for the stabilization of HMF based on the use of $\text{Na}_2\text{S}_2\text{O}_4$ was developed. Publ. 2D, 3D, 6D, and 7D reported the preparation of HMF from glucose, diformyl furan, as well as various ethers of HMF.

The preparation of various biologically active compounds based on lupanin, cytosine, and oleuropein was studied on the second topic (publ. 1D, 12D, and 5D).

Of particular interest is the review paper devoted to the methods for obtaining Shikimic acid, its epimers, and its synthetic modifications and applications (publ. 4D).

The results of Reader Simeonov's published research have found a significant response in the international scientific community. To date, Simeonov's publications have been cited over 2,200 times. 901 citations were submitted for the competition, of which 100 were on the competition publications. Among the publications presented for the competition, which aroused serious interest, I can mention 1C with 25 citations, 4D with 18 citations, and 2D with 17.

Participation in projects and scientific forums

Information is presented on the participation of Reader Simeonov in 8 research projects, of which 3 are international, in which Sv. Simeonov is the leader of the Bulgarian team. Reader Simeonov is the leader of two projects and a participant in another 3, financed by Bulgarian sources.

Pieces of evidence from two invited lectures and participation with reports and posters in 4 international and one national conference are presented.

Assessment of educational and pedagogical activity

Reader St. Simeonov supervised the preparation of bachelor theses of two students and is currently the supervisor of one doctoral student.

Evaluation of the candidate's personal contribution

The research carried out by Reader Simeonov involves combining the knowledge and efforts of specialists from different fields, which leads to the participation of larger scientific teams in some of the publications. I do not doubt the applicant's substantial

personal contribution to the submitted articles. In three of them Reader Sv. Simeonov is the first author, and in 9 he is listed as a corresponding author.

3. Critical remarks and recommendations

The documents submitted for the competition are precisely designed, and the habilitation work is written in clear and understandable language. I have no critical remarks about the materials submitted for participation in the competition and about the work of Reader Simeonov. I would recommend Sv. Simeonov to expand his work in the training of young specialists - masters and doctoral students, to which the project on the NNP "Vihren" led by him would also contribute.

CONCLUSION

The documents and materials, presented by Assoc. Dr. Svilen Plamenov Simeonov, meet all the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria (DASRBA), the Regulations for the Implementation of the DASRBA, the Regulations for the Implementation of the DASRBA of the BAS and the Regulations of the IOCCP- BAS.

The candidate in the competition has submitted a sufficient number of scientific works published after the materials used in the defense of the Ph.D. Thesis and the competition for "Reader". In the works of the candidate, there are original scientific and applied contributions that have received international recognition as a representative part of them has been published in renowned international journals. His theoretical developments have practical applicability. Simeonov's scientific qualification is unquestionable.

The results achieved by Reader Svilen Plamenov Simeonov, Ph.D. in the scientific and research activity fully correspond to the specific requirements of the Regulations of the IOCCP-BAS for the application of DASRBA.

After getting acquainted with the materials and scientific works presented in the competition, and analyzing their significance, I find it reasonable to give my positive assessment and recommend the Scientific Jury to prepare a report-proposal to the Scientific Council of the IOCCP-BAS award to Reader Svilen Plamenov Simeonov the academic position of "professor" in the IOCCP-BAS by professional direction. 4.2. Chemical sciences, scientific specialty "Organic Chemistry".

Sofia

Prepared the review:

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.. Prof. Dragomir Yankov, PhD