Annex 2.25

REVIEW

From Assoc. Prof. Dr. Eng. Pencho Angelov Stoychev
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on the materials submitted for participation in a competition
for the academic position "Associate Professor"
in the Field of Higher Education - 5. Technical sciences,
Professional Area - 5.13. General engineering,
specialty - Engineering Ecology

The competition for „Associate Professor“ has been announced in the State Gazette no. 68 / 31.07.2020, on the website of TU-Gabrovo and in the section "Competitions" of the Register for academic positions and dissertations of NACID. In the announced competition the needs of the Department of Mathematics, Informatics and Natural Sciences at the Faculty of Economics, as the only candidate participates Ch. Assistant Professor Dragomir Stoyanov Vassilev, PhD, who works in the Department of Mathematics, Informatics and Natural Sciences of the Technical University - Gabrovo and holds the academic position of "Assistant Professor".

1. Short biography of the candidate

Ch. Assistant Professor Dragomir Stoyanov Vassilev, PhD, was born on July 13, 1981 in the town of Sevlievo. He graduated from Vasil Levski Sevlievo High School in 1999. He graduated in Chemistry at the Paisii Hilendarski University of Plovdiv, where he studied from 1999 to 2003, and then in a Master's degree in Medical Chemistry at the same university- 2004. In 2016 he defended his dissertation on "Ultrasonic synthesis of biodegradable plasticizers for plastics" at the University of Food Technology, Plovdiv in a professional field 4.2. "Chemical Sciences", doctoral program "Organic Chemistry". In 2016 he graduated with a master's degree in "Environmental Protection and Sustainable Development" and obtained the qualification "environmental engineer".

In 2004, after a competition, he was elected an assistant in the Department of Chemistry and Ecology at the Technical University of Gabrovo. In the period 2004-2020 he held the position of assistant, senior assistant and currently is a chief assistant in the Department of Mathematics, Informatics and Natural Sciences.

Ch. Assistant Professor Dragomir Stoyanov Vassilev, PhD, is registered in the systems: Scopus with ID 57127984800, ORCID with iD 0000-0003-0579-894X, as well as Web of Science with Researcher ID: J-8837-2013. According to Scopus and Web of Science, the candidate has a Hirsch Index h = 3.

2. Overview of submitted competition documents

To participate in the competition, the candidate has submitted a list with the titles of 31 scientific publications (7 articles and 24 reports), 1 textbook, 4 manuals for laboratory exercises, reference for citations, taught disciplines and a list of participation in 15 research projects, 2 of which he is the head.

I do not accept for review scientific publications № G.8.14 and G.8.15, as well as the textbook № У / УП.3 in which I am a co-author.

Of the peer-reviewed scientific papers, 29 are scientific publications in publications of international conferences and journals, 3 of them are in international conferences abroad (№ G.8.22, 26, 27), 18 in scientific conferences (including with international participation) in Bulgaria (G.8.1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 17, 24, 25, 28, 29, 30, 31), 7 in journals in Bulgaria (№ G.8.9, 16, 18, 19, 20, 21, 23) and 1 in Scientific papers of PU “P. Hilendarski ”(№ D.8.4).

13 works have been written in English and 18 in Bulgarian, 5 are independent, 8 with one co-author, 6 with two co-authors; the other 12 have three or more co-authors. The candidate is in first

place in 16 publications and second in 6. In the attached list he has not presented scientific papers in journals with impact factor.
The compliance of the points by groups of indicators with the minimum requirements for holding the academic position of “Associate Professor” in field 5 “Technical Sciences”, laid down in Art. 2b of ZRASRB, is presented in the following table:

Group of indicators	Indicators	Min. number of points for "associate professor"	Number of points of the candidate
A	Indicator A1	50	50
B	Indicator B3	100	100
G	Sum of indicators from 5 to 11	200	272,3
D	Sum of indicators from 12 to 15	50	76

The summary of this information is as follows:
Group of indicators A (at least 50 points) – PhD thesis - 50 points;
Group of indicators B (at least 100 points) - published monographic work or equivalent scientific publications (not less than 10) in publications that are referenced and indexed in world-famous databases with scientific information - 1 published monograph - 100 points;
Group of indicators G (at least 200 points) - scientific publications in non-refereed editions with scientific review or in edited collective volumes - 31 publications with different number of authors - 272.3 points.
Group of indicators D (at least 50 points) - citations in scientific journals, referenced and indexed in world-famous databases - 7 citations in referenced scientific journals of 2 scientific publications (70 points), 3 citations in non-refereed journals with scientific review points) - a total of 76 points.
My conclusion is that with the presented monograph, scientific publications and citations, the candidate Ch. Assistant Professor Eng. Dragomir Vassilev fully meets the minimum national requirements for holding the academic position of "Associate Professor" for the field of "Technical Sciences" in higher education, laid down in Art. 2b of Law for development of the academic staff in the Republic of Bulgaria.
The minimum quantitative requirements for candidates for the academic position of "Associate Professor", according to the rules of the Technical University - Gabrovo, are also met by the candidate Dragomir Vassilev, which can be seen from the following table:

Indicators	Min. requirements of TU Gabrovo for "Associate Professor"	Number submitted by the candidate
Total number of publications (articles and reports)	20 of which at least 4 standalone and (1) * with IF (WoS)	31, of which 5 independent author
Number of known citations from other authors	5	10
Number of known citations from other authors	2	5
Project and contract management	1	2

3. Reflection of the applicant's scientific publications in the scientific community (known citations)
To participate in the competition, the candidate has submitted a list of 10 citations in scientific publications abroad of 4 of his works. All are in foreign editions.
As a result of publishing activity and the corresponding reflection by citation from other authors, the candidate has a Hirsch index of 3 according to the world-famous scientometric databases Scopus and Web of Science, and it can be concluded that he is known to the scientific community.

4. Overview of the content and results in the presented works
The scientific works that Ch. Assistant Professor Dragomir Vassilev, PhD, presented for participation in the competition for "Associate Professor" can be summarized in three main areas:

Thematic area 1. Application of ultrasonic and microwave energy for synthesis and modification of organic compounds

This thematic group covers publications G.8.1, G.8.10, G.8.18, G.8.23, G.8.24, G.8.25, G.8.26, G.8.30, G.8.31 and the monograph. They are dedicated to engineering solutions for the synthesis, modification and application of organic compounds in modern chemical and environmentally friendly technologies, related to the introduction of green technologies. It seeks to limit the application of conventional methods in chemical technology and to replace them with those aimed at limiting pollutants (harmful or non-degradable waste from chemical production) in the three main components of the environment (water bodies). , air and soil). The topicality is reduced to a detailed application of the interconnected principles of "green chemistry", summarized and specified in the following areas:

- more efficient utilization of material and energy resources by increasing the degree of conversion into the target product in chemical synthesis.
- minimizing the release of waste chemical compounds that cannot be disposed of.
- application of fast modern methods for analysis of products of synthetic chemistry, which will allow effective control of safety and working conditions.
- reducing financial and material costs in chemical technologies by creating opportunities for recycling of chemical products.

To achieve these results, it is proposed to use microwave (MW) and ultrasonic (US) effects when conducting chemical interactions with organic compounds, which will reduce the consumption of energy, solvents and time.

It is pointed out that ultrasound is one of the modern directions of the so-called "green chemistry" and emphasizes the main advantages of sonochemistry, associated with the acceleration of chemical reactions through cavitation and the generation of microbubbles. These processes take place both in the extraction and in the chemical modification of natural biologically active organic compounds. The principles of green chemistry and the main characteristics of ultrasonic action and its application in organic chemistry are discussed. A characteristic of cavitation, its parameters and the factors influencing the ultrasonic field is made. The influence of the solvent on the cavitation is discussed, as well as that of external factors, such as the presence of gases in the liquid, external pressure and temperature. The chemical modification of organic compounds under ultrasonic treatment and the necessary tools for its implementation in laboratory conditions are considered. The reactors with ultrasonic influence, which are used in industrial conditions, are also systematized.

Methods for the synthesis of polymers and for the modification of carbohydrates are considered. The application of modified polysaccharides in the food and pharmaceutical industry, as well as in the chemical industry in the production of plastics is also analyzed in detail. The synthesis and modification of natural organic compounds under ultrasonic treatment, which includes the synthesis of esters of higher fatty acids, is considered, and the mechanism of Fisher esterification as well as transesterification is clearly presented. Intraesterification of triglycerides and that with carboxylic acid is discussed. The synthesis of aliphatic esters of fatty acids with methanol and ethanol under ultrasonic exposure is presented. The synthesis of L-ascorbyl palmitate was carried out under the same effect. The results of esterification of inulin with various reagents and catalysts, with and without solvents, by transesterification have been published, but the sources do not mention ultrasonic action.

The applicability of esters obtained with ultrasonic and microwave energy is considered. The use of biodegradable fillers in plastics solves part of the problem of environmental pollution. Esters of fatty acids with mono-, oligo- and polysaccharides are cheap and safe raw materials that can be used both in the chemical and in the food and pharmaceutical industries. The applied innovative methods for synthesis - ultrasonic and microwave effects meet the basic requirements of scientific approaches to solve environmental problems - energy savings, minimum consumption of raw materials, reagents, consumables, reduced waste of non-renewable products, preservation of biological value of natural products.

There are many examples of successful solutions to a wide range of engineering, environmental and technological problems in the field of chemical production.

Thematic area 2. Engineering ecology and environmental protection

Publications G.8.2, G.8.3, G.8.4, G.8.6, G.8.11, G.8.17, G.8.19, G.8.20, G.8.28 and G.8.29 are included in this thematic group.

They point out that environmental protection is one of the most important problems of our time. The main sources of air and water pollution are industrial enterprises and transport. The latter emit huge amounts of organic and inorganic substances into the environment - oxides of carbon (CO, CO_2), nitrogen, sulfur, as well as cyanides, especially toxic hexavalent chromium and others. Prevention or reduction of pollution can be achieved in various ways.

One of the most reliable ways of destroying harmful compounds based on their catalytic oxidation with the participation of complete oxidation catalysts has been applied. In addition to solving environmental problems, complete oxidation catalysts are used to produce heat generators that ensure the conversion of chemical energy into heat, as well as to create sensitive gas analyzers.

It was found that the pH of the medium strongly influences the degree of oxidation of the metal included in the catalyst and determines its activity.

The content of total and surface active oxygen in the obtained oxide systems, as well as its influence depending on the pH of the medium were studied.

The specific surface of the catalytic systems was studied. The density of the obtained catalysts was studied. The resulting catalysts can be successfully used in environmental catalysis for the catalytic purification of fluids (gases and liquids) containing organic substances, which is favored by the high content of active oxygen due to the method used to prepare.

The activity of catalysts in the oxidation of organic compounds in solutions was studied.

Thematic area 3. Ensuring safety at risk of exposure to chemicals

Scientific publications G.8.5, G.8.9, G.8.16 and G.8.21 present developments on risk assessment through the OiRA online platform, which consists of an OiRA tool generator (where developers create sector tools) and OiRA sectoral risk assessment tools, accessible through an interactive website where micro and small enterprises can carry out risk assessment. The assessment is developed on the basis of the methodology for economic activity "Human Health" created by the author.

5. General characteristics of the candidate's activity

5.1. Educational and pedagogical activity

The candidate for "Associate Professor" Ch. Assistant Dragomir Vassilev, Ph.D. He is a holder of 4 disciplines - 1 for Bachelor's degree and 3 for Master's degree. Conducts laboratory and seminar exercises in 13 disciplines. He participated in the competition with 1 textbook and 4 textbooks, all of which were peer-reviewed.

Under the guidance of the candidate, 5 diploma theses were successfully defended, and another 1 was a consultant. All are on topics related to the research activities of Ch. Assistant Dragomir Vassilev, PhD, in the field of engineering ecology. Of these, 4 are for a bachelor's degree and 2 for a master's degree. He has been a reviewer of 21 dissertations and numerous papers at the international conference UNITECH.

Ch. Assistant Eng. Dragomir Vassilev was responsible for the master's degree in "Environmental Protection and Sustainable Development" in the academic year 2019/2020.

Ch. Assistant Dragomir Vassilev has participated in the preparation of curricula in the disciplines of Chemistry, Environmental Chemistry, Engineering Ecology and others. in bachelor's and master's degrees.

Member of the State Examination Commission for the Protection of Diplomas works for students majoring in "Environmental Protection and Sustainable Development" in 2018/19 and 2019/20 academic year. The candidate has a good language training. He speaks English, which allows him to maintain useful contacts and exchange information with colleagues from abroad working in his scientific field.

5.2. Scientific and scientific-applied activity

The scientific and applied activity of the candidate is related to his participation in 15 research projects, 2 of which he was a supervisor.

He is a participant in a project funded by the National Research Fund, 3 under the Operational Program "Human Resources Development" and in one project under the "Research Fund", 1 under the "Leonardo da Vinci" program.

The thematic focus of the projects in which the applicant has participated can be summarized in the following technical areas:

- Synthesis and activity of oxide catalyst systems for catalytic and photocatalytic oxidation of toxic organic compounds in an aqueous medium;
- Prevention and control of pollution from industry;
- Design, spectral and structural characterization of new organic materials with nonlinear optical properties and application in high technologies;
- Environmental protection and sustainable development;
- Exploring the possibilities for environmental protection.

5.3. Implementation activity

The applicant has submitted an official note proving its implementation, a practical tool for workplace risk assessment in economic activity "Human Health" (code 86 of NACE.BG-2008) under project BG051RO001 - 2.3.01 "Prevention for safety and health in work", financed under the Operational Program "Human Resources Development", co-financed by the European Union through the ESF, implemented by the Executive Agency "General Labor Inspectorate".

6. Contributions (scientific, scientific-applied, applied).

I accept the contributions formulated by the author regarding the publications with which he participates in the competition for associate professor. In essence, they have a scientific-applied nature and can be summarized as follows:

Scientific and applied contributions in the works on the thematic area "Engineering ecology and environmental protection"

• Catalytic systems for complete oxidation based on nickel and cobalt oxides are applied for treatment of wastewater contaminated with organic substances.

• A tool for monitoring the parameters of the process of complete catalytic oxidation in a static and flow-circulation reactor has been created.

Scientific and applied contributions in the works on thematic area "Application of ultrasonic and microwave energy for synthesis and modification of organic compounds"

• Ultrasonic treatment was applied in the preparation of aliphatic and sugar esters of higher fatty acids.

• A microwave effect has been applied for the synthesis of new organic substances with potential biological activity.

• Reaction parameters for optimization of ultrasonic synthesis of aliphatic and sucrose esters of higher unsaturated fatty acids, in which no destruction, isomerization and oxidation of the reaction products are performed, are optimized.

• The antimicrobial and antifungal activity of ultrasonic esters has been proven.

• The ultrasonic synthesis of sucrose palmitate is optimized, the optimal parameters of esterification are determined and the influence of the type of catalyst on the yield and the duration of the process is determined.

• The applicability of sucrose esters as biodegradable plasticizers in plastics processing has been proven for the first time.

• The morphology of plasticized polyvinyl chloride with sucrose esters was determined using scanning electron microscopy.

Applied contributions in the works on the thematic area "Ensuring safety at risk of exposure to chemicals"

The interactive online risk assessment tool OiRA for the economic activity "Human Health" has been developed.

7. Assessment of the personal contribution of the candidate.
On the topics presented in the works for participation in the competition, Ch. Assistant Dragomir Vassilev has been working since entering the department in 2004. I know his work and considering his good theoretical training and engineering skills I believe that the presented materials are personal developments or with his leading participation.

8. Critical remarks and recommendations
Based on the analysis of the works submitted to me for review, I make the following remarks and recommendations for the future work of Ch. Assistant Professor Dragomir Stoyanov Vasilev, PhD:
• To intensify its work with doctoral students and young scientists in order to create a team with the capacity to obtain more meaningful results;
• Participation in several projects funded by the university should be a prerequisite for successful application with projects such as the National Research Fund of Bulgaria;
• To intensify its participation in projects under the profiled research programs of the European Union, as well as in other international and regional specialized programs.
The critical remarks made in no way detract from the candidate's contributions. I recommend to Ch. Assistant Dragomir Vassilev, PhD, to continue his scientific and publishing activity in the areas defined by him, as well as to look for opportunities to apply his results.

9. Personal impressions
I know Ch. Assistant Professor Dr. Eng. Dragomir Stoyanov Vassilev for 16 years and I think that his attitude to official duties, colleagues and students is at an excellent level. He always shows responsiveness and readiness to undertake the implementation of all assigned educational, pedagogical and research tasks. During half of this period I was the head of his department and on this basis I believe that he is an established scientist and researcher in the field of engineering ecology.

10. CONCLUSION
On the basis of my thorough acquaintance with the presented scientific works by the candidate, the contributions contained in them, as well as on the basis of all other presented achievements in the educational activity, the comparison with Law for development of the academic staff in the Republic of Bulgaria, the Regulations of TU-Gabrovo and my personal impressions, I offer regarding the appointment of Ch. Assist. Prof. Dragomir Vassilev as "Associated Professor" at Technical University of Gabrovo in Field of Higher Education - 5. Technical sciences, Professional Area - 5.13. General engineering, specialty - Engineering Ecology.

26.10.2020

Review prepared by: /signature/
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