

REVIEW

in a competition for the academic position "**Professor**" in Professional Management 4.2 Chemical Sciences, Scientific Specialty "Physical Chemistry" for the needs of the Department of Physical Chemistry

announced in the State Gazette, issue 21 from 15-03-22 page 138 ..

Candidate: Associate Professor Dr. Veselin Kostadinov Petrov,

Reviewer: Professor Tsonko Mitev Kolev, Institute of Molecular Biology - BAS

Only one candidate participates in the competition for Professor of Chemical Sciences (Physical Chemistry) at the Department of Physical Chemistry - Associate Professor Dr. Veselin Kostadinov Petrov. To participate in the competition, the candidate has submitted the entire set of documents in accordance with the requirements of the Regulations for the implementation of the Law on the Development of the Republic of Academic Staff in Bulgaria. The materials are prepared with care and precision

The candidate - Chief Assistant Dr. Veselin Kostadinov Petrov with address: Sofia, zh.k. Mladost-3, bl. 308, ap. 17, tel :... 0888 930 908, 0876 617 930, +351 93 482 4843 ...

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Website: <https://goo.gl/CXBUZb>

has submitted the following documents for participation in the competition:

in pdf format at <https://elearn.uni-sofia.bg/course/view.php?id=73380> as the numbering and file names correspond to the list as follows:

1. Curriculum vitae (file named 1.CV.pdf)
2. Diploma of higher education and to it - scanned document * (file named 2.DiplomaHE.pdf)
3. Diploma for educational and scientific degree "Doctor" - scanned document * (file with name 3.DiplomaPhD.pdf)
4. Diploma for scientific degree "Doctor of Science", if the candidate has one - scanned document * (file named 4.DiplomaDSc.pdf)
5. Document for scientific title or academic position - scanned document * (file with name 5.DiplomaAcadPosition.pdf)

6. Certificate of work experience in the specialty (file named 6.WorkExperience.pdf) 7. Documents proving the possibility of the requirements under Art. 115, para. 1, item 2 (official notes and certificates from employer, project manager, financing organization or project assignor.
7. References and evaluations, awards and other appropriate evidence for the evaluation of the candidate) (file with name.Artefacts.pdf)
8. Medical certificate certifying mental and physical health ** (file named 8.MedicalDocs.pdf)
9. Certificate of criminal record, certifies the absence of a penalty "deprivation of the right to practice a certain profession or activity" ** (file named 9.CriminalRecordsCertificate.pdf)
10. List of publications, inventions and other scientific and applied results: a / list of all publications (file named 10A.AllPublicationsList.pdf) b / list of publications submitted for participation in the competition (file named 10B.SelectedPublicationsList.pdf)
11. List of publications, conferences, projects and supervisors created by the system "Authors", in cases where the candidate already holds an academic position at Sofia University "St. Kliment Ohridski "(file named 11.AuthorsSummary.pdf)
12. Information on education for completion of the minimum national requirements for scientific field and the additional requirements of Sofia University "St. Kliment Ohridski ", to which the necessary evidence is attached (in the cases of Art. 115, para. 1, item 5 a) and b)) (file named 12.CompletionMinRequirements.pdf)
13. Reference to the citations with a complete bibliographic description of the cited and cited publications (file named 13.Citations.pdf)
14. Information on the original scientific contributions to which the costs are applied evidence (file named 14.Contributions.pdf or 14.Contributions.rar)
15. Information on the indicators under Art. 122, para. 2 with appropriate (with description and appendices) (file named 15.Artefacts.pdf or 15.Artefact.rar, containing description and evidentiary appendices in pdf format)
16. Scientific papers submitted for participation in the competition, structured and numbered according to the list under item 16. 10b (file named 16.JointNumberedPublications.pdf or archived in one file 16.JointNumberedPublications.rar, containing the articles submitted for the competition in pdf format and numbering according to 10b)
17. Abstracts of peer-reviewed publications in Bulgarian and one of the languages traditionally used in scientific field (in one document) (file with name 17.PublicationsSummary.pdf)
18. Copy of the advertisement in the State Gazette (file named 18.StateGazette.pdf)
19. Habilitation work.

Vesselin Kostadinov Petrov was born on November 10, 1970. In the period 1984-1988 he graduated from the National High School of Natural Sciences and Mathematics, Acad. L. Chakalov. Between 1988-1990 he completed his military service. In 1990 he entered Sofia University "St. Kliment Ohridski ". He graduated in 1996 with a degree in Especially Pure Substances and Materials Based on Them. In the period 2000-2004 he was a doctoral student at the University of Forestry. Acquired specialty: Doctor of Ecology.

Between 2006 and 2014 he was a senior researcher / photochemistry and supramolecular chemistry at the Faculty of Science and Technology, New University of Lisbon, Portugal. Since 2015 he has been a senior assistant at the Department of Physical Chemistry at Sofia University "St. Kliment Ohridski ".

From **2017 to present** Associate Professor in the Department of Physical Chemistry at Sofia University "St. Cl. Ohrid.

Teaching activity:

Physical Chemistry Part I (Thermodynamics) - seminars and exercises - SU, FHF Physical Chemistry Part II (Kinetics and Statistical Thermodynamics) - seminars - SU, FHF ICS - lectures and exercises - SU, FHF Information Technology - lectures and exercises - SU, FHF POD and NIT I and II part - lectures and seminars - SU, FHF Chemical Informatics, lectures and exercises - SU, FHF Non-equilibrium Thermodynamics, lectures and exercises - SU, FHF Infrared Spectroscopy in the Near Area (NIR), lectures and exercises - SU , FHF Physical Chemistry and Coloidal Chemistry (I and II), lectures - SU, FHF Mathematical modeling in Chemistry - lectures and exercises (Lisbon) General and Analytical Chemistry - exercises (Lisbon) Introduction to Java, C and C ++ programming - lectures and exercises, Code

Academy PhD students: Raquel Gomes, Luis Crus, Frederico Neve, and Andre Sousa, together with Prof. F. Pina (Lisbon), Stoyanka Slavcheva, together with Prof. I. Petkov and Dr. Stanislav Stanimirov. In my opinion, the scientific guidance of Assoc. Prof. Dr. Petrov for the scientific growth of Dr. Slavcheva is indisputable.

Publications and quotes:

To date: 47 published, 1 accepted for printing, 1 sent for review. 43 publications are in international journals with impact factor. The publications have been cited more than 1,000 times (830 according to scopus).

index 16. <http://www.scopus.com/authid/detail.url?a0puthorId=35743495600>

<https://scholar.google.com/citations?hl=en&user=Os337VQAAAAJ>. The list of publications can be seen for reference.

Research interests of Assoc. Prof. Petrov can be grouped in general as:

Chemistry and physicochemical characterization of dyes:

Properties of dyes in solution and solid state studied using molecular spectroscopy, fluorescence and theoretical chemistry. Color characteristics and related phenomena (aggregation, tautomerism, protonation, complexation); Connection structure - optical properties; Reactions caused by external influences - photoreactions, thermoreactions, electrochemical reactions.

Optical recording and optical media for information recording and energy storage. Thermodynamic and kinetic constants related to the characterization of complex systems. Optical properties of metal complexes.

Spectral data processing:

Separation of overlapping strips; Estimation of the number of bands in a complex spectrum and the number of individual components in a complex mixture. Quantitative analysis of undefined mixtures and complex equilibria. Complexes of inclusion and determination of stability constants.

Derivative spectroscopy:

Methods for improving the signal-to-noise ratio and quantitative analysis of complex mixtures.

Physicochemical analysis of complex equilibria:

Methods for quantitative analysis of undefined, complex and multicomponent systems.

Analysis of undefined mixtures:

Methods for analysis of mixtures with unknown in number and type components and their applications in practice.

Kinetics and mathematical modeling in chemistry

Chemometrics and mathematical modeling of chemical processes. Application of statistics, chemometrics, programming and mathematical modeling in chemistry and related sciences.

The languages the candidate speaks are:

Bulgarian, English, Russian, Portuguese. My opinion is that the Portuguese language should pass after the Bulgarian language. Reading lectures and seminars in any foreign language requires a high level of professional knowledge and a broad general culture.

Computer skills:

Operating systems: Expert level in DOS, Windows, Linux, Free BDS, UNIX Programming languages: Expert level in Assembler, Basic, Java, C, C ++, Delphi, and others Software: Uses Microsoft, Borland, Adobe, Corel, Wolfram, Mathad and others.

Hardware: In-depth knowledge of computer hardware.

Organizational experience:

Participation in courses and seminars for acquiring organizational skills and teamwork skills.

I should note that Assoc. Prof. Petrov is a spectroscopist experimenter who skillfully interprets the obtained experimental data and uses the methods of theoretical chemistry to understand the

mechanism of the studied processes. His fruitful collaboration with leading Portuguese scientists shows that he is sought after as a collaborator.

The candidate has prepared a List of all publications referred to in SCOPUS: [1-45]

Total citations: 788; Total factor factor (IF): 131; Average number of citations per article: 17.5.

Auditorium employment 406.5 hours. Total employment 432.3 hours.

The habilitation thesis of Associate Professor Dr. Veselin Petrov is entitled "Molecular Metamorphoses" for the Competition for Professor of Specialty (4.2 Physical Chemistry), and is written on 44 pages, divided into 6 parts and cited 51 references. The habilitation text is structured as follows:

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In the last chapter Conclusions and conclusions Assoc. Prof. Petrov clearly and succinctly emphasizes that

Flavilla compounds are very good examples of systems capable of chemical metamorphosis. These seemingly simple molecules, as often represented by flavian salts, can generate complex and diverse reaction networks, including several possible forms, which exist in equilibrium and have velocities of time of change of years as time is interrupted and bound. I think that the study of these balances makes habilitation work valuable, and the time intervals are particularly impressive.

In addition to being functionalized with specific substituents in position determination, flavilium cations can generate other flavilium isomers with different chemical and physical properties that further increase the number of species in the resulting reaction compounds and

complex combinations. The reversible nature of all chemical reactions or transformations constituting a reaction network of schemes of compounds of synthetic and natural flavils, allowing molecular potential application in molecular devices as optical and numerous elements. However, these systems have been studied especially as dilute isolated molecules in solution, soft materials or in a microheterogeneous medium.

I find it very important that the candidate noted the topic of future research, namely that the inclusion of these molecules in polymers, nanoparticles, surfaces, interfaces or as molecular building blocks of micelles or for the construction of molecular machines and complex systems can lead to complex systems of development of new materials with complex adaptive properties and the ability to react as living beings to external influences.

Critical remarks:

Given the significant volume of the attached documentation and the habilitation text, it is found that the errors and inaccuracies are within acceptable limits. The noticed small spelling mistakes, which are not evaluated on the value of the presented achievements of the candidate. The publication and discussion of the data from the only "absolute" method - single crystal X-ray diffraction would make the candidate's achievements even more significant. In one of the articles of the article only the parameters of the unit cell and the asymmetric unit are given, but there is no comment on the molecular and crystal structure of the observed compound. The authors only state that there are hydrogen bonds that are involved in building the "supramolecular" structure of the crystal, but do not describe or discuss it. It is not clear which interactions are dominant - intermolecular hydrogen bonds or π - π interactions between aromatic nuclei. Scientific contributions are a little more widely written, but this does not diminish the value

The most important scientometric indicators cited above give a clear idea of the value of Assoc. Prof. Dr. Veselin Petrov as a scientist. His teaching activity, mentioned in paragraph Teaching activity gives me reason to believe that Assoc. Prof. Dr. Veselin Petrov, in addition to being an established scientist in the field of Physical Organic Chemistry and Spectroscopy is also a good and valuable teacher and to manage the following

Conclusion:

Presented by the candidate for publication on the topic of the competition and represent original scientific developments with significant contributions in the fields of fundamental and applied physical organic chemistry - UV-vis spectroscopy and spectrochemistry. The research was conducted at a high scientific level, using the most modern experimental and theoretical approaches. They shed light on new aspects of spectrochemistry and spectroscopy of the studied classes of molecules. The materials attached to the competition give me reason to believe that the candidate is a scientist with deep knowledge and practical skills in the fields of physical organic, mathematical and theoretical chemistry, as well as instrumental methods. Associate

Professor Dr. Veselin Petrov demonstrates creative thinking and the ability to successfully select and solve tasks essential to science and practice. In conclusion, as a result of the above, I believe that with his scientific and scientific-teaching activities Associate Professor Dr. Veselin Kostadinov Petrov fully meets all the requirements of the Law on Occupying the Academic Position "Professor". I propose that he be elected Professor at the Department of Physical Chemistry at the Faculty of Chemistry and Pharmacy at Sofia University "Kliment Ohridski".

June 22, 2022

Sofia

(Prof. DSc Tsonko Kolev)