REVIEW

by Prof. DSc Krasimir Ivanov Ivanov - Department of General Chemistry, Agrarian University - Plovdiv, (now retired), on the materials submitted for participation in the competition for the academic position of Associate Professor at Plovdiv University "Paisii Hilendarski"

By order No. RD-22-55 of 09.01.2026 of the Rector of Plovdiv University "Paisiy Hilendarski" (PU), I have been appointed as a member of the scientific jury in a competition for the academic position of "Associate professor" in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.2. Chemical Sciences (General and Inorganic Chemistry), announced in the State Gazette, issue 96 of 11.11.2025.

1. General presentation of the materials received

The only candidate in the competition for the academic position of "Associate professor" is Senior Assistant Professor Dr. Kirila Trifonova Stoinova. The set of materials presented by Dr. Stoinova is in accordance with Article 29 of the Law on the Development of Academic Staff in the Republic of Bulgaria and Article 66(2) of the Regulations for the Development of the Academic Staff of the University of Plovdiv. To participate in the competition, the candidate has attached a total of 21 scientific publications (all published after obtaining a doctoral degree and the academic position of "Chief assistant") and all necessary documents for participation in the competition for the AD "associate professor" at the University of Plovdiv.

2. Brief biographical details of the applicant

Dr. Kirila Stoinova graduated with a Bachelor's degree in "University Chemistry", a professional qualification as a "Chemistry Teacher" in 2008, and in 2009 with a Master's degree in "Medical Chemistry" at the Faculty of Chemistry of the University of Plovdiv. After a short break and work as a "chemist" at the Medical University - Plovdiv, she returned as a full-time doctoral student at the Department of "General and Inorganic Chemistry with Chemistry Teaching Methodology" of the University of Plovdiv, where she received her PhD in 2014. Since 2015, she has been elected as a Chief assistant in the same department.

3. Evaluation of the candidate's scientific and applied activity

Publication activity

- *Scientific publications:*

The total number of scientific publications of Dr. Kirila Stoinova is 30 (29 of them indexed and referenced in the Scopus and/or Web of Science databases). She participated in the announced competition with 21 publications, all with an impact factor (ORCID: 0000-0003-2550-4339 https://orcid.org/0000-0003-2550-4339), three of them in journals with the highest rank Q1.

No claims have been made by the co-authors of the publications regarding the candidate's participation in the competition. No other information has been received about incorrectness or elements of plagiarism in the materials submitted for participation in the competition.

- *Participation in national and international scientific forums:*
  Dr. Stoinova's participation in scientific reports and posters is a total of 36, of which 11 with international participation (4 abroad).
- *Response in the scientific literature:*

The impact in the scientific literature of Dr. Stoinova's publications includes 57 noted citations (excluding self-citations) of 19 publications, with 37 of the citations being in journals in Web of Science and Scopus. It should be borne in mind that most of the

publications for participation in the competition are from recent years and their potential for serious impact in the scientific literature is yet to be developed.

According to Art. 29, item 5. of the Law on the Development of Academic Staff of the Republic of Bulgaria (in force from 05.05.2018), candidates for the acquisition of the title of Associate Professor must meet the minimum national requirements. In Art. 64. (2) and Art. 65. (1) of the PRASPU PU has also regulated additional requirements for acquiring the title of "Associate professor" and the Faculty of Chemistry also has specific requirements for candidates related to their teaching activities. From the report presented by Dr. Stoinova, it is clear that it exceeds the minimum requirements for all indicators (the total number of points from the materials for participation in the competition is 454 with minimum requirements of 400), as well as the specific requirements of the Faculty of Chemistry of PU.

4. Scientific and applied contributions

- ***Scientific contributions:***

The scientific research with which Dr. Stoinova participates in the competition is mainly in the field of coordination chemistry and is aimed at obtaining and characterizing new complex compounds with potential for application in various fields of ecology and environmental protection, medicine, pharmacy and applied inorganic chemistry. Some of them are also related to the search for new solutions and expanding the scope of research on the possibilities for application of extraction techniques in analytical practice.

The main scientific and scientific-applied contributions of the candidate are related to the synthesis and characterization of ion-associated complexes of Mo(VI), Ge(IV), Zn(II), Co(II), Ga(III), W(VI), Fe(III). They are described in detail in the attached Habilitation (in all 8 articles included in the reference, the candidate is the first author) and Author's Reference, which synthesize the most important results of the research with which Dr. Stoinova participates in the competition. All research is up-to-date and in line with the main priorities of the EU – Environmental Protection, Green Energy and Healthy Living. The most significant results and contributions, in my opinion, are in the development of coordination and analytical chemistry and can be summarized in two groups:

1. Preparation and study of ion-associated complexes:

Extensive studies have been carried out on a large number of ion-associated complexes obtained in liquid-liquid extraction systems containing bidentate and tridentate ligands of organic compounds and bulky cations of various nature, which in itself is a contribution to coordination chemistry. Eight new ion-associated complexes with complexing agents Zn(II), Mo(VI) and Ge(IV) have been obtained. The optimal conditions for their formation (absorption maximum λmax, extraction time, acidity of the aqueous phase and amount of reagents) have been determined and the composition of the obtained complexes has been established, which has alLawed to propose schemes for the complexation processes. The influence of side ions and reagents on the complexation and extraction has been studied, since the metal ions used as complexing agents in the newly obtained complexes are contained in various natural objects and metallurgical products, accompanied by a number of side elements. The influence on the extraction equilibria of side ions, which are most often found together with the studied metal in various objects, was studied. The influence of some reagents, which were used in the process of work as masking agents, was traced. Special attention was paid to Mo(VI) (publications 2, 3, 4, 5, 6), one of the ten vital and indispensable trace elements for living organisms, characterized by an extremely rich coordination chemistry.

2. Determination of the analytical characteristics of extraction systems:

It is known that photometric methods for determining transition metals in various objects are used in practice and some of them are the basis of a number of international ISO standards. However, the rapid development of analytical techniques in recent years has put extraction-spectrophotometric studies and the possibilities for their application in analytical chemistry under discussion and serious test. However, I believe that obtaining new knowledge on the complex formation and properties of transition metal complexes expands the potential possibilities for their application in other areas, for example, medicine and pharmaceuticals. This is a sufficient argument for the need for such studies. This opinion is also confirmed by the fact that the main results of the studies have been accepted and published in journals with an impact factor, including those with a Q1 rank. Research in this area builds on and upgrade the results of the candidate's dissertation work by expanding the scope and developing new extraction-spectrophotometric methods for determining metals important for living organisms, medicine and practice. The proposed approaches are distinguished by comparable, and in some cases even better analytical indicators compared to the known methods, expanding the possibilities for applying extraction techniques in analytical practice. A sensitive analytical procedure for the determination of Co(II) in the form of an ionic associate in vitamin B12 has been developed (publication 17), using the liquid-liquid extraction system Co(II) – TAR – MTT – H_2O – $CHCl_3$. The procedure is applicable to biological, medical and pharmaceutical samples containing cobalamin (vitamin B12). The ternary ion-associated complex $(BA^+)_2[WO_2(4NC)_2]$ has been used to develop a method for the analysis of steel and artificial mixtures resembling tungsten-containing alloys. The complex is intensely colored, which alLaws sensitive and economical determination of traces of W(VI) without the use of complex instruments and expensive consumables (publication 18). The intensely colored Law-spin complex of iron(III) with the general formula $(XMH^+)_3[FeIII(4NC)_3]$ has been successfully applied for the analysis of pharmaceutical and industrial samples. The method is distinguished by high reliability and a wide optimal range of parameters (publication 20). For the determination of Ga(III) in a model mixture including metals accompanying gallium in its alloys (Ge – Ga, Ga – In, In – Ga, In – Ga – Pb, etc.), the liquid-liquid extraction system Ga(III) – PAR – TTC – H2O – CHCl3 was used. The method is distinguished by affordable equipment, high accuracy and stability of the extracted complex, Law absorption of the blank sample and wide optimal ranges of the studied parameters (publication 18).

5. Implementation and expert activities

- *Participation in scientific and applied contracts and projects:*

Dr. Stoinova's project activities include 8 scientific projects, 2 of which with the Research Fund of the Ministry of Education, 5 with the Research Fund of the University of Plovdiv and one under the "Program for Accelerating Economic Recovery and Transformation through Science and Innovation", pillar 2 "Creating a Network of Research Higher Education Institutions in Bulgaria"

- *Expertise:*

Dr. Stoinova's expert activity is expressed as:

1. Participation in the organizing committees of nine scientific forums for the period 2015 - 2025, one of which is international (International Conference on Green Technologies and Sustainable Ecosystemsgreen Technologies and Sustainable Ecosystems, Paisii Hilendarski University of Plovdiv, Duecos, November 6-7, 2025).

2. Member of the Commission by quality at the Faculty of Chemistry of P. Hilendarski University, 2019 - present

- *Educational and pedagogical activities*:

Dr. Stoinova's teaching and pedagogical activity is entirely at the University of Plovdiv, and in the period 2015 - 2025 she has realized 5,346 hours of employment, of which 5,040

hours of classroom employment in the Bachelor's Degree Program. She has participated in 5 courses to improve her qualifications in teaching and research work.

6. Evaluation of the personal contribution of the candidate

Dr. Stoinova's publishing activity began in 2012 and is related to the topic of her dissertation and these publications (3 articles with IF) are not part of the materials for the competition. In 10 of the publications submitted for participation in the competition, she is the first author, and in 8 - the second, which is recognition not only for her active, but also for her leading participation in the research. This gives me reason to assume that the personal contribution of Dr. Stoinova in the materials submitted for participation in the competition is undeniable.

7. Personal impressions

I know Dr. Stoinova from my participation in the scientific jury at the defense of her dissertation, from which I have good impressions. I have no joint research or publications with the candidate and my opinion on the participation in the competition is based entirely on the materials and documents presented**.**

CONCLUSION

The documents and materials presented by Dr. Kirila Trifonova Stoinova meet all the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of ZRASRB, as well as the specific requirements of PRASPU and the Faculty of Chemistry. The candidate has presented a sufficient number of scientific works published after the defense of the PhD. The presented works contain original scientific contributions published in reputable journals with an impact factor, published by international academic publishing houses. All this gives me reason to give my positive assessment and to confidently recommend to the Scientific Jury to prepare a report-proposal to the Faculty of Chemistry of the University of Plovdiv for the election of Dr. Kirila Trifonova Stoinova to the academic position of "Associate Professor" at the University of Plovdiv "P. Hilendarski" in the professional field 4.2 "Chemical Sciences", scientific specialty "General and Inorganic Chemistry".

06.03.2026 г.

Reviewer:
(Prof. DSc Krasimir Ivanov)