OPINION

by *Assoc. Prof. Dr. Eng. Blagovesta Nikolaeva Midyurova*

Department of "Ecology and Environmental Protection", Faculty of Natural Sciences, Burgas State University "Prof. Dr. Assen Zlatarov" field of higher education 4. Natural Sciences, Mathematics, and Informatics, professional field 4.2. Chemical Sciences

of a dissertation for the scientific degree of "**Doctor of Science**" presented by Prof. Dr. Rumyana Zlatanova Yankova-Avramova on the topic "Structure and Functional Properties of Oxoselenates (IV, VI)", field of higher education: 4. Natural Sciences, Mathematics and Informatics, professional field: 4.2 Chemical Sciences, Scientific specialty "Inorganic Chemistry".

Reason: member of the scientific jury under procedure the procedure announced to Order UD – 583/19.12.2025 of the Rector of BSU "Prof. Dr. Asen Zlatarov". I received all materials related to the dissertation on electronic media.

1. General presentation of the procedure

The submitted set of materials complies with the Higher Education Act, the Regulations for the Implementation of the Higher Education Act, and Article 43, paragraph 3 of the Regulations on the Conditions and Procedure for Acquiring Academic Degrees and Holding Academic Positions at Burgas State University for the acquisition of the academic degree "Doctor of Science" and includes an application to the Rector of Burgas State University "Prof. Dr. Asen Zlatarov" for the initiation of the procedure, a curriculum vitae signed by the candidate, a copy of the diploma for the acquired educational and academic degree "Doctor", a dissertation for the scientific degree of Doctor of Science, an abstract of the dissertation in Bulgarian and English, a report on the scientific and applied scientific contributions of the dissertation, a list of scientific publications related to the dissertation, containing complete bibliographic descriptions and information for indexing in Scopus and Web of Science, copies of the scientific publications included in the dissertation, a report on the fulfillment of the minimum national requirements and the minimum requirements under the internal rules of "Prof. Dr. Asen Zlatarov" University a report on citations based on data from Scopus and Web of Science, as well as a declaration of originality and authorship of the dissertation.

2. Topic and relevance of the dissertation

The increased interest in modern science in selenium-containing compounds, and in particular in oxoselenates (IV, VI), determines the relevance of this dissertation. These compounds represent an essential class of inorganic materials, characterized by rich structural diversity and a wide range of functional properties. The targeted synthesis of substances with predetermined characteristics is becoming increasingly important in inorganic chemistry, requiring in-depth knowledge of the relationship between chemical composition, crystal structure, and physicochemical properties.

The potential of oxoselenate compounds for application in photonics, optoelectronics, nonlinear optics, catalytic processes, energy technologies, and biomedicine further emphasizes the importance of this research. The need to expand the experimental and theoretical database for selenite and selenate systems, including poorly studied and newly synthesized structures, determines its scientific value. The combination of modern experimental methods with quantum chemical modeling and analysis of biological activity is fully in line with current interdisciplinary trends in chemistry and materials science.

I believe that the topic discussed is extremely relevant, and the goals and objectives set have been achieved to the necessary extent.

3. Evaluation of the dissertation and research methodology.

The dissertation of Prof. Rumyana Zlatanova Yankova-Avramova represents an in-depth and large-scale scientific study devoted to the synthesis, structural characterization, and investigation of the physicochemical and functional properties of oxoselenate compounds. The topic is relevant and significant both for fundamental chemistry and for its potential applications in materials science, photonics, and biomedicine. The volume and content of the work testify to its comprehensiveness, with the material being logically structured and clearly presented, which facilitates the tracking of the objectives, methods, and results of the research.

The literature review is distinguished by its critical and analytical approach and is based on an impressive bibliography of 339 sources, including leading international publications. It clearly formulates the unresolved problems and scientific challenges that justify the necessity and significance of the research conducted.

The experimental part is characterized by high methodological precision and scientific accuracy. A wide range of modern synthetic, analytical, and spectroscopic methods are used, supplemented by quantum chemical calculations and biological tests, which guarantees the reliability and reproducibility of the results.

The section "Results and Discussion" is distinguished by its analytical depth, high scientific value, and interdisciplinary nature. The conclusions and scientific contributions formulated logically follow from the results obtained and emphasize the originality of the research. The work contributes significantly to the development of knowledge in the field of crystal chemistry of oxoselenate compounds and outlines new possibilities for their practical application.

In conclusion, the dissertation is distinguished by its high scientific level, methodological consistency, and significant contribution to contemporary chemical science, and fully meets the requirements for the award of the scientific degree of "Doctor of Science."

4. Publications and citations related to the dissertation

Group G includes 20 publications in international refereed journals indexed in Web of Science and Scopus (Q2–Q4), a significant number of which have been published by leading international publishers, and in many cases Prof. Yankova-Avramova is the lead or corresponding author.

The publications are distinguished by their high scientific level, precise application of modern experimental and theoretical approaches, and clearly argued interpretations of the results, and their scientific significance is confirmed by 96 citations (192 points on the D indicator), which significantly exceed the minimum requirements and testify to the international impact of the results.

5. Abstract and author's report

After reviewing the 71-page abstract, I believe that the most essential part of the dissertation has been sufficiently presented, allowing for an assessment of the relevance and scientific contributions of the dissertation.

The author's report shows that the candidate exceeds the minimum national requirements under the Higher Education Act and the Regulations on the conditions and procedures for acquiring academic degrees and occupying academic positions at Prof. Dr. Asen Zlatarov University of Burgas.

6. Brief comments

I have no critical comments on the dissertation.

Conclusion

I consider that the dissertation meets the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for its implementation, as well

as the Regulations on the conditions and procedures for acquiring scientific degrees and occupying academic positions at Burgas State University "Prof. Dr. Asen Zlatarov" – Burgas.

In accordance with the results achieved, their precise interpretation, and the scientific and applied scientific contributions made, I give a **positive assessment** of the dissertation on "Structure and Functional Properties of Oxoselenates (IV, VI)". I propose that the esteemed Scientific Jury award the scientific degree of "**Doctor of Science**" to **Prof. Dr. Rumyana Zlatanova Yankova-Avramova** in the field of higher education 4. Natural Sciences, Mathematics, and Informatics, professional direction 4.2 Chemical Sciences, Scientific specialty "Inorganic Chemistry."

Burgas Signature:

15.01.2026 /Assoc. Prof. Dr. Eng. B. Midyurova/