

South-West University "Neofit Rilski"

Stance

From Assoc. Prof. Dr. Galin Rusev Borisov

Member of the academic jury in a competition for the position of Associate Professor, announced by SWU 'Neofit Rilski' in Official Gazette No. 57/04.07.2023

Subject: The Scientific, Scientific-Application, and Professional-Academic Activities and Productions Presented by the Sole Candidate in the Competition, Elitsa Yordanova Chorbadzhiyska (formerly Elitsa Hristova), for the Position of Associate Professor in Professional Field 4.2. Chemical Sciences (General and Inorganic Chemistry).

Candidate - Elitsa Yordanova Chorbadzhiyska

I. Summary of the candidate's scientific production and activity

The materials presented by the candidate, Dr. Elitsa Yordanova Chorbadzhiyska, fully meet and cover the minimum requirements for acquiring the academic position of "Associate Professor" in the Republic of Bulgaria, in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulation for the Implementation of LDASRB, and the Regulation for the Development of the Academic Staff at South-West University "Neofit Rilski" in Blagoevgrad. The candidate has presented her documentation in an exceptionally organized and structured manner, leaving a very favorable impression.

Regarding the fulfillment of the minimum national requirements, the candidate defended her doctoral dissertation on the topic "New Electrocatalysts for Bioelectrochemical Hydrogen Production" in 2015, thereby meeting Indicator A of the table for fulfilling the minimum national requirements.

In Indicator B, the candidate has presented 7 scientific publications, including 2 in quartile Q2 and five in quartile Q4. It is noteworthy that all publications have an impact factor, especially the ones in quartile Q2, which reach up to 3.861.

In Indicator C, the candidate has presented 12 scientific works, 4 of which are in quartile Q1, one in Q2, five in Q4, and two publications with SJR. Some of these works have an impact factor reaching as high as 6.776, indicating a very high level of scientific output.

In Indicator D, the candidate has provided the required number of citations, even exceeding them by 10 points.

Additionally, the information provided to me for assessment clearly indicates that the candidate has participated in national projects funded by the National Science Fund (FNI) and has the capability to lead project activities for the Ministry of Education and Science (MON), covering Indicator E.

From the provided table of workload distribution, it is evident that the candidate is responsible for numerous courses directly related to her field of expertise.

The information provided to me for this assessment reveals that the candidate has presented her research at a total of 33 scientific forums (both national and international), some of which I have personally attended.

- II. Evaluation of the candidate's scientific and practical results and contributions in the submitted creative output for participation in the competition

The candidate has made significant contributions in three main research directions:

Synthesis, Characterization, and Investigation of New Electrocatalysts:

In this first research direction, the candidate has made substantial contributions to the development of active materials applicable in (bio)electrochemical systems. She has synthesized mono and bimetallic catalytic substrates, applicable as cathodes in (bio)electrochemical systems, and studied their catalytic behavior when dispersed on various carriers. The candidate has also developed new methodologies aimed at providing information on the thermodynamic and kinetic characteristics of electrochemical systems. Various electrochemical and analytical methods, including linear voltammetry, chronoamperometry, mass spectrometry, gravimetric analysis, and impedance spectroscopy, have been used to investigate the electrocatalytic activity. The candidate has explored and researched mono and bimetallic systems based on Ni (NiCo, NiW, NiMo, NiFe, and NiFeP) and Fe (Fe₂O₃, Fe₃O₄) dispersed on a graphite substrate. Overall, the candidate presents new approaches and hypotheses to enhance the catalytic activity of materials applicable in (bio)electrochemical systems, aiming to achieve synergy between individual elements.

(Bio)electrochemical Systems for Current and Hydrogen Generation:

In the second research direction, the candidate primarily focuses on microbial fuel cells and electrolysis cells. Her research aims to develop technologies for converting chemical energy into electricity, focusing on the use of different fuels and bio-catalysts. Her work includes detailed investigations into various fuel cell types, such as fuel cells with sulfur electrooxidation, yeast biofuel cells, metallurgical microbial fuel cells, sediment microbial fuel cells, and microbial electrochemical snorkels. Her contributions clearly demonstrate a vision for enriching existing knowledge, introducing new theories, hypotheses, and methods for generating clean electrical energy.

Chemical Experiments - Science and Attraction: In the third research direction, the candidate focuses on creating attractive and engaging chemical experiments to spark the interest and motivation of students in the study of chemistry. These experiments combine entertainment with the scientific aspects of chemistry and aim to enhance the educational process. The candidate emphasizes the connection between the attractiveness of the experiments and their scientific characteristics while presenting methods to link chemical knowledge with real-world practical applications. This approach can be applied across different age groups and thematic areas in the study of chemistry, from students to doctoral candidates.

Overall, the candidate's contributions in these three research directions demonstrate her dedication, competence, and innovative thinking in the fields of chemistry and bioelectrochemistry. Her work contributes significantly to the advancement of knowledge and technologies in these areas.

III. Critical Notes and Recommendations

I have no remarks regarding the materials submitted for participation in the competition.

The candidate has an exceptionally impressive scientific contribution in three key areas: the synthesis of electrocatalysts, bio-electrochemical systems, and engaging chemical experiments. His work has the potential to enhance the efficiency of (bio)electrochemical systems and stimulate the interest of students and learners in chemistry and science as a whole.

IV. Conclusion

In conclusion, based on all the aforementioned information, I provide my positive evaluation and recommend to the Academic Jury to propose to the Faculty Council of South-West University "Neofit Rilski" to appoint Dr. Elitsa

Chorbadzhiyska to the academic position of "Associate Professor" in the field of 4.2 "Chemical Sciences" (General and Inorganic Chemistry) at South-West University "Neofit Rilski" - Blagoevgrad.

Date: 02.10.2023г.

Member of the jury:

/associate prof. Galin Borisov/