

## OPINION

by Prof. Dr. George Tzvetanov Tzvetkov, Faculty of Chemistry and Pharmacy, SU "St. Kl. Ohridski", on the materials submitted for participation in a competition for the academic position of "Associate professor" in professional field 4.2. Chemical sciences (Chemistry of the solid state), announced in the State Gazette, no. 24 of 17.03.2023

In the announcement by SU "St. Kl. Ohridski" competition for the academic position of "Associate professor" at the "Applied Inorganic Chemistry" department, the only candidate is Ch. Assistant Dr. Lyuben Dimitrov Mihaylov. The materials presented by Dr. Mihaylov in electronic form are in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB) and the Regulations on the Terms and Conditions for Acquiring Scientific Degrees and Holding Academic Positions at SU "St. Kl. Ohridski", and includes all required documents. Dr. Mihaylov graduated in 2006 from the Faculty of Mining Technology of the University of Mining and Geology "St. Ivan Rilski" as a mining engineer, in 2009 he obtained a master's degree at the Faculty of Chemistry and Pharmacy of the University of St. Kl. Ohridski", and in 2013 he successfully defended his doctoral thesis on "Electrocatalytic activity of amorphous and nanocrystalline alloys for hydrogen evolution". Currently, Dr. Mihaylov is chief assistant in the Department "Applied Inorganic Chemistry" of the FCF, where he leads lectures and exercises on "Applied Electrochemistry", lectures and exercises on "Processes and Apparatus" and "Inorganic Chemical Technologies".

From the materials submitted for the competition, it is clear that the candidate is the author/co-author of a total of 25 publications (indexed in SCOPUS and/or WoS), and 17 of them have been submitted for participation in the competition. It is worth noting that 13 of these articles fall in Q1. Dr. Mihaylov's Hirsch index is 12. Attached is a report on the implementation of the Minimum National Requirements and the recommended criteria of the SU for occupying the academic position of "Associate professor" in the professional field of "Chemical Sciences". The distribution by indicators is as follows: indicator A – 50 points; indicator B – 110 points (required 100), indicator D – 285 points (required 220), indicator D – 790 points (required 70) indicator G – 258 points (required 70). It can be seen that the scientometric data of Dr. Mihaylov cover and in some cases repeatedly exceed the set requirements. A habilitation thesis on the topic "Obtaining and studying porous metal structures as catalysts and electrodes in lithium-ion batteries" and an author's reference for the scientific contributions of the candidate's works are presented. The works presented are mainly in the field of chemistry and physicochemistry of the solid state and inorganic chemistry. One part of his scientific work is related to the preparation and research of various metal alloys used as electrodes for ion batteries, and another part - to the characterization of inorganic materials with applications in other scientific fields, in which the candidate also has well-defined contributions. The candidate's scientific contributions have an applied nature and are novel in the fields of materials science, electrochemistry and electron microscopy. They can be grouped into five main areas:

1. Preparation and characterization of metal alloys.
2. Chemical and electrochemical selective dissolution of the obtained metal alloys and formation of porous electrodes with a highly developed catalytic surface.

3. Study of the catalytic activity of porous materials in relation to the hydrogen reaction in solutions of aqueous electrolytes.
4. Study of porous materials as electrodes for ion batteries.
5. Characterization of nanomaterials with TEM and STEM-EDS.

I have no comments on the presented Habilitation thesis and the author's reference. My personal impressions of the candidate are excellent. In recent years, Dr. Mihaylov has established himself as a competent researcher in the field of electrochemical processes. His contribution to the proper functioning of the FCF STEM microscope is beyond any doubt.

The submitted materials for the competition and the contributions of Dr. Mihaylov show that his scientometric indicators meet and exceed the requirements for occupying the academic position of "Associate professor", defined in the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Rules for its Implementation, as and the additional criteria of the Faculty of Chemistry and Pharmacy. The analysis of the scientific production and the pedagogical workload of the candidate give me reason to give my positive assessment and to confidently recommend Ch. Assistant professor Dr. Lyuben Dimitrov Mihaylov to take the academic position of "Associated Professor" in professional direction 4.2. Chemical Sciences (Chemistry of the Solid State) at the Department of Applied Inorganic Chemistry of the FCF at SU "St. Kl. Ohridski".

27.06.2023

G. Tzvetkov