

REPORT

on the competition for filling the academic position of an Associate Professor in the Professional Field 4.2, Chemical Sciences, Scientific Specialty Electrochemistry (incl. Chemical Power Sources), for the needs of Electrochemistry and Corrosion Department, announced in SG, issue 62/27.07.2021

Applicant: Nelly Dimitrova Boshkova, PhD, Assistant Professor in IPC-BAS

Member of the Academic Jury: Olya Stoilova Stoilova, PhD, Professor in IP-BAS

This Report is prepared in response to Order №71-RD-09/20.09.2021 issued by the Director of the Institute of Physical Chemistry, Bulgarian Academy of Sciences (IPC-BAS), following the decision made by the Academic Jury that was held on 08.10.2021. The Report is in compliance with Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), the Rules for the Application of the DASRBA, the Rules of BAS and with the Rules set at the IPC-BAS, for applying the Act aforementioned.

Dr. Nelly Dimitrova Boshkova, Assistant Professor in IPC-BAS, is the sole candidate in the competition. She began work as a chemist of the Electrochemistry and Corrosion Department at IPC-BAS in 2003, and in 2015 she was enrolled as a PhD-student of the same Department. In 2017 she defended doctoral thesis on "*Zinc composite coatings with embedded polymer particles – preparation and protective ability*" and has held the position assistant and since 2018 until now she has occupied the academic position Assistant Professor of the same Department.

1. Assessment of the research and applied activities of the applicant

In the competition, Dr. Nelly Boshkova has participated with **14 research publications (5 in Group C.4. and 9 in Group D.7) all co-authored**, which do not repeat those for the acquisition of the educational and scientific degree "Doctor". A separate monograph is also included, which is not presented as the habilitation thesis (**in Group D.5.**).

In the Group C.4. a total of 5 publications equivalent to a habilitation thesis are presented. They were published in specialized international journals with IF that are referenced and indexed in *Web of Science (WoS)* and *Scopus*, all of which are in quartile Q2 for the respective year. In two of them, Dr. Boshkova is the first author. **Thus, the score on this indicator is 100.**

In the Group D a monograph (**indicator 5**) on "*Alloys and composites of zinc, increasing the protective and anticorrosion properties of low-carbon steel*" is presented, with ISBN 978-619-245-154-7, accepted for publication in September 2021 in the publishing house of BAS "Prof. Marin Drinov". Out of the habilitation thesis, 9 publications are presented in the **indicator 7**. Four of which are in quartile Q2 and 4 – in Q2 for the respective year. It should be mentioned, that no quartile is available for the journal of publication 9

(*Bulgarian Chemical Communications*) in the year of publication. However, according to the Rules for the Application of the DASRBA, the available quartile should be used for the closest year to it, which is 2009 with quartile Q4. **Thus, these two indicators give a total of 182 points.** In the **indicator 8**, two chapters of co-authored books are presented (30 points), published in the non-periodical scientific journal *Jahrbuch Oberflächentechnik-Galvanotechnik*, which has two different editors for the respective years of publication – Dr. Ing. R. Suchentrunk (2010) and Prof. Dr. Timo Sörgel (2019), and has 2 different ISBNs numbers. This does not contradict the meaning of the “chapter of a book” of the DASRBA (additional provisions § 1, item 11). **Indicator 9** includes patent (25 points) on *Anticorrosion hybrid galvanic zinc coatings containing nanodisperse particles of polyaniline, electrolyte composition and method for electrodeposition of coatings* with protection number 67266, issued on 25.02.2021 by the Bulgarian Patent Office. This is a good testimonial for the scientific level of research and especially for their applied contribution. **Thus, the points of all indicators in the group D give a total score of 237**, instead of the calculated 235 points, **against the minimum 220 require.**

In the Group E.11, a list of citations of 12 publications is provided, 2 of which are not submitted for participation in this competition. Referring in the *Scopus* database shows that the citations (excluding self-citations and citations by co-authors) only of the publications participating in the competition are 42, which makes **84 points out of the minimum required 60.**

In addition to the required indicators, Dr. Boshkova has also presented a list for participation in research projects. She is applied in 13 projects, funded by BNSF, OP, firms, etc. Currently, she is a project leader of an ongoing research project funded by BNSF, which make an excellent impression. A list of participations in international (25) and national (23) scientific forums is also presented, but it is difficult to assess the personal contribution, because the name of the reporting author is not highlighted.

The applicant's scientific output evaluation shows that in all Groups of indicators (A, C, D and E), the candidate Dr. Boshkova exceeds the minimum national requirements, as well as those of IPC-BAS (for required minimum of 430 points, she has 471 points) for filling the academic position Associate Professor in the Professional Field 4.2. Chemical Sciences.

2. Main scientific and applied contributions

The assessment of the research work (publications, monograph and patent) submitted for the competition outlines clearly defined thematic area and with applied potential. The studies are mainly devoted to the preparation of zinc coatings (alloys or composites) for low-carbon steel protection, which are characterized by improved corrosion resistance and

protective ability than those of pure zinc. In part of them, various zinc composite polymer coatings were used, applied as layers or included as (nano)particles or nanocontainers. It should be noted that in this case, during the corrosion of zinc, a mixed protective film is formed in depth, which leads to a delay of local corrosion. In another part, polyaniline was used as a corrosion inhibitor, whereby significant corrosion resistance was achieved. Various compositions of electrolytes and a method for their galvanic deposition on products and details of iron alloys of anticorrosive hybrid zinc coatings have also been developed. Undoubtedly, the scientific contributions of Dr. Boshkova are original, have significant applied potential and relevance to the electrochemistry, materials science and protection of metals from corrosion thematic areas.

3. Recognition of the applicant's research

The high number of the citations of the publications from the last 3 years that participate in the competition compare to the total number of citations evidence of the good scientific level and the importance of the obtained results. Therefore, these studies attract international attention, which is also an important measure of their quality.

4. Opinions, notes and recommendations

I do not know Dr. Boshkova personally, but the presented materials make a good impression on her work and knowledge. The topic in which she works is also clearly outlined – preparation of protective zinc coatings against corrosion.

As a critical note, I will mention that it was very difficult to assess the contributions of the presented publications, because of the numbering of the publications have not correct presented. Moreover, only the works with which the candidate participates in the competition should be summarized. In addition, the numbering of the publications should be the same in the reference for fulfillment of the minimum requirements, in the author's reference of the scientific contributions, as well as of the presented full texts. I will also pay attention to the fact that in group E only the citations in scientific journals, referenced and indexed in *WoS* or *Scopus*, should be scored.

I would recommend to Dr. Boshkova to be the first/corresponding author in her future research, which will highlight her personal contribution. In addition, I would recommend her inclusion as a mentor and supervisor of graduates and PhD-students, which will be extremely important for her career development.

CONCLUSION

Regardless of the remarks and recommendations made, based on the analysis and evaluation of the presented materials, **I consider that Dr. Nelly Boshkova, is a developed scientist, and meet the minimum national requirements** as defined in the DASRBA, the

Rules of BAS and the Rules set at the IPC-BAS, for occupying the academic position of Associate Professor in the Professional Field 4.2. Chemical Sciences.

My overall assessment is positive and I would like to recommend to the Scientific Council of IPC-BAS to support the election of Assistant Professor Dr. Nelly Dimitrova Boshkova, at the Academic position of Associate Professor in the Professional Field 4.2. Chemical Sciences, Scientific Specialty Electrochemistry (incl. Chemical Power Sources) for the needs of Electrochemistry and Corrosion Department.

18.11.2021

Report prepared by:

Prof. O. Stoilov

Member of the Academic Jury