Attitude of Reviewer

by competition

for the academic position "Associate Professor" in
Institute of General and Inorganic Chemistry - BAS
for the Laboratory „High Temperature Oxide Systems“

professional field - 4.2. Chemical Sciences (Inorganic Chemistry)
published in the Newspaper of State no. 36 of 03/05/2019

with candidate Assistant Professor Dr. Albena Dimitrova Bachvarova-Nedelcheva

Reviewer: Prof. Dr. Alexander Zhivkov Karamanov, IPC - BAS

1. Characteristics of the research and scientific activities.

Assistant Professor Dr. Albena Dimitrova Bachvarova-Nedelcheva is the only candidate, who participate in the announced competition. The presented materials are in agreement with the Rules for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, of academic positions in BAS (since 29.10.2018), as well as with the specific requirements, added in the Rules for the procedure for obtaining scientific degrees and academic positions in the IGIC-BAS.

In 2000 Dr. Bachvarova-Nedelcheva graduated as Engineer in Chemistry at the Department of Silicate Technology at the University of Chemical Technology and Metallurgy, Sofia. In 2005, after a full-time postgraduate course at UCTM, she defended thesis on "Glass Formation and Phase Formation in Selenite Systems of SeO_2-Ag_2O-M_nO_m, SeO_2-CuO-M_nO_m (M_nO_m = B_2O_3, MoO_3)". In the period 2005-2009 she worked as a chemist at the Institute of General and Inorganic Chemistry - BAS, and since 2010 she is Assistant Professor in the Laboratory "High Temperature Oxide Systems", IGIC- BAS.

Up to now she is co-author of 61 scientific articles, 41 of which are in journals with IF. 56 of these publications are published after the defense of her Ph.D. The total number of citations, related to these publications is 307, of which 206 are associated to the publications used in materials for this competition.

The provided documentation also contains information for the participation in 10 research projects, 58 scientific forums (37 of which are international) and the work of candidate as a scientific advisor to 4 graduates and 3 Ph.D. students. In addition, Dr. Bachvarova-Nedelcheva is a reviewer of several prestigious international publications and actively participates in organization of various national forums with international participation.

The materials of candidate, presented for the fulfillment of minimum requirements of BAS and the additional requirements of the IGIC for the position "Associate Professor", correspond to 1042 points, which are twice the minimum requirements.

Her habilitation report is based on 10 publications in journals included in the Scopus scientific database, in 8 of which she is the first author and in the other two she is the second author. Outside the materials for the habilitation report, other recent 18 publications are presented and discussed.

2. Main scientific contributions.

The research activity of candidate is mainly related to the large-scale experimental works. Nevertheless, the major scientific and applied contributions of Bachvarova-Nedelcheva can be characterized as enrichment of existing knowledge and theories.

The results discussed in the habilitation report extend the research initiated in her Ph.D. work. They contribute to elucidate the glass formation and crystallization in various non-traditional compositions based on SeO_2, where the priority is the variation of glass structure and its change as a function of the type and concentration of the added modifying ions (such as Ag^+ and Cu^{2+}).

I would like to note also the promising new studies on the sol-gel synthesis, which are started after 2010 and are not presented in the habilitation report. It is evident that this topic will become a serious part of future research of Dr. Bachvarova-Nedelcheva. Up to now, powders with nano-size have been successfully synthesized in the system TiO_2 - ZnO, which shows good antibacterial properties. In the recent years, was started also the synthesizes of transparent monolithic gels with different coloration by varying the composition and the used precursors.

3. Critical notes and recommendations.

Due to the experimental problems, associated with the sublimation processes during the melting of some of the studied glasses, the experimental results for the determination of their final chemical compositions can be presented in more details. Considering the improved experimental capabilities of the IGIC in the recent years it is possible also to re-analyze some of these glasses; this might lead to a partial revision and refinement of the plotted areas of glass formation.

A more critical approach for the XRD analysis of crystalline phase formed is also needed. I would like to recommend, if this is possible, in the future research the chemical composition of precipitating crystal phases to be confirmed also by EDS analysis.

CONCLUSION

The documents, presented by Assistant Professor Dr. Albena Dimitrova Bachvarova-Nedelcheva are in accordance with the Rules for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, with the Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions in the Bulgarian Academy of Sciences and with the specific requirements added to the Rules for the Terms and Conditions for Acquisition of Academic Degrees and for Occupation of Academic Positions at IGIC- BAS.

The candidate presented an appropriate number of scientific papers, published after her Ph.D. degree defense. The supporting materials meet 1042 points, which exceeds twice the minimum requirements of BAS and the additional requirements of IGIC.

As a result, I declare my positive valuation and recommend to the Scientific Jury to propose Dr. Albena Dimitrova Bachvarova-Nedelcheva in the Scientific Council of IGIC - BAS for the position "Associate Professor", required for the Laboratory "High Temperature Oxide Systems".

Sofia , 27. 08.2019 г. Sincerely:

Prof. Dr. Alexander Karamanov