

# OPINION

of Assoc. Prof. Dr. Kristina Kostova Chakarova

Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences  
(member of the scientific jury)

on the application of Chief Assistant Dr. Lyubomir Ivov Aleksandrov  
to occupy the academic position of Associate Professor in the professional field  
4.2. Chemical sciences (Inorganic chemistry) in the laboratory "High temperature  
oxide materials" of IGIC-BAS

Chief Assistant Dr. Lyubomir Aleksandrov is the only candidate in the competition for occupying the academic position of Associate Professor in the professional field 4.2. Chemical Sciences (Inorganic Chemistry) announced in SG, issue 98 of 17.11.2020 for the needs of the laboratory "High temperature oxide materials" of IGIC-BAS.

## **I. Submitted documents**

To participate in the competition, Dr. Aleksandrov has submitted all the necessary documents required by the Act on Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation and the Regulations on the conditions and order for acquiring scientific degrees and for holding academic positions in IGIC-BAS. On 18.01.2021, a commission appointed by the Director of IGIC-BAS (order № RD 09-14/ 18.01.2021) has declared that the applicant's documents meet the eligibility requirements of the above-mentioned laws and regulations.

## **II. Education and career development of the candidate**

Lyubomir Aleksandrov has received a Bachelor's degree in Metallurgy in 2002 and a Master's degree in Silicate Materials in 2004 at the University of Chemical Technology and Metallurgy (UCTM) – Sofia. In 2009 the candidate defended his Ph.D. Thesis at IGIC-BAS on "*Synthesis and structure of amorphous and polycrystalline molybdate phases containing oxides of rare earth elements*".

Dr. Aleksandrov has several specializations at the Technical University of Vienna, Austria (2009), Friedrich Schiller University in Jena, Germany (2013) and the Nagaoka University of Technology, Japan (2009–2011 and 2014–2015). Considering that the countries in which the candidate has specialized are known for their high technological level and their significant

investments in science, these specializations have undoubtedly helped him to improve his skills and have enabled Dr. Aleksandrov to get acquainted with the latest achievements in the field he works.

From 2009 to 2012 Lyubomir Aleksandrov held the position of chemist at IGIC-BAS, and in 2012 he was elected to the position of Chief Assistant.

### **III. Scientometric indicators of the candidate**

The candidate's complete list of publications includes 62 scientific articles, 42 of which have been published in journals with impact factor (IFs very between 0.2 and 6.4), 11 in journals without impact factor and 9 in conference proceedings.

Dr. Aleksandrov participates in the competition with 30 scientific publications, published between 2009 and 2020 and not included in the candidate's Ph.D. Thesis for the educational and scientific degree "Doctor". The scientific publications are distributed as follows:

*(i) publications included in the indicator group "C"* of the minimum requirements of BAS for acquiring scientific degrees and for holding academic positions, 3 of which in journals with quartile Q1, 6 in journals with quartile Q2 and 1 in a journal with SJR without IF.

*(ii) publications included in the indicator group "D"* of the minimum requirements of BAS for acquiring scientific degrees and for holding academic positions, 8 of which in journals with quartile Q1, 4 in journals with quartile Q2, 3 in journals with quartile Q3, 3 in journals with quartile Q4 and 2 in journals with SJR without IF.

The total number of citations of the candidate (excluding autocitations of all authors in a given publication) at the time of submitting the documents for the competition is 292, and his h-index is 10.

The candidate has a total of 53 participations in scientific forums, 35 of which were international.

He has participated in 1 international and 14 national research projects and, apart from that, he has been a leader of two projects – one funded by the Bulgarian Ministry of Education and Science and one funded by the Japan Society for Promising Scientists.

Dr. Aleksandrov has been a reviewer of 4 Bachelor's and 7 Master's theses at UCTM-Sofia.

#### **IV. Habilitation work and scientific contributions in the works of the candidate**

To participate in the competition, in indicator group C of the minimum requirements of IGIC-BAS for acquiring scientific degrees and for holding academic positions, the candidate has submitted 10 scientific publications, which are equivalent to Habilitation work. The original scientific contributions in these publications, described in the Habilitation Report of Dr. Aleksandrov, are related to the detailed study of new compositions of non-traditional molybdate and tungstate glasses and include (i) development of a reproducible method for synthesis of these glasses based on the melt quenching method, (ii) determining the regions of glass formation and liquid-phase separation and clarifying the influence of the local structure of molybdenum on these processes; (iii) study of the thermal and optical characteristics of glasses and (iv) proposing structural models describing the amorphous network of these glasses (near and middle order). The topics of the research included in the Habilitation work are interesting and scientifically significant in view of the constantly growing interest in non-traditional glasses due to the possibility to change their structure depending on the content of the corresponding transition oxide and the incorporation of various active ions, which, in turn, allows tuning of their characteristics for specific applications.

The candidate's contributions in the publications presented outside the Habilitation work (included in indicator group D) are (i) synthesis, structural and thermal characterization of a series of glasses from the  $B_2O_3$ - $Bi_2O_3$ - $MeO_3$  system (Me = Mo or W), (ii) synthesis and detailed structural characterization of amorphous organo-inorganic hybrids in the systems  $SiO_2$ /biopolymer and  $SiO_2$ /polysaccharides/Me (Me = Ag, Cu or Zn) and (iii) synthesis of boro-silicate glasses of different compositions that are doped with gold or silver ions in order to induce formation of three-dimensional structures by laser radiation and to initiate specific optical properties.

#### **V. Information on the fulfilment of the minimum requirements of IGIC-BAS for holding the academic position of Associate Professor**

The indicators of the candidate not only meet, but also significantly exceed the minimum requirements of BAS and the additional requirements of IGIC for holding the academic position of Associate professor (Annex 1 of the Regulations on the terms and conditions for acquiring scientific degrees and holding academic positions at IGIC-BAS). Regarding the minimum requirements of BAS (indicator groups A-F), the indicators of Chief Assistant Lyubomir Aleksandrov exceed almost 3 times the required credits. Regarding the additional requirements of IGIC-BAS (indicator group G), the candidate collects over 4 times more credits than the required minimum.

## **VI. Personal impressions**

As a member of the research team of IGIC-BAS, I know Dr. Lyubomir Aleksandrov personally and I have excellent impressions of his scientific work, expertise and skills. Besides his scientific activity, the candidate is always willing to participate in organizational actions for the benefit of the institute and in solving various problems related to the daily functioning of IGIC.

## **CONCLUSION:**

**Taking into account the scientific achievements of the candidate and the over-fulfilment of the criteria of IGIC-BAS for holding the academic position of Associate Professor, I recommend Assist. Prof. Dr. Lyubomir Ivov Aleksandrov to be elected to the position of Associate Professor in the professional field 4.2. Chemical sciences (Inorganic chemistry) in the laboratory "High temperature oxide materials" of IGIC-BAS.**

10.02.2021

Signature:



/Assoc. Prof. Dr. Kristina Kostova Chakarova/