

STANDPOINT

by Assoc. Prof. Dr. Ivanka Spassova, Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, on the materials submitted for participation in the competition for awarding the academic position "*Associate Professor*" in the professional field 4.2 "Chemical Sciences" (Chemical kinetics and catalysis) announced in State Gazette, issue no. 36 of 03.05.2019.

In the announced by IGIC-BAS competition for awarding the academic position "Associate Professor" in the Lab. "Reactivity of solid surfaces", the only candidate is Assist. Prof. Stanislava Metodieva Andonova, PhD. The submitted materials for participation in the competition are in compliance with the Regulations for the Terms and Procedure for Acquisition of Academic Degrees and for Occupation of Academic Positions in IGIC - BAS and include all necessary documents.

Brief details of the applicant

Assist. Prof. Dr. Stanislava Andonova graduated in 2000 from the UCTM Sofia, specialty "Technology of inorganic substances", acquired Master's degree and qualification "chemist- engineer ". From 2001 to 2004 she was a PhD student at Institute of Catalysis, BAS, where in 2005 she defended her doctoral dissertation. From 2004 to 2013 she worked at the Institute of Catalysis as a chemist and Assistant Professor, and since 2013 she has been working at IGIC, BAS, where in 2015 she was appointed as Assistant Professor in Lab. "Reactivity of solid surfaces". Between 2007 and 2013, she was a post-doctoral student at Bilkent University, Turkey and Chalmers University of Technology, Sweden.

Scientific research activities

Assist. Prof. Dr. Stanislava Andonova exceeds the minimum requirements recommended by the Bulgarian Academy of Sciences and the additional requirements of IGIC-BAS, according to the Regulations for the Terms and Procedure for Acquisition of Academic Degrees and for Occupation of Academic Positions in IGIC - BAS. She is co-author of 32 publications, with 22 of them participating in this competition. Fifteen of the competition's publications are in journals indexed with Q1 (4 of which leading the rankings), 4 with Q2 and one patent application, all in the Web of Science database. In addition, the applicant also participates with two published patent applications included in the database at <http://www.patentbuddy.com> . More than 315 citations (Scopus) have been found on all articles, with the citations on the publications for the competition being over 215 (by Scopus). The h-index of Dr. Stanislava Andonova, according to Scopus data, is 10, which exceeds the additional requirements of IGIC-BAS for h-index of 7. The leading personal contribution of the candidate in the research performed and in the summary of the results is confirmed by the fact that she is first author in 13, and second in 5 of the submitted publications. Results of the research carried out with the participation of Assist. Prof. Dr. Stanislava Andonova, have been presented at 5 national and 18 international scientific forums with 12 oral and 11 poster reports. Dr. Andonova has participated in 3 international and 3 national scientific projects.

Scientific contributions

Dr. Stanislava Andonova's Habilitation Report is presented on the results of 9 scientific publications. The applicant's contributions are on the development and research of

new effective metal oxide catalysts used for deNO_x by storage-reduction catalysis and metal-exchanged zeolites used as effective catalysts for selective catalytic reduction of NO_x:

- The influence of metal or metal oxide (CeO₂, ZrO₂, Rh) additives on the structure, adsorption and reduction properties of the Pt/BaO/γ-Al₂O₃ classical storage-reduction catalyst is determined.
- The required surface structure of the triple oxide system BaO/TiO₂/γ-Al₂O₃ for optimal NO_x adsorption capacity is established.
- A new type of Fe/SAPO-34 zeolite catalyst with improved hydrothermal stability compared to conventional Cu/CHA for SCR of NO_x with NH₃ has been synthesized for the first time and has been investigated in the process. By combining these two types of catalysts, a monolithic two-layer system has been developed covering a wide temperature range of the process.
- The main reason for decreasing the efficiency of Cu/BEA zeolite in the SCR of NO_x with NH₃ by phosphorus- poisoning has been found to be due to the formation of various phosphate compounds on the surface of zeolite, leading to a decrease in the number of active Cu²⁺ centers involved in the redox cycle.

The report for the contribution of Assist. Prof. Dr. Stanislava Andonova on the non-habilitation works for participation in the competition is built on 13 scientific papers. Two of these are patent applications, the contributions of which are described in the habilitation section. The applicant's research is aimed at developing new effective catalysts for nitrogen oxides environmental pollution control and to new and promising materials such as adsorbents for gas purification and selective gas mixture separation. The main contributions of the applicant are in the field of infrared spectroscopy of adsorbed molecules (CO, NO, NO + O₂, H₂, D₂, etc.) in order to determine the oxidation and coordination state of the loaded metals and metal cations, the effect of the surface modification of the materials on their acidity, as well as the mechanism of formation and identification of surface adsorbed species.

CONCLUSION

The documents and materials submitted by Assist. Prof. Dr. Stanislava Andonova, meet all the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for its Implementation and the relevant Regulations of the Institute of General and Inorganic Chemistry, BAS. The results achieved in the research activity by Dr. Stanislava Andonova, fully correspond to the additional requirements of the Institute of General and Inorganic Chemistry, BAS, adopted in connection with the Regulations for the application of LDASRB, also.

Therefore, I convincingly recommend to the members of the Scientific Jury and to the Scientific Council of IGIC-BAS to award to Assist. Prof. Dr. Stanislava Andonova the Academic Position "*Associate Professor*" in the field 4.2. Chemical Sciences (Chemical kinetics and catalysis).

01.08.2019

Member of the Scientific Jury:

(Assoc. Prof. Dr. Ivanka Spassova)