

## STANDPOINT

by Assoc. Prof. PhD Dimitrinka Aleksieva Nikolova  
Institute of Catalysis, Bulgarian Academy of Sciences

on the competition for occupying the academic position an Associate Professor in a professional field 4.2. "Chemical Sciences", scientific research specialty "Chemical kinetics and catalysis" for the needs of the Institute of General and Inorganic Chemistry at the Bulgarian Academy of Sciences, Laboratory "Reactivity of solid surfaces"

The competition for "Associate Professor" in the scientific research specialty "Chemical Kinetics and Catalysis" was announced in „Newspaper of State”, issue 36 of 3 May 2019 by the Institute of General and Inorganic Chemistry (IGIC) at the Bulgarian Academy of Sciences (BAS) for the needs of the Laboratory "Reactivity of solid surfaces". The only candidate in the competition was Assistant Professor PhD Stanislava Metodieva Andonova. All the documents, required and specified by the “Regulations for the Conditions and Order of Appointing in Academic Positions” in the Institute of General and Inorganic Chemistry of BAS have been duly submitted. The candidate meets the minimum requirements of BAS for occupying the academic position of "Associate Professor", as well as the increased criteria of the Institute of General and Inorganic Chemistry.

Assist. Prof. Andonova is co-authored of 32 publications, 22 of which she participate in the competition, 15 of them being of the highest Q1 category and 4 in Q2. There are also three patent applications. The leading role and significant personal contribution of Assist. Prof. Andonova in the researches and summarizing the results is evident from the fact that she is referred to as the first author in all publications included in the habilitation work [1-9] and in one of them she is corresponding author. Scientific significance of the studies is confirmed by the international prestigious of the journals in which they were published. The rest of 13 publications [10-22] are included in out-of-habilitation work. Of the total 384 citations (w/o auto citations), 254 are on the publications included in the competition. The results from these studies, performed with the participation Assist. Prof. Andonova, have been presented at 16 international scientific forums, 10 of which are oral presentations as well as national forums with two oral presentations. It must be noted that Assist. Prof. Andonova was presenting author in almost all oral presentations (10).

The chronology of the professional development of Assist. Prof. Andonova shows that in the period 2006 - 2013 she specialized in the Politehnica University of Bucharest, Romania; Bilkent University, Turkey; and Competence Centre for Catalysis, Chalmers University of Technology, Sweden.

The scientific contribution included in the *Habilitation work* of Assist. Prof. Andonova reveals clearly outlined subject of the researches in one global, highly important subject, concerning improving the quality of the atmospheric air by eliminating harmful NO<sub>x</sub> emissions.

Two topics of the investigation are defined: research and development of new effective metal oxide catalysts for NO<sub>x</sub> storage and reduction and new metal-exchange zeolites used as catalysts for selective catalytic reduction of NO<sub>x</sub> by NH<sub>3</sub>.

The essence of scientific contributions in the first topic is consisted in the study of the promoting effect of CeO<sub>2</sub> and ZrO<sub>2</sub>, and Rh additives on the classical Pt/BaO/γ-Al<sub>2</sub>O<sub>3</sub> catalyst in the processes of nitrogen oxides storage and reduction. The role of additives on the mechanism of NO<sub>x</sub> adsorption has been clarified. It has also been found that the introduction of the TiO<sub>2</sub> modifying additive increases the adsorption capacity of the BaO/γ-Al<sub>2</sub>O<sub>3</sub> system.

The scientific contributions in the second topic are related to the development of several Cu- and Fe-exchanged zeolites for the purification of NO<sub>x</sub> emissions from mobile and stationary sources by selective catalytic reduction of NO<sub>x</sub> with NH<sub>3</sub> as a reagent. The three patent applications with regard to Fe-exchanged zeolite structures of the SAPO-34 type are impressive, which is Dr. Andonova's certificate of professional quality.

The catalytic tests in both topics have been conducted on a pilot installation under conditions similar to those in industrial practice. The researches can be evaluated as a novelty in science by applying scientific advances in practice.

Other publications presented by Assist. Prof. Andonova outside *Habilitation work* are organized in three thematic directions: further studies on modified Pt/BaO/γ-Al<sub>2</sub>O<sub>3</sub> catalyst used for NO<sub>x</sub> storage and reduction and of Fe- and Cu-exchanged SAPO-34 zeolites for selective catalytic reduction of NO<sub>x</sub> with ammonia; studies on new and promising materials used as adsorbents for one also topical area - industrial gas purification and selective separation of gas mixtures. These investigations show that catalyst systems have been systematically studied and also that Assist. Prof. Andonova works in wide scientific field.

The actuality among the scientific community of the works presented in the competition is confirmed by the number of citations and it is indisputable proof of the scientific work of Assist. Prof. Andonova. Assuredly, Dr. Andonova is a researcher with extensive knowledge in the catalysis and adsorption fields.

After reviewing the presented materials and based on personal impressions, I suggest with conviction of the members of the Jury and to the Scientific Council of IGIC-BAS to vote positively and to approve Assistant Professor PhD Stanislava Metodieva Andonova for occupying the academic position of "Associate Professor" in the professional field 4.2. "Chemical Sciences", scientific research specialty "Chemical kinetics and catalysis" for the needs of the Institute of General and Inorganic Chemistry at the Bulgarian Academy of Sciences, Laboratory "Reactivity of solid surfaces", Institute of General and Inorganic Chemistry at the Bulgarian Academy of Sciences.

Date 14. 08. 2019

Member of the Scientific Jury:

/Assoc. Prof. Dr. Dimitrinka Nikolova /