

R E V I E W

on the competition for the academic position Associate Professor scientific direction 4.2. Chemical Sciences (Chemical Kinetics and Catalysis)

at the Institute of Catalysis to the Bulgarian Academy of Sciences (IC-BAS)
annocement in ДБ-77- 01.10. 2019

Applicant: **Assistant Prof. Dr. Katerina Ivanova Aleksieva** (IC-BAS)

Member of the Scientific Jury: Prof. Dr. Radostina Konstantinova Stoyanova (IGIC-BAS)

A. Report on the fulfilment of the minimal criteria of BAS

In the competition for associate professor on chemical kinetics and catalysis Dr. Aleksieva participated with a habilitation thesis based on 7 scientific publications devoted mainly to the application of EPR spectroscopy for analysis of irradiated plant foodstuffs. It is of importance that 5 of these articles were accepted in international journals from the first quartile in field of nuclear science and technology (Radiation Physics and Chemistry) and food science and technology (Food Research International). Along with them, Dr. Aleksieva presents 20 scientific publications focusing on the utilization of EPR spectroscopy for the study of gamma-generated radicals and the oxidative state of paramagnetic ions in food-based systems, waste lignocellulosic materials and catalysts. It is specific that 15 of articles have been published in the journals classified outside the first quartile of the respective fields (such as 27% in Q2, 33% in Q3 and 40% in Q4), and the last 5 papers are in journals without impact factor. Dr. Aleksieva's scientific publications have so far received 87 independent citations, 32 of them are only on one publication that is outside of habilitation work. Part of the research results have been presented by Dr. Aleksieva mainly at national events as four talks and 25 posters. Dr. Aleksieva has participated in five projects funded by the NSF programs (two of which are ongoing), one project under OP Human Resource Development as a member of a target group and two bilateral projects. The Hirsch index (H-factor) of Dr. Aleksieva's total scientific output is 7 (SCOPUS database).

The report analysis reveals that Dr. Aleksieva's scientific output covers the subject of the competition and meets the minimal national requirements for occupation of the academic position of associate professor in the field of Natural Sciences, Mathematics and Informatics, Direction of Chemical Sciences, mentioned in The Law for the Development of the Academic Staff in Bulgaria, the Regulations for its Implementation and the Rules for the Conditions and Procedures for Acquisition of Academic Degrees and Occupation of Academic Positions at IC-BAS.

B. General features of the applicant's research activities

B1. Main scientific contributions presented in the habilitation thesis: the EPR study of plant foods is one of the approaches for the experimental evaluation of changes occurring during their treatment with ionizing radiation. This is the scientific area, where the Alexieva's research falls: from one hand, they contribute to the enrichment of knowledge on the radiation capability of plant foods, and from the other – they would have a potential for a practical application in refining the protocols and standards of irradiated products. This topic is a continuation of the candidate's dissertation research with expansion of the subjects of study.

B2. Scientific contributions presented in the non-habilitation thesis: these studies are based on the investigation of radicals and the oxidative state of paramagnetic ions by means of EPR spectroscopy. The received information is needed to get inside into the nature and chemical states of paramagnetic centres stabilized in foods, biosorbents and oxide catalysts and to correlate it with their functional properties. These studies were carried out in a team composed of scientists from IC-BAS, IGIC-BAS and UCTM-Sofia. Dr. Alexieva's role is to perform the EPR experiments.

C. Recommendations

Dr. Alexieva's research focuses mainly on the application of EPR spectroscopy in the field of irradiated foods. The topic on EPR in catalysis is in an early stage of development, but it has great potential to be crosslinked to the research program of the Institute of Catalysis. To achieve this, there is a need to deepen and extend the EPR methodologies for investigating complex catalytic systems – a scientific challenge aiming to enhance the reliability of the data interpretation.

D. Conclusions

Taking into account the overall research output, I propose that the Scientific Jury to award to Dr. Katerina Alexieva the Academic Position Associate Professor in Chemical Kinetics and Catalysis in the Institute of Catalysis to the Bulgarian Academy of Sciences.

6.02.2020

Sofia

Radostina Stoyanova