OPINION

Regarding application procedure for taking the academic position "associate professor" in chemical sciences, physical chemistry, department "Surfaces and colloids", Institute of Physical Chemistry "Acad. Rostislaw Kaischew", Bulgarian Academy of Sciences.
Position topic: "Electrical properties and stability of colloid-polymeric suspensions".
The announcement for the academic position has been published in State Gazette №45, 28.05.2021.
Applicant: **Kameliya Pavlova Kamburova-Petkova**, PhD, assistant professor
Member of the scientific jury: Ivaylo Lyubenov Dimitrov, PhD, associate professor

Kameliya Kamburova-Petkova was born in 1977. She graduated with Master of Science degree in physics from SU "St. Kliment Ohridski" in 2002. In 2009 she defended her PhD thesis "Electrical properties and thickness of multilayer films of biopolymers formed on colloidal particles" in Institute of Physical Chemistry "Acad. Rostislaw Kaischew", Bulgarian Academy of Sciences. Since 2011 Kameliya Kamburova-Petkova has been assistant professor in the same institute.

1. Overview of the research activity of the applicant.
The research activity of Kameliya Kamburova-Petkova is focused on the investigation of suspensions containing organic polymer molecules, their adsorption on inorganic nanoparticles and fabrication of multilayer supramolecular structures via alternating adsorption of positively and negatively charged polymers. During the last several years the applicant has expanded her research activity both in multidisciplinary and practical aspects. This activity involves studies of drug (e.g. indomethacin) encapsulation and assembling of structures for storage and controlled release of corrosion inhibitors. The applicant has also investigations in relevant topic in the field (№16) and studies that have been part of hers earliest research activities (№1).
Kameliya Kamburova-Petkova has participated in many research projects and featured science-related programs, being coordinator of one of the projects. She has attended around 60 scientific forums and seminars. Kameliya Kamburova-Petkova has good experience in teaching, reviewing and organization of scientific forums.

2. Major scientific achievements of the applicant.
The major scientific achievements of the applicant have been published in 25 scientific papers out of 27 in total. Twenty one of them belong to journals with impact factor and fall almost exclusively to quartiles 1 and 2. The achievement of the applicant can be summarized in two major topics:
1. Electrical properties of colloidal particles in water suspensions containing ionogenic polymers (polyelectrolytes) and stability of the suspensions.
2. Design, formation and characterization of multilayer films of polyelectrolytes formed on colloidal particles.
The applicant has studied the formation and properties of model prolate ellipsoid crystallites of β- FeOOH as a core nanoparticles for polymeric adsorption, the electric properties of the system upon adsorption of oppositely charged polymers, the response of such water-based suspensions to a changes in pH, ionic strength and salt type. These studies have revealed important fundamental relation between the adsorption degree and the charge density of the adsorbing polyelectrolytes. It has also been found that small counterions could participate in the overall adsorption process and their mobility has been established. The

applicant has obtained reliable results for the electrical polarization of the supramolecular structures, thickness of the multilayer film, and the conformation of the adsorbed polymers. (№2, 5, 7, 9, 10, 11, 12). Kameliya Kamburova-Petkova examines systematically a lot of aspects of the layer-by-layer adsorption of oppositely charged polyelectrolytes (№3, 4, 6, 8, 14). Although her achievements in this respect are undeniable, I would like to underline the successful transfer of the obtained knowledge to more interdisciplinary topics of investigation – encapsulation of drug substances (№13, 18) and incorporation of anticorrosion agents into the supramolecular polymer matrix to make it of hybrid nature (№17, 19, 23, 26), using additional types of core nanoparticles such as hematite, kaolinite, carbon nanoparticles and zinc oxide (№15, 22, 25, 26). Papers №20, 21, 24, 25, 27 represent important practical results regarding incorporation of steel anticorrosion agents throughout the volume of regular anticorrosion zinc films, which are additionally treated with polymers to prevent aggregation and to stabilize the experimental suspensions.

3. Recognition of the applicant's research.

Publications of Kameliya Kamburova-Petkova have been cited 176 times. Some of her most recent publications have already been cited as well (№26). It is worth noting that the articles of the applicant, excluding №3 which has been cited 33 times so far, are being cited regularly on a yearly basis. This means that the studies constantly attract attention which is also an important measure of the quality of the research.

4. Critical comments and general recommendations to the applicant.

Kameliya Kamburova-Petkova is first author in 13 of the papers which she has applied with in the current procedure. Although this is not unambiguous criterion for an author's significant contribution, there is no doubt for me that the applicant has major contribution in all of her studies. Moreover, she is a corresponding author in 4 of the papers. That testifies for a solid activity in manuscript preparation and good experience across the challenges of scientific publishing. My only virtually negative comment is that papers №20 and 21 are practically identical. This, however, is probably an involuntary mistake or one of the two articles is merely in preliminary form.

CONCLUSION

The scientific production of Kameliya Kamburova-Petkova meets both the Bulgarian national requirements and the requirements of Institute of Physical Chemistry "Acad. Rostislaw Kaischew" for occupying the position "associate professor". Furthermore, I would like to note that I personally closely follow the career of Kameliya Kamburova-Petkova. She is highly efficient and precise researcher which also possess a robust set of administrative skills. Taking into account the information above, I strongly suggest to the scientific jury to recommend Kameliya Kamburova-Petkova to the Scientific Council of Institute of Physical Chemistry "Acad. Rostislaw Kaischew" for taking the academic position "associate professor" in chemical sciences, physical chemistry, department "Surfaces and colloids", Institute of Physical Chemistry "Acad. Rostislaw Kaischew", Bulgarian Academy of Sciences.

Author of the opinion: [redacted]

Sofia, 10.09.2021 /Dr. Ivaylo Dimitrov/