

R E P O R T

for a competition for the academic position "Professor", professional field
4.2 Chemical Sciences, scientific specialty "Physical Chemistry"

Announced in State Gazette issue 20 of 10.03.2020

Applicant **Dr. Bogdan Stavrev Ranguelov**, Assoc. Professor at IPC-BAS

Member of the scientific jury: **Dr. Tsvetanka Krumova Babeva**, professor
at IOMT-BAS

1. General description of the basic and applied research of the applicant

The materials submitted by the sole applicant in the competition, Assoc. Prof. Dr. Bogdan Ranguelov, meet the requirements of ZRASRB (The Law of promotion of academic staff in Republic of Bulgaria), the Regulations for its implementation, the Regulations of BAS and the Regulations on the terms and conditions for acquiring scientific degrees and occupying academic positions at IPC-BAS. Dr. Ranguelov participated in the competition with 21 scientific publications, 8 of which were thematically combined and presented as the equivalent of a habilitation thesis. All papers are peer-reviewed and published in indexed journals (the distribution by quartiles is 7 in Q1, 7 in Q2, 5 in Q3 and 1 in Q4), which proves the high level of research and the relevance of the topic.

Dr. Ranguelov has disseminated the results of his scientific work through more than 50 participations in various national and international scientific forums in the country and abroad, having personally delivered more than 10 oral presentations. The applicant has participated in the working teams of 13 projects and has been a project leader of one. Dr. Ranguelov is a co-supervisor of a PhD student. The materials presented in the competition not only meet the minimum national requirements and those of BAS and IPC, but significantly exceed them: group A - 50 points (from a minimum of 50), group B - 160 points (from a minimum of 100), group D - 302 points (from a minimum of 220), group D - 226 points (from a minimum of 120), group E - 185 points (from a minimum of 150 points). The total number of Dr. Ranguelov's publications indexed in the Scopus database is 42.

2. Basic scientific and applied contributions

I characterize the applicant's contributions as *i*) formulation of new theories and hypotheses and *ii*) enrichment of existing knowledge and theories. The basic scientific contributions are related to theoretical and experimental studies, mainly electron microscopy studies, of the processes of two-dimensional phase formation, crystal growth, critical width of terraces and instability on vicinal surfaces, as well as Monte Carlo simulations of diffusion processes on vicinal crystal surfaces. The applied scientific contributions concern electron microscopic studies of the processes of phase formation in

condensed matter. Here I will mention the research related to the use of non-stoichiometric titanium oxides as support for cobalt-based catalysts, the use of incinerator bottom ashes from municipal solid waste for the production of ceramic materials, as well as the research of nucleation processes in glass-ceramics obtained from metallurgical waste.

All papers of the applicant are co-authored, which is reasonable considering the interdisciplinary nature of research now a day. I have known Dr. Rangelov for a long time and although I have not worked closely with him, my personal impressions are that he is a very good experimenter, with very strong theoretical background and a well-developed scientific imagination. I am confident that the personal contribution of the applicant to the achieved results is significant.

3. Response to the applicant's scientific papers in Bulgarian and foreign literature

According to a reference in the Scopus database (August 21st 2020) the number of the independent citations of the applicant is 212 and his *h*-factor is 8. Dr. Rangelov participated in the competition with 113 citations. It is worth noting that papers from recent years have already found a response in the scientific literature. For example a paper published in 2017 (№30 from the list of all publications) has already been cited 11 times.

4. Critical remarks and recommendations

I have no critical remarks and recommendations to the candidate and the submitted documents.

CONCLUSION

Based on the presented materials and my personal impressions, I can confidently conclude that Dr. Rangelov is an active scientist whose results and contributions are significant and not only fully meet the minimum national requirements, as well as those of BAS and IPC, but exceed them. In addition to many years of research experience, Dr. Rangelov has administrative and teaching experience.

Based on all written above, I strongly recommend the respective Scientific Jury to support the application and propose to the Scientific Council of IPC- BAS, Assoc. Prof. Dr. Bogdan Stavrev Rangelov to be selected to the academic position "Professor" in professional field 4.2. Chemical sciences.

24th August 2020

prof. Dr. Isvetanka Babeva