

THE REVIEW

by competition for the occupation of the academic position "professor" by professional direction 4.4. Earth Sciences (Mineralogy and Crystallography) for the needs of the "Structural Crystallography and Materials Science" department at the Institute of Mineralogy and Crystallography - BAS, announced in State Gazette No. 95/14.11.2023.

Candidate: associate professor Dr. Rositsa Hristova Titorenkova, Institute of Mineralogy and Crystallography "Acad. Ivan Kostov", Bulgarian Academy of Sciences

Member of the Scientific Jury: Professor Dr. Mihail Pavlovitch Tarassov, Institute of Mineralogy and Crystallography "Acad. Ivan Kostov", Bulgarian Academy of Sciences

1. Career development of the candidate

In 1989, Rositsa Hristova Titorenkova received a diploma of higher education ("master's degree") in geology, qualification "geologist-chemist", at the Faculty of Geology and Geography of Sofia University "St. Kliment Ohridski" (SU-GGF). From 1989, with small breaks, he worked as a mineralogist-specialist: first at the Institute of Applied Mineralogy - BAS (IPM-BAS), "Single Crystal Growth" section (1989-1994), then at the Central Laboratory of Mineralogy, transformed by IPM-BAS and crystallography - BAS (since 2010 Institute of Mineralogy and Crystallography - IMC), section "Topographic Mineralogy" (1996-2012). Since 2012, he has been working in the "Structural Crystallography and Materials Science" section and the Spectroscopy Laboratory of IMC-BAS, first as a doctor-specialist, and from 2013 until now as an associate professor. Data on the doctoral studies are not included in the candidate's documents, but in 2007 she successfully defended her doctoral dissertation on the topic "Mineralogical features of zircon from Paleozoic metagranitoids in Ograzhden Planina, Serbian-Macedonian Massif, SW Bulgaria". During the period 28.11. 2010 – 28. 11. 2012 increased his professional qualification at the Graduate school for science and engineering, Yamaguchi University, Japan (Post-doctoral specialization with JSPS (Japan society for promotion of Science) scholarship).

Throughout her professional development, Associate Professor Dr. Rositsa Hristova Titorenkova has shown a deep research interest in various areas of geological sciences (mineralogy, geochemistry and petrology) - at the beginning of her career, and in various areas of materials science (biomaterials, porous materials, ceramics and ceramic pigments and others). She is a participant in a significant number of scientific projects and scientific publications with a high international impact (citation); has experience in supervising doctoral students and is a participant in educational courses at the Central Academy of BAS. All this makes her a very suitable candidate for the position announced in the competition.

2. General description of the presented materials

The materials submitted by the candidate are fully in accordance with the requirements of the current "RULES ON THE CONDITIONS AND PROCEDURES FOR THE ACQUISITION OF SCIENTIFIC DEGREES AND ACADEMIC POSITIONS IN THE INSTITUTE OF

MINERALOGY AND CRYSTALLOGRAPHY "AKAD. IVAN KOSTOV" - BAS", specified in Section IV. Conditions and procedure for occupying the academic position "professor". They include the applicant's application for participation in the competition, accompanied by a curriculum vitae and other documents according to Art. 19 of the Regulations. The necessary certifying administrative documents are presented, such as: diploma for higher education, diploma for the educational and scientific degree "doctor", certificate for scientific title "associate professor", certificate of work experience in the specialty, issued by the "Human Resources" department of IMC-BAS, documents proving the fulfillment of the requirements under Art. 2, para. 5, item 3 of the Regulations, as well as an announcement in the State Gazette No. 95/14.11.2023.

When assessing the fulfillment of the minimum national requirements (MNR) for occupying the academic position "professor", the reviewer was guided by the minimum required points, listed in the current REGULATIONS ON THE CONDITIONS AND PROCEDURE FOR ACQUIRING SCIENTIFIC DEGREES AND FOR HOLDING ACADEMIC POSITIONS IN THE BULGARIAN ACADEMY OF THE SCIENCES. In document 14, the candidate presents a table for the implementation of the MNR for occupying the academic position "professor" in the Bulgarian Academy of Sciences for professional direction 4.4. Earth Sciences (scientific field Mineralogy and crystallography), namely: 112.74 points in indicator group B (at a minimum of 100 points), 236.54 points in indicator group D (at a minimum of 220), 500 points in indicator group D (at a minimum of 120) and 350 points in indicator group E (with a minimum of 150). According to the reviewer, the cited reference (document 10) gives almost double the number of points in indicator group D. In the reviewer's opinion, the points for indicator group E (the candidate participates here with projects) are unnecessarily exaggerated. For example, projects listed as 9 and 15 are more likely to be either a contract for payment (9) or a short-term assignment with external funding (15). This reduces the E score to 300, which is again double the required 150 points. An analysis of the given data shows that the candidate fully covers the MNR for occupying the academic position of professor.

The general list of the candidate's scientific works includes 82 publications (Document 8.2). In the current competition, the candidate participated with 36 papers (Document 8), published after taking the academic position of "associate professor": 27 publications in publications referenced and indexed in WoS and/or SCOPUS databases (B4 and D7), 7 publications in non-refereed publications with peer review (G8), 2 published chapters of collective monographs (G9).

All publications are in English; 22 publications have Q rank in WoS and/or SCOPUS databases (Q1 – 10 items, Q2 – 5 items, Q3 – 2 items, Q4 – 5 items); 1 publication with SJR, 4 publications in indexed journals without SJR; 7 publications in non-indexed journals and 2 chapters in 2 books. In 2 publications, the candidate is an independent author; the remaining 34 works are co-authored, of which the candidate is the first author in 3 of them. The number of authors in collective publications varies between 2 and 12.

The articles with the participation of the candidate have been published in the following renowned international and national journals: Journal of Raman Spectroscopy, Ceramics International, Journal of biomedical materials research, Gels, Materials, Inorganic

Chemistry, RSC Advances, Microporous and Mesoporous Materials, Voprosy Khimii i Khimicheskoi Tekhnologii, Review of the Bulgarian Geological Society, Bulgarian Chemical Communications, Optical Materials, Nanomaterials, Transactions of the Materials Research Society of Japan, Journal of Solid State Chemistry, Journal of Molecular Structure, Comptes rendus de l'Académie bulgare des Sciences

The candidate has submitted a reference only for citations in WoS or Scopus for the period 2014-2023 with a full bibliographic description of the cited and citing publications (Document 10). According to this reference, for this period the total number of citations of publications in WoS or Scopus with the participation of the candidate is 207.

Since 2014, associate professor Dr. Rositsa Hristova Titorenkova has been a participant or leader in 14 funded projects (Document 13), in 3 of them she is the leader; 5 projects are financed by the Ministry of Education, Science and Research; 3 projects are within the framework of bilateral cooperation between BAS and the Czech Academy, BAS and the Romanian Academy. The other projects were financed under the Operational Program "Science and Education for Intelligent Growth", the EUROPE 2014 PROGRAM of Sofia Capital Municipality and the German foundation DAAD (German Academic Exchange Service).

3. Basic scientific and scientific-applied contributions

Of the 36 publications with which the candidate participated in the competition, 34 were written in groups of 2 to 12 co-authors. In the submitted documents, there are no separate protocols for the specific contribution of each author, but this data, in the reviewer's opinion, is not necessary. In the opinion of the reviewer, the work in collectives is an indication that Rositsa Hristova Titorenkova is a respected scientist and sought-after co-author. The candidate's contribution to the scientific works is first of all distinguished by precise and professional use and interpretation of vibrational spectroscopy data and organizational skills.

The publications are in several thematic areas: (1) Biominerals and synthetic biomaterials; (2) Synthetic porous materials and other materials; (3) Ceramics and ceramic pigments; (4) Natural minerals; (5) Archaeomineralogy.

I see the main contributions of a candidate in the following:

I. Investigation of biological minerals and synthetic biomaterials (publications 1-6, 28, 35) using vibrational methods:

- The structural inhomogeneities of dental apatite from enamel and the impact of dental laser treatment on the structural characteristics of dental apatite;
- Studies of the potential of new, hybrid materials for the remineralization of dental apatite;
- Studies of synthetic Ca-phosphates for use in dentistry

II. Investigation of synthetic heteropolyhedral porous materials using vibrational spectroscopy (Publications 7-9 and 19)

III, Ceramic Pigments (Publications 10, 11, 12, 13, 14, 15, 29-33)

- Study of the influence of isomorphic substitutions on the phase, structural and optical characteristics and color of ceramics

IV. Natural Minerals and Archaeomineralogical Research (Publications 22-25, 34, 36).

- structural and spectroscopic characteristics of new discoveries of the minerals fluorwavellite and libbetenite;

- mineralogical and spectroscopic characteristics of ancient plasters and pigments from the early Hellenistic Dokumatsi tomb (Romania) and Thracian tombs in Bulgaria;

4. Reflection of the candidate's scientific publications in Bulgarian and foreign literature

According to the presented reference (Document 10), citations in WoS or Scopus for the period 2014-2023 are 207. The total number of citations according to the applicant's data is 442. The data for the cumulative h-index according to Scopus in the documents is equal to 9 and exceeds the threshold values of h -index for a professor in some BAS institutes. According to data from Google Scholar and ResearchGate, the real h-index of the candidate is 12.

The applicant's documents do not include any information about participation in peer review of scholarly articles for renowned scientific journals or participation in editorial boards.

5. Critical remarks

The reviewer has no significant remarks about the candidate for participation in the competition. The reviewer recommends that the candidate be the lead author more often in future publications.

7. Personal impressions of the candidate

I have very good personal impressions of the candidate. My opinion is that Prof. Dr. Rositsa Hristova Titorenkova is a responsible, hardworking and persistent researcher whose approach is characterized by great precision and professionalism.

8. Conclusion

The review of scientific works and citations, the attached information on participation in projects, as well as my personal impressions give me reason to believe that Assoc. Dr. Rositsa Hristova Titorrenkova deserves to occupy the academic position of "professor" at IMK-BAS

25.03.2024 r.

Professor Mihail Tarassov, PhD