S T A T E M E N T

by a member of the Scientific Jury: assoc. prof. dr. Genoveva Atanasova
in connection with the competition for the academic position of "Associate Professor" at the Institute of Catalysis – Bulgarian Academy of Sciences, in professional field 4.2. Chemical Sciences, scientific specialty "Solid State Chemistry", for the needs of the Laboratory „Design and Characterization of Catalytic Materials", announced in State Gazette No. 58 of 26 June 2026

1. General presentation of the procedure.

Dr. Evgeni Petrov Popov, Chief Assistant Professor at the Laboratory of Design and Characterization of Catalytic Materials, is the sole candidate in the competition for the academic position of Associate Professor in professional field "4.2 Chemical Sciences", in the scientific specialty of Solid State Chemistry. The position is intended for the Laboratory of Design and Characterization of Catalytic Materials, within the thematic area of Surface Analysis, and was announced in the State Gazette, Issue No. 58, dated 26 June 2026.

Dr. Evgeni Popov has submitted all the required documents in accordance with the Development of Academic Staff in the Republic of Bulgaria Act and the Regulations of the Institute of Catalysis. The submitted documents meet the applicable requirements and provide sufficient information regarding the candidate's scientific contributions and publications.

2. Brief biographical data for the candidate.

- Education:

In 2006, Evgeni Popov obtained a Master's degree in Physics, specializing in "Nuclear and Elementary Particle Physics," from the Faculty of Physics at Sofia University "St. Kliment Ohridski," Sofia. In 2013, he obtained the scientific degree of Doctor in scientific specialty "4.1. Physical Sciences (Nuclear Physics)". His doctoral dissertation was entitled "Model Calculations of Positron Interactions in Materials for ITER."

- Professional development:

Dr. Evgeni Popov's scientific career includes positions as Physicist, Assistant, and Assistant Professor at the Institute for Nuclear Research and Nuclear Energy of the Bulgarian Academy of Sciences, as well as Physicist at the Institute of Solid State Physics. Since 2018, he has held the position of Senior Researcher at the Joint Institute for Nuclear Research in Dubna, Russia, which is equivalent to the academic position announced in the present competition. Since 2025, he has held the position of Assistant Professor at the Institute of Catalysis, in the Laboratory "Design and Characterization of Catalytic Materials."

3. Compliance with the minimum criteria for the academic position of "Associate Professor."

According to the documents provided for this competition, Dr. Popov has met all the requirements:

- Indicator A — A1. Doctoral dissertation for the award of the educational and scientific degree "Doctor".
  Successfully defended dissertation entitled "Model Calculations of Positron Interactions in Materials for ITER" — Diploma No. 000371, issued on 15 January 2014, scientific specialty: Physical Sciences (Nuclear Physics).
  Awarded: 50 points, against a required minimum of 50 points.

- Indicator B — B4. Habilitation work: scientific publications in journals indexed and abstracted in internationally recognized scientific databases (Web of Science and Scopus).
  The habilitation report comprises eight scientific publications: Q1: 5 publications — 125 points Q2: 1 publication — 20 points Q4: 1 publication — 12 points SJR: 1 publication — 10 points.
  Total: 167 points, compared to the required minimum of 100 points.
- Indicator G — G7. Scientific publications in journals indexed and abstracted in Web of Science and Scopus, outside the habilitation work.
  The report on the main scientific contributions of the research conducted outside the habilitation work comprises 11 scientific publications, all classified in category Q1.
  Total: 275 points, compared to the required minimum of 220 points.
- Indicator D — D11. Citations in scientific journals, monographs, edited volumes, and patents indexed and abstracted in internationally recognized scientific databases (Web of Science and Scopus).
  A total of 83 citations have been documented, corresponding to 166 points, compared to the required minimum of 60 points.

The candidate has submitted 19 scientific publications for consideration in the competition, all published in international indexed journals with an impact factor (17 publications) or an SJR indicator (2 publications). Based on all his publications included in the ISI database, the candidate has an h-index of 10.
According to the information provided by the candidate and the verification carried out in Scopus, Dr. Popov's scientific output exceeds the minimum national requirements for holding the academic position of "Associate Professor" in the field of Natural Sciences, Mathematics and Informatics, professional field of Chemical Sciences, as stipulated in the Development of Academic Staff in the Republic of Bulgaria Act, its implementing regulations, and the Regulations on the Terms and Procedure for Acquiring Scientific Degrees and Holding Academic Positions at Institute of Catalysis – Bulgarian Academy of Sciences. The candidate has accumulated 658 points, exceeding the minimum requirement of 430 points.

4. Overview of the candidate's research activities.

- Main scientific contributions presented in the habilitation work:

The habilitation report entitled "Analysis of the Properties of Candidate Materials Intended for Operation under Dynamic Radiation and Corrosion Conditions" combines the results of eight scientific publications.
The properties and radiation resistance of seven materials have been investigated, leading to the identification of promising candidates for use in fusion reactors, including Ta/W and Fe-Cr, as well as an assessment of the limitations associated with the use of Widia-N (WC-6Co). The effectiveness of the W–6 wt% B_4C–2 wt% TiC–1 wt% C composite and the role of B_4C under irradiation with light and heavy ions have been confirmed. The maximum gamma irradiation doses at which ZrB_2 and TiN retain their functionality have also been determined. The research presented is related to the development of materials for applications in nuclear reactors and space technologies.
The candidate's main scientific contributions concern the investigation and characterization, primarily by positron spectroscopy and neutron diffraction, of the properties of materials intended for operation under dynamic radiation and corrosion conditions. Radiation-induced defects in materials have been investigated in five publications dealing with ion irradiation and in two publications addressing gamma irradiation. Defects in the structure of solid-state materials have been investigated and analyzed under different initial and

operating conditions, including the determination of vacancy concentrations and the nature of vacancy clusters. The investigation of chemical properties, the identification of defects—including the identification of bulk oxygen vacancies in oxide compounds—and the characterization of structural changes in solid-state materials under various external influences are of key importance for their applications in catalysis, biology, and medicine.

- Scientific contributions presented in publications outside the habilitation work:

The report on the main scientific contributions presented in publications outside the habilitation work is based on 11 scientific publications. The main contributions concern the investigation of radiation-related materials (seven publications) and corrosion-resistant materials (seven publications).

The mechanisms of formation, localization, and recombination of radiation-induced defects in ZrB_2, tungsten composites, and W–Ni alloys have been investigated, demonstrating their high radiation resistance. The possibilities for controlling the defect structure of $BiVO_4$ and improving the morphology and crystallinity of HDPE/SiO_2 nanocomposites have been demonstrated, with potential applications in photocatalysis and radiation shielding. Multicomponent TiZrSiCN, TiZrNbCN, and Ti(C,N) coatings have been investigated. These coatings exhibit improved corrosion resistance, radiation tolerance, and controllable defect structures, making them promising candidates for nuclear and aerospace applications. The influence of hydrostatic pressure and YSZ content on the microstructure and mechanical properties of Al_2O_3–YSZ ceramics has been established, and an optimal composition for achieving high density, hardness, and strength has been identified.

5. Conclusion

In the submitted documentation, Dr. Evgeni Popov has described his contributions to the development of new materials intended for operation under dynamic radiation and corrosion conditions. The materials submitted for the competition are complete and comprehensive.

The research activities and scientometric indicators of Chief Assistant Professor Dr. Evgeni Popov meet the requirements for holding the academic position of “Associate Professor,” in accordance with the Development of Academic Staff in the Republic of Bulgaria Act, its implementing regulations, the regulations of the Bulgarian Academy of Sciences, and the regulations of the Institute of Catalysis – BAS.

Having reviewed the materials and scientific publications submitted for the competition, as well as the contributions presented therein, I give my positive assessment and recommend that the Scientific Jury of the Institute of Catalysis – BAS award Chief Assistant Professor Dr. Evgeni Popov the academic position of “Associate Professor” in professional field “4.2. Chemical Sciences (Solid State Chemistry)”.

I hereby express my positive assessment of the candidacy of Dr. Evgeni Petrov Popov.

14 October 2026, Sofia

assoc. prof. dr. Genoveva Atanasova