STANDPOINT
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on the competition for occupying the academic position an Associate Professor in a professional field 4.2. "Chemical Sciences", scientific research specialty " Solid-State Chemistry " for the needs for the needs of the Laboratory “Design and Characterization of Catalytic Materials”, research area “Surface Analysis”, Institute of Catalysis, Bulgarian Academy of Sciences

The competition for "Associate Professor" in the scientific research specialty " Solid-State Chemistry " is announced in „Newspaper of State”, issue No. 58 of 26 June 2026 announcement No. 182, by the Institute of Catalysis (IC) at the Bulgarian Academy of Sciences (BAS). The position is intended for the Laboratory of Design and Characterization of Catalytic Materials, within the research area “Surface Analysis”. The only candidate in the competition is Assistant Professor Dr. Evgeni Petrov Popov. All the required documents specified in the Regulations governing the terms and procedures for acquiring academic positions at the Institute of Catalysis, BAS, have been submitted. The candidate meets the minimum requirements of BAS for appointment to the academic position of Associate Professor, as well as the criteria established by the Institute of Catalysis.

Assist. Prof. Dr. Evgeni Popov has co-authored a total of 59 scientific publications, which have received 357 citations. Nineteen of these publications have been submitted for consideration in the present competition. Eighteen were published in internationally peer-reviewed journals indexed in relevant databases and having an impact factor, of which 16 are ranked in Q1, one in Q2, and one in Q4. The remaining publication appeared in a journal without an impact factor. The 19 publications submitted for the competition have received 84 citations according to the Scopus database, excluding self-citations. The candidate’s *h-index* according to Scopus is 10. Since 2025, Dr. Popov has been a member of the research team of the Laboratory of Design and Characterization of Catalytic Materials at the Institute of Catalysis, BAS.

The ***Habilitation work*** of Assist. Prof. Popov, according the indicator B, includes 8 scientific publications (publications B1–B8). Its main scientific and applied scientific contributions can be summarized as follows:

1. *Scientific contributions* - The radiation resistance and structural evolution of seven promising materials and material systems intended for applications in nuclear, fusion, and space environments have been investigated under ion and gamma irradiation. The investigated systems include Ta/W, Fe–Cr, W-based high-entropy alloys, W–TiC, W_2B, B_4C, Widia-N (WC–6Co), ZrB_2, and TiN. The principal types of radiation-induced defects, including vacancies, vacancy clusters, and dislocations, as well as the associated structural changes, have been identified and analyzed. Their dependence on chemical composition, irradiation type, and irradiation dose has been established. The behaviour of the ceramic materials ZrB_2 and TiN under gamma irradiation

has also been elucidated, including the identification of vacancy-type defects and the determination of conditions under which their functional properties are preserved.

2. *Methodological contribution* - A comprehensive experimental and theoretical approach has been developed for investigating the defect structure of materials by combining positron spectroscopy, X-ray and neutron diffraction, Raman spectroscopy, and numerical modelling. This approach enables the simultaneous analysis of surface and bulk structural changes.

3. *Engineering contribution* - An efficient cryostat has been developed for neutron diffraction measurements at temperatures below 2 K, enabling *in situ* investigations of structural and magnetic phase transitions.

The *Habilitation work* demonstrates a clearly defined research focus on the investigation of defect structures and the structural evolution of functional solid-state materials. The developed approaches and the expertise acquired are relevant to expanding the capabilities for investigating the structure and functional properties of catalytic systems.

Scientific contributions outside the Habilitation work. Here are presented the publications according indicator G, which comprise 11 scientific papers (publications G1–G11). A common feature of these studies is the application of positron spectroscopy as a highly sensitive tool for characterizing defect structures and the chemical nature of defects in composite materials and alloys, as well as for investigating the electrochemical corrosion behaviour of multicomponent coatings. The results broaden the possibilities for establishing relationships between defect structure and the functional properties of advanced materials. They also demonstrate considerable potential for application in the design of catalysts and electrocatalysts with controlled structures and properties.

The *Habilitation work* and the materials *Outside the Habilitation work* clearly demonstrate the research experience acquired by Chief Assistant Professor Dr. Evgeni Popov, as well as his expertise in investigating the structure, defect architecture, and functional properties of advanced materials. The candidate's experience is also relevant to the field of catalytic materials and processes. Applying his knowledge and expertise in positron spectroscopy and neutron diffraction can expand the possibilities for identifying and characterizing oxygen vacancies and for analysing the chemical properties and catalytic activity of various materials. These research directions are directly relevant to the scientific profile of the Institute of Catalysis.

Having reviewed the presented documentation and taking into account my personal assessment of the candidate, I strongly recommend that the esteemed members of the Scientific Jury and the Scientific Council of the Institute of Catalysis, BAS, award Chief Assistant Professor Dr. Evgeni Petrov Popov the academic position of "Associate Professor" in professional field 4.2 "Chemical Sciences", scientific speciality "Solid-State Chemistry", for the needs of the Laboratory of Design and Characterization of Catalytic Materials, research area "Surface Analysis", Institute of Catalysis, Bulgarian Academy of Sciences.

Date 11. 10. 2025 Member of the Scientific Jury:

/Prof. Dr. Dimitrinka Nikolova /