STATEMENT

By Prof. Dr. Eng. Radoslav Iliev Ivanov, "Ep. K. Preslavski", pensioner

Subject: scientific work on the topic: **Experimental and theoretical research of selenate systems** *with author* **DENCHO IVANOV MIHOV** *for achieving of educational and scientific degree "Doctor", High Education Category 4. Natural Sciences, Mathematics and Informatics, Professional Direction 4.2. Chemical Sciences, Doctoral Program 01.05.02. Inorganic chemistry*

According to Art. 44 of the current regulations on the terms and conditions for acquiring scientific degrees and occupying academic positions at the University "Prof. Dr. Asen Zlatarov" Burgas, in connection with the decision of the Faculty Council at the Faculty of Natural Sciences / Protocol 36/20.10.2022 and Report No. 2889/24.10.2022. by Assoc. Prof. Zhechka Mihailova Dimitrova - Dean of the Faculty of Natural Sciences for fulfillment of the procedure for the defense of a dissertation work at the FPN, I have been elected as a member of the Scientific Jury to provide an opinion, regarding a scientific work submitted for official defense on the topic: "Experimental and theoretical research of selenate systems" for awarding the scientific and educational degree "Doctor" to the full-time doctoral student Dencho Ivanov Mihov in the doctoral program 01.05.02. "Inorganic chemistry" from Professional direction 4.2. Chemical Sciences.

Brief biographical data: Doctoral student Dencho Ivanov Mihov was born on 20.10.1961 in the city of Burgas. In 1988, he completed his higher education at VHTI "Prof. Asen Zlatarov" Burgas as a chemical engineer. In the period 1988 - 1999, the candidate worked as an assistant and chief assistant at VHTI "Prof. Asen Zlatarov" Burgas. Since 1999 until 2001 he was the manager of the Employment and Structural Development Company, Aytos, and from 2002 until now he was the

manager of the Libra Scorp Publishing House, Burgas. The student's scientific, organizational and computer skills, acquired in his professional work in Aytos and Burgas, are impressive.

Regarding the structure of the dissertation.

The topic of the dissertation work of Doctoral student Dencho Ivanov Mihov is distinguished by relevance and innovation. The dissertation includes VII chapters, written on 144 typewritten pages with 30 tables and 24 figures. The bibliographic reference includes 199 literary sources, of which 169 are in Latin and 30 are in Cyrillic. The literature review /chapter II/ is 7 pages long, and a separate chapter III presents "The development of thermodynamic studies of mixed solutions of strong electrolytes". The material is very well systematized, at a very good scientific level and fully corresponds to the goals and the experimental part of the work. The aim of the dissertation work - thermodynamic study of phase equilibria in systems of metal selenates with a view to obtaining new salts, is clearly and concretely formulated, and the set 7 tasks fully correspond.

Own research. The experimental data from the study of the co-crystallization of the selenates of alkali and divalent metals were obtained by the Khlopin method for rapid isothermal depressurization. The compositions of the existing equilibrium phases of 16 ternary systems were studied. Experimental data are obtained from the isopiestic study of selenate systems. The thermodynamic quantities/heat capacities, enthalpy, entropy and thermochemicalpotential of the synthesized selenates. The Meissner and Cusick method and the Pitzer method were used to evaluate some thermodynamic parameters and interpret the solubility diagrams of the selenate systems accordingly. Various analytical methods were used, such as: physicochemical, derivatographic, X-ray phase, differential scanning calorimetry

and regression analyses. The results are illustrated with rich tabular and graphic material.

On the basis of the conducted experiments and the analysis of the obtained results, **7 scientific contributions** have been derived, which are correctly defined.

Scientific publications related to the dissertation work are 3, published in refereed journals, visible in the Scopus and Web of Science databases (with Q2 and Q3). The author has also participated in 4 scientific forums in the country.

The abstract fully corresponds, of course in abbreviated form, to what is presented in the dissertation work.

Taking into account the correct approach to solving the presented scientific problem, the precise processing of the obtained experimental results and their in-depth analysis, leading to precisely defined scientific contributions, I believe that the presented dissertation meets all the requirements for awarding the educational and scientific degree "Doctor".

In conclusion, I recommend the members of the Honorable Jury to vote positively for the awarding of the educational and scientific degree **"Doctor"** to Dencho Ivanov Mihov, as I will do with full reason.

Подпис заличен
Чл.2 от ЗЗЛД

12.12.2022 Prof. Dr. Eng. Radoslav Ivanov