**Appendix 12b**

**REPORT**

of dissertation for the acquisition of:

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|---|---|
| educational and scientific degree " **doctor** " | X |
| scientific degree **"Doctor of Science"** | |
| | the true is indicated by the sign "X" |

**Author of the dissertation**:

| | | | | | |
|---|---|---|---|---|---|
| Assistant | | Georgi | Bozhilov | Georgiev | University of Chemical Technology and Metallurgy |
| academic position | scientific degree | name | middle name | last name | workplace |

**Topic of the dissertation**:

| |
|---|
| Synthesis and Application of Modified Carbon Materials Based on Renewable Resources and Industrial Waste |

**Scientific area**:

| | |
|---|---|
| 5 | Technical Sciences |
| code | name |

**Professional area**:

| | |
|---|---|
| 5.10 | Chemical Technologies |
| code | name |

**Scientific specialty**:

| |
|---|
| Natural and Synthetic Fuel Technology |

**The report was written by**:

| | | | | | |
|---|---|---|---|---|---|
| Associate Professor | PhD | Lilia | Nikolaeva | Aljihmani | University of Chemical Technology and Metallurgy |
| academic position | scientific degree | name | middle name | last name | workplace |

**1. Meeting the minimum requirements under the Regulations:**

| | | |
|---|---|---|
| A) The candidate meets the minimum requirements | 20 points | X |
| B) The candidate doesn't meet the minimum requirements | 0 points | |
| | | one of the answers given is marked with the sign "X" |

| |
|---|
| It is mandatory to fill in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed. |

| |
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| |

**2. The relevance of the topic of the dissertation:**

| | | |
|---|---|---|
| A) The topic is relevant and new (there are no known results on the topic by other authors) | 8 points | |
| B) The topic is relevant and results from other authors are known | 6 points | X |
| C) The topic is not relevant, but results from other authors are known | 2 points | |
| D) The topic is not relevant and no results from other authors are known | 1 point | |
| E) The topic does not correspond to the level of dissertation | 0 points | |
| | | one of the answers given is marked with the sign "X" |

| The evaluation of the relevance of the dissertation must be substantiated |
|---|
| The dissertation addresses a highly relevant and significant scientific topic related to the development of sustainable approaches for the valorization of renewable resources and waste materials through the production of functional carbon materials. The research is fully aligned with contemporary trends in the circular economy, efficient waste management, and the implementation of environmentally friendly technologies. Its relevance is further emphasized by the growing demand for effective adsorbents for water treatment and novel catalysts for chemical processes that combine high performance with low production costs and minimal environmental impact. Investigations into the relationships between feedstock origin, modification methods, and the properties of the resulting carbon materials contribute both to the advancement of scientific knowledge and to the development of practical solutions for environmental and industrial applications. |

**3. Type of research:**

| | | |
|---|---|---|
| A) Theoretical | 4 points | |
| B) Applied | 4 points | X |
| C) Theoretical with application elements | 4 points | |
| D) It does not correspond to the level of dissertation | 0 points | |
| | | one of the answers given is marked with the sign "X" |

| The level of research must be substantiated if answer D is marked. |
|---|
| The presented results are predominantly derived from applied research, as they are directed toward the development of novel methods, materials, and technologies for the valorization of waste-derived feedstocks and their practical implementation. Specific carbon-based materials, adsorbents, and catalysts with demonstrated functional properties and potential for industrial application have been successfully developed. Furthermore, correlations between the feedstock characteristics, processing conditions, structural features, and material properties have been established, contributing to a deeper scientific understanding of these systems. Nevertheless, the primary focus of the research remains on the practical utilization and technological applicability of the developed materials and processes. |

**4. Objectives of the research:**

| | | |
|---|---|---|
| A) Realistic and of scientific and / or applied interest | 8 points | X |

| | | |
|---|---|---|
| B) Realistic, but not of scientific and / or applied interest | 3 points | |
| C) Unattainable (unrealistic) | 0 points | |
| | | one of the answers given is marked with the sign "X" |

| Objectives must be specified. The type of the set objectives must be justified. |
|---|
| The stated aims and objectives are realistic, logically consistent, and fully achievable within the scope of a doctoral research study. They encompass all major stages of the scientific process—from the selection and characterization of raw materials, through the synthesis and modification of carbon materials, to their physicochemical characterization and evaluation of application-related properties. The research is of significant scientific interest, as it focuses on the valorization of renewable resources and waste for the production of functional materials with potential applications in water purification and catalytic processes. The topic is highly relevant in the context of sustainable development, the circular economy, and the development of environmentally friendly technologies for environmental protection. |

**5. Contributions of the dissertation:**

| | | |
|---|---|---|
| A) With lasting scientific and / or applied response, they form the basis for new research and applications | 20 points | |
| B) They are of significant scientific and / or applied interest, complete and / or summarize previous research | 16 points | X |
| C) They are of scientific and / or applied interest | 12 points | |
| D) Lack of significant contributions | 8 points | |
| E) Lack of contributions | 0 points | |
| | | one of the answers given is marked with the sign "X" |

| Contributions must be specified. The type of results achieved must be justified. |
|---|
| The dissertation contains original results related to the development of new approaches for the valorization of waste feedstocks through the production of functional carbon materials with controlled properties. Relationships have been established between the composition of the raw materials, synthesis conditions, and the structure of the resulting materials. Novel and energy-efficient methods for the synthesis of carbon materials have been developed, and their potential for practical application as adsorbents and catalysts has been demonstrated. The obtained results have a significant scientific and applied contribution, expand the existing knowledge in the field, and build upon previous research, without, however, constituting an independent new scientific direction. |

**6. Conclusion**

| | | |
|---|---|---|
| A) The evaluation of the dissertation is **POSITIVE** | This evaluation is assigned to a total number of at least 40 points | X |
| B) The evaluation of the dissertation is **NEGATIVE** | This evaluation is assigned to a total number below 40 points | |
| | | one of the answers given is marked with the sign "X" |

| To be filled in at the request of the member of the scientific jury |
|---|

The presented work has the volume and quality of a dissertation required for awarding the educational and scientific degree “Doctor” and complies with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and its implementing regulations.
I give a positive assessment of the dissertation and recommend that the esteemed scientific jury award Eng. Georgi Bozhilov Georgiev the educational and scientific degree “Doctor” in the field of higher education 5. Technical Sciences, professional direction 5.10 Chemical Technologies, scientific specialty “Natural and Synthetic Fuel Technology.”

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| **1.06.2026** | The report was written by: | |
| date | | signature |