

REPORT

of dissertation for the acquisition of:

Educational and scientific degree "Doctor" (PhD)	X
Educational and scientific degree "Doctor of Science" (DSc)	
	one of the degrees indicated shall be marked with the sign "X"

Author of the dissertational thesis:

1	assistant	MSc	Georgi	Bozhilov	Georgiev	University of Chemical Technology and Metallurgy - Sofia
№	academic position	scientific degree	name	middle name	last name	workplace

Тема на дисертационния труд:

“Synthesis and Application of Modified Carbon Materials Derived from Renewable Raw Materials and Industrial Wastes”

Scientific area:

5.	Technical Sciences
code	name

Professional area:

5.10.	Chemical Technologies
code	name

The report was written by:

Professor	PhD	Dimitar	Kirilov	Teodosiev	Space Research and Technology Institute – Bulgarian Academy of Sciences
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 must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.

PhD student Georgi Bozhilov Georgiev has prepared and submitted the required set of documents, in accordance with the requirements of the Regulations of the University of Chemical Technology and Metallurgy, necessary for opening a procedure for defending a doctoral dissertation.

PhD student Georgi Georgiev has successfully passed all exams, in accordance with the individual curriculum and has been discharged with the right to defend PhD thesis by order No. P-ΦX-39/05.03.2026.

2. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	8 points	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	X
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	2 points	
D) The smaller part of the research is relevant	1 points	
E) Research is not relevant	0 points	
		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.

Assistant Eng. Georgi Bozhilov Georgiev participates in a doctoral dissertation defense procedure, whereas all the scientific works are included in the main research area of the investigations, and they represent the results in the submitted publications.

The relevance of the research in the dissertation work is confirmed by the necessity to develop cheap and stable carbon materials through the utilization of polymer industrial waste and biomass.

Effective methods have been developed for obtaining carbon materials from renewable and

waste raw materials, which allow precise control of the porous structure and surface chemistry of the materials.

3. Type of the investigations:

A) Theoretical investigations	4 points	
B) Applied investigations	4 points	
C) Theoretical investigations with elements of applied investigations	4 points	X
D) Do not correspond to the level of the dissertation	0 points	
		one of the answers given is marked with the sign "X"
The type of investigations must be specified		
The presented dissertation work is relevant both from a scientific and applicational point of view. The dissertation is dedicated to research related to the preparation and characterization of modified carbon materials from renewable and waste raw materials with application in environmental and chemical-technological 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 main aim of this dissertation is to obtain and synthesize modified carbon materials based on renewable raw materials and industrial waste. The structure, surface chemistry and functional characteristics of the obtained carbon materials are studied in details, related to their application as adsorbents in wastewater treatment and as catalyst carriers in various chemical processes.

5. Candidate research contributions:

A) With lasting scientific and / or applied response, they form	20 points	X
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the basis for new research and applications		
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	
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.


After implementation of the objectives and tasks of the dissertation work, the obtained results represent important contributions in the field of synthesis, characterization and application of modified carbon materials:

- A new method for the utilization of industrial and agricultural waste raw materials has been developed, by converting them into functional carbon materials with tailored structure and properties. The optimal conditions for obtaining carbon materials with porous and graphite-like structure, with potential application in environmental protection, catalysis, electrochemistry, etc. have been determined.
- An energy-efficient method for synthesis of carbon foam in open vessel under atmospheric conditions, without the use of inert atmosphere, has been developed, which significantly simplifies the process and provides conditions for industrial application.
- Based on various waste raw materials, carbon adsorbents with high adsorption capacity for the successful removal of organic pollutants have been synthesized.
- On the base of the obtained carbon materials, effective catalysts for the conversion of glucose into 5-hydroxymethylfurfural have been developed and characterized.

6. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 40 points	X
B) The evaluation of the candidate's activity 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 if requested by the member of the scientific jury
I am completely convinced to give a positive assessment of the dissertation work and propose to the esteemed members of the scientific jury to support the awarding of the educational and scientific degree "Doctor" to PhD student Georgi Bozhilov Georgiev in the field of higher education: 5. "Technical Sciences", professional area 5.10. Chemical Technologies.

03.06.2026	The report was written by: Prof. Dimitar Teodosiev	
date		signature