

REPORT

of dissertation for the acquisition of:

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

Author of the dissertation:

Eng.	MSc	Yoana	Dinkova	Stoyanova	DEPARTMENT OF BIOTECHNOLOGY FACULTY OF CHEMICAL AND SYSTEM ENGINEERING UNIVERSITY OF CHEMICAL TECHNOLOGY AND METALLURGY
academic position	scientific degree	name	middle name	last name	workplace

Topic of the dissertation:

WASTE PRODUCTS FROM THE ESSENTIAL OIL INDUSTRY – UTILIZATION AND BIOLOGICAL ACTIVITY

Scientific area:

code	name

Professional area:

5.11	Biotechnology (Technology of Biologically Active Substances)
code	name

Scientific specialty:

5.11 Biotechnology (Technology of Biologically Active Substances)

The report was written by:

Prof.	DSc	Venko	Nikolaev	Beschkov	retired
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"
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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.

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	X
B) The topic is relevant and results from other authors are known	6 points	
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

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.

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.

1. Study of the biological activity of waste fractions from the production of essential oils. It was studied against two reference strains (Gram-positive and Gram-negative), and conclusions were drawn about the effectiveness of the obtained extracts from the different raw materials (rose, lavender, clove).
2. Evaluation of the effectiveness of membrane filtration of waste fractions from the production of essential oils from the above plant raw materials. To find a relationship between the membrane selectivity during filtration and the antioxidant activity and the content of key biologically active components,
3. Study of the effectiveness of spray drying of an extract from lavender waste plant mass and retentate (concentrate) obtained during membrane filtration of the extract in terms of their antioxidant activity.

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	
C) They are of scientific and / or applied interest	12 points	X
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.
1. Membrane nanofiltration was studied and applied for the extraction of valuable components (rosmarinic acid, caffeic acid, eugenol) with biological activity from plant raw materials. Chromatographic methods of analysis were used.
2. The antibacterial activity of the extracts was studied, as well as their antioxidant activity. Standard methods were used. Differences in this activity were found depending on the obtained product compared to the respective reference strain.
3. The efficiency of spray drying of an extract of waste plant mass from lavender was studied and the antioxidant activity of the obtained preparation was evaluated.
4. The efficiency of precipitation of an extract of waste plant mass from lavender was determined in relation to the antioxidant activity of the preparation.

6. Conclusion

A) The evaluation of the dissertation is POSITIVE	This evaluation is assigned to a total number of at least 40 points	52 pts
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 work is carried out at a high scientific and technical level. The experimental methods are well selected, the analyses and specialized tests (bacterial activity, antioxidant activity) - as well. There is excellent publication activity and participation in scientific forums. Three publications (two in journals with Q3 and one in a journal with Q2) and 24 participation in scientific forums in our country and abroad.

20.03.2025	The report was written by:	
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date		signature
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