

REVIEW

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:

		Margarita	Marinova	Koleva	UCTM - Sofia
academic position	scientific degree	name	middle name	last name	workplace

Topic of the dissertation:

New ecological methods for the processing of leather sheepskins

Scientific area:

5.0	Technical Sciences
code	name

Professional area:

5.10	Chemical Technologies
code	name

Scientific specialty:

Leather and Fur Products and Tanning Technology

The review was written by:

Professor	DSc	Tsonko	Mitev	Kolev	Institute of Molecular Biology
academic position	scientific degree	name	middle name	last name	workplace

1. Completion of the provided documents:

A) The dissertation and the competition documents are in full compliance with the Regulations.	4 points	x
B) The documents are complete but do not fully comply with the requirements of the Regulations.	2 points	
C) The documents are not completed in accordance with the requirements of the Regulations.	0 points	
		one of the answers given is marked with the sign "X"

Missing documents and violated standards must be described if response C is marked.
There is no missing documents

2. 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.

The candidate has enough publications on the field of technology, even some publications are beyond the technology and are in the chemical science, e.g. "D.Danalev, M.Koleva, D.Ivanova, L.Vezenkov and N.Vassilev, Synthesis of two peptide mimetics as markers for chemical changes of wool's keratin during skin unhairing process, Protein and Peptide Letters, 2008, 15(4), 341-345 have 4 citation and

Koleva M., Danalev D., Ivanova D., Vezenkov L., Vassilev N., Synthesis of two peptide mimetics as markers for chemical changes of wool's keratin during skin unhairing process and comparison of the wool quality obtained by ecological methods for skins unhairing, Bulgarian chemical communications, 2009, 41(2), 160-164

have also 4 citations. The matching between technology and science benefits for the both sides. Mag.eng. Margarita Koleva has two more citations which are not in the field of the PhD thesis.

3. 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

In traditional leather production, a relatively small proportion of raw hides and skins (only 20%) and auxiliary materials are included in the finished product. This is one of the main reasons why both wastewater and waste by-products are high in volume. Therefore, current trends in the leather industry are aimed at the development and application of new methods and materials, as well as the use of the resulting solid waste for raw materials in other industries. Therefore the PhD-student gave a detailed description of ecological problems in leather production, construction and composition of raw animal leather, as well as materials and methods for ecologically improved pre-tanning/chrome-free tanning of leather, which corresponds completely with the purpose of the PhD-thesis. It is clear

from the literature review that mag. eng. Margarita Koleva is very familiar with the scientific literature on the subject and she is free to handle it. The aims set of the studies carried out are realistic and the results achieved on them have significant scientific and applied interest.

4. Knowledge of the problems, subject of research in the dissertation:

A) The doctoral student knows in detail the achievements of other authors on the topic of the dissertation	8 points	x
B) The doctoral student is partially familiar with the achieved results on the topic of the dissertation	4 points	
C) The doctoral student has no prior knowledge of the status of the problems in the dissertation	0 points	
		one of the answers given is marked with the sign "X"

The evaluation must be substantiated if answer C is marked.

The PhD student mag. eng. Margarita Koleva became very familiar with the research of other researchers in this field, which is reflected in the literature review presented on 52 pages of the PhD-thesis. It covers 186 literary sources, half of which have been published since 2000. Much of the older editions are textbooks and monographs. I conceive that the listed literature sources display competency of the candidate on this area.

5. 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.

I concede the research presented is really applied but there are elements of theoretical investigation of the base of the leather technology.

6. 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 PhD student has set very realistic goals for the dissertation work. They clearly outline the sequence of stages for the development of the topic and are of scientific and applied interest. The aims are modern and adequate, which can be traced from the presentation of the dissertation material.

7. Methods of research:

A) Adequate to research and set objectives	8 points	x
B) Partially appropriate, enabling part of the scientific objectives and / or applications to be achieved	4 points	
C) Inappropriate methods	0 points	
		one of the answers given is marked with the sign "X"

Methods must be specified. The type of methods used is justified.
<ul style="list-style-type: none"> I think the applied research methods are adequate to the set aims and are very well chosen. The process of the unhairing of sheepskins with alkaline pretreatment for the immunization of the wool keratin is optimized by applying an orthogonal central composite plan. According to the full three-factor design experiment, the concentration and duration of the variables are calculated. The methods used are NMR ¹³C and ¹H; infrared spectroscopy using KBr pellet technique, which is only one method for investigation of solid samples like above mentioned leathers. Specific methods in leather industry are also implemented such as Total Kjeldahl Nitrogen, Monosaccharide concentration by Mendel, Alkaline solubility, Carbamid-disulfite solubility, shrinkage temperature. Thin layer chromatography, Amino Acid Analysis and SEM(Scanning Electron Microscopy) are also used.

8. 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.
<p>In my opinion the main scientific contributions of Eng. Margarita Koleva from the presented results give the PhD-thesis a fundamentally applied character and can be summarized as follows:</p> <ul style="list-style-type: none"> - The parameters for conducting enzymatic refinement, unhairing and degreasing with the Bulgarian enzyme preparation Protozin have been established.

- The leather sheepskin unhairing technology has been developed for the first time.
- Wool obtained from the unhairing can be used in the other industries.
- For the first time, tanning preparations based on sumac, Bulgarian origin, and various metal ions have been obtained, which simultaneously skinned and dyed leather tissue.
- Complete environmental technologies have been developed for sheepskin processing that do not pollute the environment.

9. Evaluation of the compliance of the dissertation summary with the dissertation:

A) Full compliance	4 points	x
B) Compliance of the main parts	2 points	
C) Lack of compliance of the main parts	0 points	
		one of the answers given is marked with the sign "X"

The evaluation must be substantiated if answer C is marked.

On the basis of overall analysis of the dissertation summary it is fully consistent with the PhD-thesis presented.

10. Participation of the doctoral student in the achievement of the results of the dissertation:

A) The doctoral student has at least an equal participation	8 points	x
B) The doctoral student has secondary participation	5 points	
C) The participation of the doctoral student is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.

11. Critical notes:

A) Lack of critical notes	8 points	
B) Critical notes of a technical nature	7 points	x
C) Critical notes that would partially improve the results achieved	4 points	
D) Significant critical notes	0 points	

		one of the answers given is marked with the sign "X"
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Critical notes must be provided if one of the answers C or D is marked.
I have found only technical errors, typewrite ones.

12. Conclusion

A) The evaluation of the dissertation is POSITIVE	This evaluation is assigned to a total number of at least 65 points	x
B) The evaluation of the dissertation is NEGATIVE	This evaluation is assigned to a total number below 65 points	
		one of the answers given is marked with the sign "X"

To be filled in at the request of the reviewer
<p>My assessment of the PhD-thesis is positive, as it is elaborated very professionally. Different methods of investigation are used, an orthogonal central composite plan is applied to optimize the process of unhairing of the sheepskins. The use of enzyme preparations for the pre-treatment of skins and the development of new tanning agents based on vegetable tanning agents and metals replacing chromium tanning have doubtless environmental effect in the processing of leather sheepskins.</p> <p>Therefore, I am convinced to propose to the scientific jury to award the educational and scientific degree "Doctor" to Eng. Margarita Marinova Koleva in the field of higher education: "Technical Sciences", professional field 5.10. "Chemical Technologies", Scientific specialty "Leather and Fur Products and Tanning technology".</p> <p>Total Points 94</p>

31.01.2020	Prof. Tsonko Kolev, DSc:	
date		signature