Appendix 12b

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:

		Martin	Rosenov	Pernikov	UCTM
academic position	scientific degree	name	middle name	last name	workplace

Topic of the dissertation:

Synthesis, microstructure and electrical properties of oxide glass-ceramics

Scientific area:

4.0	Natural sciences, mathematics and informatics
code	name

Professional area:

4.1	Physical sciences
code	name

Scientific specialty:

Electrical, magnetic and optical properties of the condensed matter

The report was written by:

Assoc. Prof.	Dr.	Angelina	Koleva	Stoyanova-Ivanova	ISSP-BAS
academic position	scientific degree	name	middle name	last name	workplace

1. MeetingtheminimumrequirementsundertheRegulations:

A) Thecandidatemeetstheminimumrequirements	20 points	x
B) Thecandidatedoesn’t meettheminimumrequirements	0 points	
		one of the answers given is marked with the sign "X"

Itismandatorytofillinifanswer B is marked. The publication activity of the candidate is analyzed. Theresponseoftheresultsachieved (quoted) is analyzed.

2. Therelevanceofthetopicofthedissertation:

A) Thetopicisrelevantandnew (therearenoknownresultsonthetopicbyotherauthors)	8 points	x
B) Thetopicisrelevantandresultsfromotherauthorsareknown	6 points	
C) Thetopicisnot relevant, butresultsfromotherauthorsareknown	2 points	
D) Thetopicisnotrelevantandnoresultsfromotherauthorsareknown	1 point	
E) Thetopicdoesnotcorrespondtothelevelofdissertation	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 actuality of the reviewed work is determined by the necessity of the synthesis of new dielectric materials with controllable electrical properties and potential for application for energy storage in electronics/microelectronics, medicine and sensor technologies.

3. Type of research:

A) Theoretical	4 points	
B) Applied	4 points	
C) Theoreticalwithapplicationelements	4 points	x
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 researchmustbesubstantiatedifanswerD ismarked.
The investigations reported in the dissertation can be classified as theoretical with an element of applications because they concern the synthesis and the investigation of the dielectric properties of modified perovskite-based barium titanate glass-ceramics with practical application of the investigated materials in electronics/microelectronics, medicine and sensor technologies.

4. Objectives of the research:

A) Realisticandofscientificand / orappliedinterest	8 points	x
B) Realistic, butnotofscientificand / orappliedinterest	3 points	
C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectivesmustbespecified. Thetypeofthe set objectivesmustbejustified.
The objectives of the dissertation are related to the synthesis and the investigation of the dielectric properties of modified barium titanate glass-ceramics obtained from oxide glasses. The effect of the chemical and phase composition of the prepared glass-ceramics, containing nano- and submicron-sized crystals of modified barium titanate, on the micorstructure and the dielectric properties is traced.

5. Contributions of the dissertation:

A) Withlastingscientificand / orappliedresponse, theyformthebasisfornewresearchandapplications	20 points	x
B) They are of significantscientificand / orappliedinterest, completeand / orsummarizepreviousresearch	16 points	
C) Theyareofscientificand / orappliedinterest	12 points	
D)Lackofsignificantcontributions	8 points	
E) Lackofcontributions	0 points	
		one of the answers given is marked with the sign "X"

Contributions must be specified. Thetypeofresultsachievedmustbejustified.
The contributions of the dissertation are related to: 1. Selection of new oxide glass compositions with high concentrations of alkaline and alkaline-earth oxides in which dielectric phase with high volume fraction can be crystallized. 2. Determining of the main physico-chemical characteristics of the prepared glasses – glass transition and crystallization temperatures, main structural units in the glasses and glass-ceramics, phase composition and morphology of the obtained glass-ceramics and formulating a hypothesis for the occurrence of phase separation in them preceding the process of controlled crystallization. 3. Characterization of the thermophysical and mechanical properties of the obtained glasses and establishing the relationship between them. 4. Determining the conduction mechanism in the synthesized glasses and glass-ceramics and outlining the potential areas of their application as dielectrics in multilayered capacitors, parts of sensors and opto-electronic systems. The results of the dissertation are with both fundamental and applied character and could contribute to the estimation of the areas of applicability of the synthesized and investigated materials.

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) Theevaluationofthedissertationis**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 materials submitted for the competition and the outlined fundamental and applied contributions in the dissertation of eng. Martin Rosenov Pernikov comply with the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (LDASRB) and the Regulation for the Application of LDASRB for the acquiring of the educational and scientific degree “Doctor” of the University of Chemical technology and Metallurgy. Based on the stated above, I strongly suggest to the Scientific Jury in the competition to vote “**Positive**” for awarding the educational and scientific degree “Doctor” in the professional field 4.1 "Physical Sciences", specialty "Electrical, magnetic and optical properties of condensed matter" to the candidate, eng. Martin Rosenov Pernikov.

17.06.2024	**Assoc. Prof. Dr. Angelina Koleva Stoyanova-Ivanova**	
date	The report was written by	signature