

## 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:

		Hristofor	Ivanov	Skandaliev	"Hristofor Ivanov – Children's World" – Kyustendil
academic position	scientific degree	name	middle name	last name	workplace

## Topic of the dissertation:

Development and Characterization of Eco-Friendly and Non-Toxic Solid Rocket Propellants
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## Scientific area:

5	Technical sciences
code	name

## Professional area:

5.10	Chemical Technologies
code	name

## Scientific specialty:

Technology of Natural and Synthetic Fuels
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## The report was written by:

Associate Prof.	PhD	Borislav	Mitkov	Ignatov	Trakia University – Stara Zagora
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.

In Appendix 5a, the candidate has presented a list of his publication activity related to the subject of the dissertation thesis. Following the conducted review and analysis of the submitted materials, I found that the publication activity meets the minimum national requirements for obtaining the educational and scientific degree of PhD. The total number of points, calculated on the basis of the presented publications and scientific contributions, amounts to 36.67 points, which satisfies the required criteria.

## 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	<b>X</b>
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 proposed topic is highly relevant and significant, as it focuses on researching and finding solutions to a number of contemporary practical problems related to both the development of science and industry and growing social and environmental demands. The topic covers issues arising from the continuous tightening of environmental standards and the need to develop more environmentally friendly technologies and materials. In addition, the rapid development of the space industry and the increasing application of rocket technologies place new demands on the characteristics, reliability, and safety of the propellants used. Of particular importance is the need to synthesize safer, more efficient, and more sustainable solid rocket fuels that meet both high technical standards and modern requirements for environmental and operational safety. In this context, the topic under development makes a significant contribution in both scientific and practical terms.

## 3. Type of research:

A) Theoretical	4 points	
B) Applied	4 points	
C) Theoretical with application elements	4 points	<b>X</b>
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 objectives of the dissertation are clearly, consistently, and convincingly formulated by the candidate, and are well-supported from both a scientific and a practical perspective. The main focus of the research is on the synthesis and development of new solid rocket fuels that meet modern requirements for efficiency, safety, and environmental sustainability. The dissertation emphasizes the need to create fuels with minimal negative environmental impact during combustion, which is particularly important given increasingly stringent environmental requirements. In addition, one of the main objectives of the research is for the developed solid rocket propellants to possess high stability during storage and operation, which is a key factor for their safety, reliability, and practical application. The candidate correctly notes that the stability of these materials is of key importance both for their long-term storage and for preventing undesirable chemical processes and risks when working with them. Another important objective of the dissertation is for the newly synthesized fuels to

ensure high performance and efficiency in the propulsion of rocket systems, while simultaneously achieving good energy characteristics and reliable system operation. Furthermore, the study emphasizes the use of readily available, cost-effective, and non-toxic raw materials and substances, which further enhances the practical applicability and future potential of the solutions being developed. Overall, the objectives set are relevant, realistic, and in line with current trends in the field of solid rocket propellants and energy materials.

#### 4. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	<b>X</b>
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 objectives of the dissertation are well described and substantiated by the candidate. They may be summarized as follows: the synthesis of new solid rocket propellants that are environmentally friendly during combustion; stable during storage; high-performance in rocket propulsion systems; and, last but not least, manufactured from readily available and non-toxic materials.

#### 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	<b>X</b>
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.

I accept the 11 contributions outlined by the doctoral candidate in his dissertation and divide them into two categories:  
 - Scientific and applied contributions – contributions № 1; 2; 3; 4; 5; 7  
 - Applied contributions – contributions № 6; 8; 9; 10; 11

#### 6. Conclusion

A) The evaluation of the dissertation is <b>POSITIVE</b>	This evaluation is assigned to a total number of at least 40 points	<b>X</b>
B) The evaluation of the dissertation is <b>NEGATIVE</b>	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 presented by the candidate is well-described and structured. The research and testing of the TRG were well-planned and described, and the results obtained were analysed in depth. Based on my review of the dissertation and the scientific-applied and applied contributions it contains, I find it appropriate to recommend that the Scientific Jury award Hristofor Ivanov Skandaliev the academic degree of "Doctor" in Scientific Field 5. "Technical Sciences," Professional Field 5.10 "Chemical Technologies," Scientific Specialty "Technology of Natural and Synthetic Fuels."

	The report was written by:	
date		signature