REVIEW
of the official reviewer for dissertation work

Syrgabek Yerkanat Arkynuly on the theme «"Development of methods for the determination of pesticides in grapes using solid-phase microextraction"» presented for the degree of Doctor of Philosophy (PhD) in the specialty «Chemistry».

№	Criteria	Eligibility (one of the options must be checked)	Justification of the position of the official reviewer
1.	The topic of the thesis (as of the date of its approval) corresponds to the directions of development of science and/or state programs	1.1 Compliance with priority areas of science development or government programs: 1) The thesis was completed within the framework of a project or target program financed from the state budget (indicate the name and number of the project or program) 2) The thesis was completed within the framework of another state program (indicate the name of the program) 3) The dissertation corresponds to the priority direction of the development of science, approved by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan (indicate the direction)	The theis was financed by grants: - "Improvement and development of highly sensitive methods to ensure food safety in Kazakhstan" project IRN AP08857501 years 2020-2022; - "Development of a biological product to increase the yield of grapes" project IRN, years AP196805632023-2025; - "Development of highly sensitive "green" methods for the analysis of residual amounts of pesticides in grapes" "Zhas Galym" project, years 2024-2026.
2.	Importance for science	The work makes/does not make a significant contribution to science, and its importance is well disclosed/not disclosed	The development of vacuum assisted headspace SPME based procedures for the determination of pesticides in grapes is a significant scientific novelty. Special attention is given to the greenness of the procedures applied for pesticides determination in grapes, which is also scientifically novel.
3.	The principle of independence	Self-reliance level: 1) High; 2) Medium;	PhD candidate is very independent scientists. In three, out of four articles, he is the first authors, in fourth he is the

		3) Low; 4) No independence	corresponding author, what clearly indicates his significant contribution.
4.	The principle of inner unity	4.1 Justification of the relevance of the thesis: 1) Justified; 2) Partially justified; 3) Not justified.	The thesis is relevant and scientifically novel.
		4.2 The content of the thesis reflects the topic of the thesis: 1) Reflects; 2) Partially reflects; 3) Does not reflect	The content of the thesis correspond to the topic.
		4.3. The purpose and objectives correspond to the topic of the thesis: 1) correspond; 2) partially correspond; 3) do not correspond	The aims and objectives correspond to the topic.
		4.4 All sections and provisions of the thesis are logically interconnected: 1) completely interconnected; 2) the interconnection is partial; 3) there is no interconnection	The thesis is consistent.
		4.5 The new solutions (principles, methods) proposed by the author are reasoned and evaluated in comparison with the known solutions: 1) there is a critical analysis; 2) partial analysis; 3) the analysis does not represent one's own opinions, but quotes from other authors	The developed analytical procedures are compared with the previous ones in terms of greenness and applicability.
5.	Scientific novelty principle	5.1 Are the scientific results and provisions new? 1) completely new; 2) partially new (25-75% are new); 3) not new (less than 25% are new)	The scientific results are novel, as for the first time analytical procedures based on Vac-HS-SPME and Mini-HS-SPME for the determination of pesticides in grapes. The procedures have beed designed, optimized, validated and
		5.2 Are the dissertation findings new? 1) completely new;	

		2) partially new (25-75% are new); 3) not new (less than 25% are new) 5.3 Technical, technological, economic or management decisions are new and reasonable: 1) completely new; 2) partially new (25-75% are new); 3) not new (less than 25% are new)	applied for real samples analysis. The novelty is confirmed by the publication of the results in good analytical chemistry journals.
6.	The validity of the main findings	All main conclusions are/are not based on scientifically significant evidence or well-grounded (for qualitative research and areas of training in the arts and humanities)	The procedures were developed and validated according to standard practices in this area.
7.	The main provisions for the defense	It is necessary to answer the following questions for each provision separately: 7.1 Is the provition proven? 1) proven; 2) rather proven; 3) rather not proven; 4) not proven 7.2 Is it trivial? 1) yes; 2) no 7.3 Is it new? 1) yes; 2) no 7.4 Application level: 1) narrow; 2) medium; 3) wide 7.5 Is it proven in the article? 1) yes; 2) no	The provision 1 is proven in the article 10.1016/j.sampre.2024.100123, especially in section 3. The extraction temperature, extraction time, sorption fiber based on polyethylene glycol, liquid sample volume, vacuuming time pH have been optimized. The basic validation parameters have been estimated. The provision is not trivial and is new.
	The main provisions for the defense	It is necessary to answer the following questions for each provision separately:	The provision 2 is proven in the article 10.1002/jssc.70204, particularly in

		7.1 Is the provition proven? 1) proven; 2) rather proven; 3) rather not proven; 4) not proven 7.2 Is it trivial? 1) yes; 2) no 7.3 Is it new? 1) yes; 2) no 7.4 Application level: 1) narrow; 2) medium; 3) wide 7.5 Is it proven in the article? 1) yes; 2) no	sections 3.1-3.9. The extraction temperature, extraction time, pre-incubation time, sorption fiber type, sample volume, salt addition and pH have been optimized. Also basic validation parameters have been estimated. The provision is new and is not trivial.
	The main provisions for the defense	It is necessary to answer the following questions for each provision separately: 7.1 Is the provition proven? 1) proven; 2) rather proven; 3) rather not proven; 4) not proven 7.2 Is it trivial? 1) yes; 2) no 7.3 Is it new? 1) yes; 2) no 7.4 Application level: 1) narrow;	The provision 3 is proven in the article 10.1002/jssc.70204, particularly in Table 3 and Section 4. The greenness of sample preparation and applicability have been calculated and compared. The provision is new.

		2) medium; 3) wide 7.5 Is it proven in the article? 1) yes; 2) no	
8.	The principle of reliability Reliability of sources and information provided	8.1 Choice of methodology - is justified or the methodology is described in sufficient detail 1) yes; 2) no	Yes, the methodology is described sufficiently in "materials and methods" section of every article.
		8.2 The results of the thesis were obtained using modern methods of scientific research and methods of processing and interpreting data using computer technologies: 1) yes; 2) no	Yes, the methods of scientific research are modern and properly selected to deal with stated aims.
		8.3 Theoretical conclusions, models, identified relationships and patterns have been proven and confirmed by experimental research (for areas of training in pedagogical sciences, the results have been proven on the basis of a pedagogical experiment): 1) yes; 2) no	Conclusions have been made on the basis of scientific evidence.
		8.4 Important statements are confirmed / partially confirmed / not confirmed by references to current and reliable scientific literature	Important statements are confirmed by the proper literature references.
		8.5 Used literature sources are sufficient/not sufficient for a literature review	The literature sources are properly selected. They are new and relevant to the topic.
9	Practical value principle	9.1 The thesis has theoretical value: 1) yes; 2) no	The theoretical value is in the development of the variations of SPME technique. Its application to new group of compounds has also theoretical value.
		9.2 The thesis is of practical importance and there is a high probability of applying the results obtained in practice: 1) yes;	The practical potential is in possibility to develop standard procedure for the determination of pesticides in grapes.

		2) no	The procedure can be useful to labs dealing with agricultural products analysis.
		9.3 Are the practice suggestions new? 1) completely new; 2) partially new (25-75% are new); 3) not new (less than 25% are new)	The developed procedures are new.
10.	The quality of writing and design	Academic writing quality: 1) high; 2) average; 3) below average; 4) low.	The academic writing quality is high. The publications have been reviewed by the international reviewers.
11.	Notes on a thesis	I have no additional comments.	
12.	Scientific level of the doctoral student's articles on the topic of research (in case of defense of the dissertation in the form of a series of articles, the official reviewers comment on the scientific level of each article of the doctoral student on the topic of research)	All the articles have been published in international, peer-reviewed journals, with high impact factors. My assessment of scientific level is high.	
13.	Decision of the official reviewer (pursuant to paragraph 28 of the present Model Regulations)	The thesis, presented as a series of articles, is consistent, scientifically sound and novel. The results are important from both scientific and practical points of view. This drives me to the recommendation for Syrgabek Yerkanat Arkynuly to be awarded with the degree of Philosophy Doctor in Chemistry.	

In reviews, official reviewers indicate one of the following solutions:

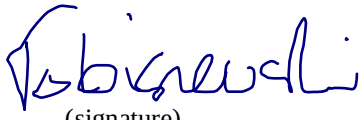
1) to award the degree of Doctor of Philosophy (PhD) or Doctor of Specialization;

2) send the thesis for revision (except for cases of thesis defense in the form of a series of articles);

3) refuse to award the degree of Doctor of Philosophy (PhD) or Doctor of Specialization.

Copies of the reviews of the official reviewers are handed over to the doctoral student no later than 5 (five) working days before the defense of the thesis.

Official Reviewer:
Gdańsk University of Technology
DSc, PhD
(place of work, academic title)


(signature)

Marek Tobiszewski
(FULL NAME)