

Jury Member Report – Doctor of Philosophy thesis.

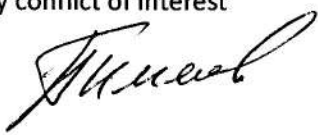
Name of Candidate: Daria Sergeeva

PhD Program: Petroleum Engineering

Title of Thesis: Development of thermodynamic models for phase equilibria of water-ice-gas-hydrate in aqueous solutions of inhibitors and in porous media

Supervisor: Principal Research Scientist Vladimir Istomin

Name of the Reviewer: Vyacheslav Pimenov

<p>I confirm the absence of any conflict of interest</p> 	<p>Date: 05-11-2021</p>
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The purpose of this report is to obtain an independent review from the members of PhD defense Jury before the thesis defense. The members of PhD defense Jury are asked to submit signed copy of the report at least 30 days prior the thesis defense. The Reviewers are asked to bring a copy of the completed report to the thesis defense and to discuss the contents of each report with each other before the thesis defense.

If the reviewers have any queries about the thesis which they wish to raise in advance, please contact the Chair of the Jury.

Reviewer's Report

Reviewers report should contain the following items:

- Brief evaluation of the thesis quality and overall structure of the dissertation.
- The relevance of the topic of dissertation work to its actual content
- The relevance of the methods used in the dissertation
- The scientific significance of the results obtained and their compliance with the international level and current state of the art
- The relevance of the obtained results to applications (if applicable)
- The quality of publications

The summary of issues to be addressed before/during the thesis defense

The PhD thesis "Development of Thermodynamic Models for Phase Equilibria of Water-Ice-Gas-Hydrate in Aqueous Solutions of Inhibitors and in Porous Media" by Daria Sergeeva consists of 7 chapters: the introduction, the relevant literature review, the chapter with thermodynamic approaches description for experimental data processing, two chapters on phase equilibria of gas hydrates and ice in porous media, the chapter with experimental data on inhibitor' influence for hydrate formation and the chapter with some applications of obtained results.

The thesis correctly represents the work that was done over the course of the PhD program. The research methods used in the dissertation are quite relevant. The scientific results obtained are significant and correspond to the international level. They are of great importance for gas production from natural hydrocarbon system, for development of hydrocarbon deposits in low-temperature reservoirs and for possible gas production from methane-hydrate reservoirs.

The scientific significances of the dissertation results are obvious; they have been published in 9 papers in peer-reviewed journals, and in 6 proceedings of international conferences. The quality and amount of publications correspond to current requirements to the PhD thesis in Skoltech.

There is a point I would like Daria to clarify before or during the thesis defense. The difference between gas hydrates forming in a bulk conditions and in pore space could be shown in the thesis more distinctly.

In summary, I recommend the presented PhD thesis for defense.

Provisional Recommendation

I recommend that the candidate should defend the thesis by means of a formal thesis defense

I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report

The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense