

Jury Member Report – Doctor of Philosophy thesis.


Name of Candidate: Julia Bondareva

PhD Program: Materials Science and Engineering

Title of Thesis: Sulfonimide-based dendrimers: synthesis and application for surface functionalization

Supervisor: Associate Professor Igor Shishkovsky

Name of the Reviewer:

<p>I confirm the absence of any conflict of interest</p> <p>(Alternatively, Reviewer can formulate a possible conflict)</p>	<p>Signature:</p>  <p>Date: 25-08-2020</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

Ms. Julia Bondareva's doctoral thesis gives an extensive introduction and sheds light on the use of the investigated materials and their applications. It forms a coherent entity and proceeds logically from an introduction to the topic, based on an extensive literature review, to description of the experiments and finally summarizes the results and gives suggestions for further studies. In general, the thesis is fluently written, and the illustrations support the narrative. As a minor remake, checking that the captions are located in the same page as the illustrations and tables would facilitate reading of the thesis.

Ms. Julia Bondareva's thesis goal was to synthesis of higher generation dendrimers and gain information for their actual use in applications. Hence, the work done focused on synthesis of dendrimers and investigated films made of those in order to apply them for surface wetting control. In her thesis work the candidate successfully developed a method to reach higher generation dendrimers up to 5 th generation. Also forming of films of the synthetized molecules is addressed. The synthesized molecules and films are extensively characterized to understand their molecular structure and properties of the formed films. Hence, the goal is successfully achieved. Moreover, the selection of the synthesis and characterization methods can be considered relevant and appropriate.

In the thesis by Ms. Julia Bondareva's a method to obtain higher generation dendrimers up to 5 th generations was demonstrated for the first time. Moreover, creating of self-standing films made of these was successfully demonstrated. Consequently, the obtained results create new knowledge and are clearly beyond the state of the art in the field. These findings have led to five publication published in international high ranked peer reviewed journals reflecting the high international quality of the thesis.

To demonstrate applications of the synthetized dendrites their film forming properties has also been investigated. The candidate has been able to produce surface films and self-standing films and has carried out surface wetting studies on those. These research efforts demonstrate potential applicability of the films made of the synthetized materials and pave way for further investigations towards real-life applications.

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