

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Daniil Ilatovskii

PhD Program: Materials Science and Engineering

Title of Thesis: Rational design of single-walled carbon nanotube films for transparent electronics

Supervisor: Professor Albert Nasibulin

Co-supervisor: Assistant Professor Dmitry Krasnikov

Name of the Reviewer: Nikolay A. Gippius

I confirm the absence of any conflict of interest

(Alternatively, Reviewer can formulate a possible conflict)

Date: 18-11-2023

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

This is a good thesis that is devoted to the synthesis and modification of SWCNT in order to create the transparent conducting films (TCFs) overperforming the ITO standards. The thesis has a clear structure. It is composed by 4 chapter: the introduction, scientific background, methods and results and discussions.

The topic of dissertation work is relevant to its actual content. The work is based on appropriate experimental methods and theoretical models.

The thesis contains lot of scientifically sound results devoted to the fabrication of TCFs, e.g. application of photophoretic deposition of SWCNTs and characterization of the doping of SWCNTs by V2O5. These results are of the international level and correspond to the current state of the art.

The results of the thesis are published in 5 (3 first author) papers and meet the PhD program requirements.

I have no major comments. In what follow I propose some minor modification:

p.4: please, replace in the abstract the abbreviation TCFs by “transparent conductive films”. This abbreviation is first explained on p. 8 and p.11.

p.22 (for -> from) high- to low-temperature zone

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