

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Aly Mohamed Tawfik Aly Elakshar

PhD Program: Physics

Title of Thesis: Single-walled carbon nanotubes in top cell for perovskite-silicon tandems

Supervisor: Professor Albert Nasibulin

Name of the Reviewer:

I confirm the absence of any conflict of interest (Alternatively, Reviewer can formulate a possible conflict)	Date: DD-MM-YYYY
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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

The thesis is devoted to the fabrication of single walled carbon nanotubes (SWCNTs) for transparent conductive electrodes. SWCNTs offers several advantages such as chemical stability, low cost, transparency, high carrier mobility, flexibility, and compatibility with different other technologies.

The goals and objectives of this thesis is to develop novel methods for passivation SWCNTs to increase efficiencies of solar cells and reduce costs. The SWCNTs were studied both as electrodes without hole transport layers (HTL-free) and back electrodes on top of HTL in the solar cell. The electrical characteristics using J-V curves under illumination and photoluminescence quenching of the photoactive layer in contact with SWCNT were exploited.

The thesis is well planned, structured, and written. A good number of references is cited.

Good number of publications by the candidate indicate that the work is highly demanded and provides the scientific groundwork for further investigations.

However, there are several issues have to be addressed:

- Fig.3.3 PL in (au) why is that? I would say it is dimensionless.
- Fig.4.1 Caption – correct misprints chemical eq.
- Fig.4.10 Absorbance more than 1, why is that?
- Fig.4.10 d) PL in (au) why is that?
- all plots are in different formats.

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