Skoltech
Skolkovo Institute of Science and Technology

Thesis Changes Log

Name of Candidate: Evgenia Gilshteyn

PhD Program: Materials Science and Engineering

Title of Thesis: Components for Stretchable Electronic based on Single-walled Carbon Nanotubes

Supervisor: Prof. Albert Nasibulin

Chair of PhD defense Jury: Prof. Nikolay Gippius, ***Email**: N.Gippius@skoltech.ru*

Date of Thesis Defense: 05 October 2018

The thesis document includes the following changes in answer to the external review process.

Please find following changes made in the final thesis file.

Based on the Jury Member Report from Prof. Sergey Shandakov, there have been made changes according to following suggestions:

1. Mistakes and misprints were corrected in the text: (e.g. in the title the word "Electronics"; on p. 8 in abbreviation list the TEM is indicated now as transmission electron microscopy; on p. 9 the CG used in the caption of fig. 9 is added in abbreviation list; on p. 15 in sentence "… the CNT films were deposited on a PET substrate, which was bent around 30 000 times with the curvature radius of 1 mm" is changed; order of the references to Figures in the text is changed; on p. 39 in the sentence "The capacitance of the device, Csp, calculated according to Equation 1 achieves the value of 7.4 F g-1" the appropriate equation is added; on p. 53 the symbol "m" used in the Eq. 2 is described; on p. 53 the numbering of the formulas is ordered.
2. Since the drop in transparency in the visible region with the removal of tension (after stretching) of CNT / hydrogel is explained by a drop in the transparency of the hydrogel (see p. 28), the decision was made to analyse the total spectra of the used structure (without subtracting it). Small discussion of the reason of the hydrogel transparency drop after stretching is added basically corresponding to the increase in scattering of hydrogel with stretching.

Based on the Jury Member Report from Prof. Krizstian Kordas, some minor corrections have been made, which are at some point correlating with the previous report suggestions.

Based on the Jury Member Report from Prof. Yael Hanein, there have been made changes according to following suggestions

1. In the Result section:
   The process flow presented in Figure 6 is the simplest form of the process description, as the whole process consist of 3 (or 4 in case of pre-stretching) steps. Current versus scan rate plots give indeed very important information in electrochemical characterization, however they are only discussed: explaining the pseudo capacitive behavior of the device. The contact resistance between SWCNTs are added and discussed in the section 3.1.3.
2. Figure captions:
   Figure 3, Figure 4, Figure 10 were improved.
3. In the text:
   In page 13 "…development of and processing" is corrected. In page 15 the sentence is rewritten. In page 16 "as a result" is corrected. In page 20 "we use the most" is used. The term "training" in page

24 is replaced with an “stabilization of the background”. Figures captions in page 25, page 38 is corrected. Page 59 – “By the moment” is replaced with “So far”.

4. The Conclusion section was split for the Chapters in order to address the compatibility and uniqueness of each approach and processes mentioned in the thesis in terms of compatibility with current state of electronics and novel devices.

Moreover, some updated and more logical information was added to the Chapter 3, section 1, such as 3.1.2 – 3.1.4.

I would like to thank all Jury Members for their time and consideration of the previous version of the thesis and work on it improvement!

Evgenia Gilshteyn