Dear Editor,

We would like to thank You and Reviewers for comments and suggestions to improve the quality of the manuscript: “The influence of different functionalization methods of multi-walled carbon nanotubes on the properties of poly(L-lactide) based nanocomposites”. Authors of this article accepted all mentioned suggestions and thanks to that, we hope that now the quality of paper is improved.

According to Reviewers’ comments and questions, Manuscript was corrected and all required changes in Revised Manuscript are marked. Also, we have found some of the Reviewers’ comments very useful and according to them, the Introduction part was rewritten. All responses to Reviewers’ questions are given in the following text:

**Reviewer A:**

- Among the wide range of available biopolymers, the polylactic acid (PLA) isone of the most widely used biodegradable polymers in the medical andpackaging industries. As known PLA can have two different configurations (Lor D) which influences various properties. Although the authors mention the

ring-opening polymerization of L-lactide, it would be significant to specifythe used form throughout the manuscript (even in the title).

Answer: We would like to thank Reviewer for this suggestion. We have specified the used form of poly(lactide) (PLLA) throughout the text and also in the title of a revised manuscript.

- Despite the fact that poly(L-lactide) has attracted increasing attention ithas some disadvantages (i.e. mechanical properties, poor thermal stabilityetc. that limit its more extensive employment) which can be resolved byintroducing the suitable fillers. Accordingly, carbon-based nanomaterials(CBN), offer the possibility to combine PLA properties with several of theirunique features (electrical conductivity, high mechanical strength, thermalstability). Due to the fact that the electric field is known to stimulatethe healing of various tissues such CNT/PLLA composite can be potentiallyused as an electrical stimulating implant, since PLLA is regularly used as abiodegradable matrix in orthopedic materials. The enhanced conductivityshould stimulate cell growth and tissue regeneration by helping the signaltransfer. Besides, the increasing PLLA conductivity can possibly be used asan antistatic coating material or for electromagnetic shielding. Similardiscussion regarding the importance and applicability of incorporation of aconducting material such as CNT into PLLA with a low electrical conductivitycan be added in the introduction part of the manuscript although the authorshave already mentioned that these bionanocomposites have differentapplications.

Answer: The authors are grateful to the Reviewer for this appropriate observation, and according to this, the Introduction was re-written.

- The parts of the manuscript that deal with the conductivity measurementsshould be given in more detail (both the experimental and discussion part).The results of sheet resistivity should be presented also within a Table,for neat PLLA, both f-MWCNT and different loadings. Furthermore, it is veryimportant that the authors have to check if the further increase of thef-MWCNT loading definitely leads to the higher sheet resistivity (for 2.1%)and to provide a plausible explanation in that case. Also, for futureinvestigations, it would be interesting to reveal the influence of thecrystallinity on the electrical properties at a given f-MWCNT concentration.Namely, in some CNTs filled polymer nanocomposites, a decrease in theelectrical conductivity is observed with the increase of matrixcrystallization as more continuous electrical pathways are available onlyfor a matrix with lower crystallinity (Liao SH, Yen CY, Weng CC, Lin YF, MaCCM, Yang CH, et al. Preparation and properties of carbonnanotube/polypropylene nanocomposite bipolar plates for polymer electrolytemembrane fuel cells. J Power Sources 2008;185(2):1225–32).

Answer: The parts of the manuscript that deal with the conductivity measurements were given in more detail. The results of sheet resistivity are presented within a Table, for neat PLLA, and PLLA based nanocomposites with irradiated and chemically functionalized MWCNTs. The authors indicated that with the further increase of f-MWCNTs concentration, sheet resistivities are relatively uniform and do not show any significant change. Also, we would like to thank to Reviewer for the suggestion about our future investigations.

-The authors could reconsider the statement given in line 207 page 11:“chf-MWCNTs and γ-MWCNTs start to lose weight at relatively lowtemperatures” in order to emphasize the evident difference between thesetwo f-MWCNTs. γ-MWCNTs is stable up to some 500 °C when chf-MWCNT hasalready lost more than 30% of the weight.

Answer: We would like to thank Reviewer for the observation. Based on Reviewers’ kind comment, this statement was changed.

- The results of the FTIR spectroscopy must include neat PLLA spectra. The quality of figures should be improved and the figures in the manuscriptshould be unique technically (using same font styles, sizes, etc., e.g. seethe difference between Fig 4. and Fig 5.).

Answer: Because of the same structure of neat PLLA and its nanocomposites with f-MWCNTs, the peaks of FT-IR spectra are overlapped, and we thought that this picture is not appropriate for publishing. The uniformity and quality of other figures in the Manuscript were improved.

- The part of the manuscript that deals with DSC measurements must be reconsidered. How the glass transition temperatures were determined? From Fig. 6 the glass transition cannot be resolved and therefore the authorsshould provide more adequate DSC scans (or to give an Insert of the Fig.6from which this transition can be detected). Instead of the melting enthalpies, the corresponding crystallinities should be presented in Table2. In addition, the authors should try to provide an explanation regarding the influence of f-MWCNTs content on the crystallinity level. When it comes to the melting temperatures, the increase in the case γ-MWCNT wasn’t discussed at all, while it is more pronounced in the case of lower concentrations compared to the chf-MWCNTs (Table 2).

Answer: The glass transition temperatures were determined from DSC curves and in the revised manuscript Figure with Tg values for neat PLLA and PLLA based nanocomposites obtained with chemically functionalized carbon nanotubes was added. Instead of the melting enthalpies, the corresponding crystallinities are presented in Table 2. Also, the authors provide an explanation regarding the influence of f-MWCNTs content on the crystallinity of composites and discussion about the increase of the melting temperatures in the case of all obtained samples.

- What is the concentration of the MWCNT in Fig 8b?

Answer: The concentration of the chemically functionalized MWCNTs in Fig 8b is 1.6wt%. According to Reviewers comment all samples names are mentioned in the caption of Figure with AFM images.

- Fig. 9 caption should emphasize the type of the MWCNT that is presented(chf-MWCNT I suppose). What is the MWCNT concentration? In addition, ifpossible the authors should also present results of γ-MWCNT SEM analysis in order to visualize the difference that is mentioned.

Answer: After the kind comment of Reviewer, the caption of Figure with SEM images was corrected. Now it is noticed that in Fig. 10 a) is shown sample chf-MWCNT-PLLA-2.1 and Fig. 10 b) shows the fractured surface of PLLA based nanocomposite with 2.1 wt% of γ-MWCNT.

**Reviewer B:**

- Last paragraph in Introduction part should be rewritten to state novelty with respect to literature. Author state what they performed.

Answer: After the kind comment of Reviewer, the Introduction was rewritten.

- Subchapter 3.1: sentences “The possible reason is as follows: the energyof π\* (π antibonding orbit) in MWCNTs is increased because of the π-πstacking interaction between the MWCNTs and the new formed functional groups(carboxyl and/or hydroxyl) resulting in the increase of the necessary energyof π-π\* electron transition. Thus, the characteristic peak assigned to theπ-π\* electron transition blue shifted, for the both appliedfunctionalization methods.” need additional explanation on influences of introduced functional group to blue shift in UV spectra. Reference literature is necessary and discussion/comparison with literature data.

Answer: The additional explanation on influences of introduced functional group to blue shift in UV spectra was given in the revised manuscript. Also, appropriate literature was cited.

- Reconsider sentence “The bands due to the C=O stretch are veryprominently registrated in the range 1740 cm–1 for the carboxylatedMWCNTs.” in relation to spectra given on Fig. 2. The peak at 3433 cm-1 isof high intensity? Please provide clear distinction between these two FTIRspectra of irradiation (γ-MWCNT) and chemically (chf-MWCNT) functionalizedcarbon nanotubes.

Answer: The authors are grateful to the referee for his/her appropriate suggestion, the sentences related to this are corrected in the revised manuscript.

- There are many studies related to oxidative modification of CNT. Compare your results with literature ones and discuss why long period of chemical modification you applied. Significant destruction of chf-MWCNTs could beevaluated according to TG curve (Fig. 3).

Answer: We would like to explain that we have used the results from FTIR analysis of functionalized MWCNTs for determining the optimum time for chemical modification of MWCNTs.

-FTIR spectrum of PLA should be added on Figs. 4 or 5, or add reference inrelated text.

Answer: Because of the same structure of neat PLLA and its nanocomposites with f-MWCNTs, the peaks of FT-IR spectra are overlapped, and we thought that this picture is not appropriate for publishing.

- Correct sentence “However, chf-MWCNTs and γ-MWCNTs start to lose weightat relatively low temperatures.” according to Fig. 3.

Answer: Based on Reviewers’ comment, this sentence was changed.

- Authors should reconsider sentences: “The registrated increase of Tm isthe result of the chemically bonded f-MWCNTs and poly(lactide) chains,causing polymer chain arrangement to become more effective, and also of thehigh surface energy of MWCNTs leading to good adhesion with the PLA andenwrapping of polymer chains onto the MWCNTs.” as the presence of chemicalbonding between PLA/f-MWCNT was not proved. It was assumed according to SEMand TEM micrographs. Authors should establish relation between surface functionalities/properties of f-MWCNT and properties of obtained nanocomposites.

Answer: We would like to thank Reviewer for this observation, we have changed our statements.

- There is disagreement in the samples used for FTIR (γ-MWCNT-PLA-0.7) and TGA analysis (γ-MWCNT-PLA-1.6). Other results could be presented in Tables.

Answer: The results of TGA analysis for all synthesized samples are presented in Table 2.

- Define functionalized MWCNT and MWCNT and corresponding nanocomposites inFigs. 8, 9 and 10 (captions) with respect to related text which precede toFigs.

Answer: In the revised manuscript, captions of Figures with AFM, SEM and TEM images are rewritten.

- Extend paragraph on sheet resistivity comparing to the results forconstituent materials in order to emphasize achievement obtained by studiednanocomposites.

Answer: The paragraph of the manuscript that deal with the sheet resistivity was given in more detail. The results of sheet resistivity are presented within a Table, for neat PLLA, and PLLA based nanocomposites with irradiated and chemically functionalized MWCNTs.