Answers to the Reviewer D

I have read the manuscript multiple times, and in my opinion it has one serious problem. This is related to the determination of chemical composition of wood before and after hot water treatments, and in use of such obtained results for explaining other examined properties of produced pellets. The results given in Table 2 reveal that there are statistically significant differences in extractives contents. That is something that should be and is expected as prior to extractives determination the wood was pre-extracted in hot water treatment, that resulted in removal of some or most of the water soluble extractives and led to increased solubility of wood constituents in toluene/ethanol mixture. The latter case could be associated with pre-treatment related mass and heat transfer limitations, liquid-to-wood ratio, wood meal size, etc. all of which influence also the hemicelluloses content, which the authors mention and use (mostly) properly through the Results and Discussion section. Aforementioned causes also influenced the possibility of lignin removal (thus the lignin content rise), but it also influenced the cellulose contents. This, alongside the facts that the Authors determined the Kürschner-Hoffer’s cellulose and that the hemicelluloses contents were determined mathematically as a “difference between the wood mass (100%) and the sum of contents of other wood components”, lead to formation of statistical difference in cellulose contents. Although the numbers and relations in Table 2 are mostly all right, in my opinion they should be used with great caution as plenty of other experimentally obtained results are related almost strictly to the chemical composition, with an emphasis on hemicelluloses. Kürschner-Hoffer’s process results in a preparation of cellulose with some hemicelluloses still present. Therefore, in order to determine the “real” hemicelluloses contents, holocellulose (by means of Wise’s chlorination) should have been prepared at first. Such obtained holocellulose should have then been used for the determination of NaOH insoluble (α-cellulose, cellulose I or simply cellulose) and NaOH soluble (β- and γ-cellulose or hemicelluloses) parts. Only then the correct values of carbohydrate part of the wood would be obtained, leading possibly to somewhat different results of the NT/T statistical analysis. Therefore I strongly suggest the authors to perform latter mentioned carbohydrates fractionation, correct the results in Table 2 and other results’ explanations accordingly. Also, an FT-IR or XRD analysis could give plenty of data on heterogeneity and crystallinity of obtained cellulose and thus help greatly to interpret the obtained results.

At this point we are in no position to perform additional analysis, i.e. to determine the content of carbohydrate components by these other suggested methods.

Alongside mentioned, I find that although the technical data in Materials and Methods chapter is mostly given, it is written inconsistently and therefore this chapter is somewhat hard to read. For instance in subchapter 2.1 Materials the Authors only give data on type or species of wood used, without any information on hammer mill type, particles size used in further experiment, their moisture content nor how was it determined.

The needed information concerning the beech particles is added in the text (lines 124-129).

Part of that information is actually given later through the Materials and Methods, but it has too many subchapters and the important information is scattered around. The way in which the Authors determined the mass loss of wood during pre-treatment is also partially wrong as they state that “The proportion of wood substance dissolved in the reaction mixture during pre-treatment was determined through the mass loss of wood ”. In my opinion more convenient way to determine the solubilised part of the wood was to simply perform the gravimetrical determination similar to the one used for extractives determination in accordance to TAPPI standards. This is so because, here the Authors are speaking about the “substance dissolved” that cannot be determined on the basis of solid matter retained after the pre-extraction without it being absolutely dry before the pre-treatment and again dried to absolute dry state after the treatment.

TAPPI method for determination of the content of substances dissovled in water (T 207 cm-99 Water solubility of wood and pulp) uses in its calculations (of dissolved matter) the difference between weight of the wood material, before and after the extraction (in absolute dry state). Of course, wood samples are not dried to the absolute dry state. The equilibrium moisture content of air dried samples was determined, and then the mass of the air dried wood, before and after the extraction, was calculated on absolute dry state.

As for the Introduction chapter I find it to be a bit too extensive, and that the data on prior researches of hot water pre-treated wood for pellets preparation should be in focus (the part starting from line 75 onwards). This does not mean that the Introduction is not written properly and that it could not stay unchanged before the manuscript publication.

The introduction is extended with the additional references concerning the water treatment.

Also I do not see the real purpose of the Figures 1 and 2, as they do not contribute to the manuscript quality. If the Authors still wish to keep them in the manuscript a word or two describing their importance should be added. What did the Authors mean with the “zero sieve” (line 127)? If that is the bottom sieve, than it should be written as that, and also please add phrases as mesh size or hole opening alongside the already given numerical values (lines 126 and 127).

It is the bottom sieve (added in the text, together with the dimensions in mesh values).

In line 148 the subscripts w0 should be changed to 0 (dw0 to d0). Text related to CHN analysis should also be shortened and therefore I suggest omitting the lines 161 (after parenthesis), 162 and 163 (to 0.04±50 mg mark).

It is corrected.

Some generic remarks could also be addressed to lack of citations confirming the Authors findings and to the fact that there is no data given on how many samples were the examined properties determined and statistical analysis performed.

Citations are added.