Dear Dr. Udawatta,

I have read your paper, the comments of the three reviewers and your replies to the comments of two reviewers. Because the first two reviews varied considerably in extent and detail, I decided to wait for the comments of a third reviewer. I think this reviewer makes valuable comments that can help to improve the paper. It may be beyond the scope of your paper to address all the comments by doing all the proposed analyses. But, I would advise you to reply to these comments and take your replies up in your manuscript. One issue that the third reviewer notices is the large standard deviation of the pore volumes and other parameters that are mentioned in table 1. I also struggled with that and with table 1 and figures 1 and 2 which I found hard to understand. The results shown in table 1 and figures 1 and 2 do not seem to be consistent with each other. Furthermore, the statistics of log-transformed variables are not presented consistently in the figures, and in the tables it is not clear whether arithmetic of geometric averages are shown.

I think the problem is in the treatment of the three replicates per treatment and the fact that for each replicate, you have sometimes a distribution of variables (pore radius and pore volume) whereas for other variables, you have only one value of that variable: characteristic connectivity and characteristic path length, total pore volume and largest pore volume.

Considering one of the comments of reviewer 2 to give more details on the distributions of pore sizes and pore volumes in the different replicates, I think this comment is very relevant and I am not convinced by your reply that the plots get too overloaded when you add the three distributions of the three replicates in one plot. I think you have to do this, maybe exemplarily for only one treatment in order to give the reader an insight in the variability of the distributions between the different replicates. Instead of showing the distributions of one sample or replicate in figures 1 and 2, you should show lumped distributions of all replicates for one treatment in these figures.

I appreciate including an image of the scanned samples. Maybe it would be helpful to include also a cut-out image of the retrieved backbone, pore throats, connectivity and tortuosity.

Detailed comments:

I do not understand table 1. There were three replicate samples per treatment. But it is not clear what the standard deviations refer to. Do they refer to the difference between the mean pore characteristics between the different samples? I think this is what they should refer to in this anova table. But, I have the impression that they refer to the standard deviations of the pore characteristics of the individual pores. Furthermore, it is not clear how the averages were calculated. Is the arithmetic average of the pore radii or pore volumes shown or is the geometric average shown (i.e. the exponent of the arithmetic average of the log-transformed pore radii or pore volume).

To the Anova part, it should be added that p values are shown there (that is what I assume).

Figure 1: The pore radii are lognormally distributed but the distribution is shown for non-transformed radii. I suppose the average radius shown is the exponent of the average of the log-transformed

radius (geometric average). But the confidence interval that is shown by the horizontal line is symmetrical around the mean when the distribution of the logtransformed variable is shown (as in Figure 2). If the distribution of the non-transformed variable is shown, the confidence interval should be non-symmetrical.

Figure 2: I do not understand the scale of the horizontal axis of the histogram. How should one interpret a logarithmic scale with 10 divisions when there are 2 log10 units (a factor 100) between the major labels? Neither do I understand how the means of the pore volumes in figure 2 correspond with the mean pore volume in table 1 or the values given in parentheses in figures 2. A mean pore volume of 7 10^5 μm^3 corresponds with 0.7 mm^3. This is much larger than the mean indicated by the circle in the histogram which is between 0.0001 mm^3 and 0.01 mm^3 (because of the major labels span two log10 units).

P11 ln 11: high and low density should be changed.