Response to review comments

Reviewer #2

In this manuscript by Pruna et al. the authors report preparation of graphene aerogels prepared using a combination of solvothermal and chemical induced gelation resulting in aerogels of variable characteristics. The aerogels are then characterized with a suite of techniques and investigated for their ability to absorb engine oil and organic solvents. The absorption properties are found to be better for the aerogels with low C/O ratio. These aerogels may be used for cleaning oil spill and treating organic solvents. As such the aerogels prepared and the relevant study is of practical interest and qualifies for publication in the journal Nanomaterials. However there are some issues (listed below) that the authors should address before this work is accepted for publication.

Response: We thank the reviewer for the time dedicated to our manuscript and the useful comments. We have revised the manuscript in agreement with the suggestions. Please find the changes in blue font in the revised manuscript.

The authors have quantified the aerogels prepared for their wettability by measuring contact angle. However, the authors have not specified what wetting fluid have they used for this purpose. Without this specification, contact angle measurements do not carry much meaning.

Response: We included the fluid (water) employed in the experimental part.

On page 5, describing Figure 3, the authors state, 'On one hand the use of expanded graphite appears to induce the formation of 3D monoliths with thinner, less stacked and parallel partially reduced GOx sheets...' While this conclusion can indeed be made from other data, in my opinion the SEM images do not seem to show this clearly. If indeed they show this, perhaps the authors can mark the relevant regions in the images from which this conclusion can be drawn. This would help the reader.

Response: We thank the reviewer for pointing out this issue. We corrected the figure and reworked the text for more clarity.

Changes made:

The morphological analysis of the obtained aerogels revealed a strong dependence on the synthesis conditions as observed in the exemplificative SEM images depicted in Figure 3. On one hand, by comparing the images in figures 3A and B depicting the morphology of the aerogels obtained by predominant chemical reduction (low temperature range), the use of expanded graphite appears to induce the formation of 3D monoliths with thinner, less stacked and parallel partially reduced GOx sheets (see the areas evidenced by circles). The same observation is made by comparing the images in figures 3 C and D, with respect to the effect of GO synthesis conditions. On the other hand, the predominant
chemical reduction (Figures 3A and B) appears to induce a structure with larger pores and larger constituent sheets than the consolidation induced by predominant thermal reduction (Figures 3C and D) but less homogeneous.

We corrected the figure.

Describing Figure 4B, on page 6, the authors state, 'By comparing the spectra a and b of the aerogels obtained...one can observe less intense peaks in spectrum a...' To me, on the contrary, spectrum b appears to have less intense peaks.

Response: We have checked the spectra and the intensity appears to decrease in spectrum a in comparison with b.

In the discussion section, all the figures are described again resulting in repetition of some information that is already given in the results section. It would be better to avoid this and limit this section only to new information obtained by making inferences from the previous section.

Response: We thank the reviewer for pointing out this issue. We have reworked the section in order to avoid repetition.

In the discussion section, the authors provide values of absorption rates for both oil as well as organic solvent absorption by the aerogels. I think this is an important piece of information and can help quantify another aspect of absorption capability of the aerogels. For this reason, I suggest including this data for all the samples investigated in the results section. Currently, the authors state only the maximum rates.

Response: We thank the reviewer and agree on the worth of including such information. We reworked the corresponding section.

Changes made: Please see updated figure which is including the corresponding absorption rate values.

Finally, the authors have provided a video of (perhaps) an aerogel absorbing a dyed liquid. However, no information is provided about this video in the manuscript. This supplementary material is interesting and should be described in more details in the manuscript.

Response: We thank the reviewer for pointing this issue. We included the relevant information in the manuscript.

Changes made:

… The demonstrative recording of the oil uptake by the aerogel obtained from GOx nanomaterial in conditions of predominant solvothermal reduction can be found in the supplementary video material. It can be observed that the aerogel presents itself as a light 3D monolith with high absorption rate…