

Interactive comment on “Carbon nanomaterials in clean and contaminated soils: environmental implications and applications” by M. J. Riding et al.

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We thank the two referees for their comments and well thought through constructive criticism. We have endeavoured to address each point individually, and have either modified the script accordingly or provided additional justification for an alternative response.

If you require additional information or clarification of points, we will be happy to elaborate further.

This review is relevant as it joins information about the fate and behaviour of one main

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types of nanomaterials, that is being produced and applied in large quantities. However, the paper needs some structural reformulations that are highlighted in comments made in the PDF of the manuscript. Hence, I think that it could be accepted after major revisions.

Point 1) The role of some soil properties in CNMs fate and behaviour was forgotten, for example, the role of clay particles.

We have added additional information to the script, specifically related to clay particles.

Point 2) The toxicity section is very poor developed and only toxicity to soil microbial community was mentioned. Invertebrates and plants were not mentioned. If no information exists for this group of organisms, (but I know that some is available), at least this needs to be mentioned.

One of the key aims of the aim of the paper is to specifically discuss the implications of CNMs on terrestrial microbiota, and the possible impact on contaminant biodegradation. This is discussed at considerable length (13 pages) in Section 5. It was never the intention of the script to consider macro flora or fauna. The scope of the script is clearly stated in the final paragraph of Section 1. We do not feel that toxicity information for additional organisms should be added.

Point 3) [The toxicity] section should appear after the description of the effects of the biological activity on CNMs in soils.

The section has been moved as suggested.

Point 4) It remained unclear, if these CNMs can be degraded or not by soil microorganisms. Or at least the role of soil microorganisms in functional groups and in the subsequent stability of these CNMs. If this information does not exist, this should be mentioned in the manuscript.

We agree that the section lacked clarity and we have modified the text accordingly.

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Point 5) It would also be mentioned, or at least reinforced that studies available aimed to perceive the role of physical and chemical properties on the fate of CNMs in the soil, but any attempt was made to perceive how soil physical and chemical properties together with the biological activity determine the modification of such CNMs and its fate. This has to be made in more real environmental scenarios, and at least the authors should call the attention for this necessity.

This is an excellent point, which to some extent is already mentioned in the first paragraph of the conclusion. We have updated this section to include the additional information that the referee recommends.

Point 6) Further through all the manuscript the most relevant results of several studies are described without any criticisms, and some important aspects of the experimental design of the studies were not added. I have exemplified this also in some comments.

We have amended the script to address the comments provided in the annotated PDF.

Point 7) The pathways for the entrance of CNMs in the soils need to be clearly mentioned in the manuscript.

Addressed by adding citation to: Köhler, A. R., Som, C., Helland, A. & Gottschalk, F. 2008. Studying the potential release of carbon nanotubes throughout the application life cycle. *Journal of Cleaner Production*, 16, 927-937.

Interactive comment on SOIL Discuss., 1, 151, 2014.