Responses to comments from editor

Ref: egusphere-2024-1266

Title: Effect of colloidal particle size on physicochemical properties and aggregation behaviors of two alkaline soils

Journal: SOIL

Editor' comments:

Thank you very much for revising the manuscript and taking almost all suggestions of the reviewers into account.

Reply: Thank you for your valuable comments on our manuscript. Please find the following detailed responses to your comments and suggestions.

Firstly, I am still not convinced by the justification for the choice of the two soils. You have not answered why you chose these two soils in relation to your main hypothesis and the main processes you are investigating. What makes these soils so special that you could carry out your research?

Reply: Lou soil (Anthrosols) and cinnamon soil (Calcisols) are calcareous soils developed from loess parent materials, which are the most common and characteristic soil types on the Guanzhong Plain, Shaanxi Province, China. Among these, Anthrosols, as a unique calcareous soil, have formed on the basis of cinnamon soil through long-term anthropogenic maturation. The primary objective of our manuscript is to reveal the effects of particle diameter on the organic components, clay minerals, surface electrochemical properties, and colloidal stability of these two most predominant alkaline soils collected within Shaanxi Province, and to analyze how the particle size affects the surface properties and suspension stability by changing the composition of soil colloidal components.

However, It should be noted that cinnamon soil (Calcisols) is one of the most representative soil groups in northern China, widely distributed in temperate climatic conditions of China, including provinces such as Shaanxi, Shanxi, Shandong, Hebei, Gansu, and Ningxia. The present study focuses on Lou soil (Anthrosols) and cinnamon soil (Calcisols). Considering the high heterogeneity in soil constitutes, which have profoundly caused the size effects of colloids, further research on other typical zonal soils will be conducted in subsequent studies.

Please add the number of replicates for each parameter analyzed. This is a very important information for the reader of the journal.

Reply: The particle diameter reported in the study is the averaged result of 15 measurements. Total carbon and organic carbon are the averaged results of 3 measurements each. The zeta potential is the averaged result of 6 replicates. The above results are expressed in the revised manuscript as the mean ± standard error.

The critical coagulation concentration is based on a single measurement result, for the following reasons. Critical coagulation concentration (CCC) is defined as the intersection point of slow aggregation and fast aggregation, which is also a turning point of attachment efficiency *vs.* electrolyte concentration. Since the attachment efficiency is changing continually with increasing electrolyte concentration until reaching CCC, usually the aggregation curve is determined only for one time without repetition; this is generally adopted by most researches (Chen and Elimelech, 2006; Mashayekhi et al., 2012; Zhu et al., 2014; Liu et al., 2018).

We have added this information in the revised manuscript.

References:

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Mashayekhi, H., Ghosh, S., Du, P., Xing, B., 2012. Effect of natural organic matter on aggregation behavior of C60 fullerene in water. J. Colloid Interf. Sci. 374(1): 111–117.

Zhu, X., Chen, H., Li, W., He, Y., Brookes, P.C., Xu, J., 2014. Aggregation kinetics of natural soil nanoparticles in different electrolytes. Eur. J. Soil Sci. 65(2): 206–217.