

Interactive comment on “Atmospheric wet and dry deposition of trace elements at ten sites in Northern China” by Y. P. Pan and Y. S. Wang

Anonymous Referee #2

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The authors measured concurrently the wet and dry deposition fluxes of trace elements at ten sites in Northern China from December 2007 to November 2010. The sites include urban, industrial, suburban, agricultural and rural. Precipitation and dry deposition (particles) were collected every month using an automatic wet and dry deposition sampler. Spatial and seasonal variations in the wet and dry deposition fluxes of trace elements are presented in this paper. I think that those data are valuable, because China is regarded as one of the most significant source regions in the world with regard to anthropogenic emissions to the atmosphere. My comments are given below.

Page 20649, Lines 13–15: The authors cited a paper of Grantz et al. (2003). Where was this observation conducted?

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Page 20652, Lines 9–11: Compared to the case for wet deposition, many uncertainties exist in the methods used to quantify dry deposition. These methods include both direct measurements and modeled estimates. To date, there is no accepted technique that can be used to evaluate the accuracy of these methods. For direct measurements, various surrogate surface, mainly solid surfaces such as Teflon plates, filters, and buckets, have been used in an attempt to quantify dry deposition. It has been shown that both the collector geometry and the surface characteristics have a large impact on the amount of collected material. In this study, the authors used a polyurethane foam (PUF) based glass bucket. What is the reason why the authors used this type of sampler? Uncertainties and problems associated with this dry deposition sampling should be discussed in this paper.

Page 20652, Lines 9–11: Where was the sampler placed at each site (on the rooftop of a building or on the ground)?

Page 20653, Lines 1–4: The precipitation samples were acidified with HNO₃ to dissolve the trace elements associated with suspended particles and to prevent their adsorption on the walls of the bottle. What was the concentration of HNO₃ in the samples? How did the authors confirm the dissolution of trace elements associated with suspended particles? I think that crustal elements such as Al and Fe are not dissolved completely in the acidified samples. This makes it difficult to calculate the enrichment factors of trace elements in the precipitation samples relative to the average crust on the basis of Al (Page 20660, Line 21).

Page 20654, Line 10: What is Mini-Q water? I know Milli-Q water.

Page 20661, Lines 6–8: Indicate Fig. S4.

Page 20664, Lines 27–28: The authors should explain the sampling and elemental analysis of size-resolved particles in the experimental section.

Page 20665, Lines 14–15: Did the authors measure the distribution of Cu and Pb

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between liquid and solid phases in the precipitation samples? This may provide information on the difference in the solubility of both elements.

Page 20666, Lines 19–21: The authors should explain the sampling and elemental analysis of soils in the experimental section.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 20647, 2014.