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Comment

Interactive comment on “Fog scavenging of organic and inorganic aerosol in the Po Valley” by S. Gilardoni et al.

Anonymous Referee #2

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This is a solid piece of work that is appropriate for publication in ACP. I only have a few minor questions/comments for the consideration of the authors.

1) The discussion of the dependence of scavenging efficiency of compositions starts with their solubilities and then later drifts to kappa values. It may be just more consistent to work with kappa values throughout in the discussions of nucleation scavenging. 2) Page 15: “The results of the present study confirm those observations and the similarity of nitrate and organic oxygen scavenging suggests that oxygenated organic aerosol could be a proxy for water soluble OA.” This statement is a bit strong. It needs a stronger quantitative correlation to say this. In fact, it is not consistent with the tone of the FTIR results on the role of different functional groups on hygroscopicity later. 3) In section 4.2, is the percentage of mixing estimated from the size distribution curves?

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If so, this can be made more explicit. 4) The discussion of internal mixing of nitrate and organic and similar scavenging efficiency is interesting. It is said that 90% of organics are internally mixed with nitrate. What it suggests is that it does not matter what chemistry the organics have, as long as they are internally mixed with inorganics, they will be scavenged, even at very low SS. The composition really does not make any difference. On the other hand, the discussion of FTIR results seems to give an opposite argument that functional group is related to OA scavenging efficiency. Some clarifications are needed. 5) Can closure analysis of scavenging efficiency be done by size segregated composition measurements and kappa estimates? 6) Page 20: I am not sure if these functional group analyses of oxygenated carbon are sufficient to reflect hygroscopicity. For example, the length of carbon chain was not addressed at all. It can change hygroscopicity of the alcohols or acids. Hence, by focusing the oxygenated functional groups alone, it is not surprising to find that they do not necessarily explain the variability of the organic oxygen scavenging.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 4787, 2014.

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