

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

Anonymous Referee #1

Received and published: 12 March 2014

The manuscript by Gilardoni et al. presented a detailed characterization of the scavenging efficiencies of aerosol species by fogs in the Po Valley. While the bulk scavenging efficiencies have been extensively studied previously, the size-resolved scavenging efficiencies for nitrate and organics are unique for this work. Also, the scavenging efficiencies were successfully related to hygroscopicity (k) and those of organic aerosols to their oxidation states. The results are very clear to me and the manuscript is well written. I recommend for publication for ACP.

Major comments:

1. Aqueous-phase chemistry has been found to play important roles in the formation of sulfate and also some secondary organic aerosols. How important of aqueous-phase

C415

production compared to fog scavenging during the fog periods with high liquid water content? For example, is this the reason leading to the lower scavenging efficiency of sulfate (61%) than nitrate (70%)? Is the author able to show the size-resolved scavenging efficiency for sulfate although it contributed a small fraction of the total PM1 mass?

2. How did the meteorological conditions and local sources affect the uncertainties of scavenging efficiencies? For example, were there any changes of planetary boundary layer height, wind direction, and also local source emissions during the formation of fog?

Technical corrections:

1. The Pearson r and correlation coefficient (r^2) were both used in the text, better use one parameter.

2. Low volatility oxygenated OA is generally abbreviated as LV-OOA rather than LVOOA.

3. P 4798, line 15, LVOAA to LV-OOA.

4. P 4799, line 7, consistently to consistent

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

C416