

We thank for the comments of the Referee #1. The comments are numbered and each of them is followed by a response from the authors.

Major issues:

1. COMMENT: *Presentation of the results in section 3 is very long and rather descriptive, making it a bit hard for the reader to pick up the most important findings and related implications. Therefore, I strongly recommend that the authors would add a couple of new paragraphs in section 4, in which they i) summarize the most important new scientific findings of this investigation, ii) discuss what implications these findings might have on air pollution and related health issues, and on the interpretation of the results of earlier studies on this subject, iii) give some recommendations for future research, including research priorities. Related to the comment above, the authors should also sharpen the main goal and more detailed objectives of this paper (Section 1). Stating that “The aim of this study was to investigate the chemistry of submicron particles. . .” is not quite enough for a scientific paper. The authors can certainly figure out a few items to give the reader a good motivation to have a more detailed look at the contents of the paper.*

REPLY: Two new paragraphs including all the suggested items (i–iii) have been added to Section 4 (Summary and conclusions). Also the last paragraph in Section 1 (Introduction) has been modified in order to clarify the main goal and the detailed objectives of this paper.

Minor/technical issues:

2. COMMENT: *Figure 2c: In my eye, the size distributions seem bimodal between 100 and 1000 nm (a clear tail toward smaller particles sizes). Therefore, I do not fully agree with the statement “. . .had one accumulation mode. . .” on page 8285 (line 20). Are the authors suggesting that the tail represents the Aitken mode rather than a smaller accumulation mode? If yes, some more discussion is needed.*

REPLY: Referee is right that the discussion of the size distributions was unclear. It seems that besides the accumulation mode at 500 nm there is an additional mode for inorganics, nitrate, sulfate and ammonium, peaking at ~100 nm being either large Aitken or small accumulation

mode. For organics the size distribution was different. There is probably another accumulation mode (~200 nm) but also an Aitken mode below 100 nm. Unfortunately the AMS is not able to measure particles < 70 nm with 100% efficiency due to the lens system, which limits the discussion on the size distribution for both small and large particles. The section describing the size distributions was revised in order to make it clearer.

3. COMMENT: *Figures in general: Please check out that all the figures have the necessary information that is needed to understand contents of the figure. This means explaining all the symbols and acronyms in the figure, and giving both the quantity and its unit in the figure axis titles. The title of each figure should be easily readable, i.e. large enough font. As a result, long titles such as the one in Figure 9b should be avoided by giving more details in the figure caption.*

REPLY: All figures have been checked and revised to make sure that they are easy to read and understand. Titles in Fig 9b have been shortened.