

This study used online TD-GCMS, offline filter+GCMS to measure the polar organic compounds at both gas-phase and particle phase, and calculate their partitioning coefficients. The data is very valuable. However, I think the current manuscript is more like a data report, not a research article. I suggest changing the article type to Measurement Report. Nevertheless, there are still lots of deficiencies for this manuscript. The analysis is insufficient, and the manuscript is far from acceptance by ACP. A major revision is required for this manuscript. My suggestions are as following:

In general, more analysis and discussion should be done in this work. e.g. 1) the partitioning behaviors of the compounds: I suggest comparing the theoretical calculation with the measurement, and to investigate whether T, RH, air mass can impact the partitioning coefficient. 2) the sources of the quantified compounds, not only simply say the compounds are possibly from primary source or secondary formation. Although, as the authors claimed, some compounds' source are unclear, cluster analysis, PCA or PMF are still useful to analyze the source, even the source can be named as unknown source. At least we can understand what compounds are from the same or similar source.

Detailed comments:

Page 3, Line 19-20: TD-GCxGC-ToF/MS is the abbreviation of "Thermal desorption comprehensive two-dimensional gas chromatography–time of flight mass spectrometer". Notice that the expression of Gas ChromatographyxGC in line 20 is invalid.

Page 4, Line 24: The expression of double chromatographic systems might be inappropriate and might be replaced by two-dimensional chromatography.

Page 6. Line 7- 9: All of these measurements were used to assess the composition of organic carbon and to estimate the experimental partition coefficient of compounds measured in both phases to be compared with theoretical values. The expression of this sentence seemed to suggest that the present manuscript displayed a large amount of data while the aim of which was just the partitioning coefficient estimation. As the last sentence of the introduction part, it is confusing why this study just focused on the

partitioning of these compounds while their sources and mechanisms remained unknown.

Page 9, Line 17: the diameter of the column (250 μm in Line 17) might be 0.25 mm as this unit was widely used.

Page 9, Line 29: why pentadecane was utilized as the internal standard?

Page 19 Line 4: “than” to “as”

Page 19 Line 9: It seems not reasonable that compounds in both gas phase and particle are high during day time. If it's controlled by the thermodynamic equilibrium, the compounds in the particle phase should be low during daytime due to evaporation.

Page 19 Line 16-18, “For example...” unclear sentence

Page 20 Line 1: “observations are different than for **that**”

There are plenty of wrong expression and grammar mistake. I list only a small part of them. I strongly suggest the authors to carefully go through the text.