

Interactive comment on “Estimation of the volatility distribution of organic aerosol combining thermodenuder and isothermal dilution measurements” by Evangelos E. Louvaris et al.

Anonymous Referee #2

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This paper provided a new technique to measure/estimate the volatility distribution of organic aerosols by combining a thermodenuder (TD) and a dilution system. Cooking OA was used as an example to show the performance of this technique. In general, it could be a better technique than a separated TD system, which would be suffered by the possible processes occurred during the heating, e.g. thermal decomposition. The manuscript is overall well written and the topic fits the scope of AMT. I therefore recommend this manuscript can be published after some revision.

1. More discussions/statements are needed to explain how these two systems are combined. What is the role of dilution system in estimating the volatility distribution of

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targeted aerosol?

2. How to understand the differences between the modelled and experimented data during isothermal dilution (Fig. 4b)? It looks that the evaporation only occurred during the first few minutes, but not a continuous evaporation. Will this influence the understanding and estimation of the volatility distribution?

3. It is highly possible that COA contain some ELVOC, e.g. HULIS (Nie et al., 2017@ACP). I suggest the author to provide a more bin of ELVOCs?

4. How to change the dilution time, by changing flow?

5. Why the mass spectrums look so similar before and after heating or dilution (25°C vs 200 °C)? The volatility of organics should be correlated to their oxidation state (e.g. O/C), molecular weight et al. (E)LOVC tends to have a higher oxidation state and large molecular weight. This indicate there should be some differences for the mass fragmentation between evaporated mass and remained mass. PMF could be used for the AMS measurements in case of several heating steps, to make the change of mass spectrums clearer, e.g. Hong et al., 2017@ACP..

6. Any ideas about the phase state of produced COA, which could influence the volatility measurement.

7. The residence time is effective residence time or total residence time? There would be a temperature profile in the thermodenuder? A effective residence time should be carefully considered.

8. The given vaporization enthalpy of COA in this study is a universal value, or can only be used in this work?

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