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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A two-dimensional volatility basis set – Part 2: Diagnostics of organic-aerosol evolution" *by* N. M. Donahue et al.

Anonymous Referee #2

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This paper presents a 2-D volatility basis set to describe the formation and aging of organic aerosol in a (volatility, C oxidation state) 2-D space. It represents a major advance on the 1-D VBS previously developed by the authors by introducing chemical discrimination through the C oxidation state. It provides an alternative to the 2-D basis set (C number, C oxidation state) developed by Kroll and others, and as the authors point out their 2-D VBS can be better anchored by measurements.

This is clearly an important paper that should be accepted in ACP. It will have a large impact. It is very wordy and chatty, which in my opinion detracts from its readability; but I respect the authors' different style if they are willing to pay the page charges.

I think that the paper can be published basically as is. I didn't see any technical problems. Previous literature is adequately referenced. Just two comments on figures:

Caption of Figure 1 says that CO and CO2 are in upper right but instead it's CH2O and the OSc in that figure stops at 1.

In captions of Figures 6 and 7, remind reader what the isopleths mean. The summary message of (excellent) Figure 7 is very important for the reader who might be deterred by the length of the paper and might just want to know the upshot, so have the caption make the Figure self-contained.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 24883, 2011.