Chemical and Physical Properties

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-difficult to bring instruments to source and/or source to the instruments

-biogenic emissions are more complicated, as we do not know the inputs

-we are no where near mass balance, when comparing the amount of BSOA found in the atmosphere and the amount of precursors know to be emitted

How close are we to representing real emissions in experimental measurements?

- Do we have all of the precursors?
- Do we know enough about the precursors and the chemical/physical transformations to achieve mass closure?
- Is laboratory-created representative of atmospheric aerosol, especially BSOA?
- Can we accelerate BSOA aging so that it approaches OOA?

  (Neil says no—1.) due to the fractional covariance term of aerosol oxidation decreasing the effective rate constant and 2.) the RO2/RO2 cross reaction.

What properties should be measured for modeling?

- We know that it depends on the model.
- We believe that the most important parameters remaining center around three areas: 1.) hygroscopicity 2.) aging, and 3.) optical properties.
- We cannot measure all of the individual compounds, and how many is enough?
- Is there a molecule or suite of molecules that could be used for tracers of 1.) hygroscopicity, 2.) aging, and 3.) optical properties? What properties should these tracers to add axes to the data matrix?

What are the big gaps in measurement capabilities?

- For BSOA, we currently often use inorganic standards, or organic standards that are not representative of real aerosol. Are there accessible and more relevant standards?
- One challenge is that we have been using instruments for inorganic analysis longer than organic. Do we understand the instruments well enough for organic chemical and physical measurements?
- Which direction should we push instrument development? Miniaturization? Power? Mobility? Time resolution? Sensitivity?