

4.088 Uncertainties in Particle Wall Loss Correction during Secondary Organic Aerosol Formation in Chamber Experiments.

Early Career Scientist

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Abstract:

Particle wall deposition must be accounted for when determining secondary organic aerosol (SOA) yields during laboratory chamber experiments. However, a number of different particle wall loss correction methods exist, adding uncertainty to this correction. Furthermore, the use of high concentrations of seed particles has been suggested as a way to minimize the effects of vapor wall loss. Use of high seed particle concentrations complicates the particle wall loss correction, as coagulation will need to be accounted for. We present experiments and model simulations showing how particle wall loss rates change with different seed concentrations and size distributions and demonstrate how coagulation can be accounted for. We furthermore present alpha-pinene ozonolysis experiments using differing seed concentrations and size distributions. We apply four different particle wall loss correction methods to these experiments to quantify the uncertainty in this correction. This study demonstrates the importance of properly accounting for particle wall loss, especially when comparing SOA yields measured in different chambers using different particle wall loss correction methods.