

Volatility measurements of SOA formed from α -pinene ozonolysis and data interpretation

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The volatility basis-set (VBS) model employs the secondary organic aerosol (SOA) volatilities evaluated from yield curve measurements. To verify the VBS model, we evaluated the volatilities of dry α -pinene ozonolysis SOA not only from yield curve measurements but also from thermodenuder-AMS measurements, LC-MS and PTR-MS chemical composition analysis, and external dilution chamber measurements. We evaluated also the uncertainty of volatility determined by each experimental method. The results of thermodenuder-AMS measurements, chemical composition analysis, and external dilution chamber measurements showed that lower-volatility organic compounds are present in SOA particles compared with the results of yield curve measurements. The thermal and dilution properties of oligomers, produced in the particle phase by heterogeneous reactions, will strongly affect the total properties of SOA particles under dry conditions.

Keywords: Secondary organic aerosol, Heterogeneous reaction, Oligomer formation