

Interactive comment on “Secondary Organic Aerosol (SOA) formation from hydroxyl radical oxidation and ozonolysis of monoterpenes” by D. F. Zhao et al.

Anonymous Referee #2

Received and published: 1 July 2014

General comments:

This manuscript describes results from experiments conducted inside of the SAPHIR chamber in Jülich, Germany. Monoterpenes were oxidized with OH or ozone, and the evolution of particle size and mass concentration were reported. Main conclusions from the manuscript include that fragmentation reactions dominated through most of the duration of the experiment, based on the observation that particle mass ceased to increase while OH was still in the chamber. I have a few concerns about the analysis used to reach the main conclusions. If my comments below can be addressed appropriately, the manuscript can be published in ACP.

C4314

Specific comments:

1. The conclusions of the paper depend on accurate measurements of particle mass in the chamber. Particles and vapors can be lost to the walls of the chamber, and different methods to correct for particle losses would result in different corrected particle mass concentrations. The authors corrected for particle losses; however, they should address how uncertainties in different particle-loss correction methods would affect their corrected data and conclusions. At a minimum, an estimate of uncertainty in reported particle mass concentrations is necessary. Also, the authors should comment on the effects of vapor wall losses (which they do not correct for) on their data and conclusions.
2. Measurements of the total reactivity (k_{OH}) are essential to the conclusions of this paper and should therefore be discussed. Also, the authors presumably have measurements of the VOC concentrations from the PTR-MS data. Are the decays of the VOCs consistent with measured OH concentrations?
3. If fragmentation was dominant during the later part of the experiments we would expect the particles to shrink (decrease in diameter). A decrease in diameter is only apparent in the limonene experiments; this should be addressed in the revised manuscript.
4. p. 15, line 19: The authors state that the overall OH reactivity of organics was determined by subtracting the OH reactivity with inorganic species. The listed inorganic species do not include HONO, which is present in these experiments as it is cited as the source of OH. This should be addressed in the revised manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 12591, 2014.

C4315