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Supplement of

Chemical aging of single and multicomponent biomass burning aerosol surrogate particles by OH: implications for cloud condensation nucleus activity

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I. Introduction

Since O_3 served as the main precursor to OH, the BBA surrogate particles applied in this study were exposed to a range of O_3 concentrations, equivalent to 1 hr and up to 10 hr of O_3 exposure at a background O_3 mixing ratio of 20 ppb [*Vingarzan*, 2004]. Here we show the effects of O_3 exposure on experimentally derived κ for the different particle systems applied in this study.

II. CCN activity of single- and multi-component BBA surrogate particles exposed to O_3

Figures S1, S2, and S3 show κ as a function of O_3 exposure for single component LEV and MNC particles, binary component particles, and ternary component particles, respectively. No significant changes in particle hygroscopicity were observed following exposure to O_3 at any *S*, thus κ is averaged over all *S*. This result is not surprising since O_3 is generally unreactive with aliphatic compounds and LEV is alicyclic [*Knopf et al.*, 2011; *Seinfeld and Pandis*, 1998]. The double bonds on MNC are susceptible to attack by O_3, however, at a much slower rate than OH, indicating that O_3 does not play a significant role in affecting the hygroscopicity of the particles over the experimental time scales and exposures accessed in this study. In addition, water adsorption on the surface of MNC at the applied RH may inhibit O_3 uptake by MNC due to competitive adsorption [*Kaiser et al.*, 2011; *Pöschl et al.*, 2001; *Slade and Knopf*, 2014; *Springmann et al.*, 2009].

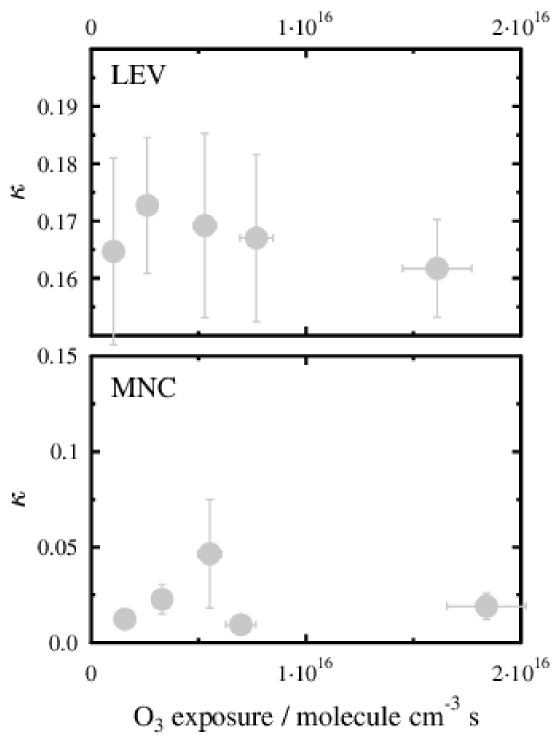

Figure S1. Experimentally derived κ for LEV (top panel) and MNC (bottom panel) particles are shown as a function of O_3 exposure. The vertical error bars represent ±1σ from the mean in the data acquired at a given OH exposure and averaged over all *S*. Horizontal error bars correspond to the uncertainty in the O_3 exposure based on a drift in the measured [O_3] of ±10%.

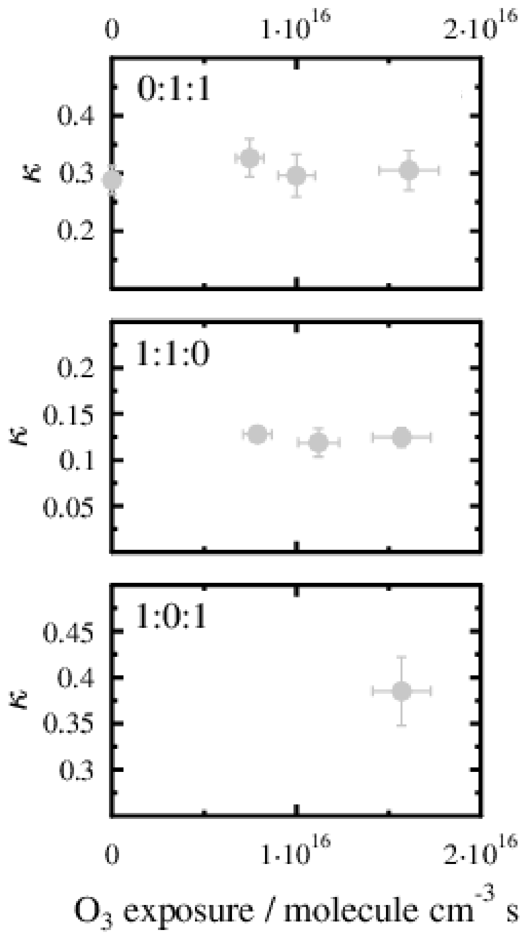

Figure S2. Experimentally derived κ for binary component particles for LEV:MNC:KS mass ratios of 0:1:1 (top panel), 1:1:0 (middle panel), and 1:0:1 (bottom panel) are shown as a function of O_3 exposure. The vertical error bars represent ±1σ from the mean in the data acquired at a given OH exposure and averaged over all *S*. Horizontal error bars correspond to the uncertainty in the O_3 exposure based on a drift in the measured [O_3] of ±10%.

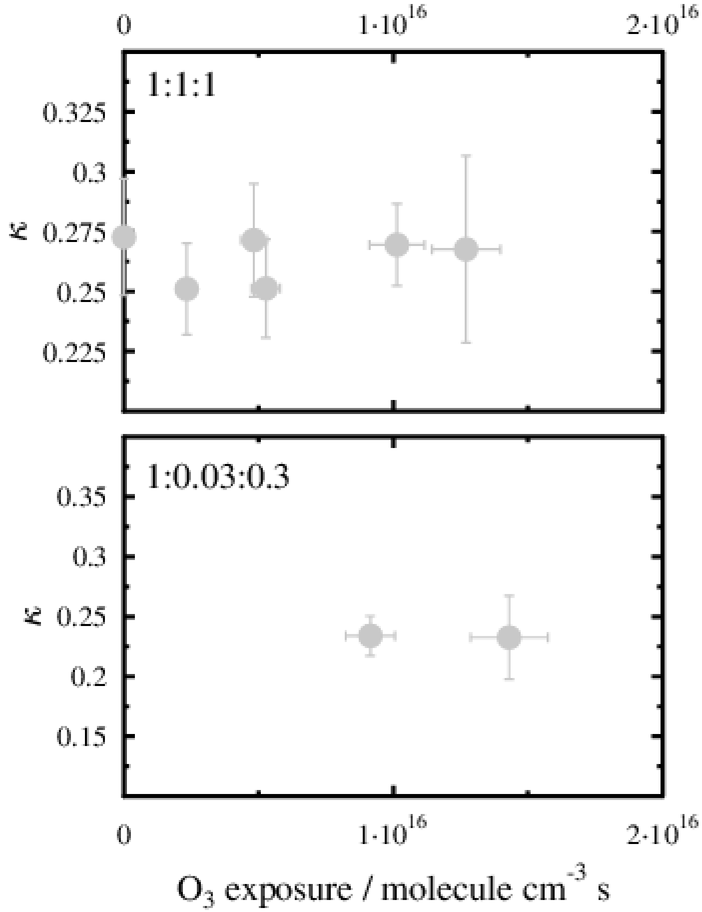

Figure S3. Experimentally-derived κ for ternary component particles for LEV:MNC:KS mass ratios of 1:1:1 (top panel) and 1:0.03:0.3 (bottom panel) are shown as a function of O_3 exposure. The vertical error bars represent ±1σ from the mean in the data acquired at a given OH exposure and averaged over all *S*. Horizontal error bars correspond to the uncertainty in the O_3 exposure based on a drift in the measured [O_3] of ±10%.

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