Supplementary Online Material for "Establishing the Impact of Model Surfactants on Cloud Condensation Nuclei Activity of Sea Spray Aerosols"

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The supplementary material consists of seven figures that provide additional support for the conclusions presented in the paper.
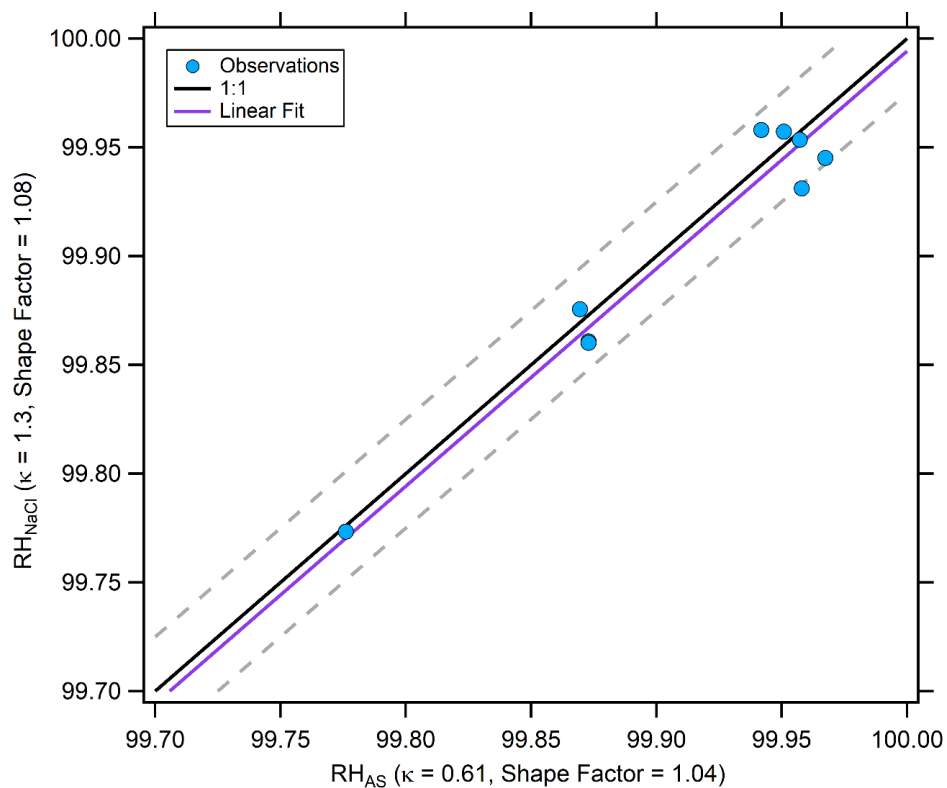
Figure S1. Relative humidity (RH) calculated from the wet droplet size of mobility size-selected NaCl (y-axis) and ammonium sulfate (AS; x-axis) measured in the continuous flow streamwise thermal gradient chamber. The purple line is the linear fit (slope = 1.0) with the y-intercept fixed at 0. The black line is the 1:1 line and the grey dashed lines are the 1:1 line $\pm$ 0.025%. The RH values were calculated from Eqn. 1 assuming that κ values were 1.3 and 0.61 and shape-correction factors were 1.08 and 1.04 for NaCl and ammonium sulfate, respectively.
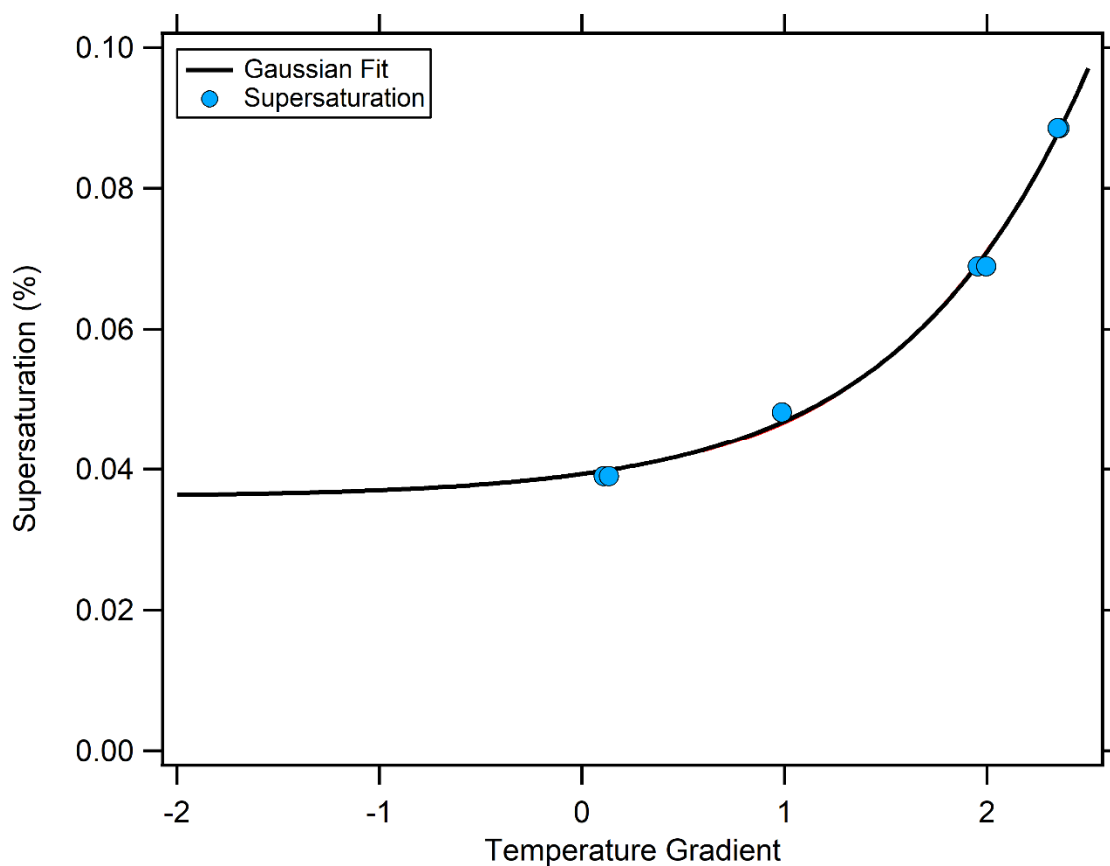
Figure S2. Calibrated supersaturation for the CCN counter as a function of temperature gradient. The black line is a Gaussian fit to the data.
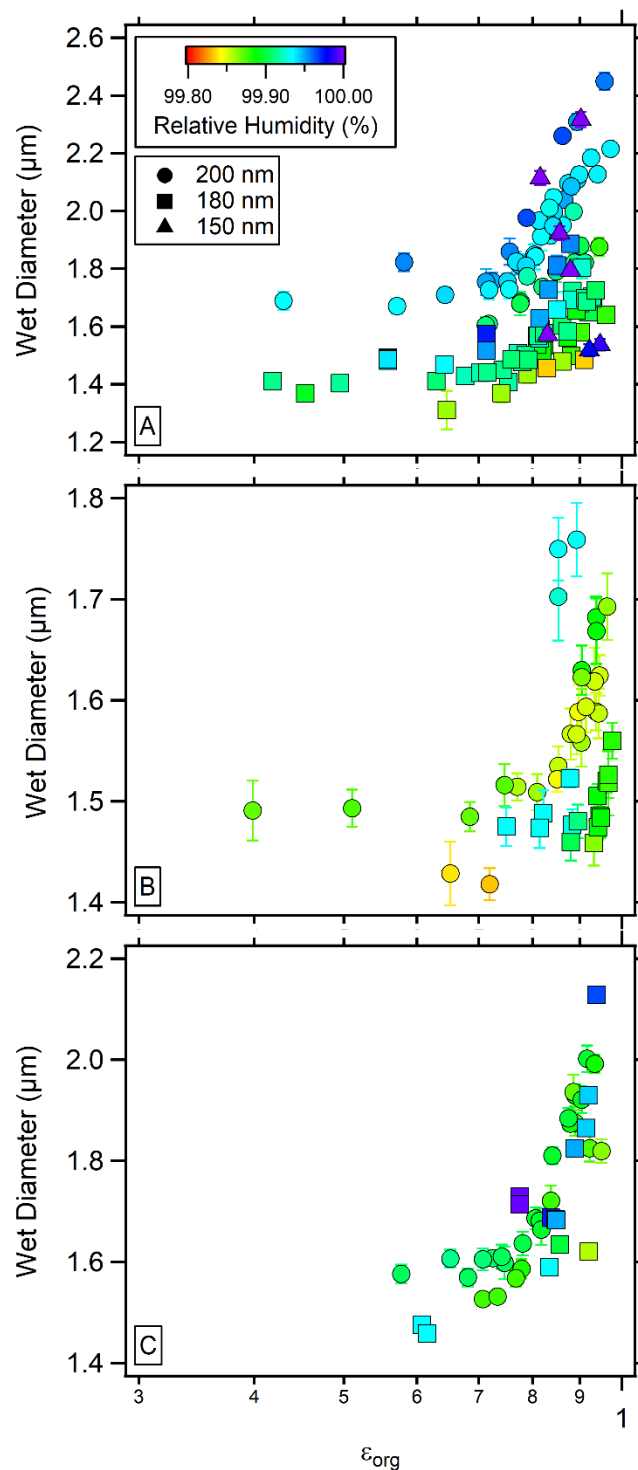
Figure S3. Measured wet droplet diameters as a function of organic coating fraction for NaCl particles coated with **(A)** oleic acid, **(B)** myristic acid, and **(C)** a mixture of palmitic and oleic acid as a function of organic volume fraction (ε_{org}). Circles, squares and triangles correspond to NaCl seed sizes of 200 nm, 180 nm, and 150 nm, respectively.
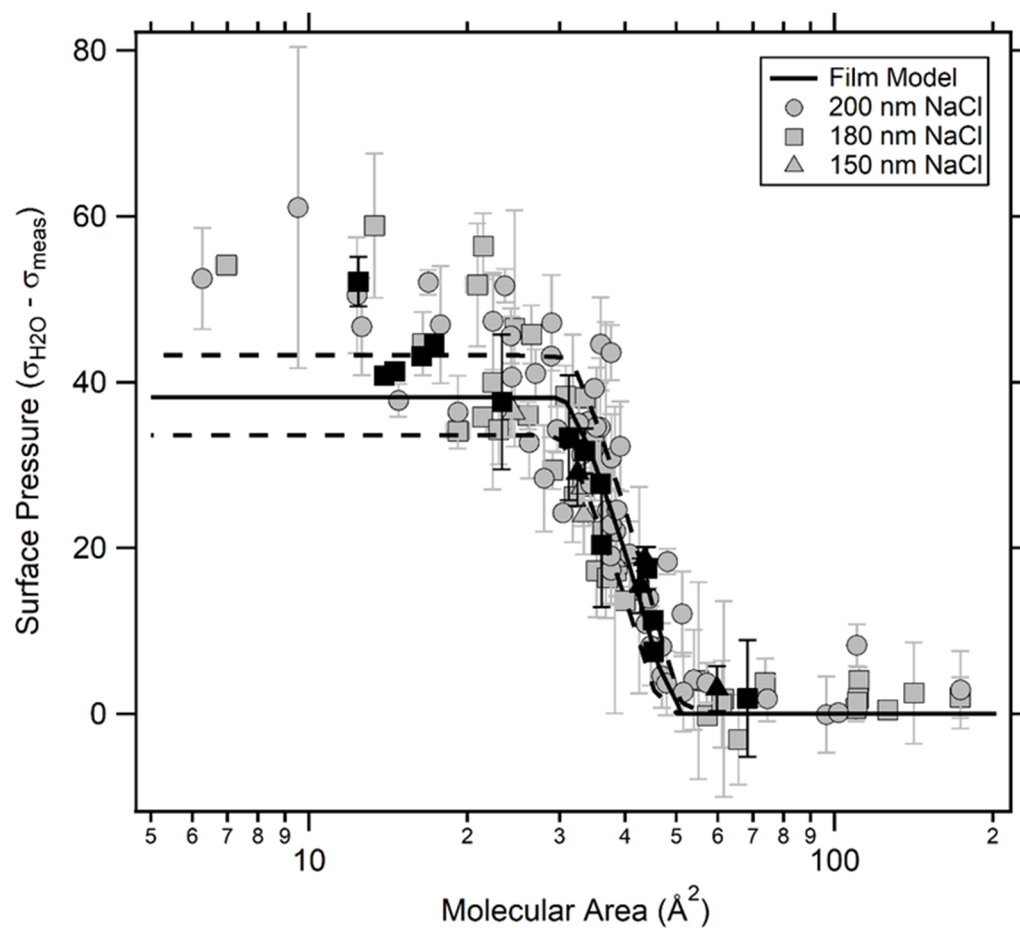
Figure S4. Upper-limit estimates of π as a function of molecular area for NaCl particles coated with oleic acid, with NaCl seed sizes of 200 nm (circles), 180 nm (squares), and 150 nm (triangles). The grey points are 90% oleic acid purity and the black points are 99% oleic acid purity.
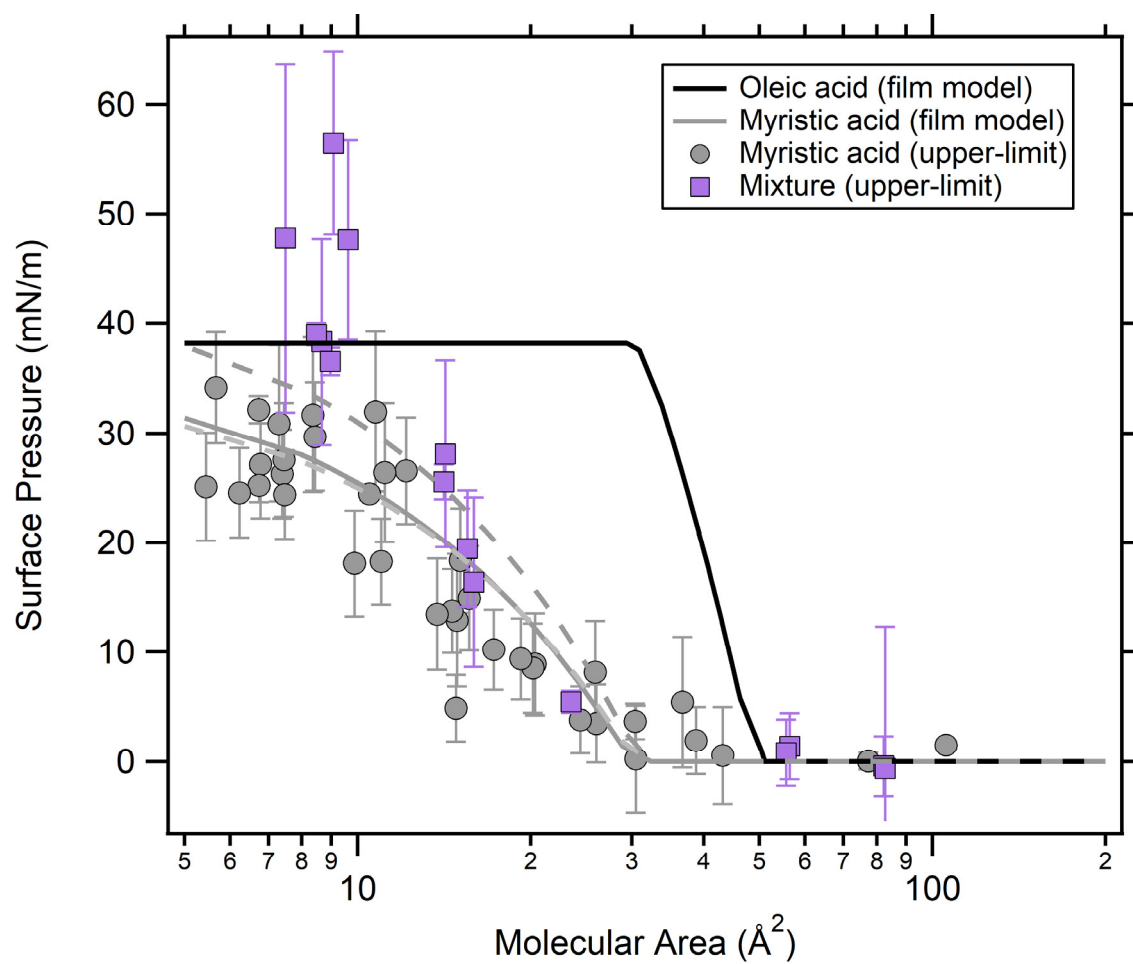
Figure S5. Upper-limit estimates for NaCl particles coated with pure myristic acid (grey) and a mixture of myristic acid and oleic acid (purple) surface pressure as a function of molecular area. The black line and grey lines correspond to oleic acid and myristic acid film model estimates, respectively, from this study.
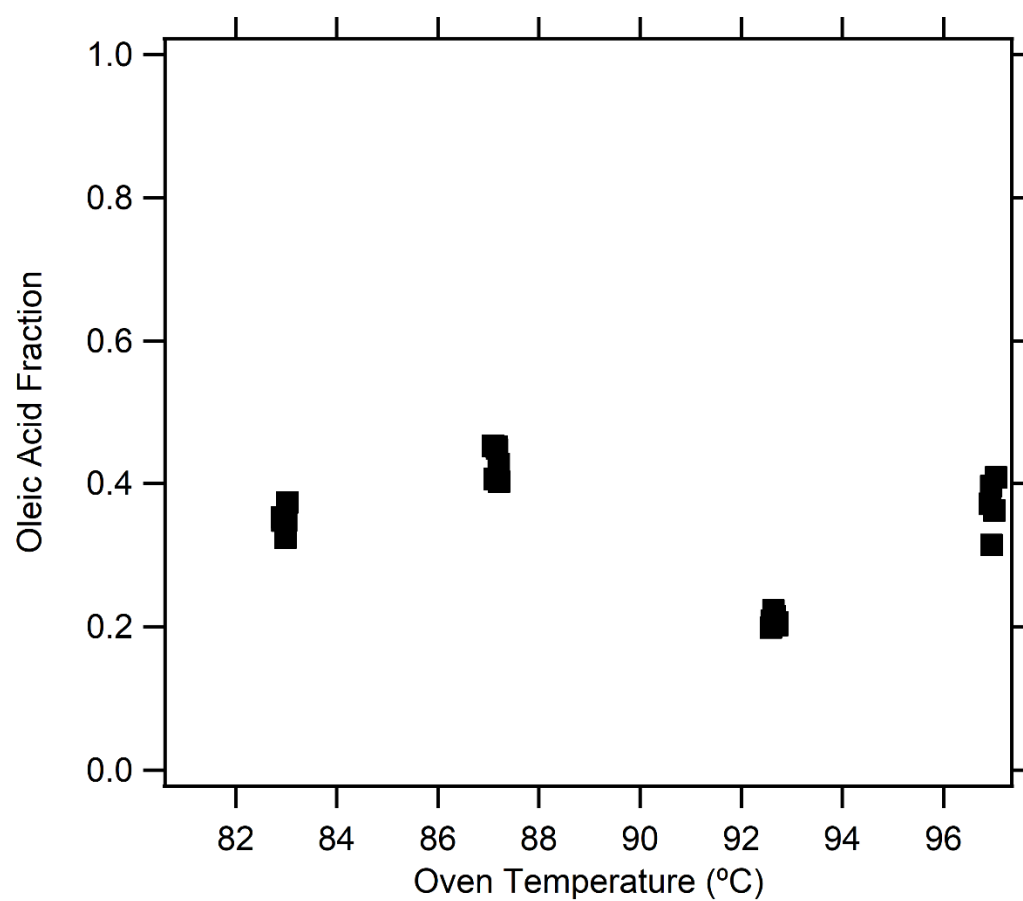
Figure S6. Molar-weighted oleic acid fraction quantified by the CIMS as a function of oven temperature for the palmitic acid-oleic acid mixture experiments.
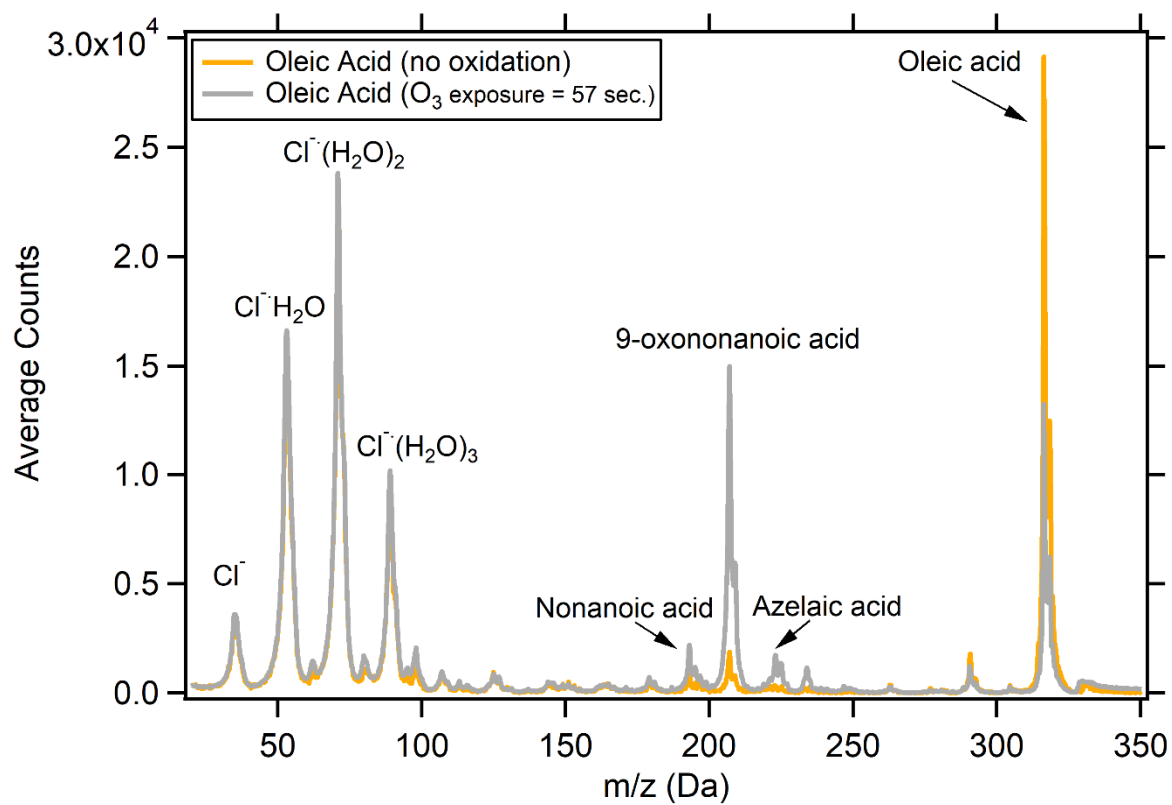
Figure S7. CIMS spectra for NaCl particles coated with oleic acid (orange) and oleic acid exposed to O₃ with a flow tube residence time of 57 seconds (grey).