Supplement of

Developing A Custom-Built Metal Cloud Chamber: Analysis of Aerosol Coagulation at Low Humidities

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The following provides additional information about the initial experiments conducted in the

LANL Cloud Chamber. Table S1 shows the number of experiments used for each aerosol type,

the statistical values and spreads for wall-loss and coagulation correction factor, specifically the

mean and median categorized for specific hours throughout the experiment. Figure S1 shows the

2D particle distribution of the raw data from the SMPS for the soot experiment presented in the

manuscript. Figures S2-S4 show particle distribution data, for each aerosol, from the SMPS fitted

to a probability mass function (PMF) along with stacked plots for each particle loss rate.

Table S1. Summary of experimental statistical results for wall eddy diffusivity and coagulation corrections, fitted for specific time intervals.

	Sodium chloride	Sucrose	Soot
# of experiments	8	4	6
Mean wall eddy diffusivity (1 hour)	0.152 ± 0.187	0.279 ± 0.422	1.12 ± 1.55
Median wall eddy diffusivity (1 hour)	0.0999	0.0631	0.343
Mean wall eddy diffusivity (1-6 hours)	0.562 ± 0.975	0.233 ± 0.286	0.201 ± 0.267
Median wall eddy diffusivity (1-6 hours)	0.220	0.109	0.0953
Mean coagulation factor (<2 hours)	0.969 ± 0.524	1.16 ± 1.38	1.23 ± 0.312
Median coagulation factor (<2 hours)	0.889	0.852	1.24
Mean coagulation factor (2-6 hours)	0.811 ± 0.352	0.911 ± 0.382	0.941 ± 0.307
Median coagulation factor (2-6 hours)	0.774	0.931	0.973
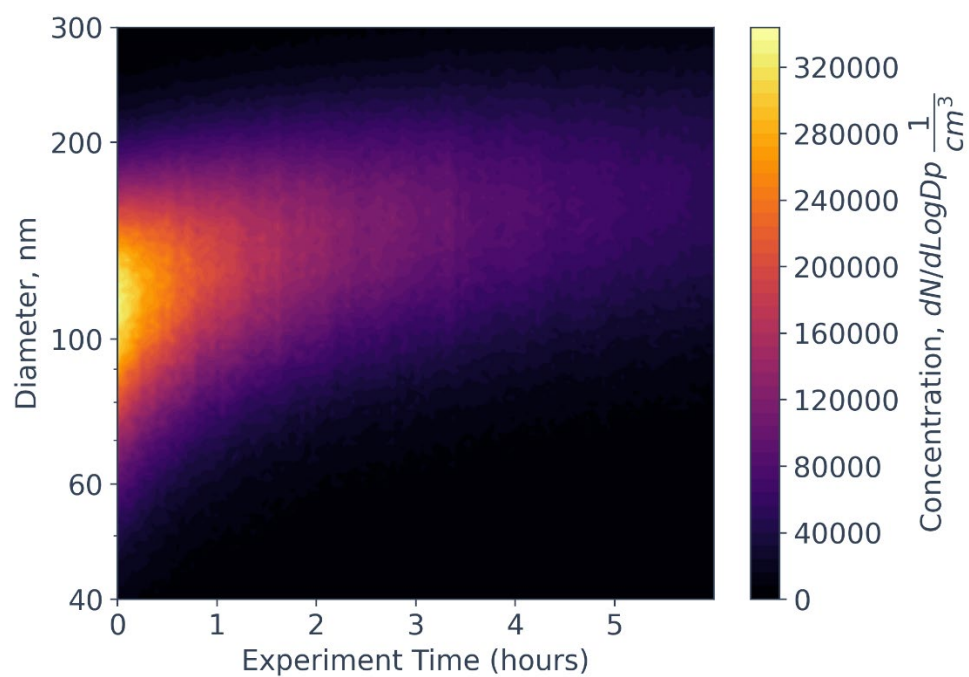
Figure S1. A 2D particle distribution plot for the raw SMPS data of the soot experiment

presented in the manuscript.
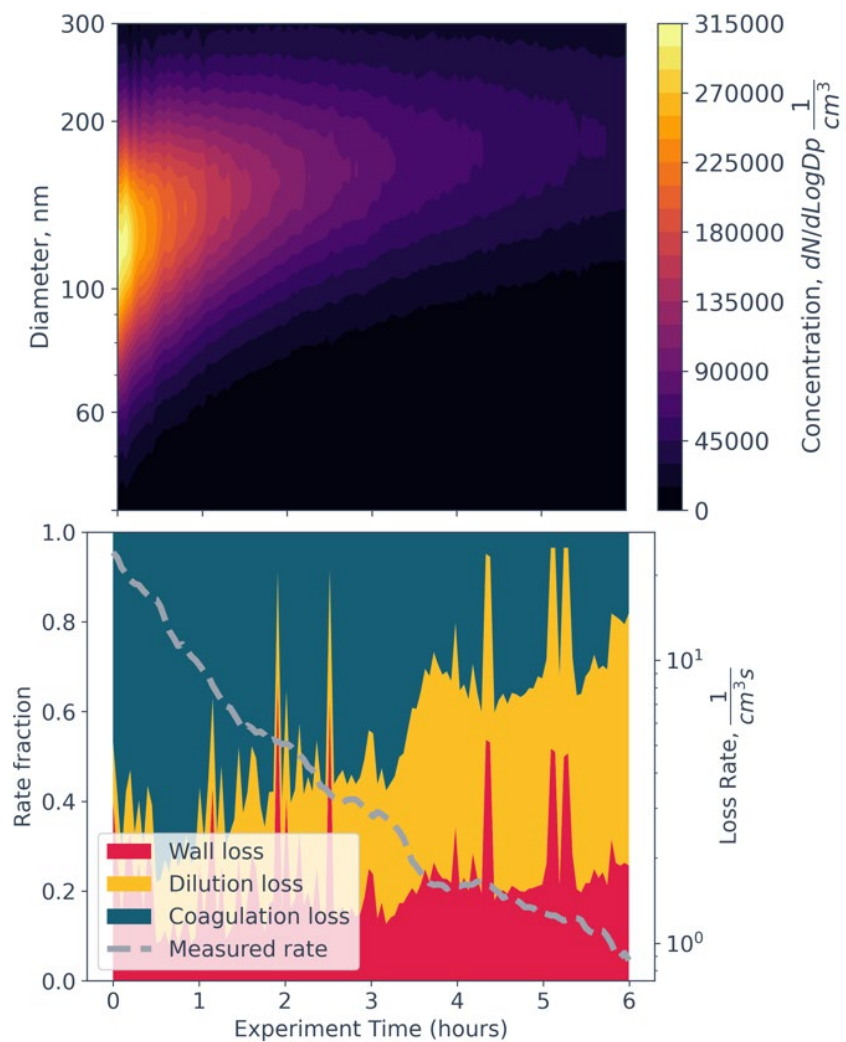
Figure S2. A 2D, two-mode, log-normal distribution plot fitted for a probability mass function representing one of the soot experiments. A stacked plot shows the particle loss rates for each process, while the dashed line shows the experimental loss rate for the particles lost.
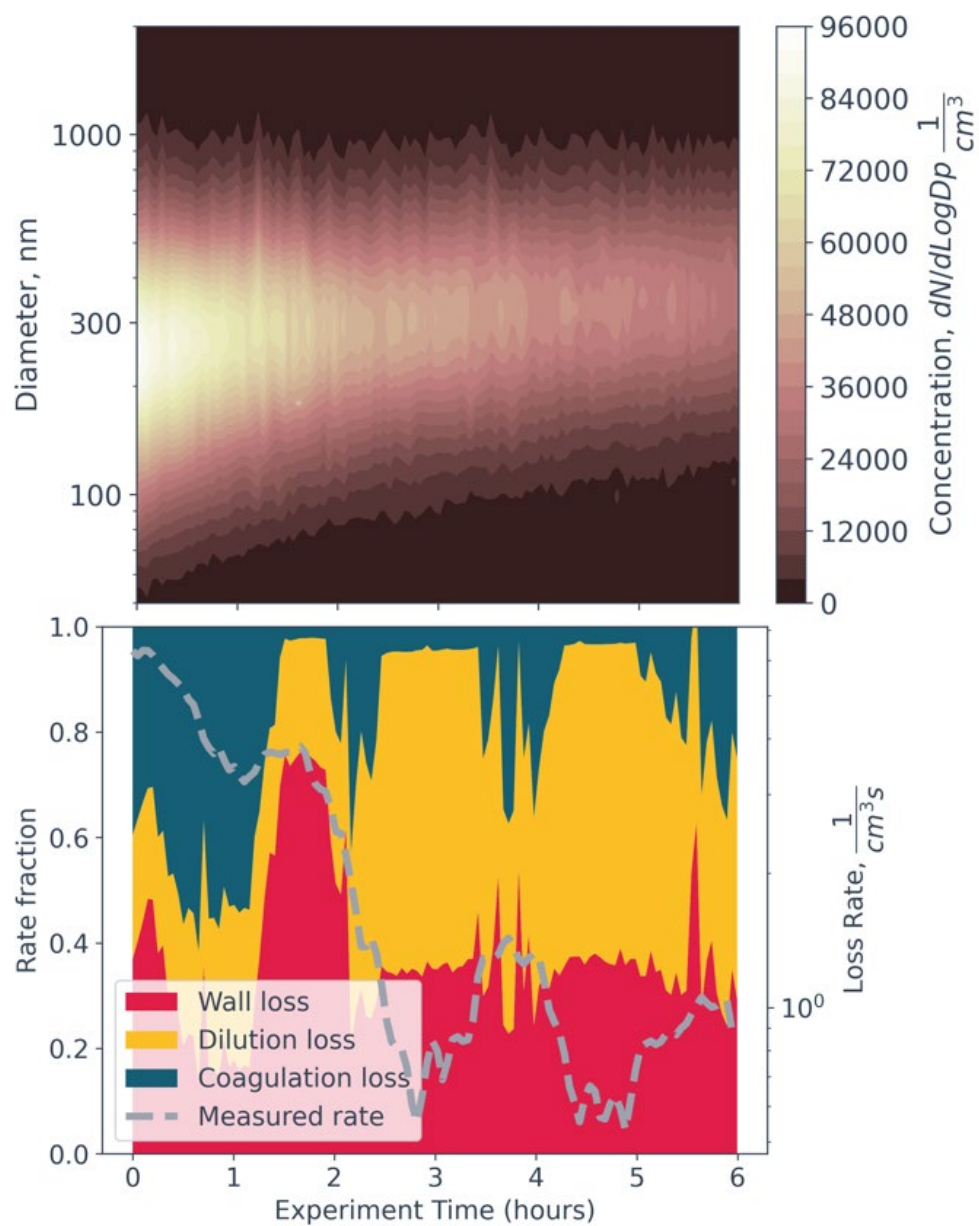
Figure S3: A 2D, two-mode, log-normal distribution plot fitted for a probability mass function representing one of the sodium chloride experiments. A stacked plot shows the particle loss rates for each process, while the dashed line shows the experimental loss rate for the particles lost.
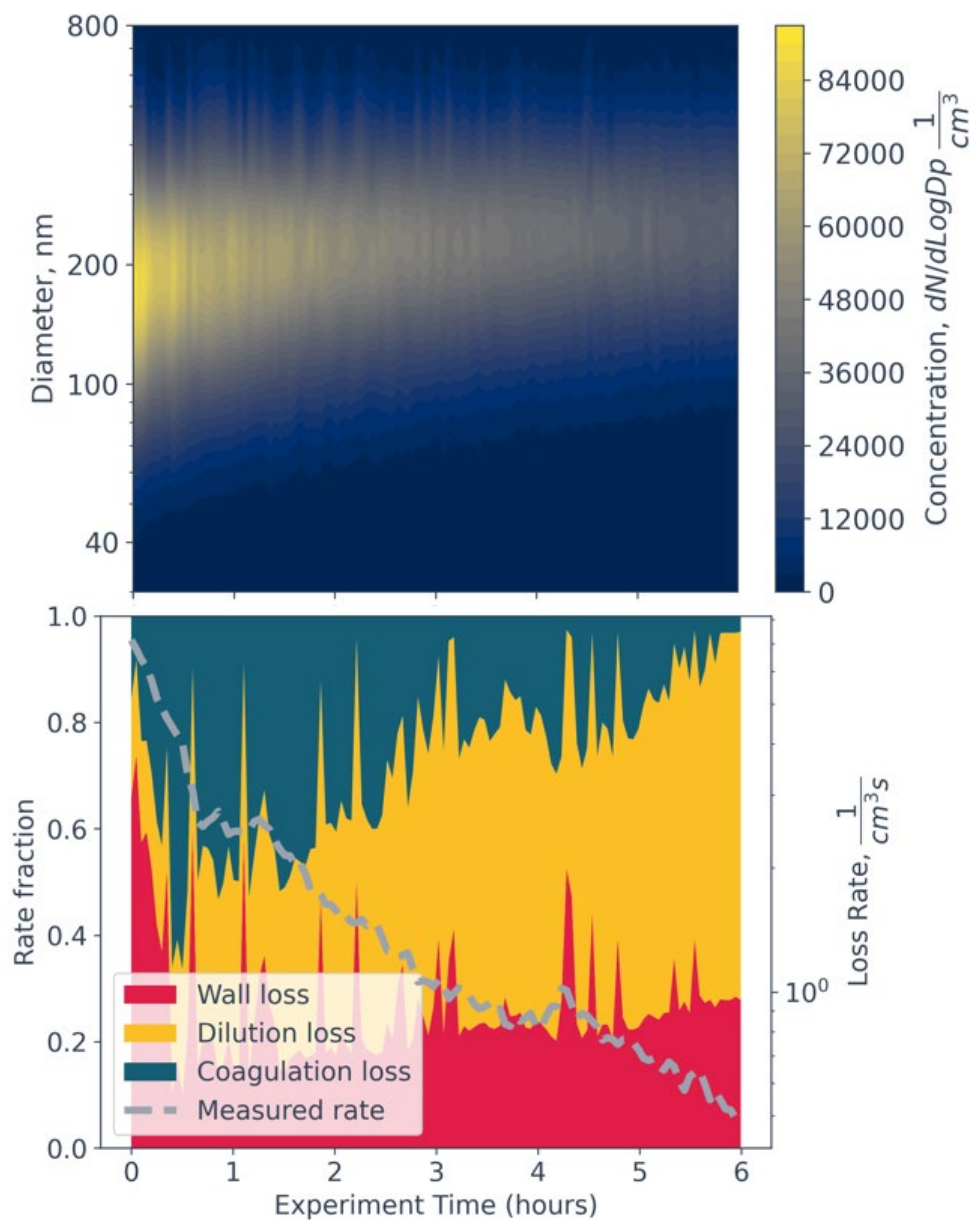
Figure S4: A 2D, two-mode, log-normal distribution plot fitted for a probability mass function representing one of the sucrose experiments. A stacked plot shows the particle loss rates for each process, while the dashed line shows the experimental loss rate for the particles lost.