Supporting information to "The microfluidic nebulator: Production of sub-micrometer sized airborne drops"

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Estimation of the air flow profile

To test if we can estimate the flow profile in the nebulator using the Poiseuille law, we estimate the flow in each channel section using this equation and the channel dimensions summarized in Table S1. To quantify the pressure drop between each main channel section, we measure the pressure-dependent expansion of a closed PDMS-channel as a function of the pressure applied to the air inlet. We convert this expansion into pressures using the calibration curve shown in Figure S1. The results are shown in Figure 3b of the main paper.
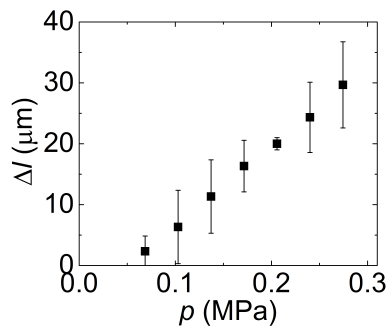
Figure S1: Calibration curve measured in closed 100 µm diameter, 100 µm tall PDMS channels as a function of the pressure applied to the air inlet.

Table S1: Length, L, width, w, and height, h, and hydrodynamic resistance, R, of the different channel sections.

	L (µm)	w (µm)	h (µm)	R (Ns/m)
I1	9322	200	100	1.62×10^{10}
I2	12320	200	100	2.14×10^{10}
I3	16160	200	100	2.81×10^{10}
I4	19980	200	100	3.47×10^{10}
I5	23005	200	100	4.00×10^{10}
I6	24260	200	100	4.15×10^{9}
M1	350	40	100	1.74×10^{10}
M2	200	80	100	1.87×10^{9}
M3	200	80	100	1.87×10^{9}
M4	200	80	100	1.87×10^{9}
M5	920	80	100	8.62×10^{9}
M6	50000	80	300	9.31×10^{10}

Quantification of the sizes of spray-dried CaCO$_3$ particles and the secondary drops they are produced in

We quantify the size and size distribution of spray-dried CaCO$_3$ particles from SEM images. A summary of the particle diameters is shown in Table S2. From these data, we calculated the size distribution of secondary drops using the known initial salt concentrations and a CaCO$_3$ × 2 NaCl density of 2.34 g/cm^3, as summarized in Table S3.

Table S2: Summary of the size distribution of spray-dried CaCO$_3$ particles

particle diameter (nm)	number of particles
2 to 4	22
4 to 6	34
6 to 8	38
8 to 10	65
10 to 12	110
12 to 14	81
14 to 16	61
16 to 18	29
18 to 20	16
20 to 22	16

Table S3: Summary of the calculated size distribution of secondary drops produced at a pressure at the air inlets of 0.28 MPa.

drop diameter (nm)	number of drops
20 to 60	20
60 to 100	36
100 to 140	42
140 to 180	86
180 to 220	146
220 to 260	81
260 to 300	33
300 to 340	17
340 to 380	11