Supplementary material: Figures S1-S10; Tables S1-S2

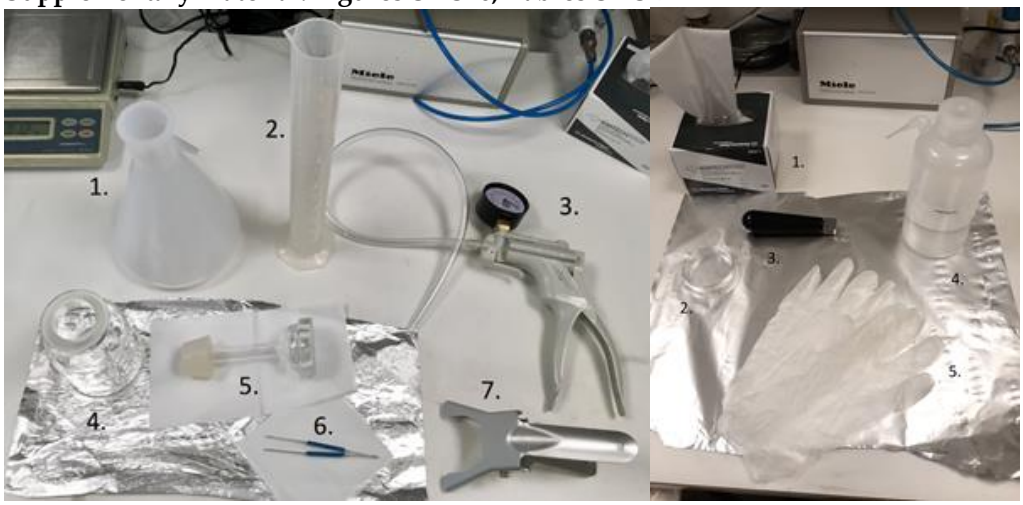

Figure S1. Filtering equipment: 1. Suction flask, 2. Measuring glass, 3. Hand pump, 4. Filtering cup, 5. Filter holder, 6. Tweezers, 7. Clamp. Other equipment needed: 1. Tissue paper, 2. Petri dish, 3. Cutting tool, 4. Organic solvent for cleaning (isopropanol), 5. Laboratory gloves.

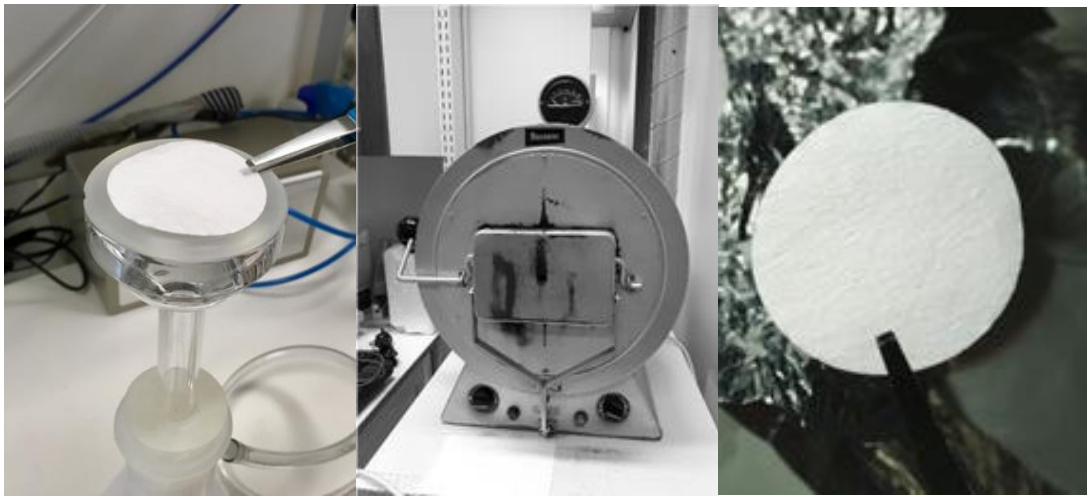

Figure S2. Quartz filters are pre-burned in an oven at 800 °C for over 4 hours. Filters are also possible to buy pre-burned. A pre-burned quartz filter is placed on the filter holder using tweezers. The filter is placed with the rough ("hairy") side up.



Figure S3. The snow samples are stored in the freezer in sterile plastic bags and melted in a microwave oven at low power.

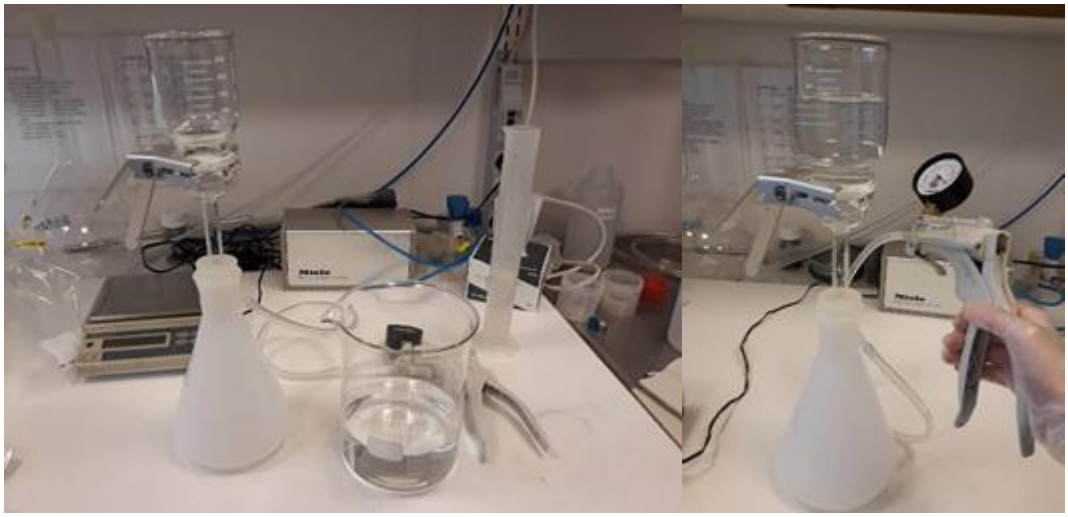

Figure S4. The melted snow sample is poured into the filtering cup. A hand pump is used to draw the liquid through the filter.

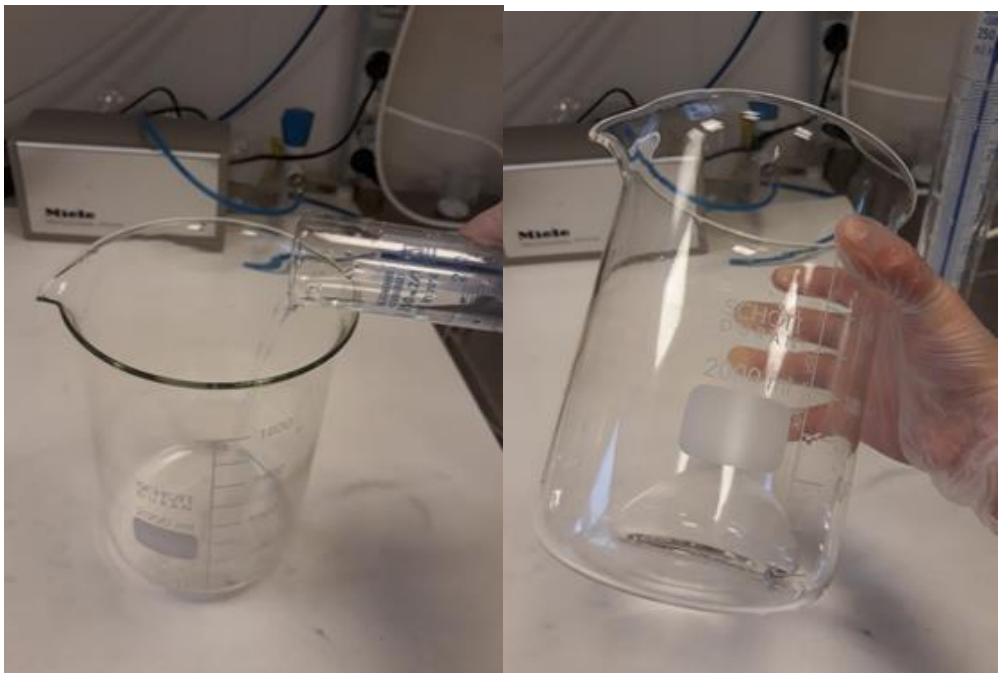

Figure S5. After pouring the sample into the filtering cup the edges of the beaker are rinsed three times with 30 ml of MilliQ-water to remove possible sample that is attached to the walls of the beaker. The rinsed water is poured into the filtering cup and filtered with the sample

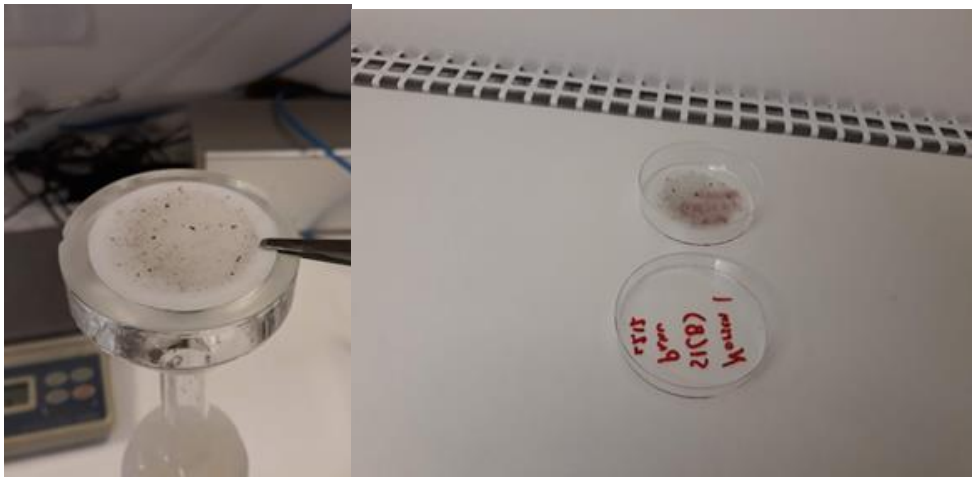

Figure S6. After filtering the rinsing water as well the filter is put in a Petri dish. Use tweezers and avoid touching the center part of the filter where the sample is. The filter is dried overnight at room temperature in a laminar cabinet before analysis.







Figure S7. The sample filter is placed on a clean cutting board covered with clean aluminum foil using tweezers. A cutting tool is used to take a 1.5x1.0 cm sample piece for the thermal optical carbon analysis. The filter piece is placed on the sample spoon after which the sample spoon is pushed inside the sample oven of the OCEC instrument. The sample is analyzed with OCEC using Eusaar2-protocol.

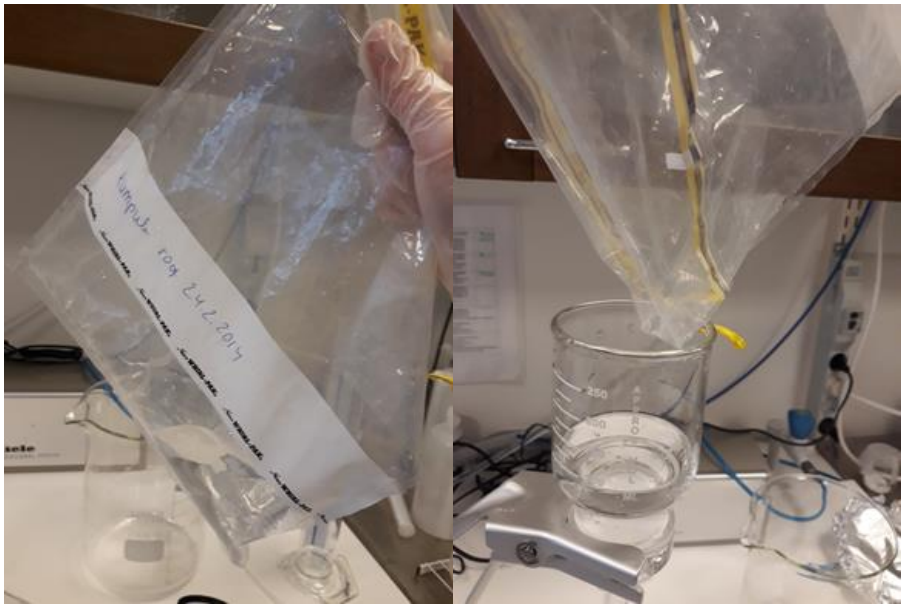

Figure S8. The plastic bag used to store the sample is rinsed with 100 ml of Milli-Q water and filtered through another quartz filter to see if there was sample loss on the surfaces of the plastic bag.



Figure S9. The melted snow samples were sonicated for 10 minutes right before filtering.

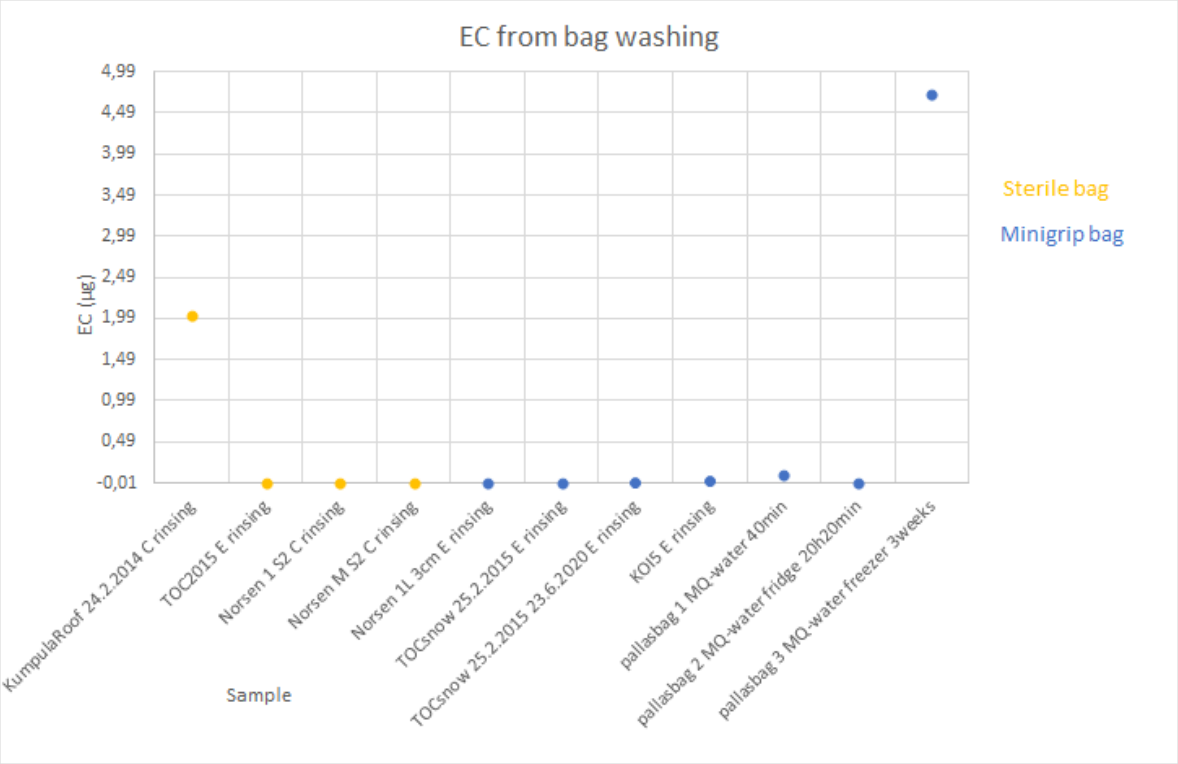

Figure S10. The results of bag rinsing.

Table S1. List of snow samples and amount of melted snow used in the sonication experiment. KO refers to Kommattivaara (67.25 N, 26.47 E), a fjäll with forest area, sampled 23.3.2010. NorSEN refers to the NorSEN mast, an open area at 67.21 N,26.38 E, sampled 23.3.2010.

Sample ID	Sample size (ml)
KumpulaRoof 24.2.2014 A1 sonic	350
KumpulaRoof 24.2.2014 A2 sonic	454
KumpulaRoof 24.2.2014 B1	594
KumpulaRoof 24.2.2014 B2	532
KumpulaRoof 24.2.2014 C rinsing	100
NorSEN 1L 3cm A	298
NorSEN 1L 3cm B sonic	302
NorSEN 1L 3cm C	564
NorSEN 1L 3cm D sonic	606
NorSEN 1L 3cm E rinsing	100
NorSEN M S2 A	198
NorSEN M S2 B sonic	180
NorSEN M S2 C rinsing	100
NorSEN 1 S2 A	438
NorSEN 1 S2 B sonic	432
NorSEN 1 S2 C rinsing	100
KOI5 A	300
KOI5 B sonic	301
KOI5 C	302

KOI5 D sonic	384
KOI5 E huuhtelu	100
TOC2015 2.6.2020 A	318
TOC2015 2.6.2020 B sonic	316
TOC2015 2.6.2020 C	334
TOC2015 2.6.2020 D sonic	282
TOC2015 2.6.2020 E rinsing	100
TOCsnow 25.2.2015 A sonic	296
TOCsnow 25.2.2015 B	300
TOCsnow 25.2.2015 C	250
TOCsnow 25.2.2015 D sonic	250
TOCsnow 25.2.2015 E rinsing	100
TOCsnow 25.2.2015 23.6.2020 A	224
TOCsnow 25.2.2015 23.6.2020 B sonic	210
TOCsnow 25.2.2015 23.6.2020 C	268
TOCsnow 25.2.2015 23.6.2020 D sonic	282
TOCsnow 25.2.2015 23.6.2020 E rinsing	100

Table S2. Solutions made for the filter wetting experiment.

Filtered amount (ml)	Base solution (ml)	MQ-water (ml)	Total volume (ml)
100	100	900	1000
500	50	450	500
600	60	540	600
700	70	630	700