Supplement of Atmos. Chem. Phys., 25, 10215–10228, 2025
https://doi.org/10.5194/acp-25-10215-2025-supplement

Atmospheric Chemistry and Physics
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EGU

Supplement of

Carbonate content and stable isotopic composition of atmospheric aerosol carbon in the Canadian High Arctic

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Figures S1–S12:

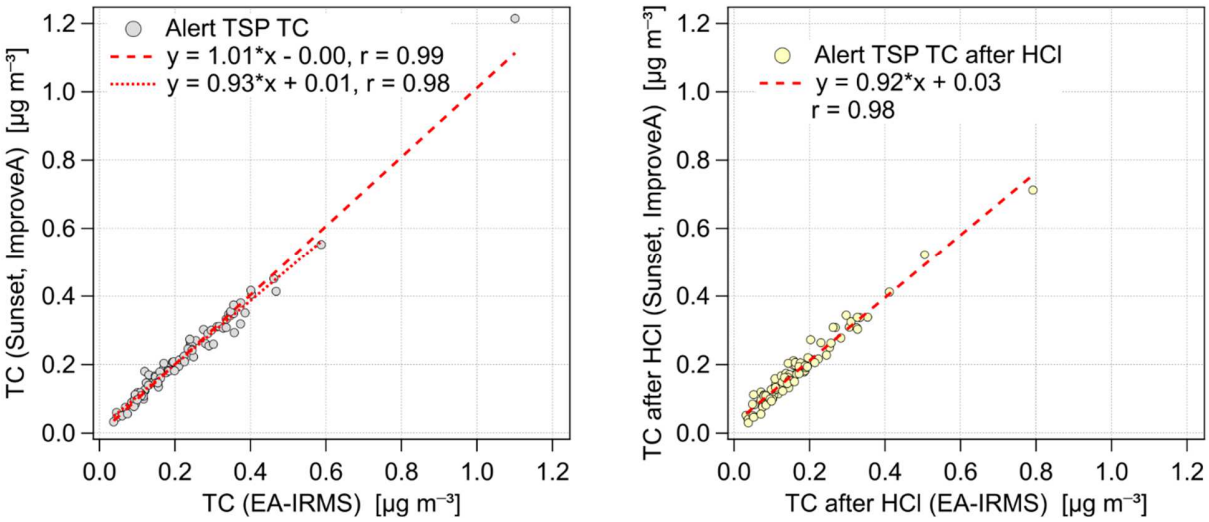

Figure S1. Comparison of TC concentrations measured by EA and EC/OC analyzer on the same filters before any treatment (left) and after HCl fumigation (right).

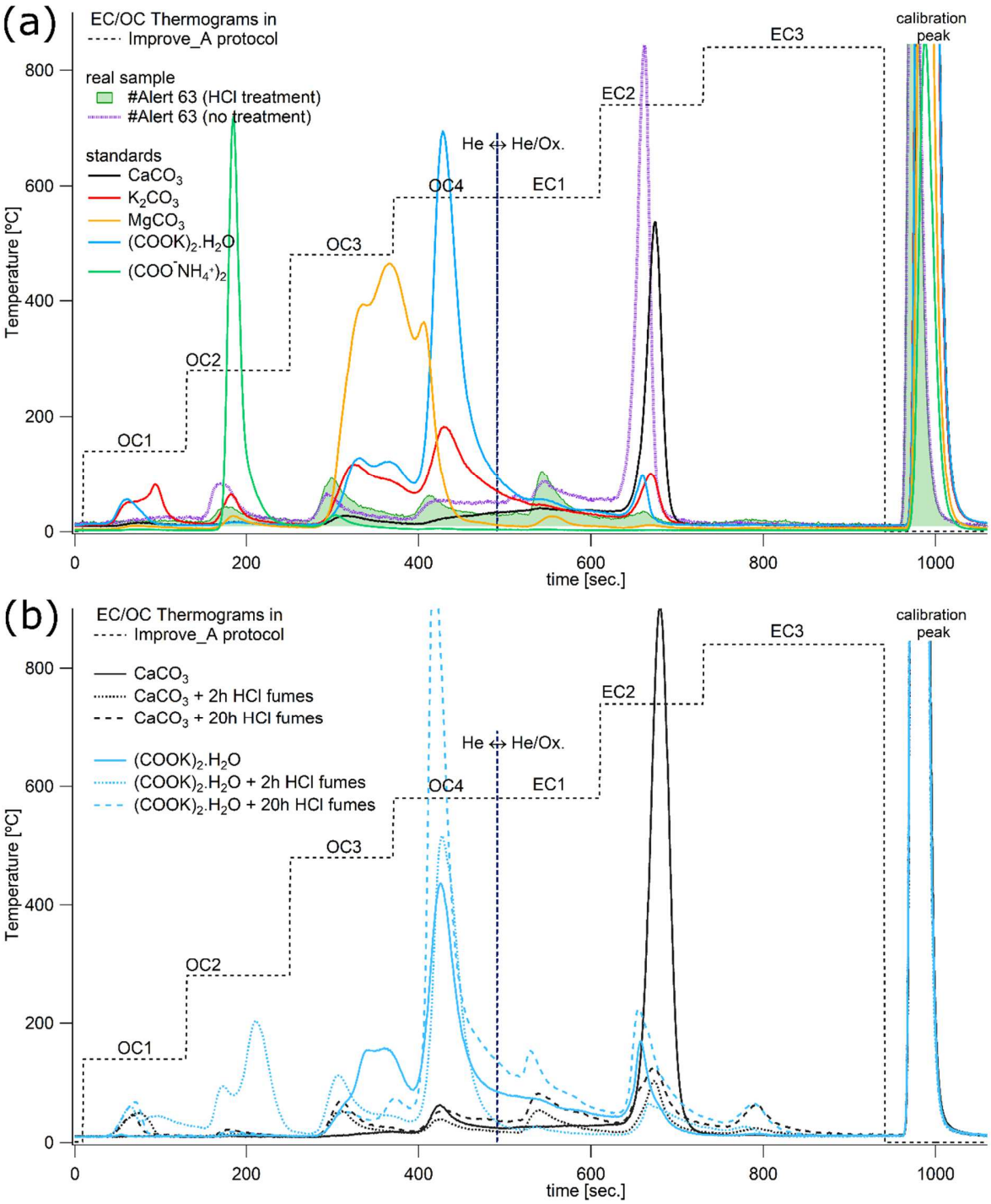

Figure S2. EC/OC thermograms of (a) one Alert sample (#63) before and after HCl treatment together with thermograms of carbonate and oxalate salts standards, and (b) $CaCO_3$ and $(COOK)_2.H_2O$ standards before and after HCl fuming.

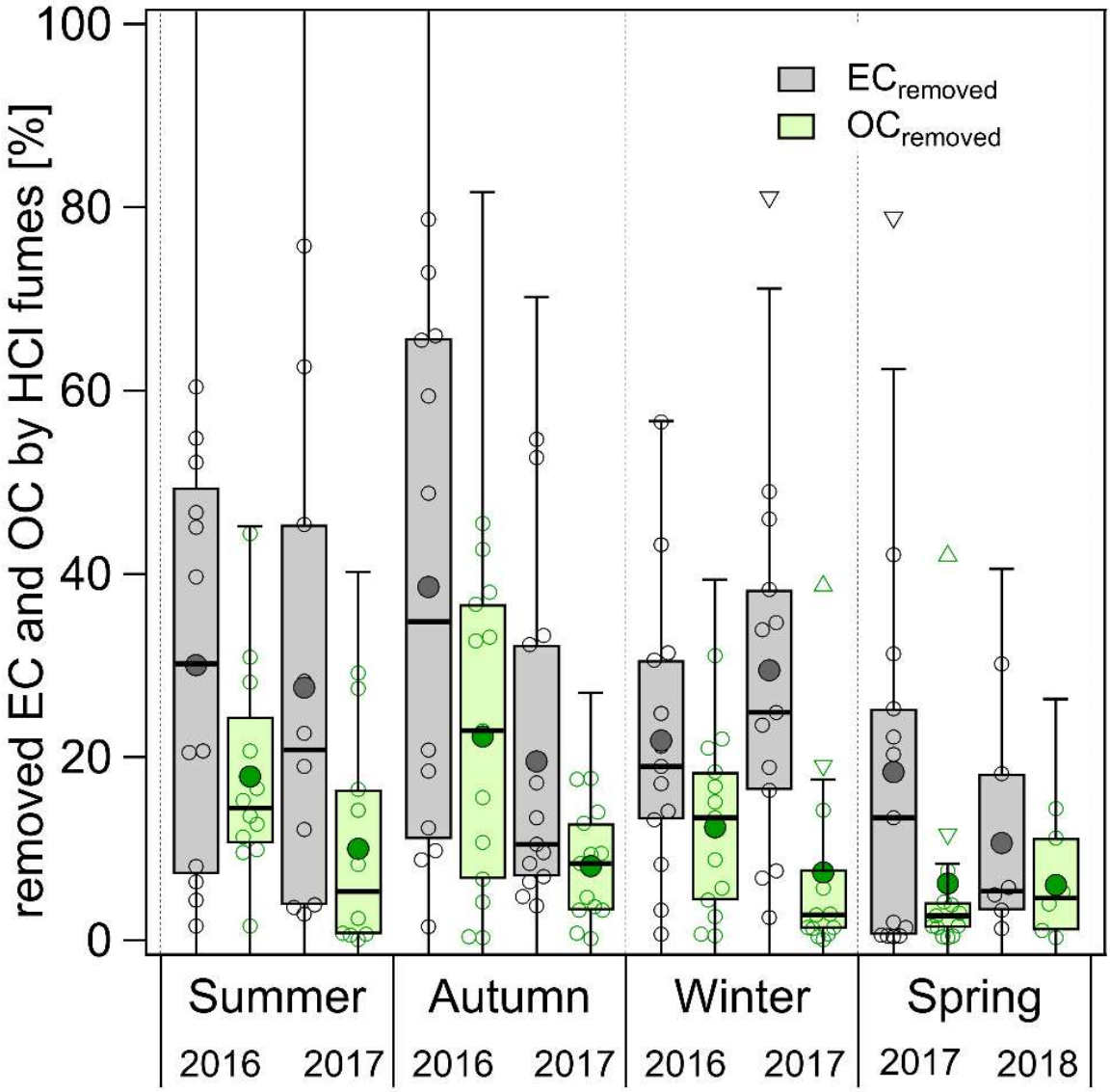

Figure S3. Seasonally differentiated percentage contributions of falsely determined OC and EC, i.e., removed part of original EC and OC from TC by HCl fumes. The boxes correspond to the interquartile range (IQR; 25 and 75 percentile) with median represented by the inner solid line. The whiskers correspond to inner fences range (1.5*IQR), triangles are outliers and mean is represented by large filled circle.

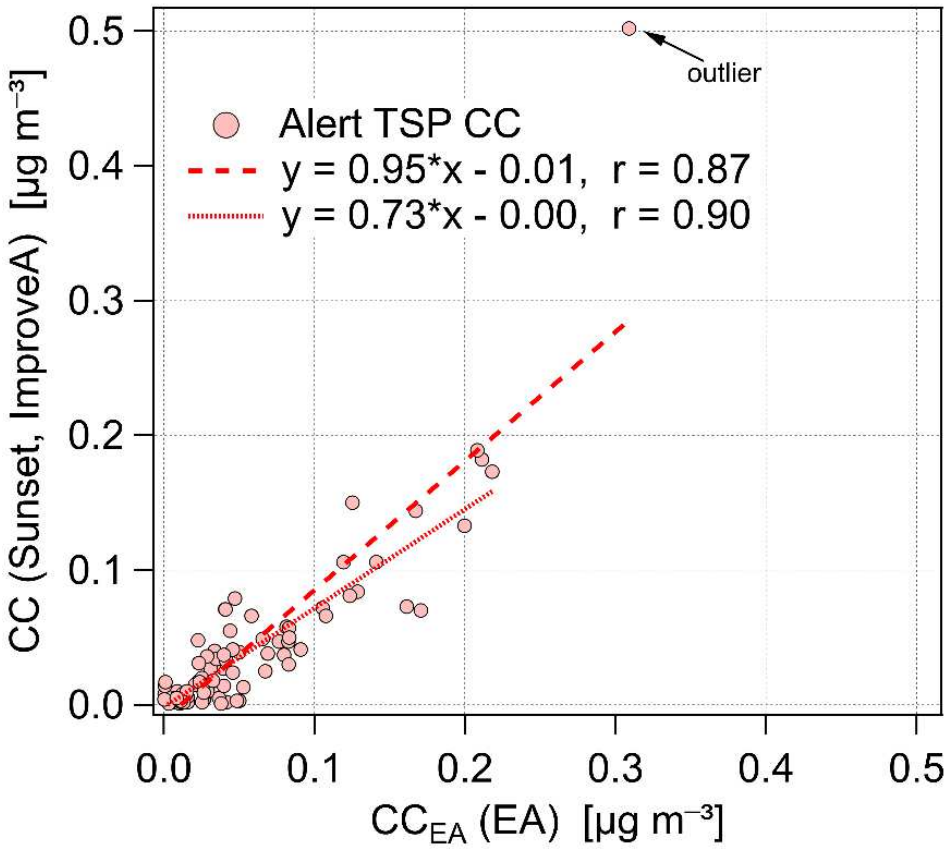

Figure S4. Comparison of CC concentrations calculated based on EA and EC/OC measurements. Linear fit with all data (y=0,95 x) and without one outlier (y = 0.73 x).

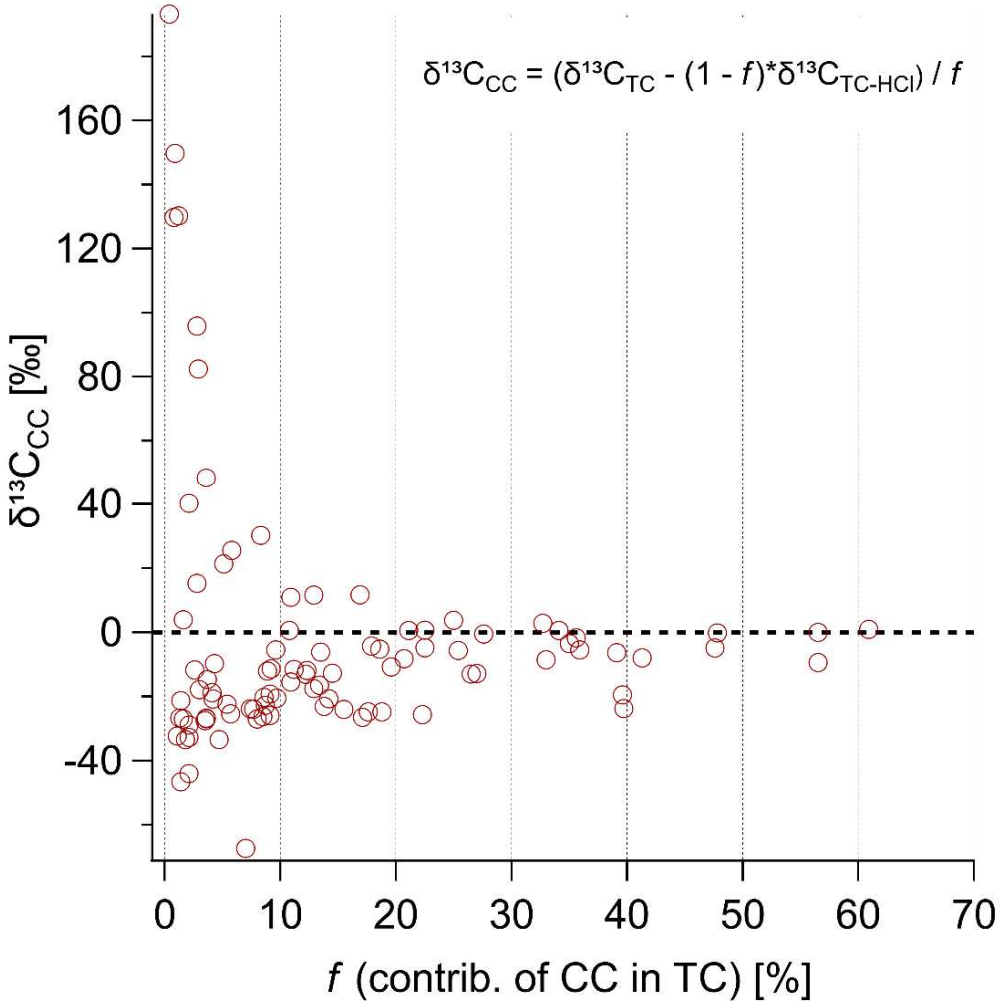

Figure S5. Relationship between calculated $\delta^{13}C_{CC}$ values and CC contribution in TC.

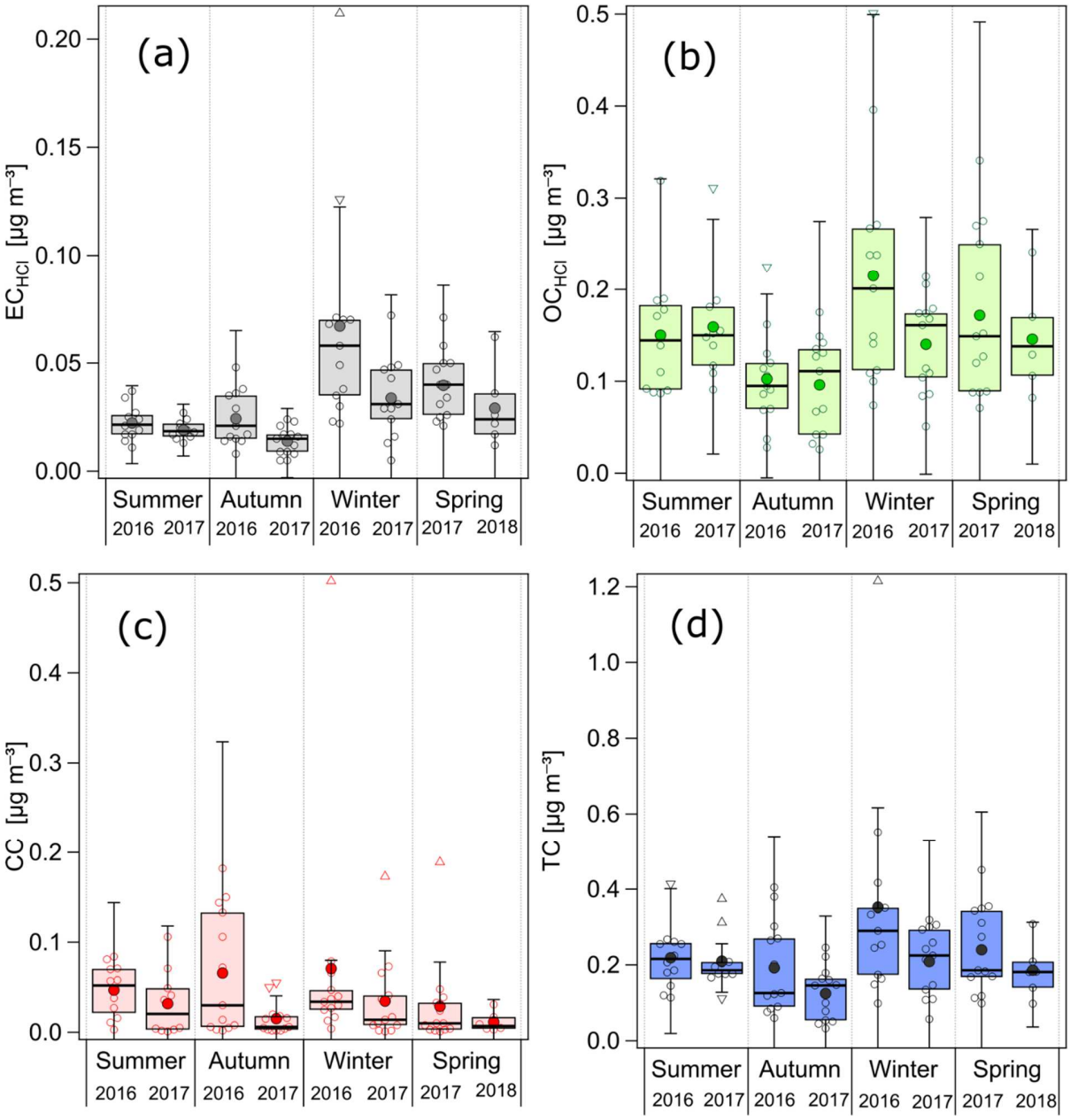

Figure S6. Seasonal variations of mass concentrations of (a) EC_{HCl}, (b) OC_{HCl}, (c) CC and (d) TC at Alert site. (TC = EC_{HCl} + OC_{HCl} + CC). The boxes correspond to the interquartile range (IQR; 25 and 75 percentile) with median represented by the inner solid line. The whiskers correspond to inner fences range (1.5*IQR), triangles are outliers and mean is represented by large filled circle.

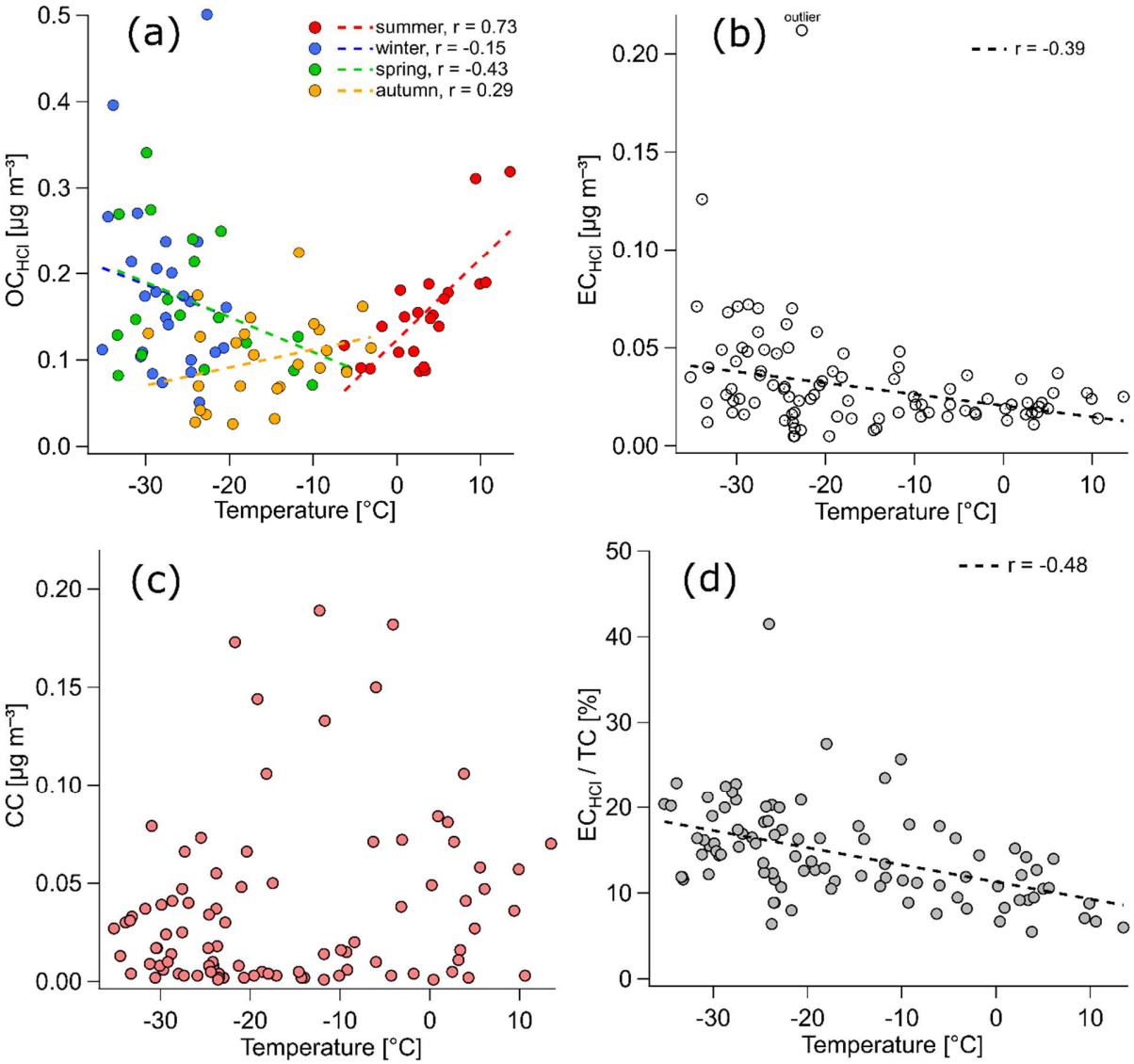

Figure S7. Changes in (a) OC_{HCl}, (b) EC_{HCl} and (c) CC mass concentrations, and (d) EC_{HCl}/TC ratio as a function of ambient temperature.

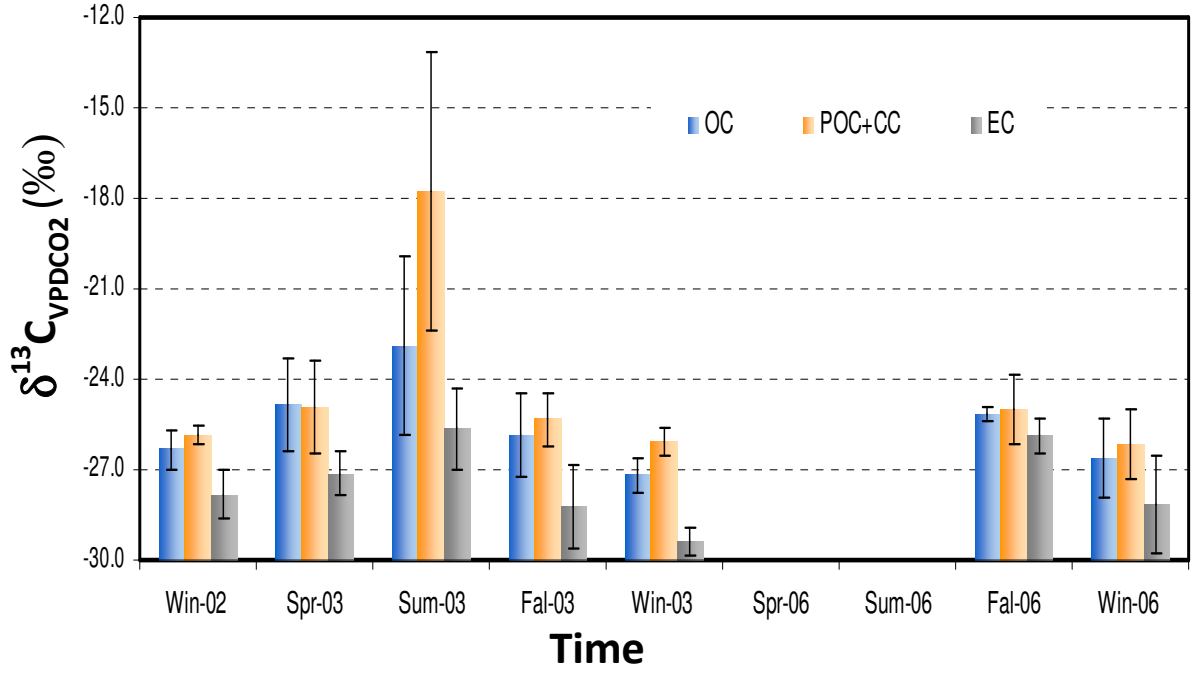

Figure S8. Seasonal variations of $\delta^{13}C$ in OC, pyrolytic carbon (POC) + CC, and EC in PM_1 fine aerosol at the Alert station during 2002-2003 and 2006.

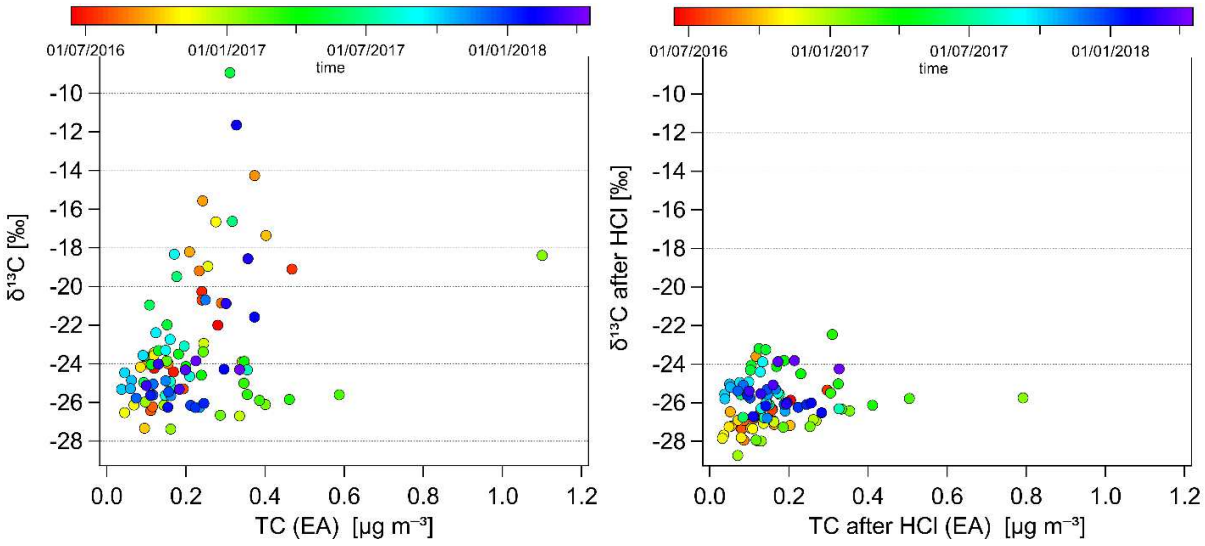

Figure S9. Relationship between $\delta^{13}C$ of TC and TC mass concentrations for untreated samples (left) and HCl treated samples (right). The color scale reflects the time of sample collection.

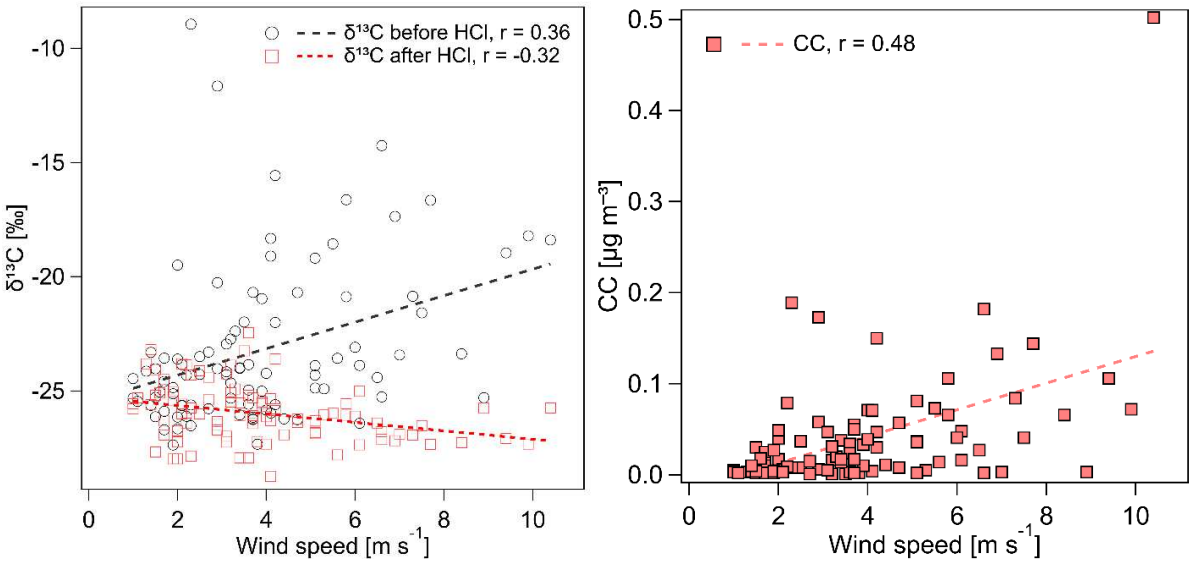

Figure S10. Dependence of $\delta^{13}C$ (right) and CC concentrations (left) on wind speed.

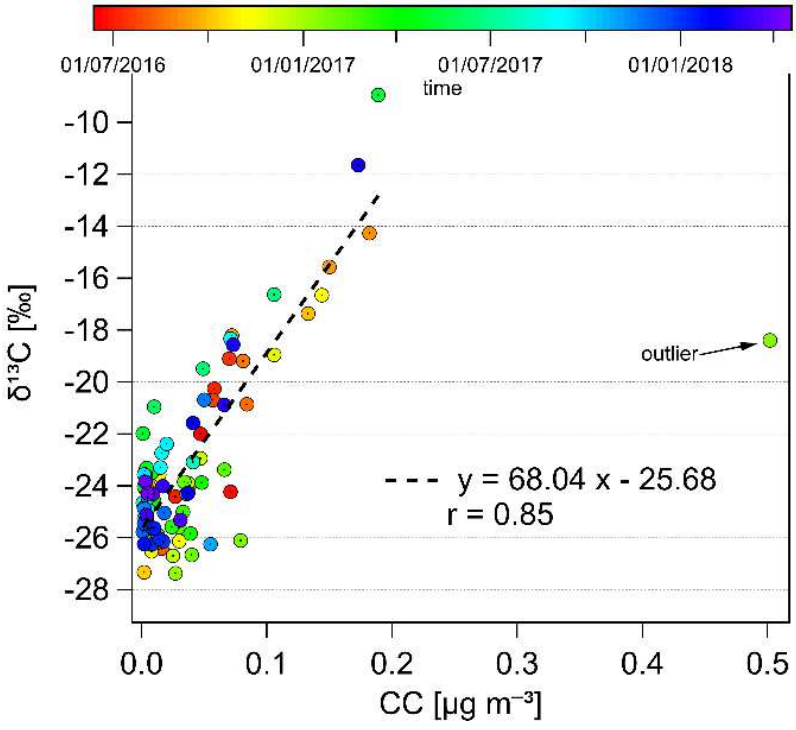

Figure S11. Dependence of $\delta^{13}C$ on CC concentration. The color scale reflects the time of sample collection.

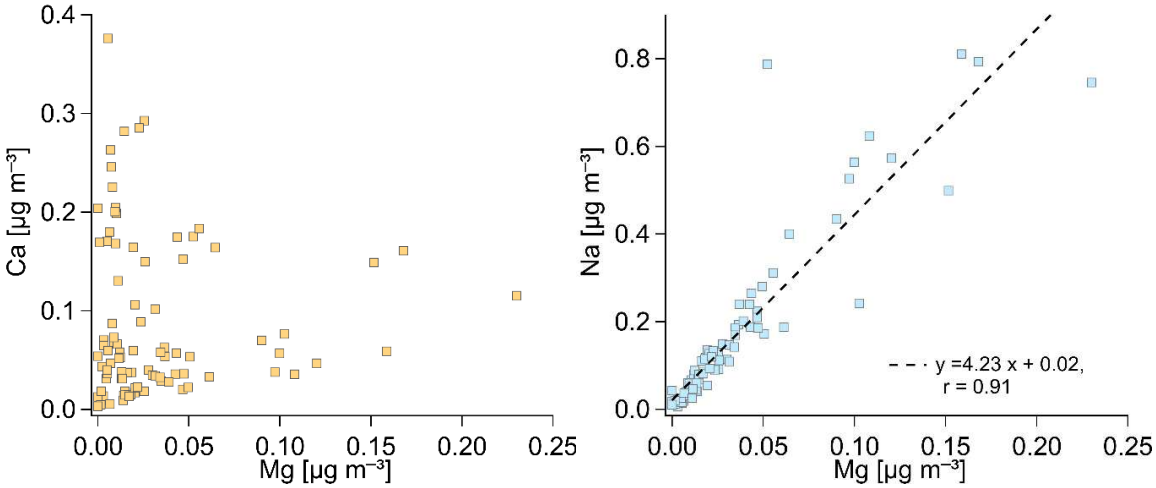

Figure S12. Relationship between Ca and Mg (right), and Na with Mg mass concentrations (left).