



Supplement of

Oxidation pathways and emission sources of atmospheric particulate nitrate in Seoul: based on $\delta^{15}\text{N}$ and $\Delta^{17}\text{O}$ measurements

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Table S1. The number of stable isotope ratios.

Period (year-month)	Number
18-May	2
18-Jun	3
18-Jul	6
18-Aug	2
18-Dec	2
19-Jan	5
19-Feb	5
19-Mar	6
Total number	31

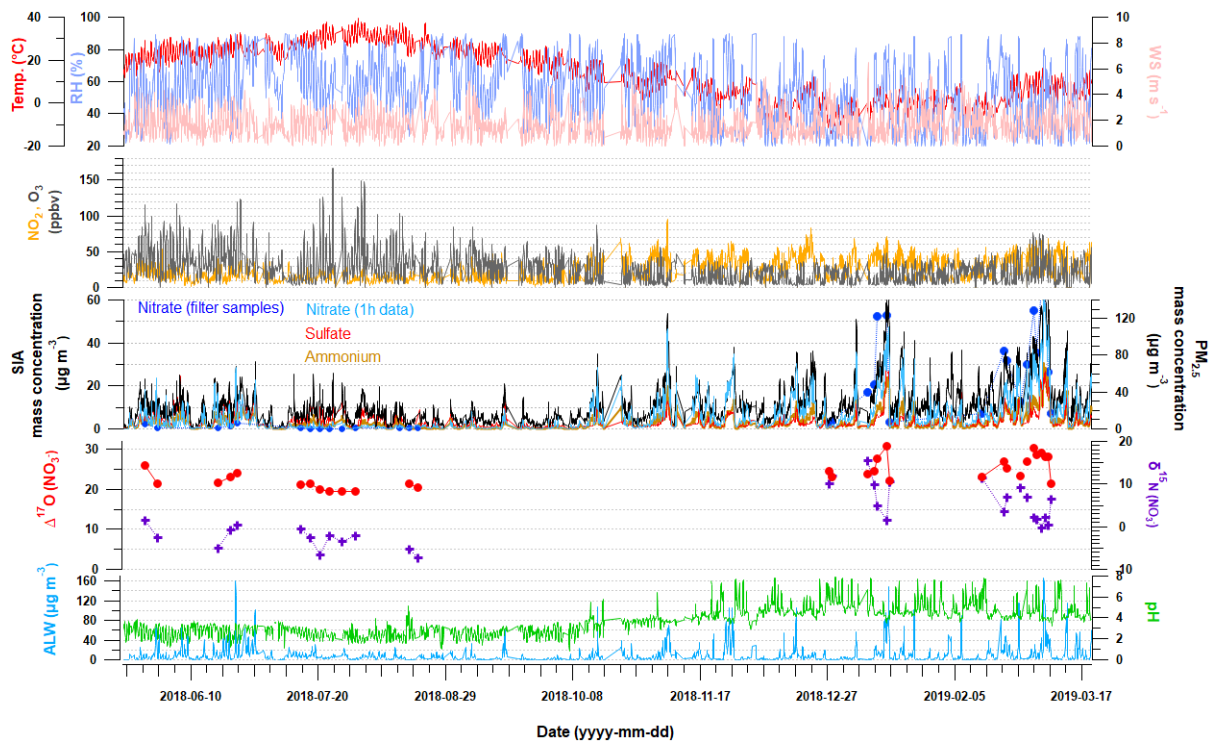
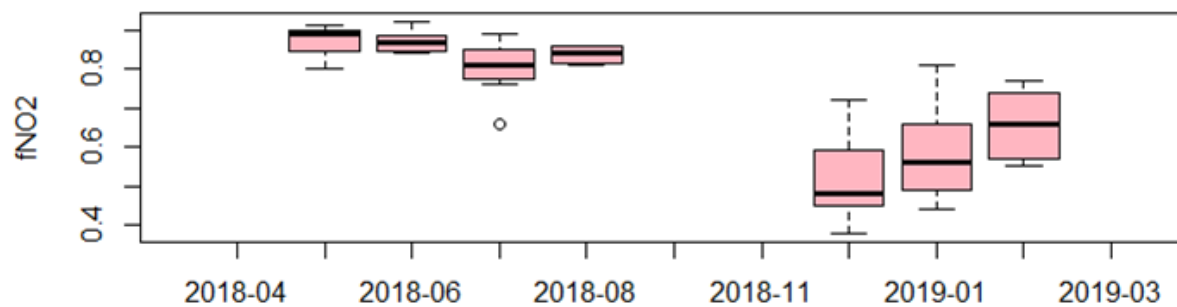


Figure S1. Time-series of measured parameters, including meteorological parameters (air temperature, relative humidity, and wind speed), gaseous precursors (NO_2 and O_3), $\text{PM}_{2.5}$ mass and SIA (NO_3^- , SO_4^{2-} , and NH_4^+) concentrations, triple oxygen and nitrogen stable isotope ratios, and calculated ALW content and aerosol pH. All is 1h-averaged data, except stable isotope ratios and NO_3^- concentration, which are filter-based measurements.

a)



b)

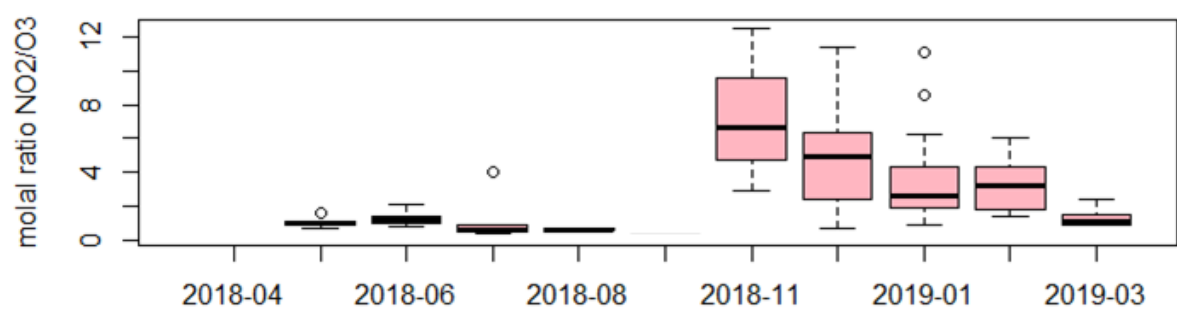
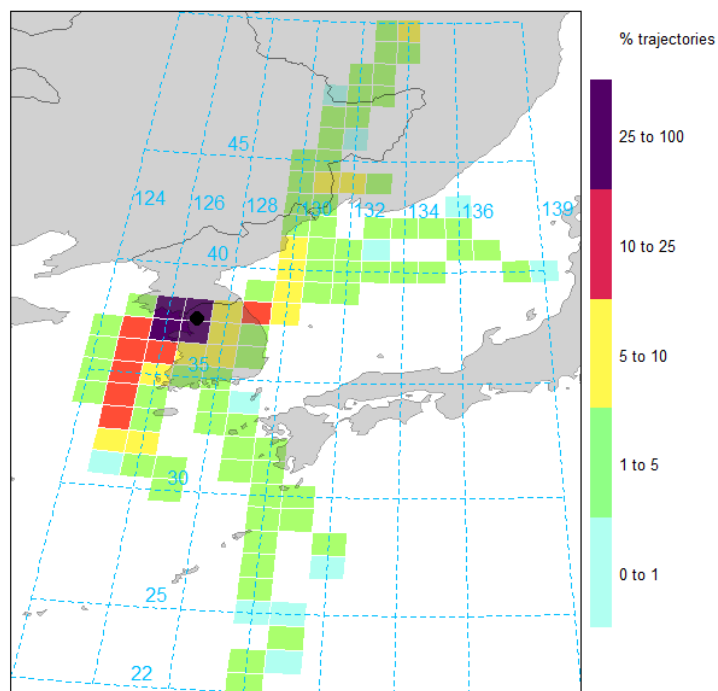


Figure S2. Monthly variations in (a) f_{NO_2} and (b) molar ratio of NO_2/O_3 for the measurement periods of May-August 2018 and December 2018-March 2019.

a)



b)

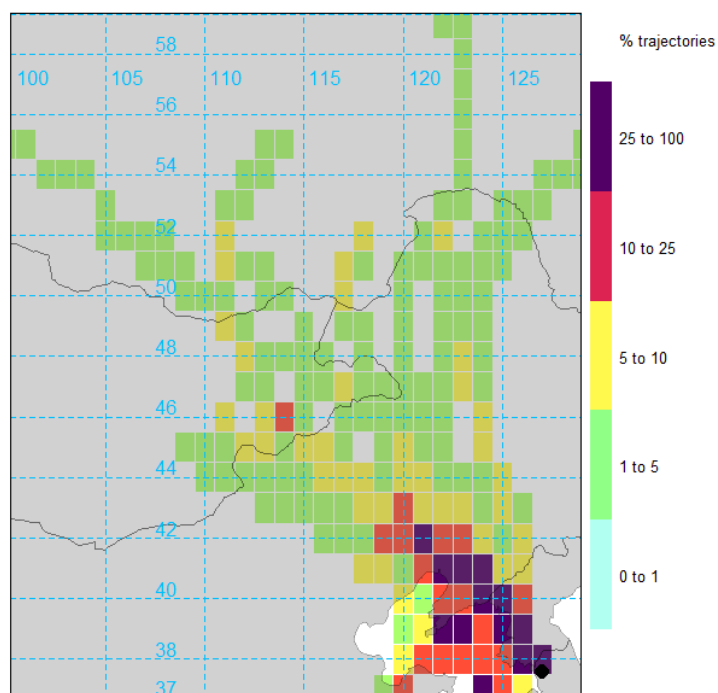


Figure S3. Frequency of air mass backward trajectories with (a) $\delta^{15}\text{N}(\text{NO}_3^-)$ lower than 20th percentile and (b) $\delta^{15}\text{N}(\text{NO}_3^-)$ higher than 80th percentile.