Supplementary Materials for:

Evaluating the degree of oxygenation of organic aerosol during foggy and hazy days in Hong Kong using high-resolution time-of-flight aerosol mass spectrometry (HR-ToF-AMS)

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1. Supporting graphs

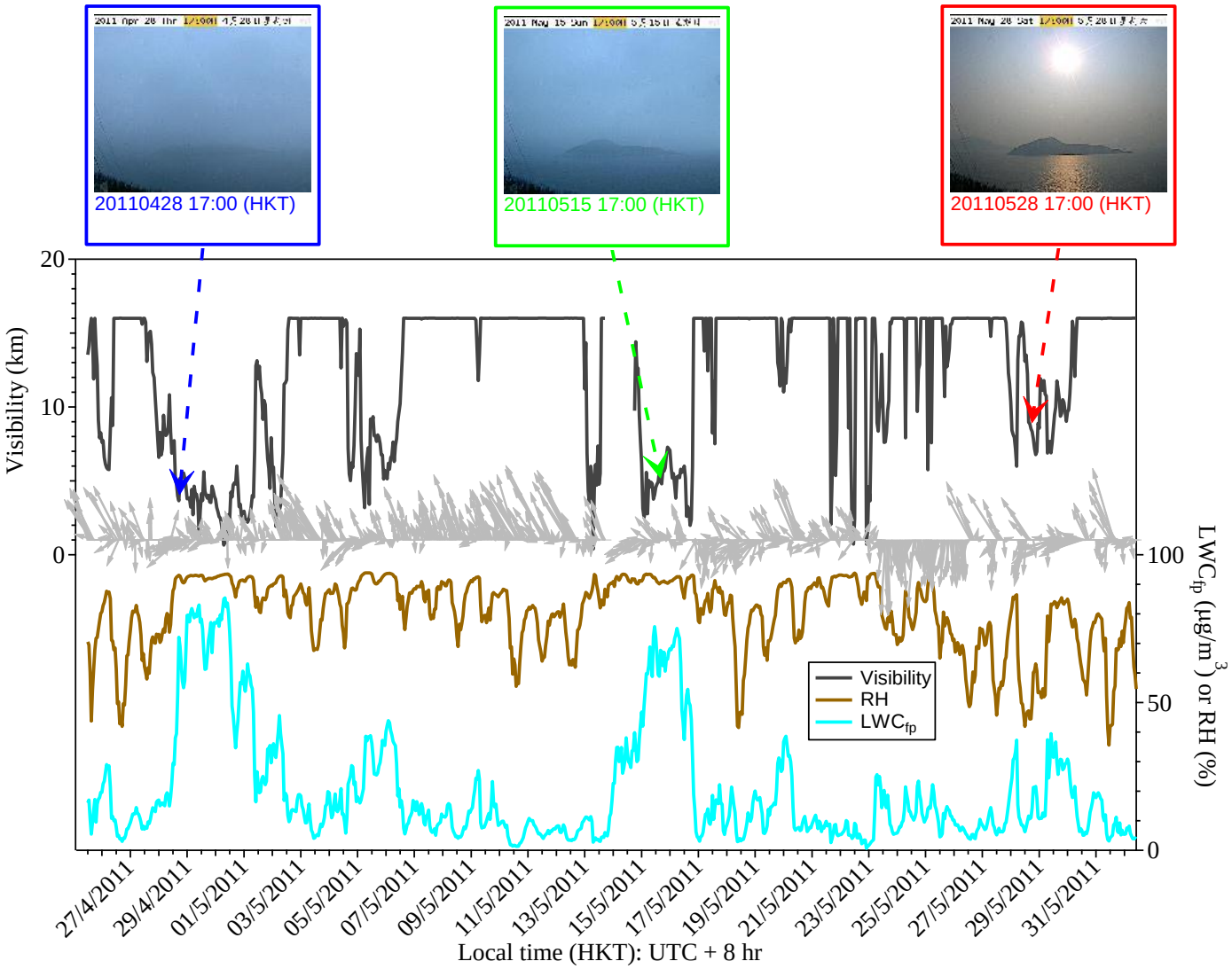

FIGURE S1. Visibility, wind vector, RH, and estimated liquid water content in fine particles (LWC_{fp}), as well as selected pictures taken during the campaign. Pictures were taken with an automatic camera on an island approximately 20 km south of the sampling site.

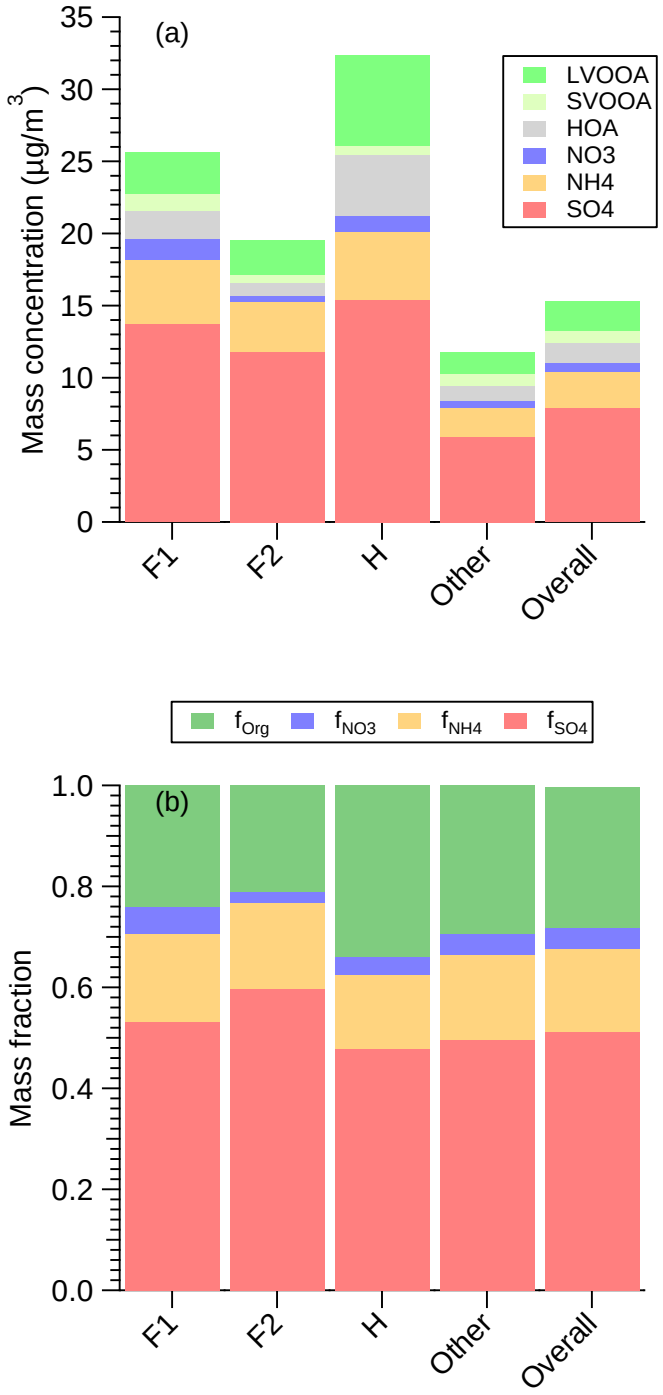

FIGURE S2. (a) Average mass concentrations of LVOOA, SVOOA, HOA, nitrate, ammonium and sulfate in five periods: foggy periods (*F1* and *F2*), hazy period (*H*), non-foggy and non-hazy period ("other"), and overall period. (b) Average mass fractions of organics, nitrate, ammonium and sulfate in the five periods.

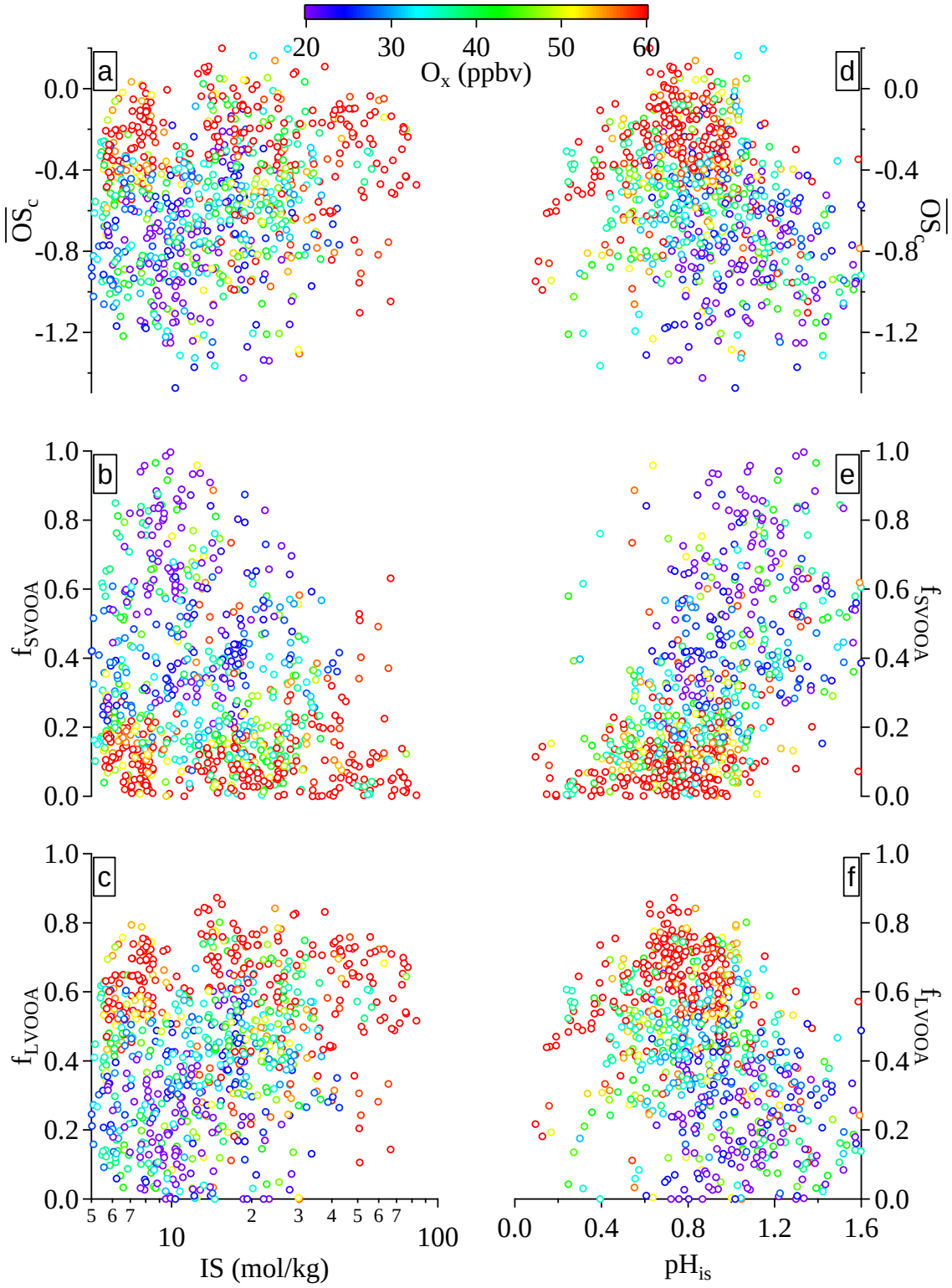

FIGURE S3. Hourly averaged carbon oxidation state ($\overline{OS}_c$) (a), SVOOA fraction (f_{SVOOA}) (b), and LVOOA fraction (f_{LVOOA}) (c) plotted against estimated ionic strength (IS). Carbon oxidation state ($\overline{OS}_c$) (d), SVOOA fraction (f_{SVOOA}) (e), and LVOOA fraction (f_{LVOOA}) (f) plotted against estimated fine particle in situ pH (pH_{is}). All data points are color coded according to O_x concentration.

2. Positive matrix factorization (PMF)

High-resolution mass spectral data were used to run the positive matrix factorization (PMF) analysis. PMF was run for 1 to 7 factors, with FPeak and Seed both set to 0 because little change was found for varying these two values. A three-factor solution was chosen based on Q/Q_{exp} values and mass spectral features. These two factors are hydrocarbon-like organic aerosol (HOA), semi-volatile organic aerosol (SVOOA), and low-volatility organic aerosol (LV-OOA). The mass fractions of these factors from PMF analysis of high-resolution mass spectral data were used directly, while they were multiplied by mass concentration of organics obtained by unit-mass-resolution data analysis when mass concentrations of these three factors were presented.