

Supplementary data supporting the organonitrate-driven suppression of HGF from the ATOFMS.

The ATOFMS (Aerosol Time-of-Flight Mass Spectrometry; Model 3800-100, TSI, Inc.) collects bipolar mass spectra of individual aerosol particles which are then imported into YAADA (Yet Another ATOFMS Data Analyzer) and grouped with Adaptive Resonance Theory neural network, ART-2a followed by procedure described in Dall'Osto and Harrison (2006). The ATOFMS has already proved to be a good tool to determine organonitrogen (ON) compounds (Angelino et al. 2001, Pratt et al. 2009a,b). Specifically, in the negative mass spectra, ON peaks are found at m/z -26 [CN] and m/z -42 [CNO]. Additionally, major ion peaks in the positive mass spectra at m/z 58, 59, 74, 86, and 104, 118 and 154 are all consistent with ON ATOFMS mass spectra peaks detected in previous field and laboratory studies.

During this study, the ATOFMS dataset was reduced to eight main different particle types, including sea salt, dust, organic and inorganic ones. During Case 1 and Case 2 period described in this work, four main ATOFMS particle types represented the majority of the detected single particle population: (1) EC-NIT (aged Elemental Carbon aerosol internally mixed with nitrate, average diameter by number - Av. D. about 700 nm), (2) EC-Aged (Aged Elemental carbon, Av. D. about 700 nm), (3) K-EC-NIT (Potassium, Elemental Carbon, Nitrate with Organonitrogen peaks, Av. D. 450 nm) and (4) OC-NIT-SUL (Organic Carbon, Nitrate, Sulphate with Organonitrogen peaks, Av. D. about 400 nm). The figure 1 shows that whilst case 1 shows mainly ATOFMS particle types without ON compounds, the opposite scenario is seen for case 2.

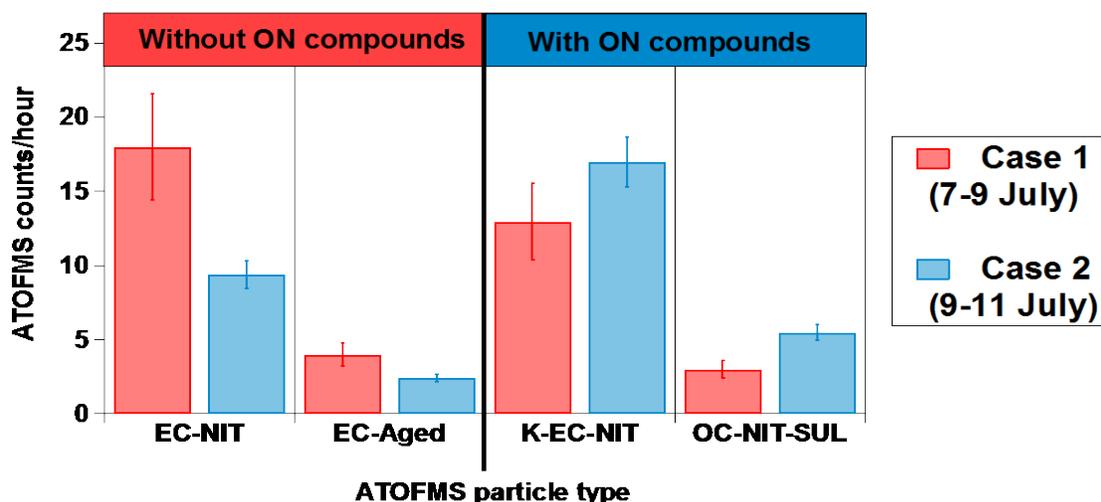


Figure 1. Four main ATOFMS particle types detected during case 1 and case 2. Please note that ATOFMS EC-NIT and ATOFMS EC-Aged (red colours) are not internally mixed with ON compounds, whereas ATOFMS K-EC-NIT and OC-NIT-SUL (blue colours) are. It is important to note the opposite trends seen for case 1 (ATOFMS red clusters) versus case 2 (ATOFMS blue clusters), supporting the ON presence in Case 2.

References:

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