

1 **Supplementary Material**

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3 **Characterization of chemical and physical changes in**  
4 **atmospheric aerosols during fog processing at Baengnyeong**  
5 **Island, South Korea**

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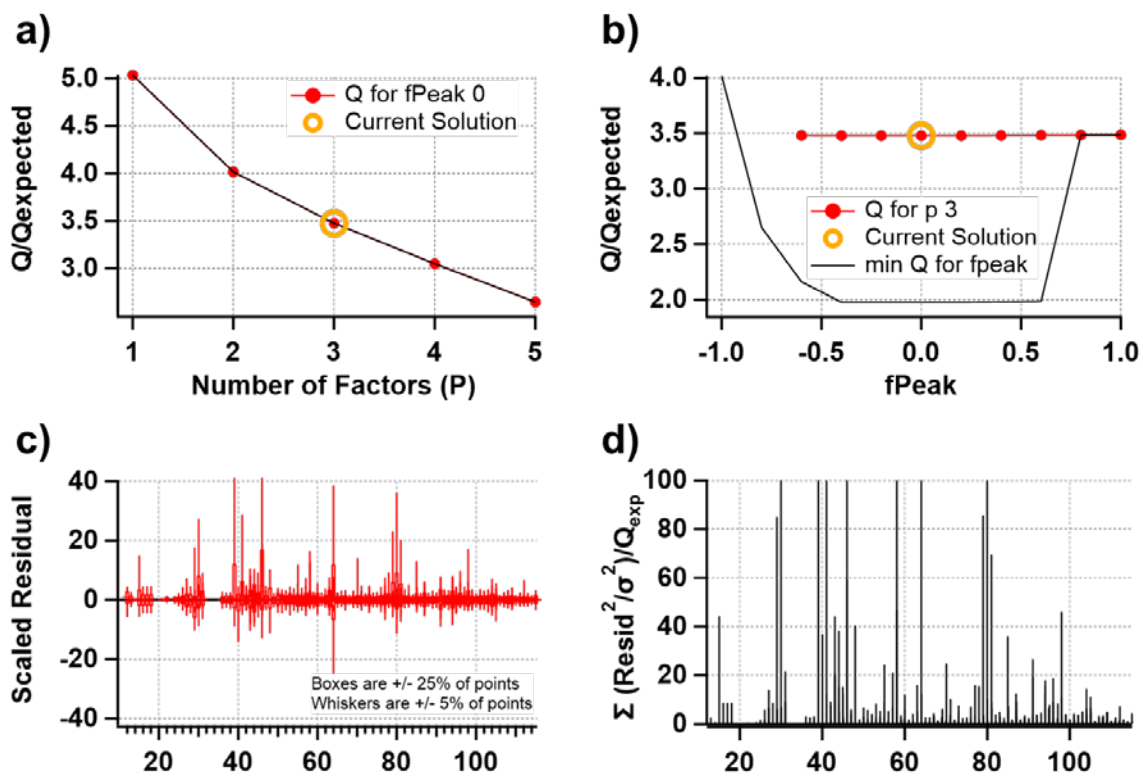
17 *<sup>e</sup>Now at California Air Resources Board, Sacramento, CA 95616, USA*

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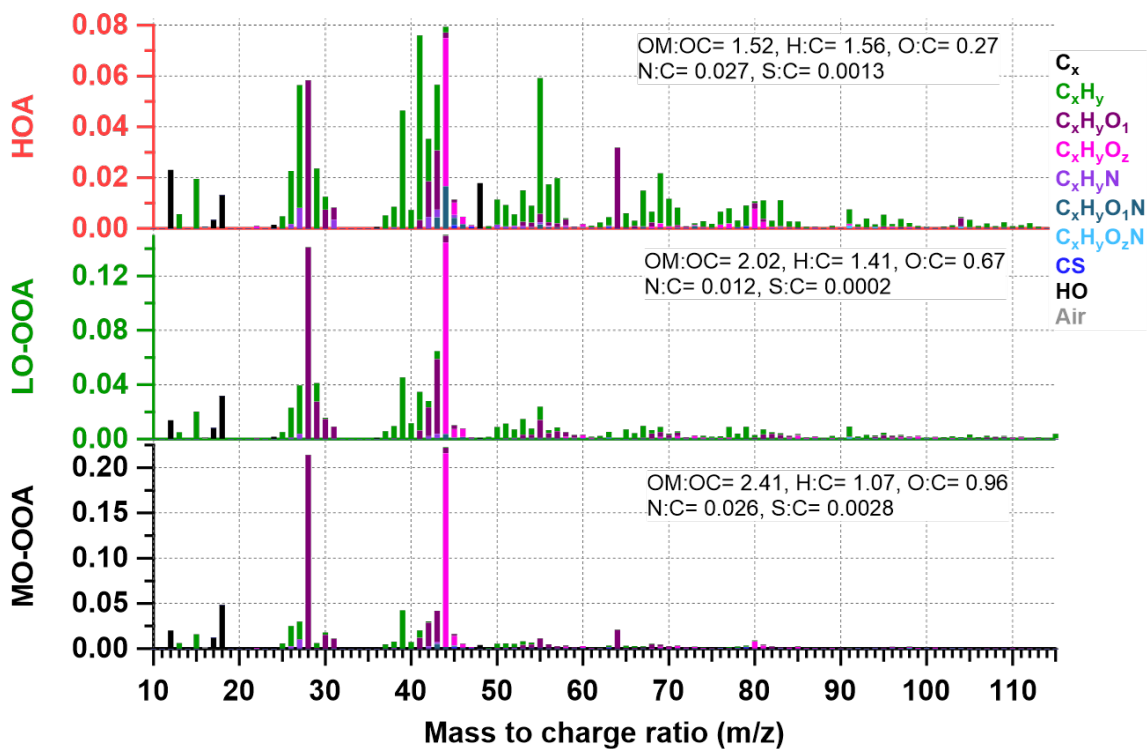
\*Corresponding author.

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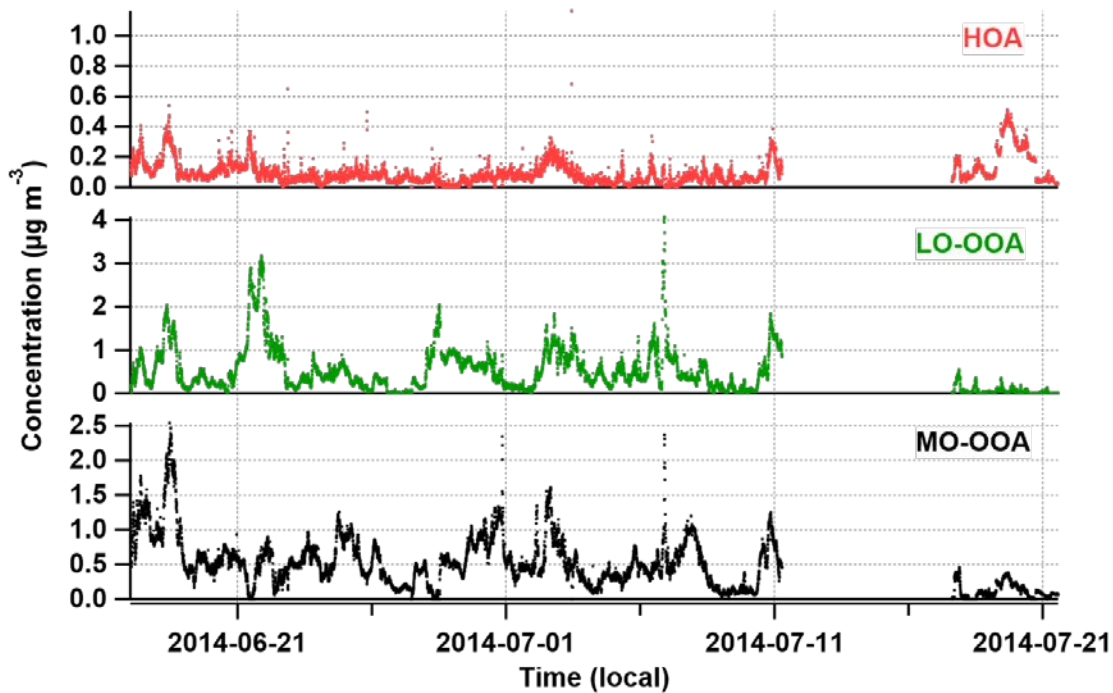
21 **Fig. S1.** Summary of PMF diagnostic plots during June-July 2014. A 3-factor solution with  
 22  $Q/Q_{\text{exp}} = 3.47$  and  $f_{\text{peak}} = 0$  was chosen for these data. a) The  $Q/Q_{\text{exp}}$  as a function of the  
 23 number of factors  $P$ , b) the  $Q/Q_{\text{exp}}$  as a function of  $f_{\text{peak}}$  for the 3-factor solution, c) and d)  
 24 the distribution of scaled residuals and  $Q/Q_{\text{exp}}$  as a function of  $m/z$ .



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26 **Fig. S2.** Mass spectra of the 3-factors identified by PMF analyses. 3-factors were identified  
 27 as HOA, LO-OOA, and MO-OOA.

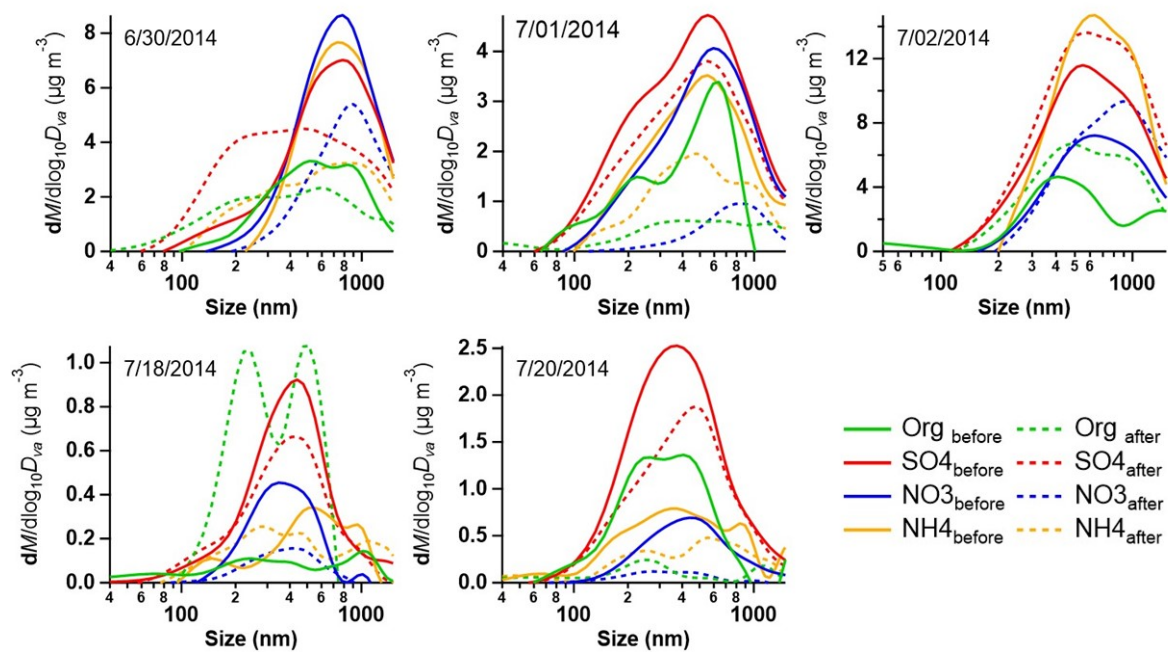
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30 **Fig. S3.** Timelines for the 3-factor solution of the PMF analysis during June 17 -July 21,  
 31 2014.

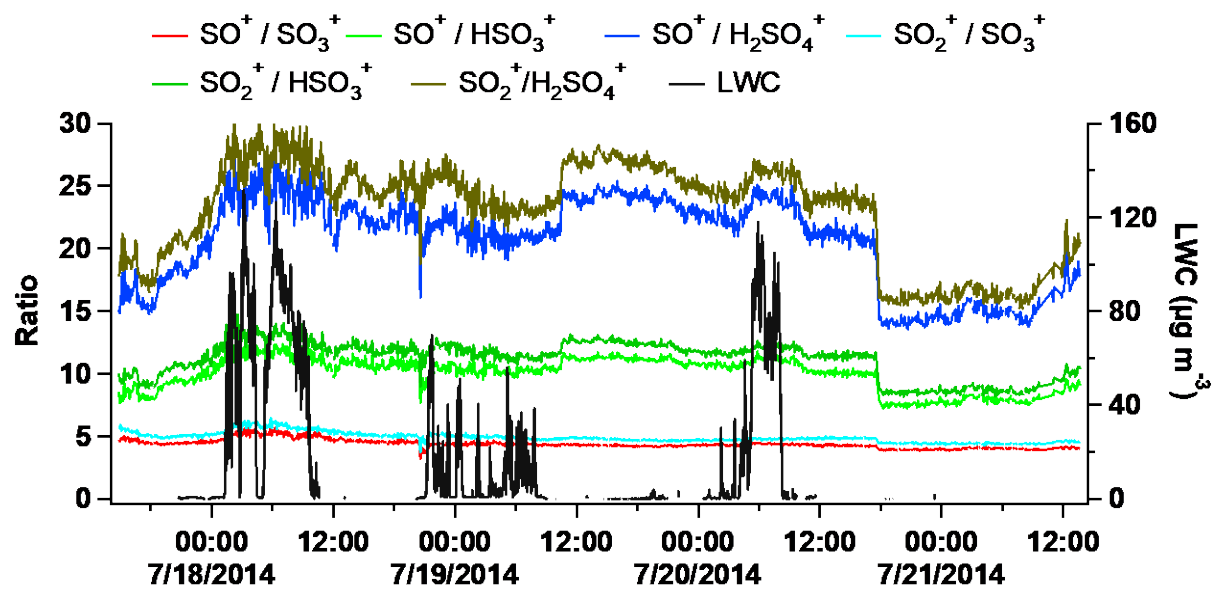
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34 **Fig. S4.** Size distributions of various particle components before and after the given fog  
 35 episodes; averages of 30 minutes were used to derive these distributions.

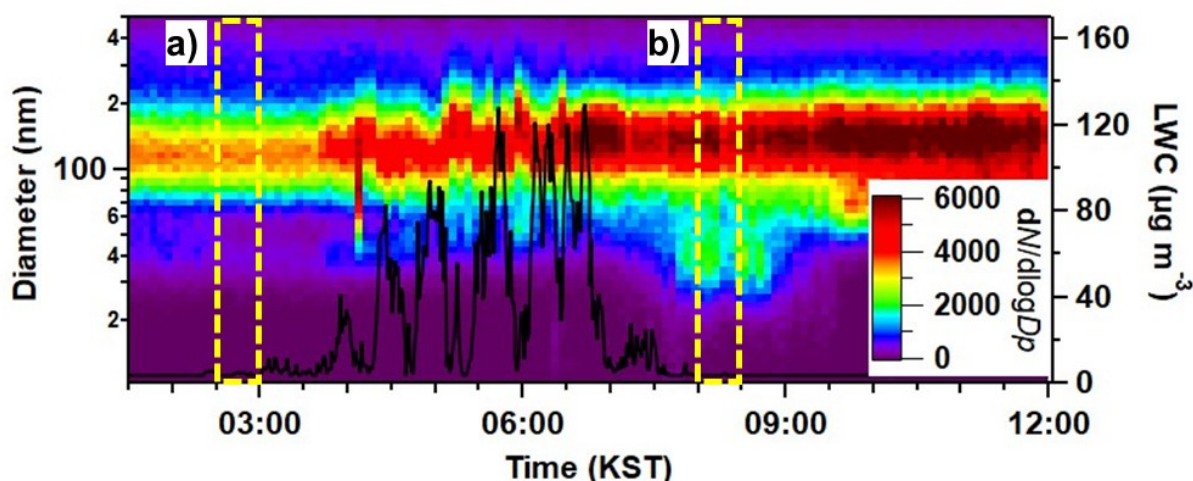
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38 **Fig. S5.**  $\text{SO}^+/\text{SO}_3^+$ ,  $\text{SO}^+/\text{HSO}_3^+$ ,  $\text{SO}^+/\text{H}_2\text{SO}_4^+$ ,  $\text{SO}_2^+/\text{SO}_3^+$ ,  $\text{SO}_2^+/\text{HSO}_3^+$ , and  $\text{SO}_2^+/\text{H}_2\text{SO}_4^+$   
 39 ratios, where higher ratios indicate higher amounts of HMS in the ambient aerosol.

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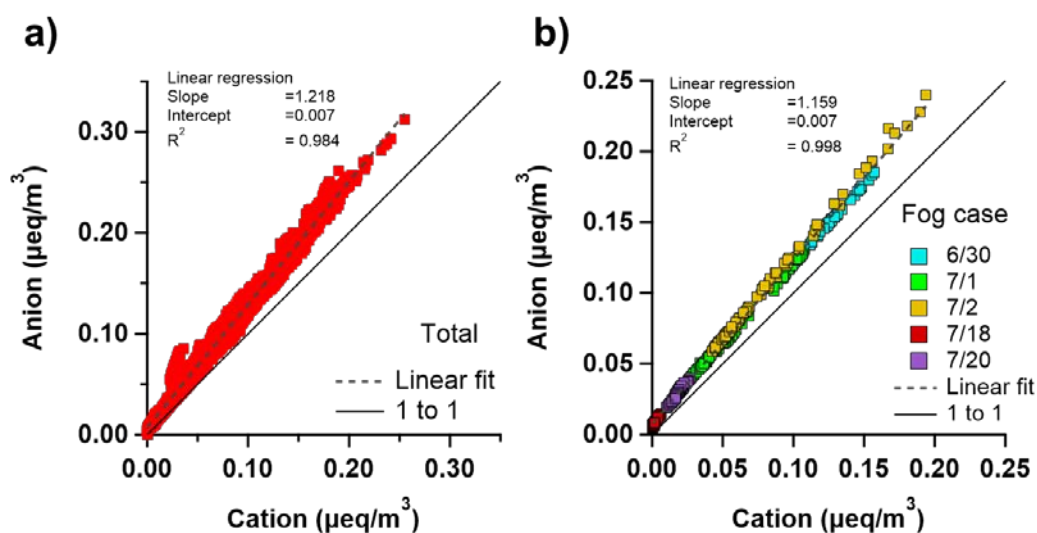
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42 **Fig. S6.** The particle size distribution of the before (a) and after (b) fog event during the 6/30  
 43 2014 fog episode.

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48 **Fig. S7.** The Mass balance of inorganics. Anion included  $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ , and  $\text{Cl}^-$ , and Cation  
 49 was  $\text{NH}_4^+$  only. Anion and Cation calculated as; Anion ( $\mu\text{eq m}^{-3}$ )=  $\text{NO}_3^- / 62.005 + \text{SO}_4^{2-} /$   
 50  $96.06 + \text{Cl}^- / 35.453$ ; Cation ( $\mu\text{eq m}^{-3}$ )=  $\text{NH}_4^+ / 18.04$

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54 **Table S1.** The fragmentation of inorganic and organic nitrate. The unit of  $\text{NO}^+$  and  $\text{NO}_2^+$  was  
55 concentration ( $\mu\text{g m}^{-3}$ ) and  $\text{NO}^+/\text{NO}_2^+$  was ratio. Farmer et al. (2010) reported that the  
56  $\text{NO}^+/\text{NO}_2^+$  ratio was increased with the organonitrate. In all other cases except 7/18, the  
57  $\text{NO}^+/\text{NO}_2^+$  ratio increased after fog.

Date (2014)	$\text{NO}^+$		$\text{NO}_2^+$		$\text{NO}^+/\text{NO}_2^+$	
	Before	After	Before	After	Before	After
June 30th	1.50	0.85	0.31	0.17	4.89	5.10
July 1st	0.94	0.15	0.22	0.03	4.31	5.09
July 2nd	1.47	1.68	0.34	0.34	4.33	4.96
July 18th	0.01	0.02	0.00	0.00	7.31	5.48
July 20th	0.15	0.02	0.04	0.00	4.01	5.49

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59 Farmer, D.K., Matsunaga, A., Docherty, K.S., Surratt, J.D., Seinfeld, J.H., Ziemann, P.J.,  
60 Jimenez, J.L., 2010. Response of an aerosol mass spectrometer to organonitrates and  
61 organosulfates and implications for atmospheric chemistry. *Proc. Natl. Acad. Sci.* 107,  
62 6670-6675. <https://doi.org/10.1073/pnas.0912340107>

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