

*Supplement of*

## **Aerosol pH and its influencing factors in Beijing**

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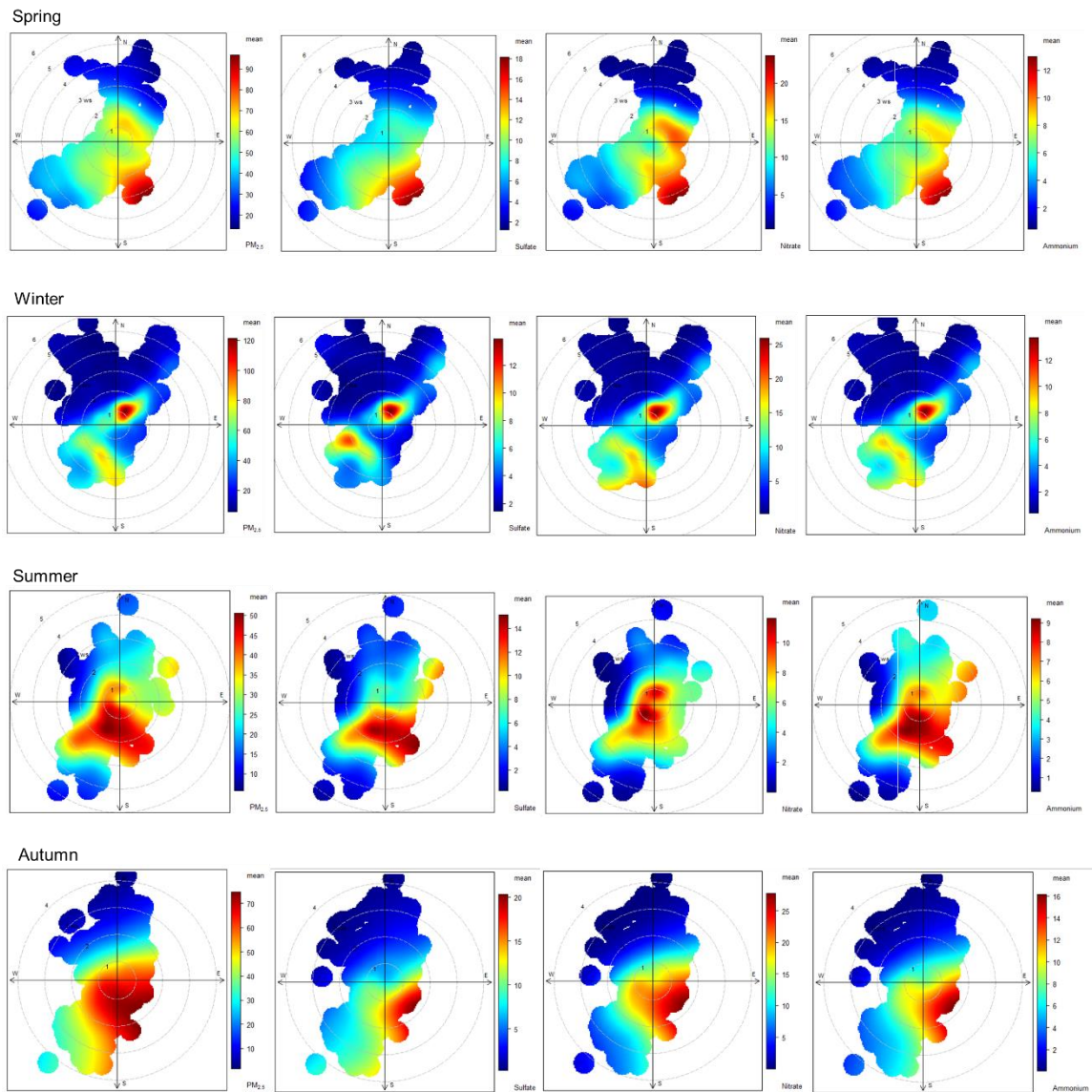
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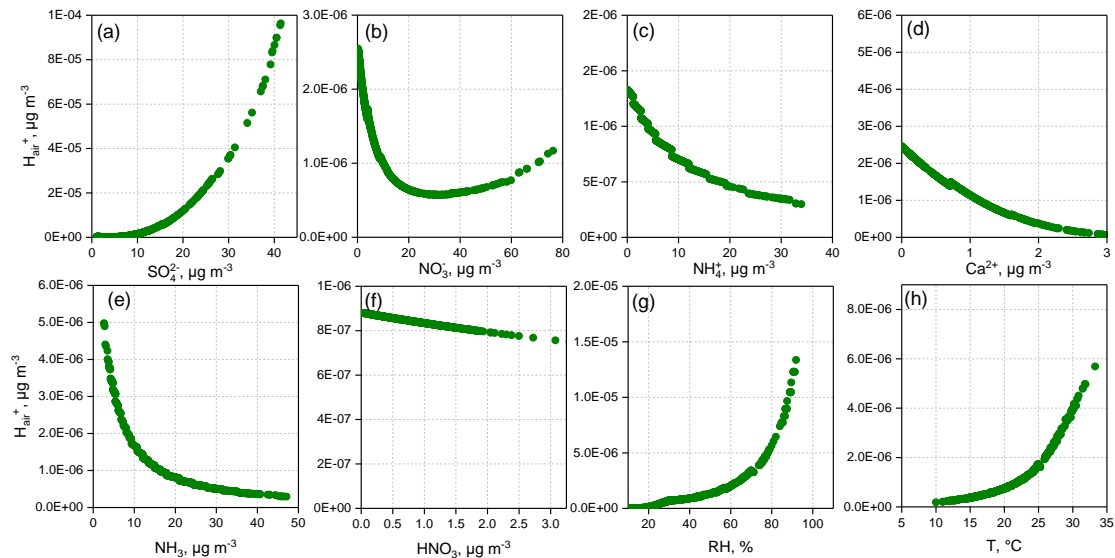
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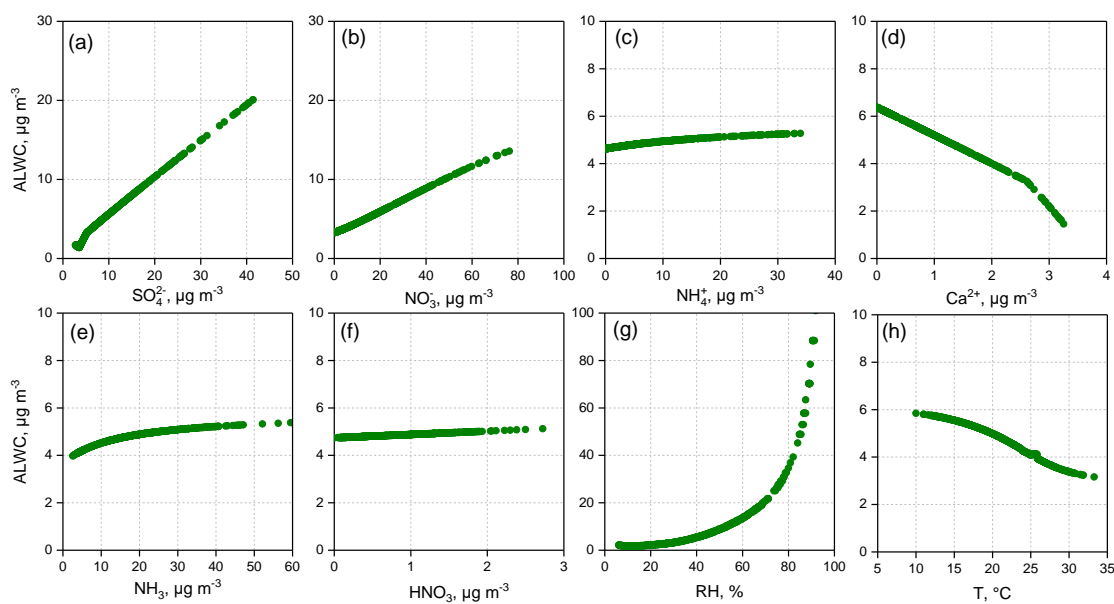
## Supplementary materials



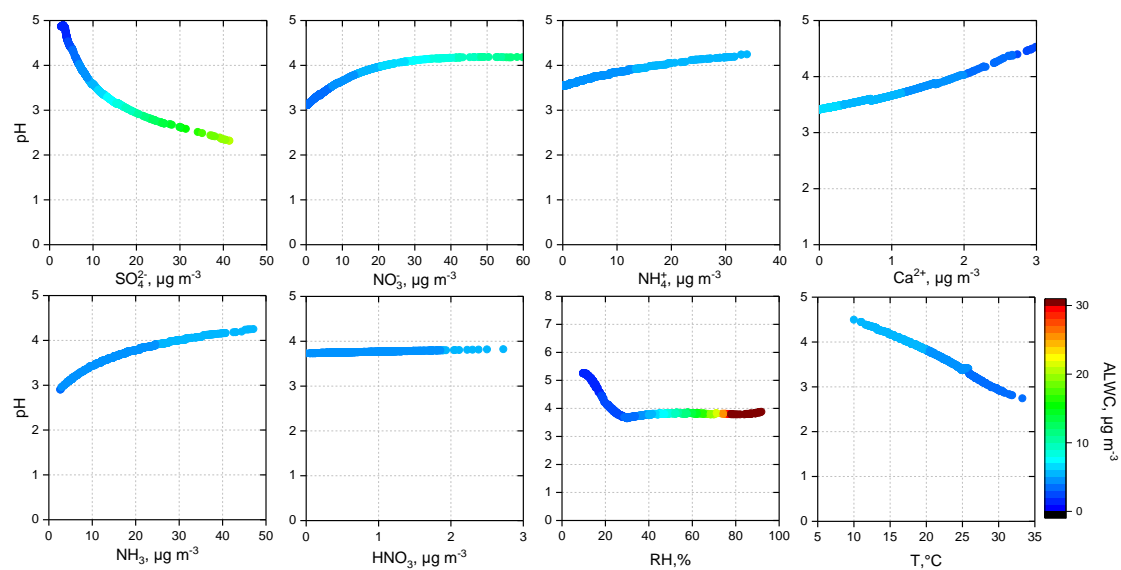
**Fig. S1** Wind dependence map of  $\text{PM}_{2.5}$ ,  $\text{SO}_4^{2-}$ ,  $\text{NO}_3^-$ ,  $\text{NH}_4^+$  over four seasons. In each picture, the shaded contour indicates the average of variables for varying wind speeds (radial direction) and wind directions (transverse direction).



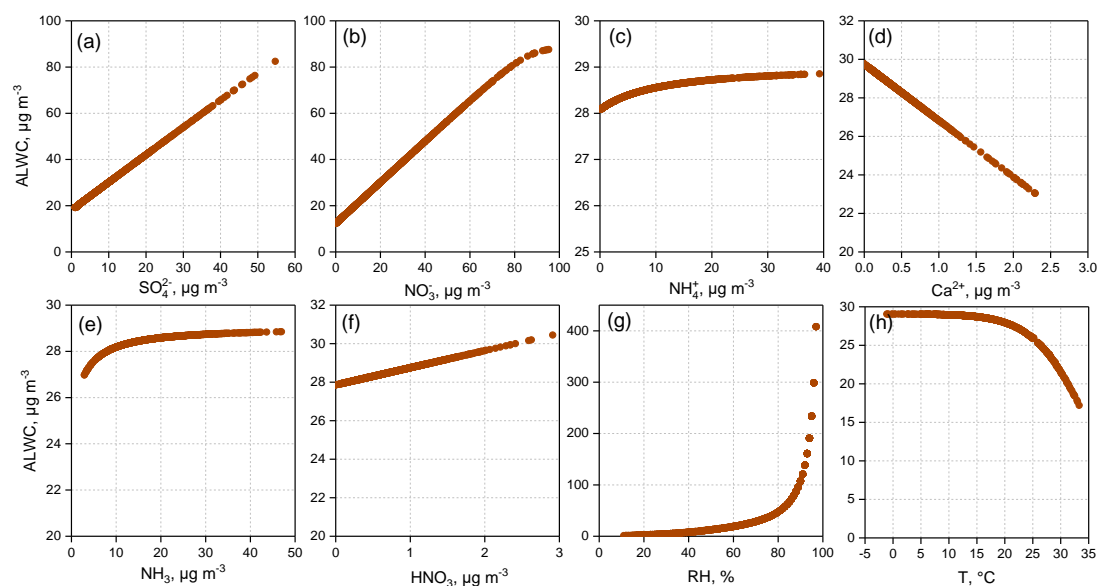
**Fig. S2.** Sensitivities of chemical components ( $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{NH}_4^+$ ,  $\text{Ca}^{2+}$ ), precursor gases ( $\text{NH}_3$ ,  $\text{HNO}_3$ ) as well as meteorological parameters (RH, T) to ALWC in spring.



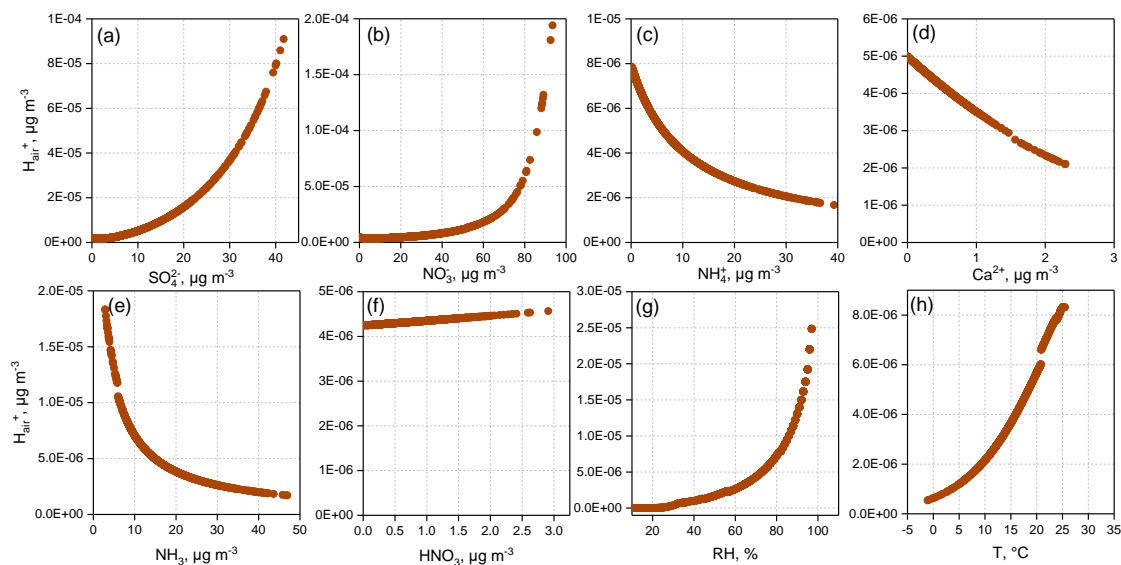
**Fig. S3.** Sensitivities of chemical components ( $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{NH}_4^+$ ,  $\text{Ca}^{2+}$ ), precursor gases ( $\text{NH}_3$ ,  $\text{HNO}_3$ ) as well as meteorological parameters (RH, T) to  $\text{H}_{\text{air}}^+$  in spring.



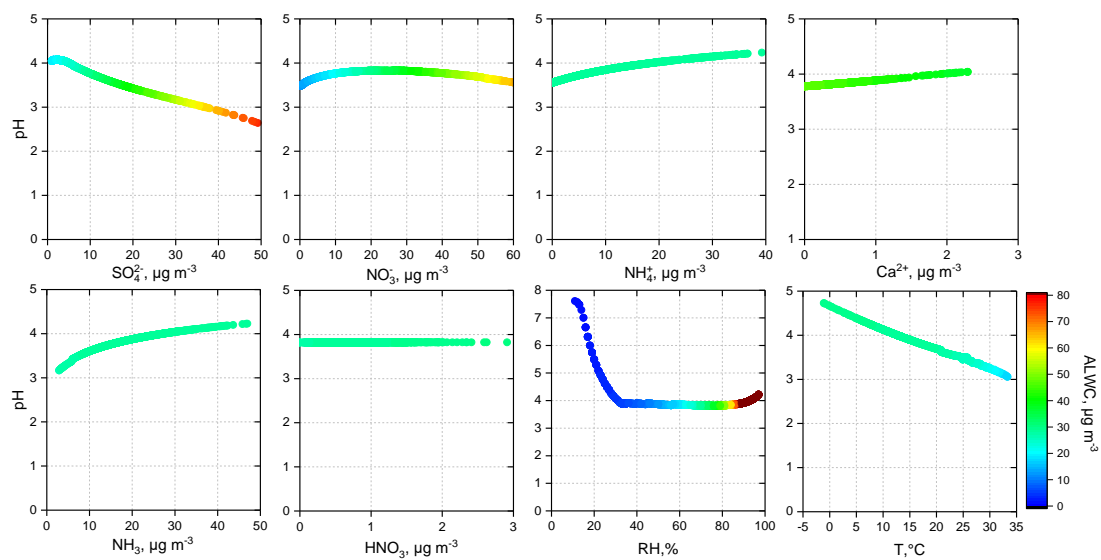
**Fig. S4.** Sensitivities of chemical components ( $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{NH}_4^+$ ,  $\text{Ca}^{2+}$ ), precursor gases ( $\text{NH}_3$ ,  $\text{HNO}_3$ ) as well as meteorological parameters (RH, T) to pH in spring.



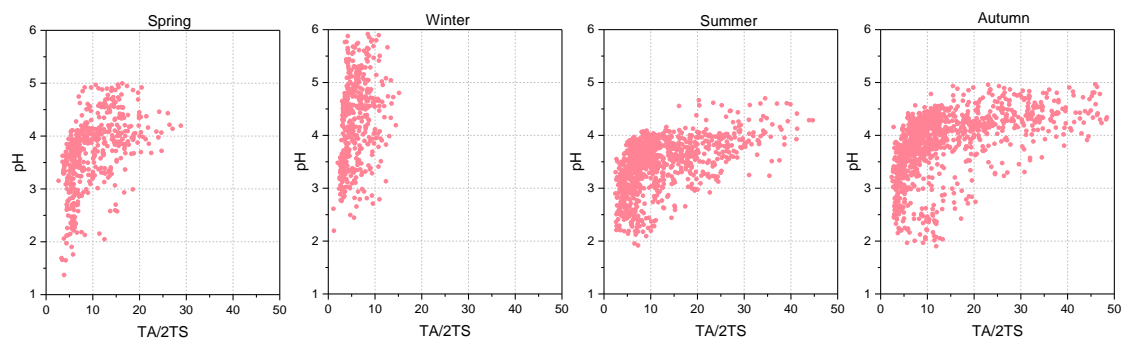
**Fig. S5.** Sensitivities of chemical components ( $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{NH}_4^+$ ,  $\text{Ca}^{2+}$ ), precursor gases ( $\text{NH}_3$ ,  $\text{HNO}_3$ ) as well as meteorological parameters (RH, T) to ALWC autumn.



**Fig. S6.** Sensitivities of chemical components ( $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{NH}_4^+$ ,  $\text{Ca}^{2+}$ ), precursor gases ( $\text{NH}_3$ ,  $\text{HNO}_3$ ) as well as meteorological parameters (RH, T) to  $\text{H}_{\text{air}}^+$  in autumn.



**Fig. S7.** Sensitivities of chemical components ( $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{NH}_4^+$ ,  $\text{Ca}^{2+}$ ), precursor gases ( $\text{NH}_3$ ,  $\text{HNO}_3$ ) as well as meteorological parameters (RH, T) to pH in autumn.



**Fig. S8.** The predicted aerosol pH versus measured TA/2TS ratio (mole mole<sup>-1</sup>) over four seasons. Data are restricted to aerosol pH in the range 1~5 for spring, summer and autumn as well as 1~6 in winter according to the aerosol pH frequency distribution.