

Supplementary Materials

Table .S1 Literature list of the history data exhibition

Label	Sample time	Data Type	Reference
1999	1999-12-01 to 2000-02-01	Averaged	(He et al., 2001)
2011	2011-12-01 to 2012-01-30	Averaged	(Cheng et al., 2013)
2013	2013-01-5 to 2013-01-24	Pollution	(Huang et al., 2014a)
2015-p	2015-01-21 to 2015-02-04	Pollution.PM ₁	(Wang et al., 2016)
2015-a	2015-01-01 to 2015-02-28 2015-12-01 to 2015-12-31	Averaged	(Liu et al., 2019)
2016	2016-12-15 to 2017-01-14	Averaged	(Shao et al., 2018)
2017-a	2017-12-15 to 2017-02-25	Averaged	This Study
2017-p	2017-12-15 to 2017-02-25	Pollution	This Study

Filter Comparisons

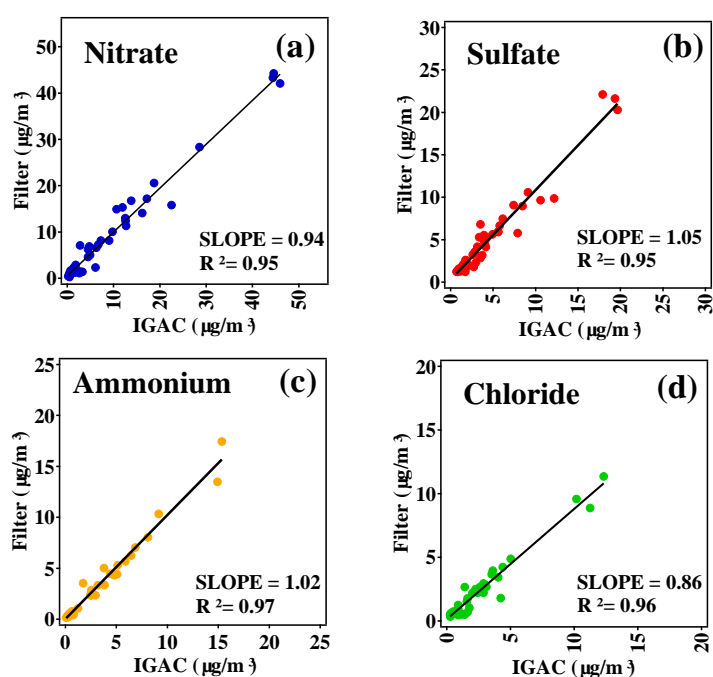


Fig.S1 Comparison of major ions in PM_{2.5} between filter sampling and IGAC measurements during the campaign.

Effect of crustal ions on particle pH prediction

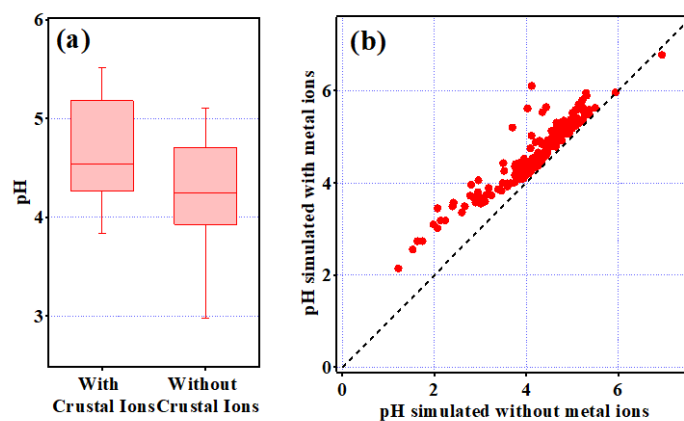


Fig.S2 Comparison of particle pH simulation with/without Crustal Ions: (a) pH level comparison and (b) Scatter Plot of the pH simulated with/without crustal ions.

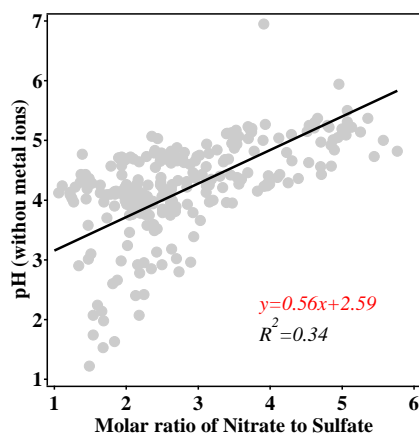


Fig.S3 Scatter plot of pH simulated without crustal ions and the Ratio N_{10-S}