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Supplementary Material

Diversity of ammonia sources in Tianjin: nitrogen isotope analyses and simulations of aerosol ammonium

Libin Wu[A], *Yiwen Zhang*[B], *Yunting Xiao*[A], *Jialei Zhu*[A], *Zongbo Shi*[C], *Yuantao Wang*[A], *Hong Xu*[D], *Wei Hu*[A], *Junjun Deng*[A], *Miao Tang*[D,*] and *Pingqing Fu*[A,*]

[A]Institute of Surface-Earth System Science, School of Earth System Science, Tianjin University, Tianjin, 300072, PR China

[B]School of Biological and Environmental Engineering, Tianjin Vocational Institute, Tianjin, 300410, PR China

[C]School of Geography, Earth & Environmental Sciences, University of Birmingham, Birmingham, B15 2TT, UK

[D]Tianjin Eco-Environmental Monitoring Center, Tianjin, 300191, PR China

*Correspondence to: Email: tangmiao32@163.com, fupingqing@tju.edu.cn

Table S1. Statistics (average ± standard deviation) of the concentrations of daytime and nighttime gaseous NH_3, aerosol NH_4^+ and other major ions, water-soluble organic carbon (WSOC), total dissolved nitrogen (TDN) and $\delta^{15}N$ in NH_4^+ in $PM_{2.5}$, as well as MixSIAR source apportionment results, when assuming there were six NH_3 sources (livestock breeding, N-fertiliser application, human waste, fossil fuel sources, NH_3 slip and biomass burning) or two classifications of NH_3 sources (volatilisation-related source and combustion-related source) of initial NH_3 to form NH_4^+ in $PM_{2.5}$ collected at Nankai and Jinghai, Tianjin respectively during the whole sampling period.

Location	**Nankai**		**Jinghai**	
Time	**Daytime**	**Nighttime**	**Daytime**	**Nighttime**
NH_4^+ (μg m^{-3})	4.99±2.89	7.65±4.26	3.80±3.63	7.75±3.98
NH_3 (μg m^{-3})	7.92±5.14	5.86±3.25	-	-
NH_3-N + NH_4^+-N (μg m^{-3})	10.18±6.08	10.74±5.46	-	-
NH_4^+-N/ (NH_3-N + NH_4^+-N)	0.40±0.12	0.56±0.17	-	-
$\delta^{15}N$-NH_4^+ (‰)	10.9±4.3	9.6±4.0	9.4±6.8	9.8±7.8
$\delta^{15}N$-initial NH_3 (‰)	–9.7±6.3	–5.6±4.8	–10.6±6.6	–6.8±7.6
SO_4^{2-} (μg m^{-3})	7.92±4.94	8.73±5.30	13.26±4.84	14.88±6.26
NO_3^- (μg m^{-3})	6.09±4.48	11.52±8.65	8.12±7.14	14.35±7.35
PO_4^{3-} (μg m^{-3})	0.79±0.04	0.78±0.02	1.04±0.02	1.04±0.04
WSOC (μg m^{-3})	2.88±1.46	3.19±1.45	3.33±1.70	3.71±1.99
TDN (μg m^{-3})	4.66±2.65	7.93±5.07	4.62±4.11	8.50±4.67
Livestock breeding (%)	15.0±3.1	14.6±3.3	15.5±3.9	14.9±4.0
N-fertiliser application (%)	10.3±1.9	7.1±1.5	11.0±2.5	10.0±2.4
Human waste (%)	11.8±2.4	9.5±2.1	12.7±3.2	10.6±2.8
Fossil fuel sources (%)	27.2±4.1	32.1±4.7	24.9±4.7	30.3±5.5
NH_3 slip (%)	14.5±2.8	12.9±2.6	15.6±3.7	11.9±2.8
Biomass burning (%)	21.3±3.9	23.8±4.4	20.3±4.6	22.5±5.1
Volatilisation-related source (%)	35.3±4.5	26.4±5.0	37.8±5.5	29.7±4.1
Combustion-related source (%)	64.7±4.5	73.6±5.0	62.2±5.5	70.3±4.1

Note: "-" means no data.