atmosphere

MDPI

Supplementary Materials:

HanZhang [1,2], Zhenyu Hong [1,2,3], Lai Wei [1,2], Barry Thornton[4], Youwei Hong [1,2], Jinsheng Chen [1,2] and Xian Zhang [1,2,*]

Table S1. Concentration of Aerosol mass ($PM_{2.5}$), total Carbon (TC) and nitrogen (TN) contents and their stable isotope ratios ($\delta^{13}C_{TC}$ and $\delta^{15}N_{TN}$), inorganic ions, and their percentages in $PM_{2.5}$ collected from Shanghai, Ningbo and Nanjing in 2014-2015.

Components	Summer (3–26 August. 2014)				Autumn (10 Octomber.-21 November. 2014)				Winter (23 December. 2014 to15 January.2015)				Spring (28 March.–28 April. 2015)			
City	**SH(n=13)**	**NB(n=13)**	**NJ(n=18)**	**Mean**	**SH(n=14)**	**NB(n=20)**	**NJ(n=14)**	**Mean**	**SH(n=11)**	**NB(n=24)**	**NJ(n=20)**	Mean	SH(n=15)	NB(n=28)	NJ(n=25)	Mean
$PM_{2.5}$ (μg/m^3)	63.9±25.1	42.9±12.9	71.4±25.4	59.4	93.6±32.2	83.3±30.1	92.9±35.5	87.9	75.9±37.9	103.1±49.2	91.5±32.9	90.2	121.5±40.1	82.2±21.4	60.4±13.9	88.0
TC(μg/m^3)	9.4±3.0	6.8±1.6	10.6±3.1	8.9	16.8±5.2	17.3±5.7	16.2±4.5	16.7	11.06±7.2	21.1±10.1	19.1±7.3	16.8	15.4±7.3	12.0±4.5	10.2±4.0	12.5
TN(μg/m^3)	5.9±3.4	4.2±2.2	9.4±4.8	6.5	10.9±5.6	10.7±5.4	14.9±6.8	12.0	9.5±6.9	11.3±5.6	13.1±5.4	11.3	9.5±3.3	8.3±3.0	9.2±3.1	9
TC/TN	1.61	1.61	1.13		1.59	1.59	1.22		1.87	1.92	1.49		1.65	1.58	1.20	
TC/PM2.5(%)	14.7±5.6	15.9±5.8	14.9±3.8	15.2	18.2±2.6	21.3±4.2	18.4±4.1	19.3	18.1±2.9	20.4±4.9	20.8±3.3	19.8	13.1±5.4	14.5±3.6	16.8±5.8	14.8
TN/PM2.5(%)	9.1±2.4	9.9±3.6	13.2±2.6	10.7	10.6±5.5	12.6±2.3	14.9±6.8	12.7	9.2±4.6	11.3±2.6	14.1±2.0	11.5	8.6±3.7	10.3±2.8	15.3±4.8	11.4
$\delta^{13}C_{TC}$	-24.5±0.4	-24.6±0.2	-24.7±0.3	-24.6	-25.0±1.0	-25.8±0.5	-25.3±0.7	-25.4	-23.7±0.9	-24.1±1.0	-24.2±0.8	-24.0	-23.9±0.6	-24.1±0.5	-24.2±0.5	-24.1
$\delta^{15}N_{TN}$	11.5±1.8	11.7±3.5	9.4±2.5	10.9	7.9±2.8	8.7±2.9	5.5±2.2	7.4	8.6±3.9	10.2±3.4	7.4±2.2	8.7	9.5±1.7	9.3±2.1	8.7±2.5	9.2
NH_4^+-N (μg/m^3)	3.6±1.7	2.2±0.9	5.9±2.2	3.9	4.2±2.3	4.6±1.9	6.9±2.7	5.2	3.9±2.7	6.9±3.2	8.0±3.5	6.3	4.1±1.8	3.6±1.6	4.1±1.4	3.9
N_{NH4+}/TN (%)	65.4±10.2	56.7±16.1	76.7±57.7		38.6±23.5	45.1±11.8	50.7±15.9		50.6±18.9	62.7±5.9	60.5±6.9		48.5±25.1	39.2±17.8	45.3±6.5	
NO_3^-N (μg/m^3)	2.1±0.9	0.6±0.6	1.8±1.5	1.5	3.3±2.7	3.4±2.3	2.2±1.1	2.9	2.1±1.5	3.2±2.1	4.1±2.3	3.1	3.0±1.8	1.8±0.9	1.9±0.8	1.9
N_{NO3-}/TN (%)	38.6±10.3	13.9±7.0	17.7±9.7		32.1±34.9	28.5±7.5	15.7±7.2		24.5±6.1	26.6±6.9	29.7±6.5		36.7±25.5	17.7±8.5	21.7±4.6	
IN%	100.1	71.0	83.2	84.8	70.7	73.9	66.4	70.2	76.8	89.4	90.2	85.5	85.2	66.4	66.9	72.8
Ca2+ (μg/m^3)									1.17±1.43	1.33±1.79	0.52±0.27					
Mg2+ (μg/m^3)									0.06±0.07	0.09±0.10	0.23±0.09					

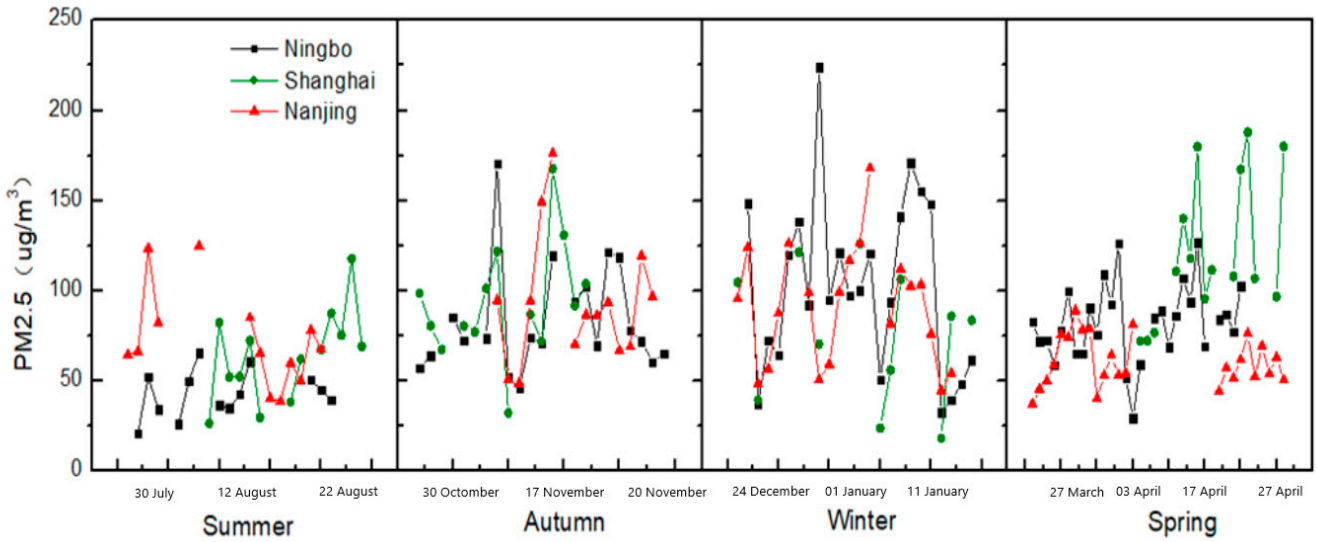
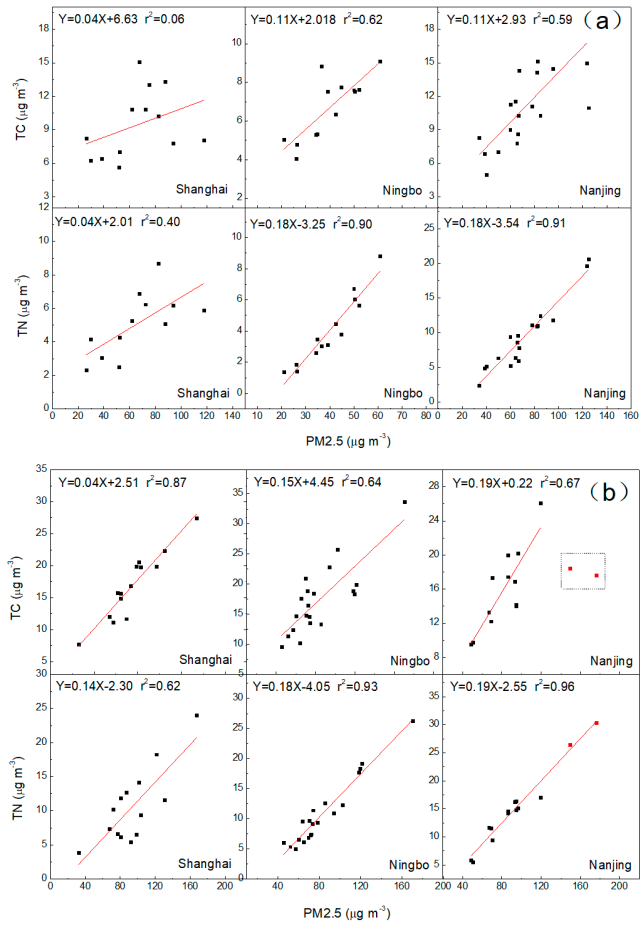


Figure S1. Time-resolved distribution of PM2.5.



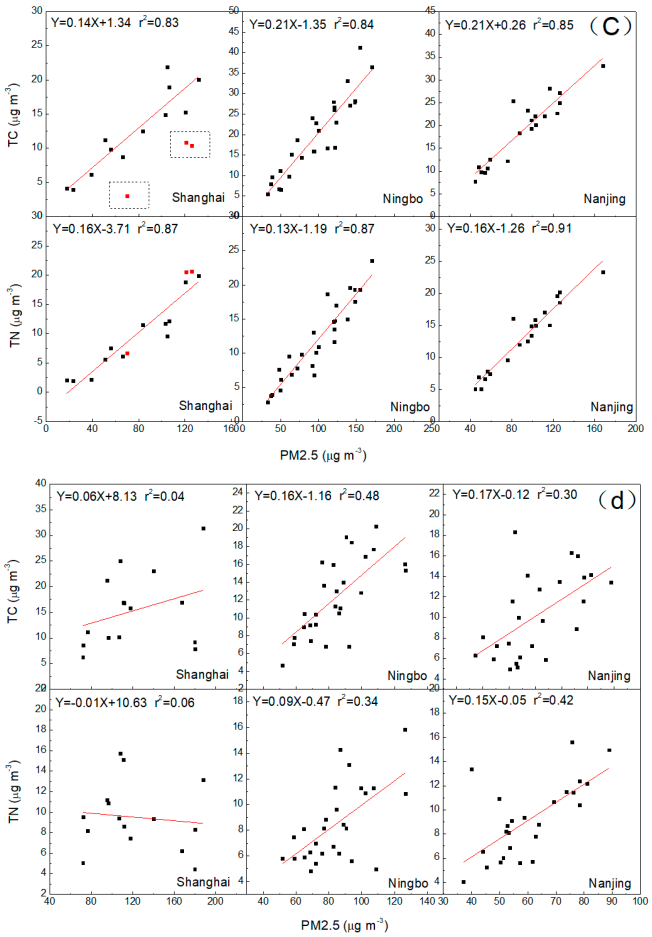


Figure S2. Correlation of TC/TN and PM2.5 in four seasons. (**a**)Summer (**b**)Autumn (**c**)Winter (**d**)Spring. In Autumn and Winter,They were haze events(red squares) in Nanjing(b) and Shanghai(c), TN increased linearly with PM2.5, while TC legged behind(red squares in dashed line)

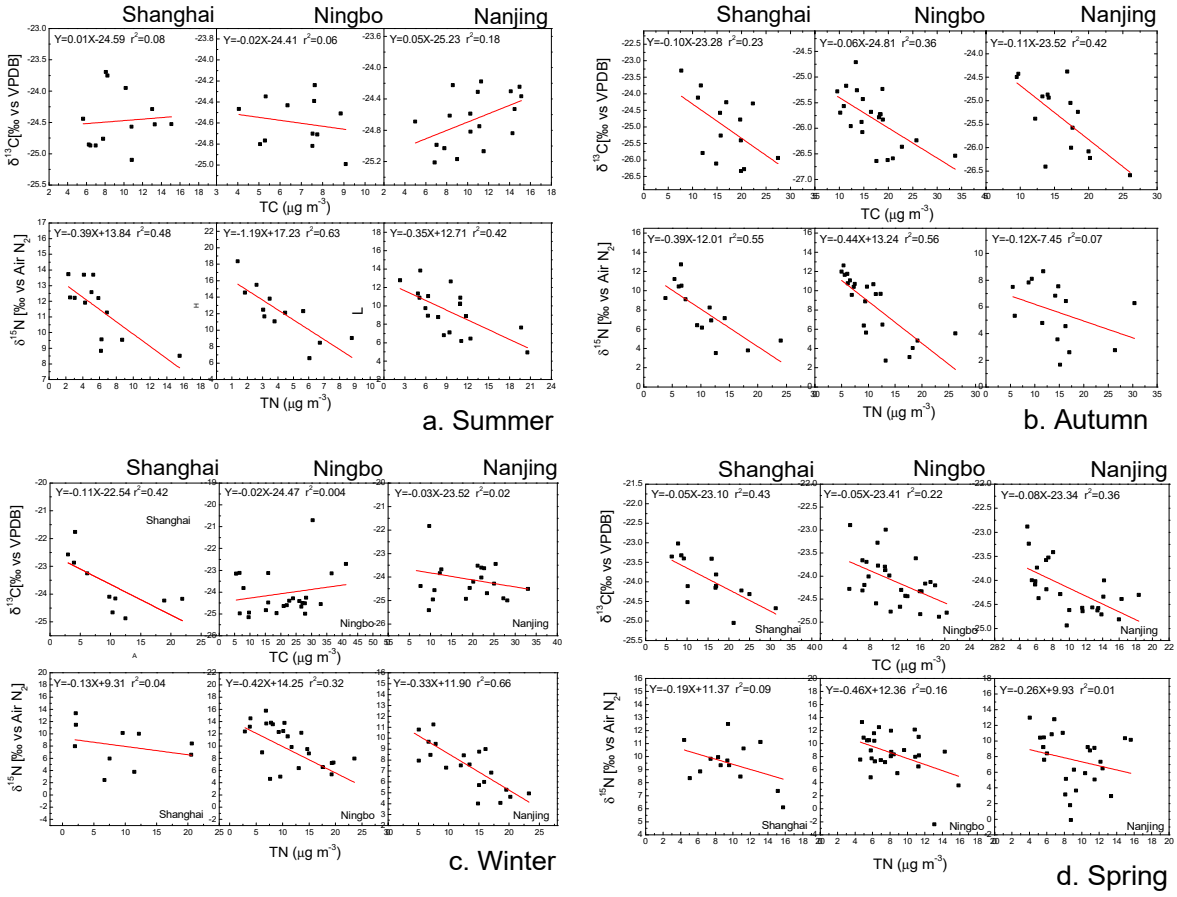


Figure S3. Correlation of $\delta^{13}C_{TC}$ andTC, $\delta^{15}N_{TN}$ and TN in four seasons. (**a**)Summer (**b**)Autumn (**c**)Winter (**d**)Spring.