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Estimation of particulate organic nitrates from thermodenuder–aerosol mass spectrometer measurements in the North China Plain

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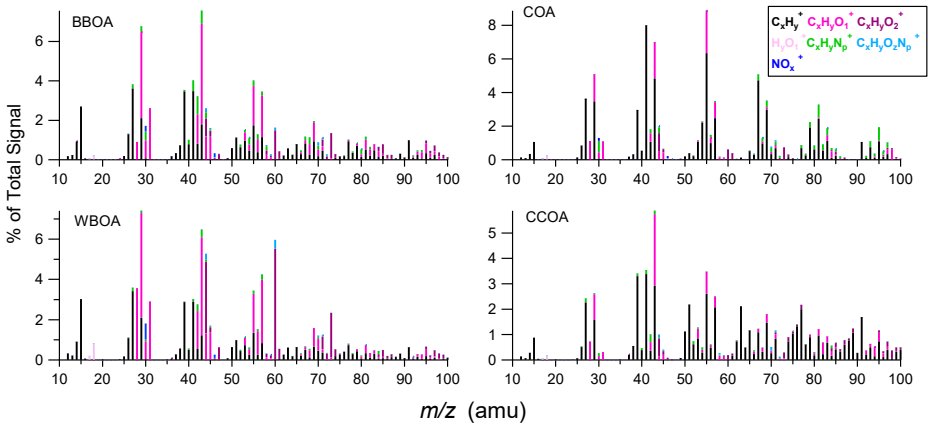

Figure S1. Average mass spectral profiles of OA from biomass burning (BBOA), cooking emission (COA), wood burning (WBOA) and coal combustion (CCOA) experiments.

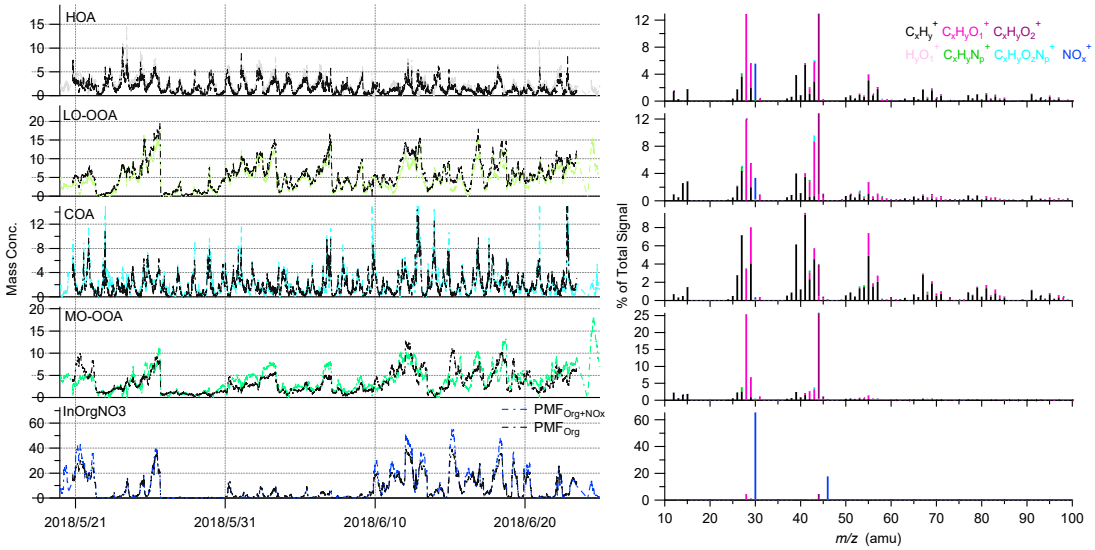

Figure S2. High resolution mass spectra and time series of PMF factors resolved from PMF_{Org} and $PMF_{Org+NO3}$ in summer in Beijing. The time series of OA factors resolved from PMF_{Org} are also shown.

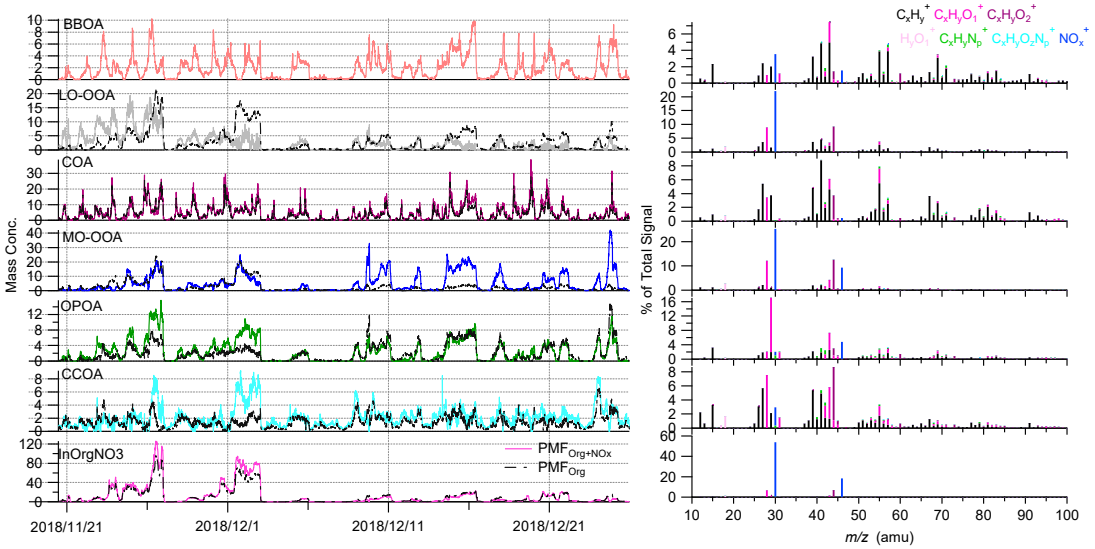

Figure S3. High resolution mass spectra and time series of PMF factors resolved from PMF_{Org} and $PMF_{Org+NO3}$ in winter in Beijing. The time series of OA factors resolved from PMF_{Org} are also shown.

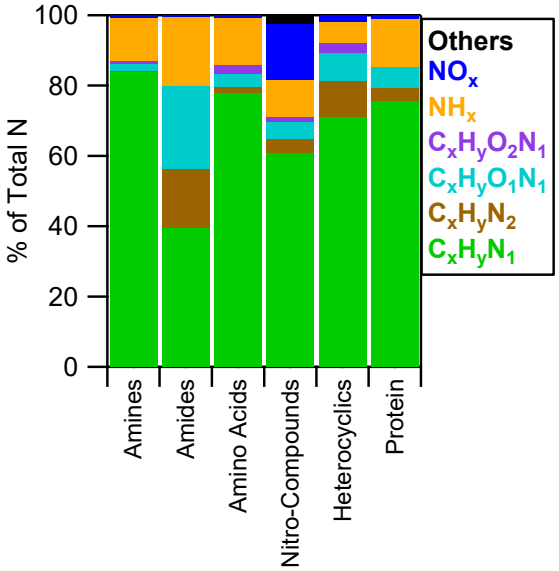

Figure S4. the contribution of ions to total N mass for standard non-ON organic nitrogen compounds.

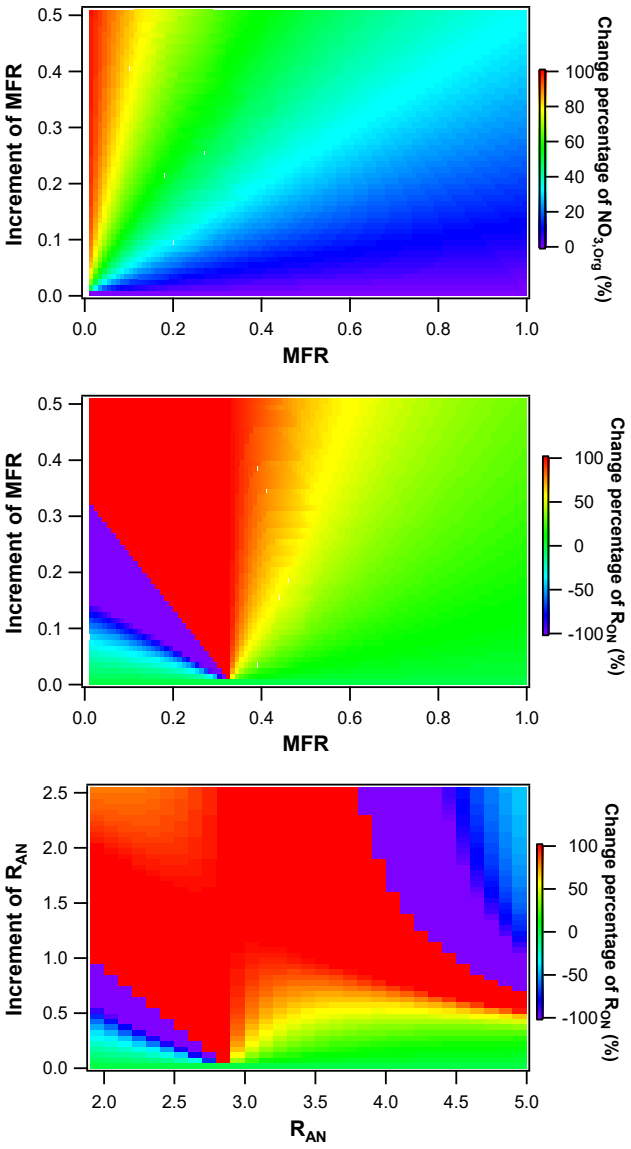

Figure S5. Dependence of increment of MFR (R_{AN}) vs. MFR (R_{AN}) on the change percentage of R_{ON} and $NO_{3,Org}$. The summer data were used as initial independent variables in equation 1-7.

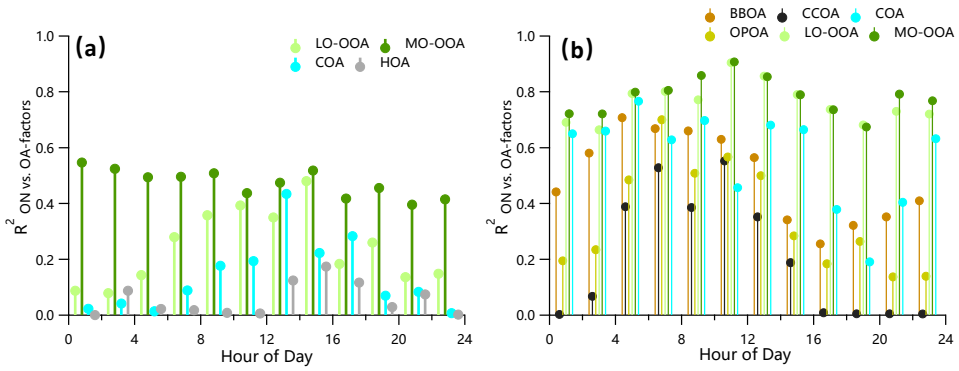

Figure S6. Diurnal cycles of correlations of each OA component with $NO_{3,org}$ in (a) summer and (b) winter in Beijing.

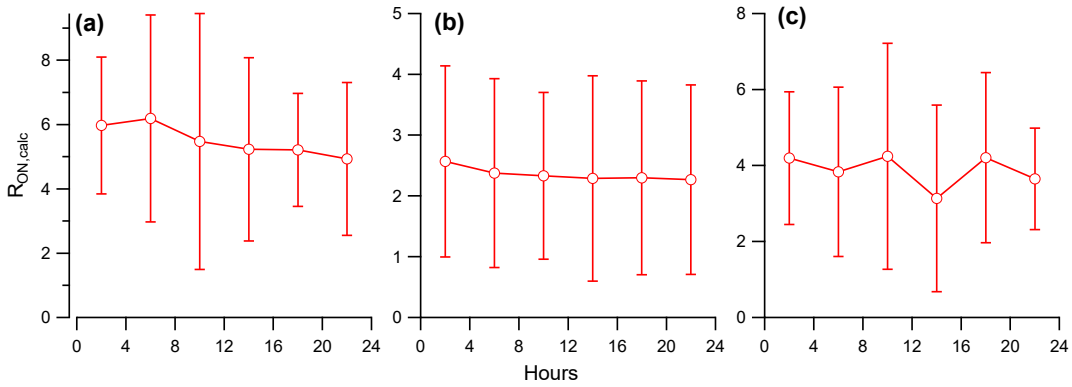

Figure S7. Diurnal profiles of $R_{ON,Cal}$ in (a) summer in Beijing, (b) winter in Beijing and (c) Gucheng.

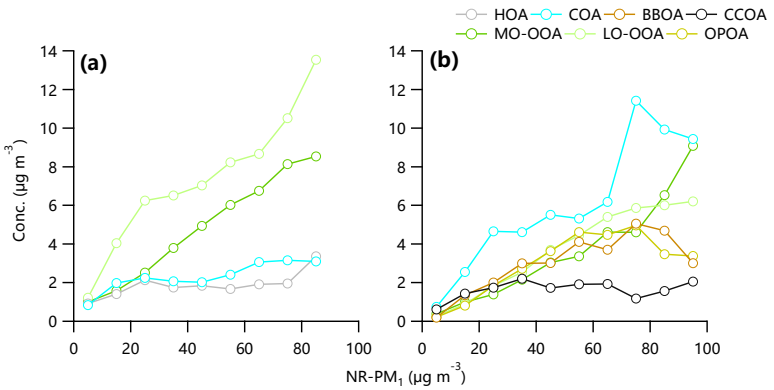

Figure S8. Variations of OA factors as a function of PM loadings in (a) summer and (b) winter in Beijing

Table S1. A summary of average pON and $NO_{3,org}$ loadings, fraction of pON in OA, and fraction of $NO_{3,org}$ in NO_3 calculated by "TD-AMS method" during three campaigns (assuming MW_{ON}=200 g mol^{-1})

	$Beijing_{Summer}$	$Beijing_{Winter}$	$Gucheng_{Winter}$
pON loadings (μg m^{-3})	5.8	3.2	6.1
$NO_{3,org}$ loadings (μg m^{-3})	1.8	1.0	1.9
Fraction of pON in OA	27.5%	14.8%	24.0%
Fraction of $NO_{3,org}$ in NO_3	24.1%	9.8%	11.6%

Table S2. A summary of contribution of NO_x^+ in factors from $PMF_{Org+NO3}$, ratio and concentrations of the concentrations PMF factors resolved from PMF_{Org} and $PMF_{Org+NO3}$.

	R. $_{PMFOrg+NO3/\ PMFOrg}$	Ratio $_{PMFOrg+NO3/\ PMFOrg}$	Fraction of NO^+	Fraction of NO_2^+
$Beijing_{Summer}$				
HOA	0.89	1.08	5.4	<0.01
COA	0.87	1.06	0.2	0.1
LO-OOA	0.97	0.86	3.1	0.03
MO-OOA	0.76	0.78	<0.01	0.3
$Beijing_{Winter}$				
BBOA	0.95	0.88	3.5	1.5
COA	0.98	1.18	<0.01	0.45
CCOA	0.60	0.96	2.6	<0.01
MO-OOA	0.49	0.82	25.2	9.3
LO-OOA	0.46	0.42	22.0	<0.01
OPOA	0.78	0.96	1.0	4.8
$Gucheng_{Winter}$				
BBOA	0.99	1.13	<0.01	2.6
HOA	0.99	1.16	5.4	0.9
CCOA	0.99	1.06	11.4	7.0
OOA	0.62	1.49	14.4	1.3
aqOOA	0.88	0.39	4.5	<0.01