Figure S1. Map with the location of measurements site, the red mark corresponds to 39° 58' 28" North, 116° 22' 15" East.
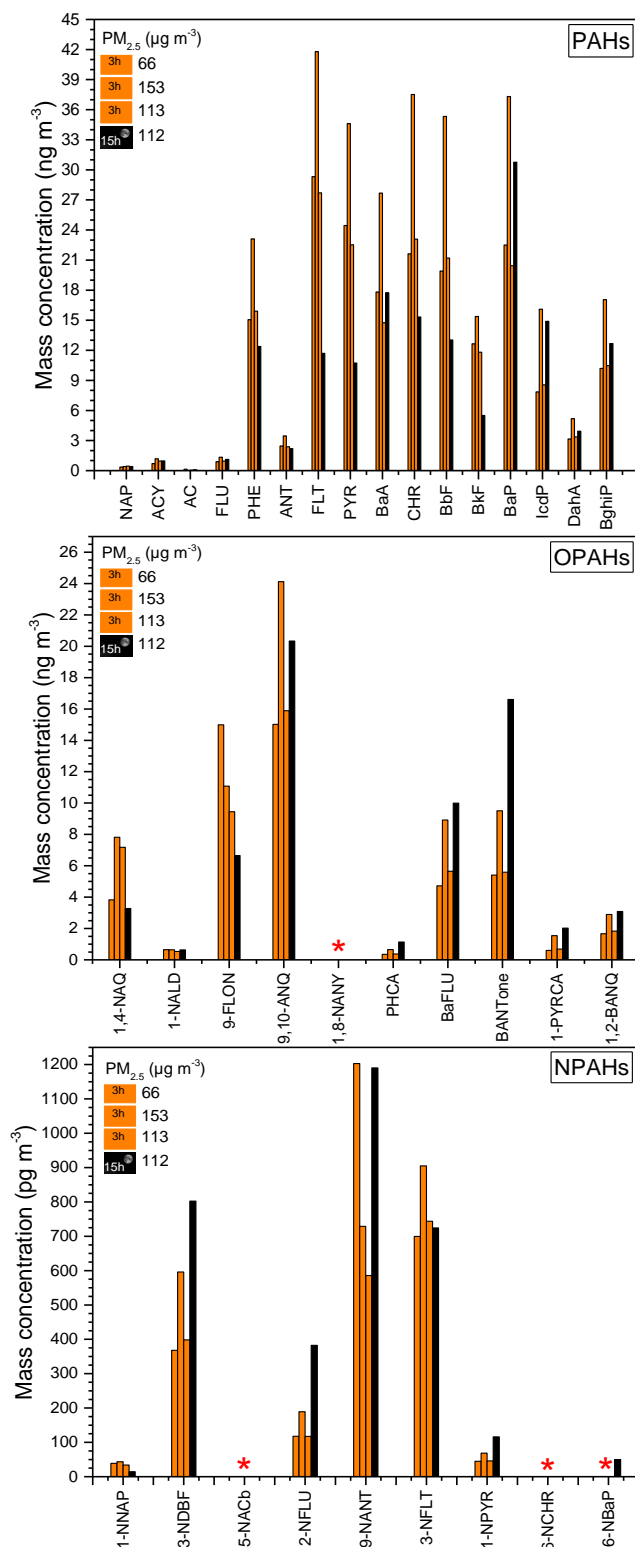
Figure S2. Column distribution illustrating the highest concentrations recorded during the sampling campaign (29 Nov 2016) for individual 16PAHs, 10OPAHs and 9NPAHs in the 3 h (day) and 15 h (night) samples. The first 3 h (PM$_{2.5}$ 130) correspond to the first sampled filter at 8:30 in the morning and so forth. Asterisk (*) means below LOQ except for 1,8-NANY, it means outside the dynamic range.
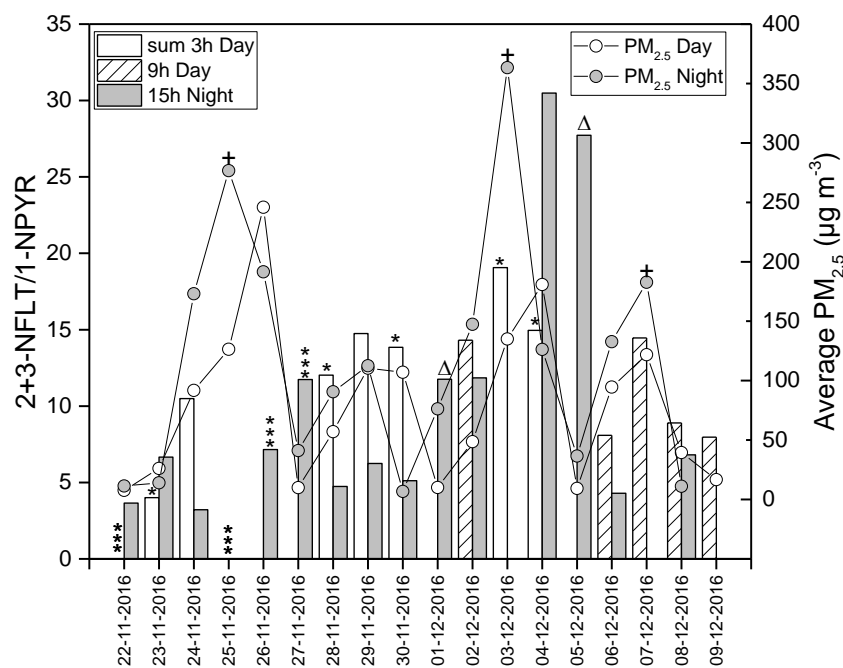
Figure S3. Ratio of 2+3-Nitrofluoranthene/1-Nitropyrene in PM$_{2.5}$ during daytime and night-time samples. One asterisk (*) means 1-NPYR < LOQ in one sample of 3 h, hence the ratios are overestimated; three asterisk mean below LOQ in three samples of 3 h (daytime data not available); (Δ) symbols refer to 1-NPYR < LOQ in the 9 h day samples (daytime data not available); (+) symbols mean night-time data not available.
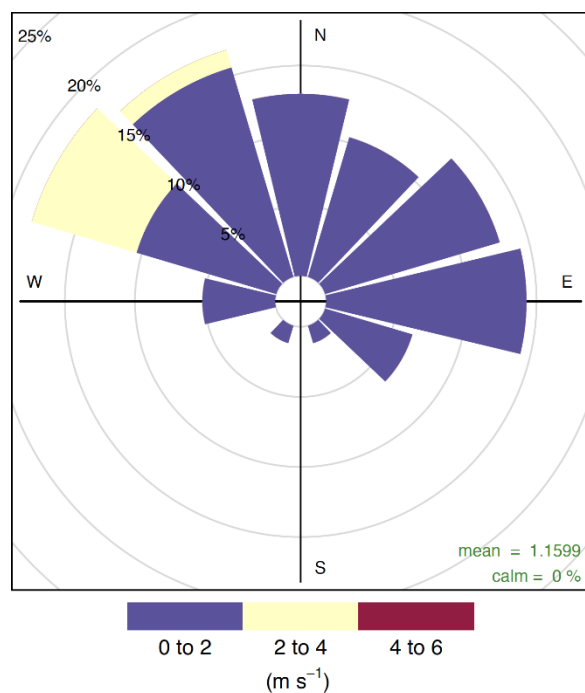

Figure S4. Wind-rose plot for the period from 22 November 2016 to 9 December 2017 in Beijing.

	Time	$\sum$PAHs	$\sum$OPAHs	$\sum$NPAHs
	3 h	-0.60	-0.59	-0.47
O_3	9 h	-0.78	-0.85	-0.80
	15 h	-0.79	-0.64	-0.75
	3 h	0.60	0.62	0.44
CO	9 h	**0.90**	**0.92**	**0.92**
	15 h	**0.88**	**0.86**	0.56
	3 h	0.60	0.55	0.38
NO	9 h	**0.97**	**0.98**	**0.98**
	15 h	**0.84**	0.73	0.37
	3 h	0.48	0.58	0.43
NO_2	9 h	**0.84**	**0.89**	**0.90**
	15 h	**0.87**	**0.82**	0.68
	3 h	0.72	0.74	0.59
SO_2	9 h	**0.90**	**0.89**	**0.90**
	15 h	**0.85**	**0.86**	0.58
	3 h	**0.87**	**0.94**	**0.94**
HONO	9 h	**0.95**	**0.87**	**0.88**
	15 h	**0.85**	0.77	0.52
	3 h	0.04	0.18	0.07
T°	9 h	-0.17	-0.23	-0.20
	15 h	0.09	0.07	0.16
	3 h	0.73	0.71	0.59
RH	9 h	0.66	0.59	0.63
	15 h	0.50	0.58	0.34

Table S1. Pearson correlation coefficients between $\sum$PAHs, $\sum$OPAHs, $\sum$NPAHs and O_3, CO, NO, NO_2, SO_2, HONO, temperature and relative humidity during the daytime (18 days with 3 h and 9 h sampling time) and night-time (14 nights with 15 h sampling time). Strong positive correlation (0.8-1) are shown in Bold (P<0.05).

	Time	n	HONO	P value
1-NNAP	**3 h**	**15**	**0.94**	**<0.001**
	9 h	5	0.82	>0.05
	15 h	10	0.59	>0.05
3-NDBF*	**3 h**	**15**	**0.93**	**<0.001**
	9 h	5	0.82	>0.05
	15 h	10	0.66	<0.05
5-NAC	3 h	1	NA	
	9 h	0	NA	
	15 h	4	0.89	>0.05
2-NFLU	**3 h**	**16**	**0.92**	**<0.001**
	9 h	5	0.84	>0.05
	15 h	**10**	**0.83**	**<0.01**
9-NANT*	**3 h**	**16**	**0.90**	**<0.001**
	9 h	5	0.78	>0.05
	15 h	10	0.15	>0.05
3-NFLT*	**3 h**	**13**	**0.93**	**<0.001**
	9 h	**5**	**0.98**	**<0.01**
	15 h	10	0.65	<0.05
1-NPYR	**3 h**	**6**	**0.90**	**<0.01**
	9 h	4	0.81	>0.05
	15 h	**9**	**0.94**	**<0.001**
6-NCHR	3 h	1	NA	
	9 h	0	NA	
	15 h	2	NA	
6-NBaP	3 h	0	NA	
	9 h	1	NA	
	15 h	6	0.3	>0.05

* Major compounds in NPAHs
(NA) not available.

Table S2. Pearson correlation coefficients between individual NPAHs in $PM_{2.5}$ and HONO. (n) correspond to the number of data in common between each NPAHs and HONO concentrations. Values in Bold correspond to strong correlation with high significance levels (R=0.8-1; P<0.05, 95% level of confidence).

Compound	TEF	References
PAHs		
Napthalene	0.001	Nisbet and Lagoy., 1992
Acenaphthylene	0.001	Nisbet and Lagoy., 1992
Acenaphthene	0.001	Nisbet and Lagoy., 1992
Fluorene	0.0005	Hester et al., 1998
Phenanthrene	0.0005	Hester et al., 1998
Anthracene	0.0005	Hester et al., 1998
Fluoranthene	0.05	Hester et al., 1998
Pyrene	0.001	Hester et al., 1998
Benzo[a]anthracene	0.082	Durnant et al., 1996
Chrysene	0.017	Durnant et al., 1996
Benzo[b]fluoranthene	0.25	Durnant et al., 1996
Benzo[k]fluoranthene	0.11	Durnant et al., 1996
Benzo[a]pyrene	1	OEHHA., 1994
Indeno[1,2,3-cd]pyrene	0.1	Hester et al., 1998
Dibenzo[a,h]anthracene	1.1	Hester et al., 1998
Benzo[g,h,i]perylene	0.02	Hester et al., 1998
OPAHs		
7H-Benz[de]anthracene-7-one	0.0039	Durnant et al., 1996
Nitro-PAHs		
5-Nitroacenaphthene	0.01	OEHHA., 1994
2-Nitrofluorene	0.01	OEHHA., 1994
9-Nitroanthracene	0.0032	Durnant et al., 1996
3-Nitrofluoranthene	0.0026	Durnant et al., 1996
1-Nitropyrene	0.1	OEHHA., 1994
6-Nitrochrysene	10	OEHHA., 1994

Table S3. Toxicity Equivalency Factor (TEFs) for individual PAHs, OPAHs and Nitro-PAHs.