Supplement of Atmos. Chem. Phys., 24, 6525–6538, 2024
https://doi.org/10.5194/acp-24-6525-2024-supplement

Atmospheric Chemistry and Physics
Open Access

Supplement of

Non-negligible secondary contribution to brown carbon in autumn and winter: inspiration from particulate nitrated and oxygenated aromatic compounds in urban Beijing

Yanqin Ren et al.

Correspondence to: Hong Li (lihong@craes.org.cn) and Gehui Wang (ghwang@geo.ecnu.edu.cn)

Table S1. Concentrations of nitrated and oxygenated aromatic compounds in $PM_{2.5}$ during the sampling periods in Beijing.

	The whole sampling N=122	Before Heating Period 18/10–14/11 N=56	Heating Period 15/11–23/11, 23/12–17/1 N=66
Nitrated aromatic compounds (NACs, ng m^{-3})			
4-nitrophenol(4NP)	14 ± 14 (0.75 – 94)	6.6 ± 4.5 (0.75 – 19)	20 ± 17 (2.0 – 94)
3-methyl-4-nitrophenol(3M4NP)	3.7 ± 4.6 (0.13 – 26)	0.99 ± 0.79 (0.13 – 4.3)	6.1 ± 5.2 (0.83 – 26)
2,4-dinitrophenol(2,4-DNP)	2.4 ± 4.6 (0.01 – 24)	3.4 ± 5.6 (0.01 – 24)	1.6 ± 3.3 (0.02 – 17)
4-nitroguaiacol(4NGA)	1.8 ± 2.0 (0.02 – 11)	0.52 ± 0.46 (0.02 – 2.7)	2.8 ± 2.2 (0.39 – 11)
5-nitroguaiacol(5NGA)	0.06 ± 0.04 (0.01 – 0.39)	0.04 ± 0.03 (0.01 – 0.16)	0.07 ± 0.05 (0.01 – 0.39)
4-nitrocatechol(4NC)	11 ± 16 (NA[a] – 87)	5.4 ± 8.6 (NA – 54)	16 ± 19 (0.19 – 87)
4-methyl-5-nitrocatechol(4M5NC)	3.6 ± 5.6 (NA – 28)	1.9 ± 3.4 (NA – 23)	5.1 ± 6.6 (0.04 – 28)
3-nitrosalicylic acid(3NSA)	0.59 ± 0.80 (NA – 3.5)	0.33 ± 0.53 (NA – 3.6)	0.81 ± 0.93 (0.02 – 3.5)
3-nitrosalicylic acid(5NSA)	0.78 ± 0.91 (NA – 4.5)	0.43 ± 0.54 (NA – 2.7)	1.1 ± 1.0 (0.03 – 4.5)
∑9NACs	38 ± 44 (1.2 – 263)	20 ± 21 (1.2 – 108)	53 ± 51 (4.5 – 263)
∑9NACs/OM (%)	0.25 ± 0.17 (0.03 – 0.86)	0.15 ± 0.09 (0.03 – 0.44)	0.33 ± 0.17 (0.09 – 0.86)
Oxygenated polycyclic aromatic compounds (OPAHs, ng m^{-3})			
1-naphthaldehyde(1-NapA)	20 ± 18 (0.81 – 90)	18 ± 16 (0.81 – 88)	22 ± 18 (2.1 – 90)
9-fluorenone(9-FO)	1.8 ± 1.9 (0.06 – 9.2)	0.33 ± 0.23 (0.06 – 1.1)	3.1 ± 1.9 (0.49 – 9.2)
Anthraquinone(ATQ)	11 ± 12 (0.4 – 62)	2.8 ± 2.1 (0.4 – 11)	18 ± 12 (2.4 – 62)
Benzathrone(BZA)	6.6 ± 9.0 (0.002 – 49)	3.7 ± 6.5 (0.002 – 39)	9.1 ± 10 (0.31 – 49)
benzo(a)anthracene-7,12-dione(7,12-BaAQ)	1.3 ± 1.6 (NA – 9.0)	0.61 ± 0.77 (NA – 4.6)	1.9 ± 1.8 (0.10 – 9.0)
1,4-chrysenequione(1,4-CQ)	5.5 ± 10 (NA – 98)	4.8 ± 14 (NA – 98)	6.1 ± 6.1 (0.45 – 28)
5,12-naphthacenequione(5,12-NAQ)	0.93 ± 1.4 (NA – 8.1)	0.41 ± 0.78 (NA – 4.4)	1.4 ± 1.6 (0.08 – 8.1)
6H-benzo(cd)pyrene-6-one(BPYRone)	0.38 ± 0.36 (NA – 1.8)	0.27 ± 0.26 (NA – 1.7)	0.47 ± 0.40 (NA – 1.8)
∑8OPAHs	47 ± 44 (2.1 – 234)	31 ± 36 (2.1 – 234)	61 ± 45 (6.9 – 218)
∑8OPAHs/OM	0.33 ± 0.15 (0.06 – 0.81)	0.24 ± 0.16 (0.06 – 0.81)	0.40 ± 0.10 (0.18 – 0.58)

[a] NA: not available.

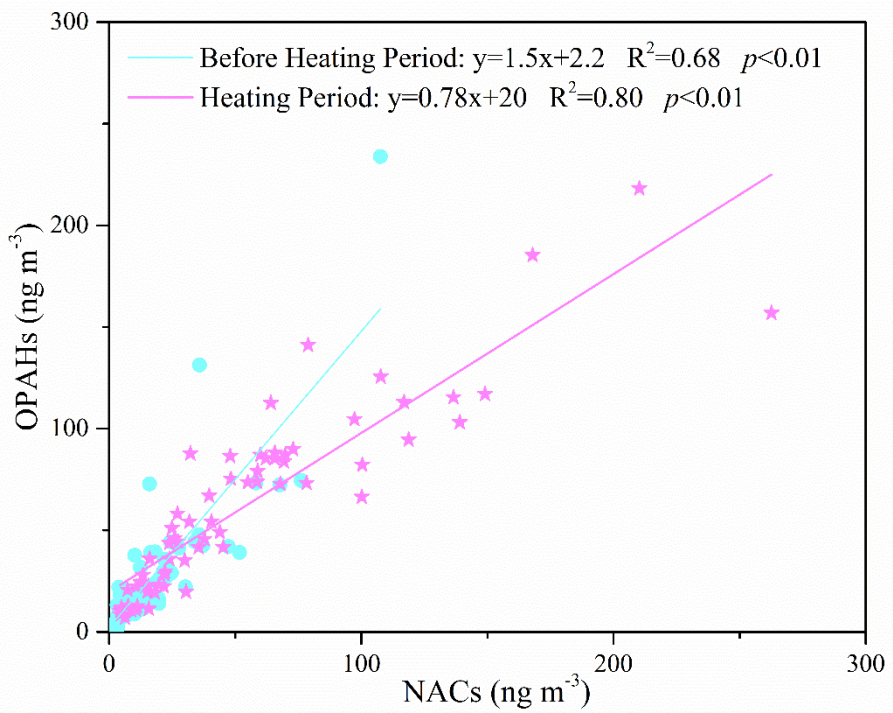

Fig.S1 Linear fit regressions of OPAHs with NACs before and during heating period.