

Supplementary for “Spatial-temporal characteristics and source apportionment of ambient VOCs in southeast mountain area of China”

Xiaoting Ji^{a,b,c}, Ke Xu^{a,b,d}, Dan Liao^e, Gaojie Chen^{a,b,c}, Taotao Liu^{a,b,c}, Youwei Hong^{a,b,c,d*},
Sijun Dong^{b,d}, Sung-Deuk Choi^f, Jinsheng Chen^{a,b*}

^a*Center for Excellence in Regional Atmospheric Environment, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, 361021, China*

^b*Key Lab of Urban Environment and Health, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, 361021, China*

^c*University of Chinese Academy of Sciences, Beijing, 100049, China*

^d*School of Life Sciences, Hebei University, Baoding, 071000, China*

^e*College of Environment and Public Health, Xiamen Huaxia University, Xiamen 361024, China*

^f*Department of Urban and Environmental Engineering, Ulsan National Institute of Science and Technology, Ulsan, 44919, South Korea*

*Corresponding author: Institute of Urban Environment, Chinese Academy of Sciences, 1799 Jimei Road, Xiamen 361021, China. Tel.: +86-592-6190585; Fax: +86-592-6190531.

E-mail address: jschen@iue.ac.cn; ywhong@iue.ac.cn

1 **Table S1.** Criteria air pollutants and meteorological parameters at the county and rural areas during the sampling periods.

Items	County area				Rural area			
	April		September		April		September	
	Range	Mean \pm std	Range	Mean \pm std	Range	Mean \pm std	Range	Mean \pm std
O ₃ ($\mu\text{g m}^{-3}$)	10–147	64.4 \pm 41.4	22–152	93.0 \pm 31.6	12–64	32.1 \pm 18.2	34–155	105 \pm 38.6
PM ₁₀ ($\mu\text{g m}^{-3}$)	36–138	63.7 \pm 22.6	9–84	38.5 \pm 5.0	27–131	43.8 \pm 28.1	12–73	31.9 \pm 21.3
PM _{2.5} ($\mu\text{g m}^{-3}$)	5–76	34.0 \pm 16.0	1–43	16.3 \pm 9.5	10–28	16.9 \pm 5.9	9–13	10.7 \pm 1.3
SO ₂ ($\mu\text{g m}^{-3}$)	4–40	18.6 \pm 10.7	1–36	7.3 \pm 6.2	2–3	2.3 \pm 0.5	3–7	3.9 \pm 1.4
CO (mg m ⁻³)	0.3–1.4	0.7 \pm 0.2	0.1–1.1	0.5 \pm 0.2	0.4–0.6	0.5 \pm 0.1	0.5–0.9	0.6 \pm 0.1
NO ₂ ($\mu\text{g m}^{-3}$)	2–57	19.7 \pm 11.6	2–46	12.6 \pm 10.7	4–10	5.6 \pm 1.6	4–13	7.5 \pm 2.9
Temperature (°C)	11.9–30.7	23.3 \pm 5.0	20.4–30.4	25.1 \pm 2.6	12.8–30.1	22.6 \pm 5.4	21.1–30	24.7 \pm 3.0
RH (%)	23–97	60.4 \pm 20.2	35–85	61.8 \pm 11.8	25–95	66.1 \pm 21.0	46–80	62.3 \pm 12.2
Wind speed (m s ⁻¹)	0–2.3	0.7 \pm 0.5	0.1–3.5	1.4 \pm 0.8	0–0.6	0.2 \pm 0.2	0.2–0.5	0.3 \pm 0.1

3 **Table S2.** Comparisons of VOC compositions in Nanping and in other sites.

Site	Type of site	Period	Alkanes (ppb)	Alkenes (ppb)	Alkynes (ppb)	Aromatics (ppb)	Halocarbons (ppb)	OVOCs (ppb)	TVOCs (ppb)	References
Nanping	County areas	2018.4.9–4.12 9.26–9.29	8.82 (27.6%)	3.97 (12.4%)	0.31 (0.96%)	2.91 (9.10%)	4.56 (14.3%)	11.4 (35.6%)	31.9	This study
Wuhan	Urban	2017.4.26–6.6	14.8 (51.1%)	2.90 (10.0%)	1.80 (6.22%)	2.25 (7.78%)	3.16 (10.9%)	3.80 (13.1%)	28.9	Hui et al. (2020)
Shanghai	Urban	2017.5.20–5.30	15.1 (35.4%)	2.4 (5.62%)	1.2 (2.81%)	5.1 (11.94%)	5.4 (12.7%)	13.5 (31.6%)	42.7	Liu et al. (2019)
Beijing	Urban	2013.2.26–3.8	22.4 (34.5%)	10.9 (16.8%)	6.33 (9.75%)	5.67 (8.74%)	5.87 (9.04%)	13.7 (21.1%)	64.9	Gao et al. (2018)
Zhengzhou	Urban	2019.12.1–31	22.0 (45.1%)	5.1 (10.5%)	3.5 (7.17%)	6.5 (13.32%)	8.1 (16.6%)	3.6 (7.38%)	48.8	Zhang et al. (2021)
Nanping	Rural	2018.4.9–4.12 9.26–9.29	5.33 (23.9%)	2.54 (11.4%)	0.25 (1.12%)	1.08 (4.83%)	4.30 (19.2%)	8.83 (39.5%)	22.3	This study
Guilin	Rural	2018.5–11	4.53 (19.1%)	0.98 (4.16%)	0.75 (3.16%)	15.6 (65.8%)	1.36 (5.75%)	0.43 (1.81%)	23.7	Zhang et al. (2019)
Xianghe	Rural	2017.11.6–2018.1.29	23.7 (38.8%)	12.3 (20.1%)	4.24 (6.95%)	10.3 (13.6%)	8.47 (11.6%)	5.18 (8.49%)	61.0	Yang et al. (2019)

Table S3. Comparisons of concentrations and proportions of isoprene in different Chinese cities

Site	Type of site	Concentration of isoprene (ppb)	Proportion of isoprene to TVOCs (%)	References
Nanping	County area	0.25	0.91	This study
Nanping	Rural	0.55	2.73	This study
Beijing	Urban	0.07	0.01	Li et al., 2015
Dinghu mountain	Background	0.76	3.9	Wu et al., 2016
Shanghai	Urban	0.04	0.04	Zhang et al., 2018
Guilin	Urban	0.01	0.04	Zhang et al., 2019

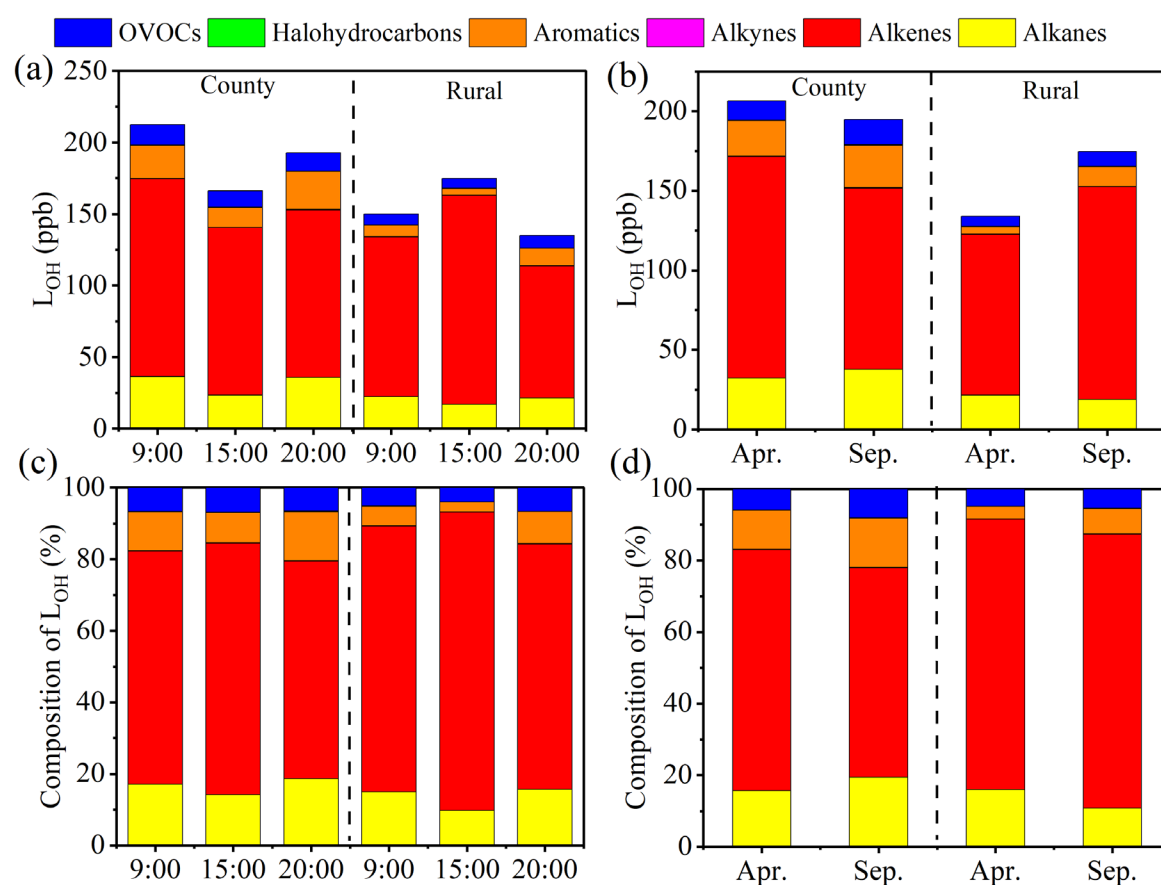


Fig. S1. LOH in county areas and rural site at 9:00, 15:00 and 20:00 (a), in April and

September (b), Compositions of VOC species to total LOH in county areas and rural site at 9:00, 15:00 and 20:00 (c), in April and September (d).

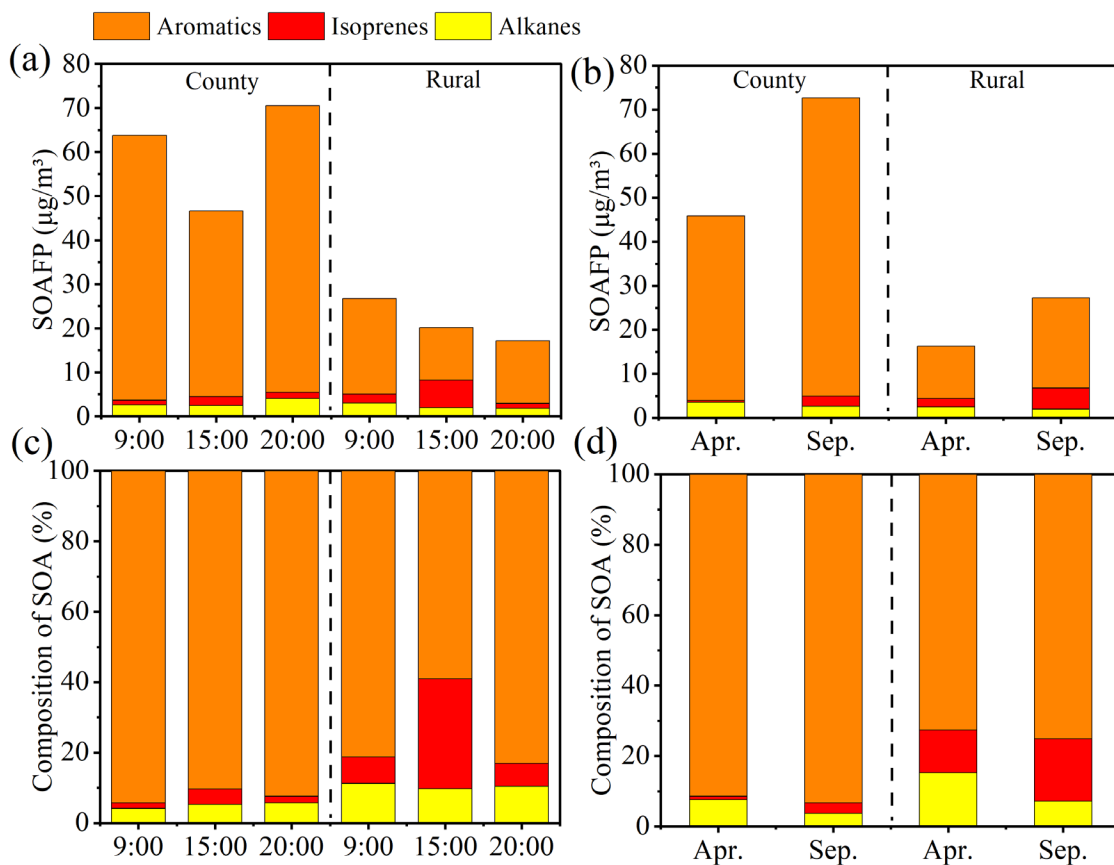


Fig. S2. Distribution of the SOAFP in the county areas and rural site at 9:00, 15:00, and 20:00 (a), in April and September (b). Compositions of VOC species to the total SOA in the urban and rural areas at 9:00, 15:00, and 20:00 (c), in April and September (d)