Supplement of

Sources of volatile organic compounds and policy implications for regional ozone pollution control in an urban location of Nanjing, East China.

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14 **Table S1.** Annual average concentrations of total volatile organic compounds and four hydrocarbon classes (ppbv) for several urban sites worldwide.

Location	Study period	TVOCs	Alkanes	Aromatics	Alkenes	Acetylene	Reference
Nanjing, China	2016.1-2016.12	25.7	13.6	4.4	3.2	4.5	This study
Nanjing, China[1]	2011.3-2012.2	43.5	19.6	9.7	11.0	3.2	An et al., 2014
Shanghai, China[1]	2009.1-2010.12	27.8	12.8	8.7	3.6	2.6	Wang et al., 2013
Tianjin, China[2]	2014.11-2015.10	28.7	18.3	5.3	5.2	-	Liu et al., 2016
Guangzhou, China[3]	2011.6-2012.5	42.7	25.2	10.3	7.2	-	Zou et al., 2015
Wuhan, China[4]	2013.2-2014.10	24.3	-	-	-	-	Lyu et al., 2016
Beijing, China[5]	2014.4-2015.1	35.2	16.5	5.8	9.3	3.6	Zhang et al., 2017
Nagoya, Japan[2]	2003.12-2004.12	28.6	16.5	5.4	4.9	1.9	Saito et al., 2009
Seoul, Korea[3]	1998.8-1999.7	53.0	28.2	11.8	9.6	3.4	Na and Kim, 2001
London, UK[4]	1996.1-1996.12	30.5	15.3	5.0	5.6	4.6	Derwent et al., 2000
Lille, France[5]	1999.7-2000.6	22.0	11.5	4.7	4.3	1.5	Borbon et al., 2002
Dallas, USA[6]	1996.1-2004.12	41.5	29.3	7.1	3.8	1.3	Qin et al., 2007

15 Note: 1. PAMS 56 measured using a GC-FID (AMA Instruments, Germany) at an industrial area; 2. C2-C12 VOCs using GC-FID (Chromate-sud airmoVOC)
16 and two columns for C2-C6 and C6-C12 separately; 3. PAMS 56 species analyzed by using GC-FID (AMA instruments GmbH, Germany); 4. PAMS 56 by
17 using a GC-FID (AMA, Germany) with two columns for C2-C6 and C6-C12 separately; 5. Fifty-six NMHC analyzed by GC-FID-MS (TH_PKU-300); 6,
18 fifty-nine NMHC using the Airmo online analyzer (Chromatotes, France); 7. 48 non-methane hydrocarbons analyzed using GC-FID (Shimadzu, CO.) with
19 a methyl silicone fused silica column; 8. C2-C9 VOCs sampled using SUMMA canisters and analyzed using GC-FID for C2-C3 species and GC-MS for
20 C4-C9 species; 9. Twenty-six C2-C8 hydrocarbons using Chrompack VOCAIR system; 10. Thirty-seven C2-C9 NMHC using Perkin-Elmer GC-FID
21 system; 11. Forty-five C2-C10 NMHC measured using the Perkin-Elmer ozone precursor system (GC-FID)

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Table S2. Policy measures for the control of VOCs in Jiangsu and their implementation date.

Sector	Measures	Date
Comprehensive	Advice on Promoting Air Pollution Joint Prevention and Control Work to Improve Regional Air Quality (Office of the State Council [2010] No. 33)	2010
	Guidance on the Prevention and Control of Volatile Organic Compounds Pollution (Provincial Office of the Joint Conference on the prevention and control of air pollution [2012] No. 2)	2012
	Guidelines for the Implementation of Leak Detection and Repair (LDAR) in Jiangsu Province (Trial) (Provincial Office of Environmental Protection [2013] No. 318)	2013
	Implementation Plan for Air Pollution Prevention Action Plan in Jiangsu Province (Jiangsu Provincial Government [2014] No. 1)	2014
	Outline of the 13th Five-Year Plan for National Ecological Protection (Environmental Ecology [2016] No. 151)	2016
	Notice on Organizing and Conducting VOC Emission Inventory and Source Apportion Work (Provincial Office of Environmental Protection [2013] No. 231)	2017
Key Industries	Implementation Plan for Clean Production and Transformation of Key Industries in Jiangsu Province (Provincial Office of Economic and Information Commission [2014] No. 733)	2014
	Guidelines for Control of Volatile Organic Compounds Pollution in Key Industries in Jiangsu Province (Provincial Office of Environmental Protection [2014] No. 128)	2014
	Plan for Remediation of Volatile Organic Compounds in Key Industries in Jiangsu Province (Provincial Office of Environmental Protection [2015] No. 19)	2015
	Interim Measures for Calculation of Volatile Organic Compounds Emissions in Key Industries in Jiangsu Province	2016
Motor Vehicles	Regulations on Prevention and Control of Vehicle Exhaust Pollution in Nanjing	2017
	Regulations on Prevention and Control of Vehicle Exhaust Pollution in Jiangsu Province	2018
Chemical Industry	Investigation on VOC Pollution and Remediation Pilot Work in Chemical Industry (Provincial Office of Environmental Protection [2012] No. 183)	2012
	Technical Specifications for Prevention and Control of Air Pollution in Chemical Industries in Jiangsu Province (Provincial Office of Environmental Protection [2014] No. 3)	2014
	Notification on carrying out the technical demonstration and pilot work of leak detection and repair (LDAR) in petrochemical and chemical industries (Provincial Office of Environmental Protection [2015] No. 157)	2015
	Technical Guidance for Control of Unorganized emissions in Chemical Industries in Jiangsu Province (Provincial Office of Environmental Protection [2016] No. 95)	2016
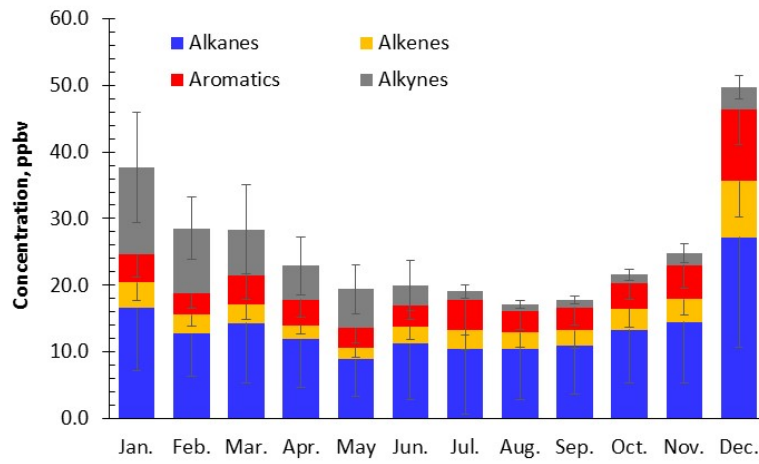
Figure S1 Monthly variations of different VOCs groups at JAES site
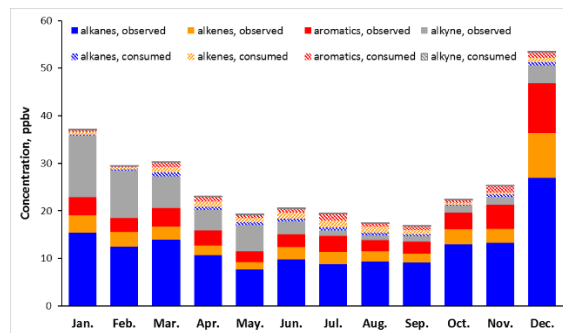
Figure S2 Monthly variations of the estimated initial VOCs summarized from the measured concentration and estimated consumed fractions.
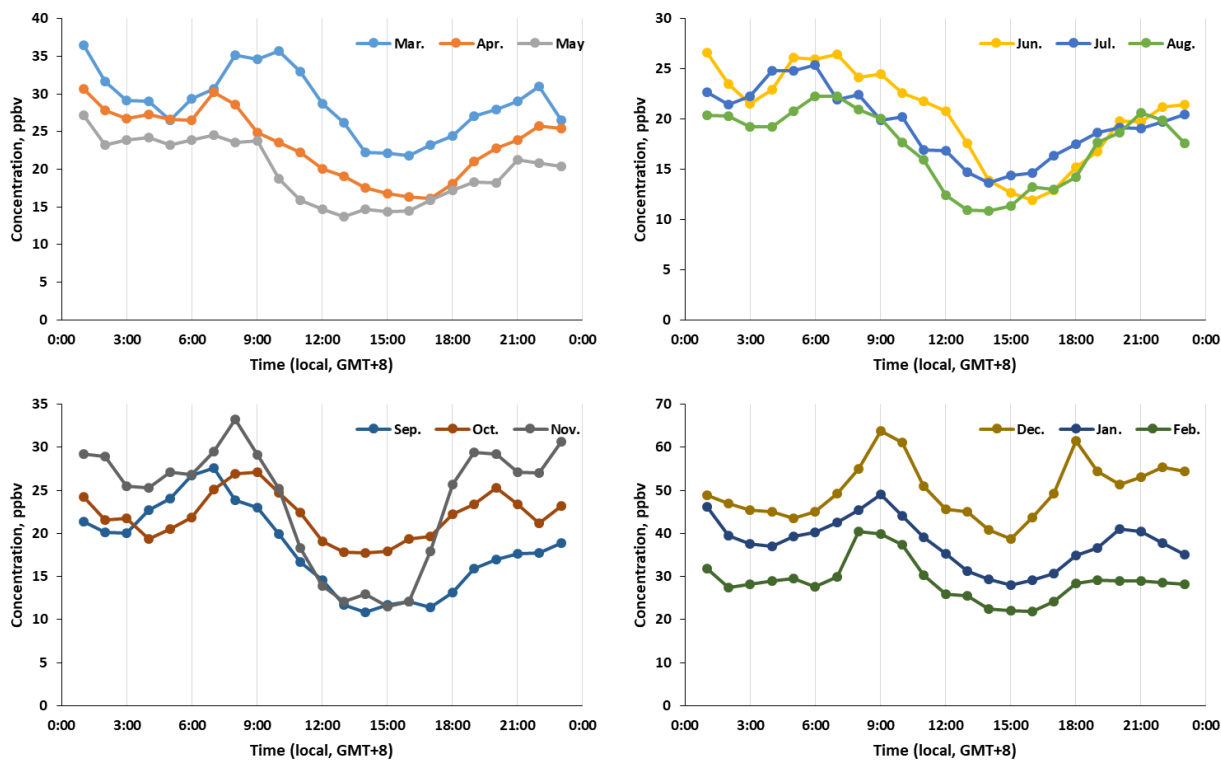
Figure S3 Diurnal variations of ambient VOCs in different months at JAES site