

Supplementary Materials: Chemical Characteristics and Source-Specific Health Risks of the Volatile Organic Compounds in Urban Nanjing, China

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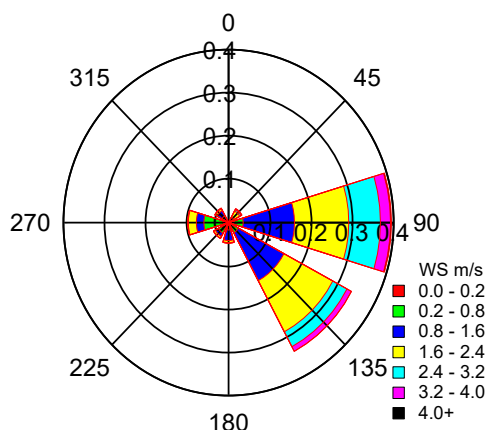


Figure S1. Wind rose plot during the sampling period.

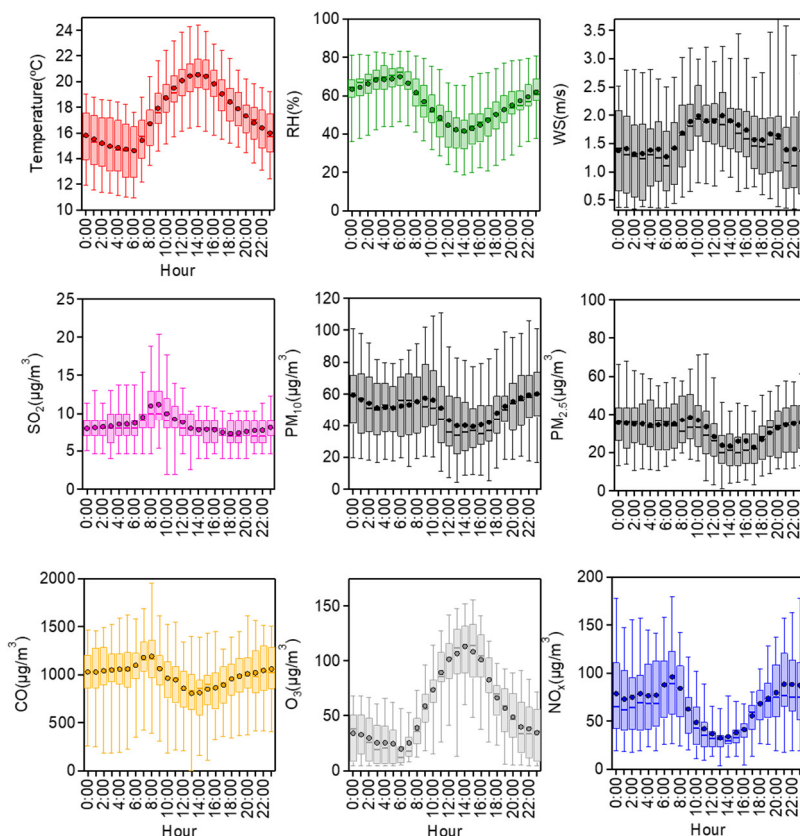


Figure S2. Diurnal patterns of the meteorological parameters and major air pollutants (the whiskers above and below the boxes mark the 90 % and 10 % percentiles, respectively; the upper and lower edges of the boxes represent the 75 % and 25 % percentiles, respectively).

% percentiles, respectively; and the lines and solid/hollow dots inside the boxes denote the median and mean values, respectively).

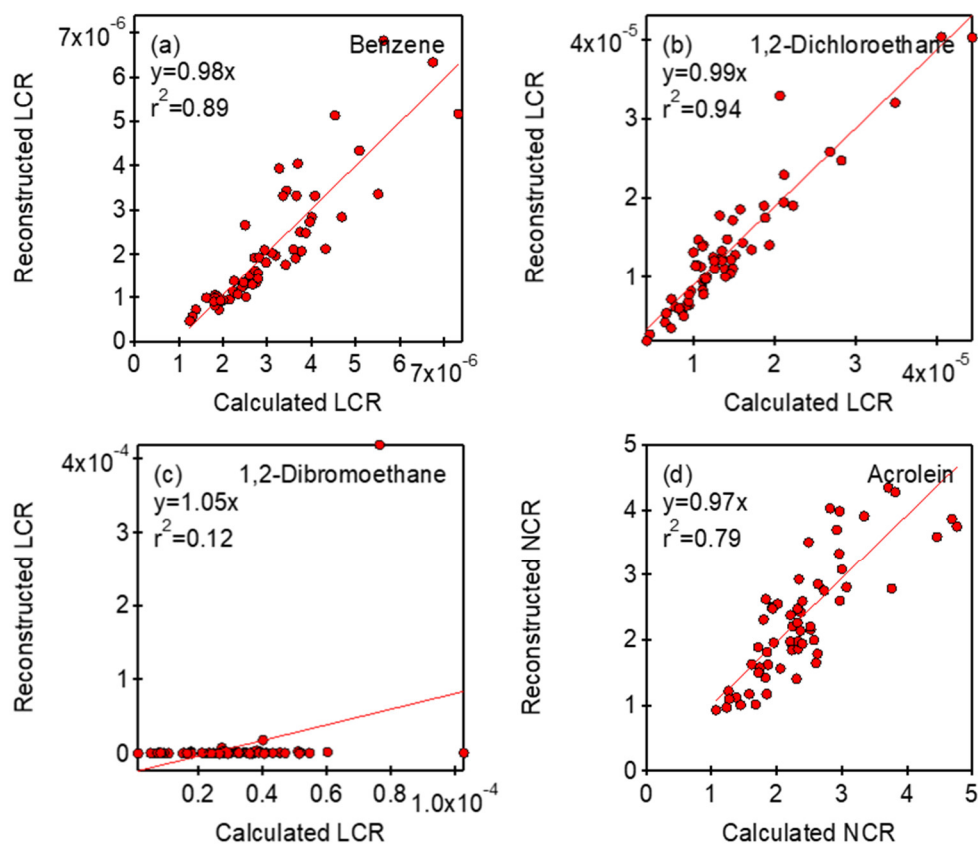


Figure S3. Scatter plots of calculated LCR/NCR values versus reconstructed values from PMF-MLR analysis (see main text), for (a) LCR of benzene, (b) LCR of 1,2-dichloroethane, (c) LCR of 1,2-dibromoethane, and (d) NCR of acrolein.

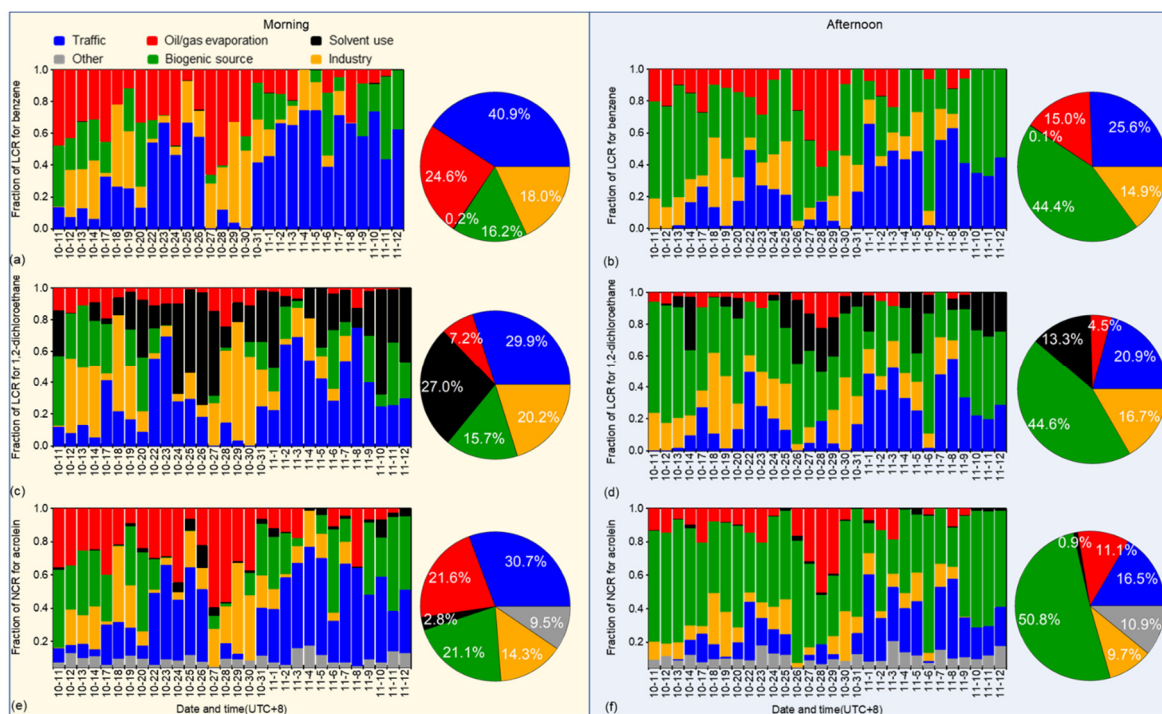


Figure S4. Relative contributions of different sources to the LCR of benzene in morning (a) and afternoon samples (b), to the LCR of 1,2-dichloroethane in morning (c) and afternoon samples (d), and to the NCR of acrolein in morning (e) and afternoon samples (f) (the pie charts are average contributions of corresponding morning or afternoon samples).

Table S1. The available parameters for NCR and LCR assessment of VOCs and the results of this work, with selected results from other cities in China.

VOCs Species	RfC	IUR	Zhengzhou[1]		Langfang[2]		Beijing[3]		This study	
	(mg/m ⁻³)	(µg/m ⁻³)	NCR	LCR	NCR	LCR	NCR	LCR	NCR	LCR
1,1,1-Trichloroethane	5.00E+00		1.30E-06		4.60E-07		2.40E-07		3.05E-07	
1,1,2-Trichloroethane	4.00E-01	1.60E-05	1.00E-04	6.60E-07		2.30E-07			8.15E-05	5.21E-07
1,1-Dichloroethane	5.00E-01	1.60E-06	6.90E-05	5.50E-08					8.06E-05	6.45E-08
1,1-Dichloroethylene	2.00E-01		1.60E-05						1.64E-05	
1,2,3-Trimethylbenzene	6.00E-02		5.80E-04		5.70E-04				2.88E-04	
1,2,4-Trichlorobenzene	2.00E-01		2.10E-05						1.56E-04	
1,2,4-Trimethylbenzene	6.00E-02		1.70E-03		1.70E-03				6.91E-04	
1,2-Dibromoethane	9.00E-03	6.00E-04	1.40E-03	7.40E-06	2.60E-04	7.10E-07	4.90E-05	2.70E-07	1.54E-03	8.30E-06
1,2-Dichloroethane	2.40E+00	2.60E-05	3.10E-04	1.90E-05					2.11E-04	1.31E-05
1,2-Dichloropropane	4.00E-03		4.30E-02		1.20E-01		8.00E-02		4.98E-02	
1,3,5-Trimethylbenzene	6.00E-02		8.40E-04		7.90E-04				2.52E-04	
1,3-Butadiene	2.00E-03	3.00E-05	1.60E-03	9.40E-08	4.40E-02	2.60E-06	8.10E-03	4.90E-07	1.69E-03	1.01E-07
1,4-Dichlorobenzene	8.00E-01	1.10E-05	1.10E-04	9.30E-07	1.40E-05		5.90E-05		3.46E-05	3.05E-07
1,4-Dioxane	3.00E-02	5.00E-06	5.50E-05	8.20E-09						

2-Butanone	5.00E+00		3.90E-05							6.09E-05	
2-Hexanone	5.00E+00		2.00E-05							2.28E-06	
4-Methyl-2-pentanone	3.00E+00		1.00E-05								
Acrolein	2.00E-05		1.60E+00		4.90E+00					2.36E+00	
Benzene	3.00E-02	7.80E-06	1.80E-02	4.10E-06	3.50E-02	8.30E-06	3.60E-02	8.40E-06	8.84E-03	2.07E-06	
Bromoform		1.10E-06		2.70E-08		3.20E-09				1.11E-08	
Bromomethane	5.00E-03		1.80E-03		1.30E-03		5.40E-03		2.24E-03		
Carbon disulfide	7.00E-01		1.40E-04						9.29E-05		
Chlorobenzene	1.00E+00		2.90E-05						2.92E-05		
Chloroethane	1.00E+01		1.40E-06						2.43E-06		
Chloroform	9.80E-02	2.30E-05	5.80E-03	1.30E-05		1.30E-05					
Chloromethane	9.00E-02		1.70E-03						4.14E-03		
Cyclohexane	6.00E+00		9.10E-06		1.20E-04		5.20E-05		7.64E-06		
Dichloromethane	6.00E-01	1.00E-08	1.90E-03	1.20E-08					2.03E-03	1.22E-08	
Ethylbenzene	1.00E+00	2.50E-06	2.10E-04	5.30E-07	5.40E-04		4.20E-04		1.93E-04	4.82E-07	
Hexachloro-1,3-butadiene	9.00E-02	2.20E-05	2.90E-04	5.70E-07					1.92E-04	3.79E-07	
Isopropyl benzene	4.00E-01		4.40E-05		9.10E-05		1.50E-05				

m/p-Xylene	1.00E-01		2.00E-03		1.50E-02		1.30E-03		4.04E-03	
Methyl methacrylate	7.00E-01		8.40E-05		2.60E-03	1.60E-08	5.40E-03	3.20E-10	1.70E-05	
MTBE	3.00E+00	2.60E-07	2.80E-05	2.20E-08	2.90E-05					
Naphthalene	3.00E-03	3.40E-05	2.40E-02	2.40E-06					1.06E-02	1.08E-06
n-Hexane	7.00E-01		2.40E-03		4.20E-04		3.40E-04		1.43E-04	
o-Xylene	1.00E-01		7.00E-03		4.90E-03		1.00E-02		1.45E-03	
Propylene	3.00E+00		1.90E-05						4.90E-05	
Styrene	1.00E+00		4.20E-05		2.90E-04		6.50E-05		6.90E-05	
Tetrachloroethylene	4.00E-02	2.60E-07	2.10E-02	2.20E-07	2.50E-02	2.60E-08	2.00E-02	1.90E-07	1.33E-03	1.39E-08
Tetrachloromethane	1.00E-01	6.00E-06	5.90E-03	3.50E-06						
Toluene	5.00E+00		1.50E-04		2.40E-04		1.50E-04		1.18E-04	
trans-1,3-Dichloropropene	2.00E-02	4.00E-06	6.90E-04	5.60E-08					1.66E-04	1.33E-08
Trichloroethylene	2.00E-03	4.10E-06	1.00E-02	8.40E-08	2.00E-02	1.70E-07	2.10E-01	1.70E-06	3.86E-02	3.16E-07
Vinyl acetate	2.00E-01		4.30E-03						6.63E-05	
Vinyl chloride	1.00E-01	8.80E-06	1.30E-04	1.20E-07	3.70E-04	3.30E-07		4.70E-06	1.27E-04	1.12E-07

Table S2. Selected studies of VOCs measurements in the five economically developed regions in China

Sample site	Site Type	Period	Season	VOCs (in ppb)								References
				Alkanes	Alkenes	Alkyne	Aromatics	Halogens	OVOCs	Others	<u>TVOC</u> <u>s</u>	
Nanjing	Suburb	2020.10- 2020.11	Autumn	10.72	2.58	1.44	2.86	5.69	5.78	0.12	29.04	This study
Beijing	Urban	2019.03	Spring	36.39	8.59	3.91	10.24	0.00	0.00	0.00	59.13	[4]
Beijing	Suburb	2019.04- 2019.05	Spring	13.47	2.49	1.61	2.89	3.86	5.29	0.76	30.40	[5]
Beijing	Urban	2016.01- 2016.10	Four Seasons	16.19	5.19	3.08	3.39	4.80	11.00	0.31	44.00	[6]

Changsha	Urban	2020.8	Summer	4.50	0.90	0.60	2.80	2.30	6.50	0.00	17.60	[7]
Chengdu	Urban	2018.06- 2019.01	Summer, autumn, winter	29.32	6.40	8.53	5.33	3.73	0.00	0.00	53.30	[8]
Chengdu	Urban	2016.05- 2017.01	Four Seasons	19.36	4.13	3.17	4.58	4.37	8.98	0.33	44.92	[9]
Chongqing	Suburb	2015.08- 2015.09	Summer and autumn	14.63	5.89	4.33	4.82	4.00	6.26	1.24	41.20	[10]
Dongguan	Urban	2020.06- 2020.08	Summer	23.90	3.72	0.53	24.96	0.00	0.00	0.00	53.10	[11]
Guangzhou	Suburb	2014.10- 2014.11	Autumn	16.66	5.10	3.40	8.84	0.00	0.00	0.00	34.00	[12]
Guangzhou	Urban	2017.09- 2017.11	Autumn	20.15	2.40	1.67	12.09	0.00	0.00	0.00	36.30	[13]

Lianyungang	Urban	2018.04-2018.09	Spring and summer	19.31	3.80	0.63	7.91	0.00	0.00	0.00	31.65	[14]
Shanghai	Urban	2017.05	Spring	14.95	2.39	1.20	5.08	5.42	13.66	0.00	42.70	[15]
Wuhan	Urban	2016.09-2017.08	Four Seasons	15.90	4.16	2.43	3.47	3.81	4.94	0.30	34.65	[16]
Wuhan	Urban	2016.10-2016.11	Autumn	13.19	3.83	2.03	3.26	3.59	8.66	0.31	34.87	[17]

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