



Supplement of

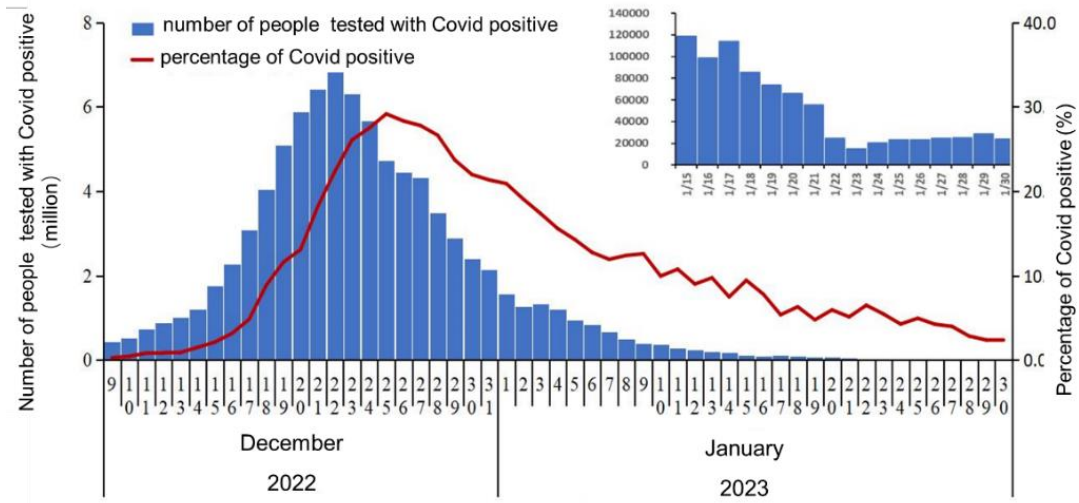
The variations in volatile organic compounds based on the policy change for Omicron in the traffic hub of Zhengzhou

Bowen Zhang et al.

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- 1 **Fig. S1. Trend of Omicron infection in China from 9 Dec. 2022 to 1 Jan. 2023.**
- 2 **Fig. S2. (a) the $Q_{\text{true}}/Q_{\text{expected}}$ ratio for different F_{peak} value solutions; (b) The**
- 3 **$Q_{\text{true}}/Q_{\text{expected}}$ ratios in different solutions.**
- 4 **Fig. S3. Relative humidity and (a) $\text{PM}_{2.5}$, (b) NO_x , (c) TVOCs correlation.**
- 5 **Fig. S4. Potential source areas for VOCs (a) Infection period (b) Recovery period (Black**
- 6 **pentagrams represent sampling locations).**
- 7 **Fig. S5. Characteristics of daily changes in different sources obtained using the PMF**
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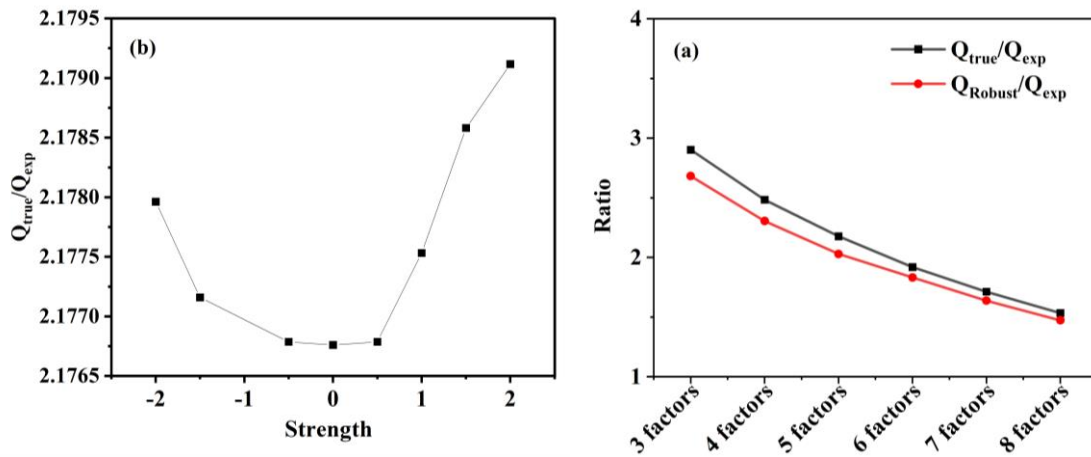


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Fig. S1. Trend of Omicron infection in China from 9 Dec. 2022 to 1 Jan. 2023 (CCDCP, 2023)



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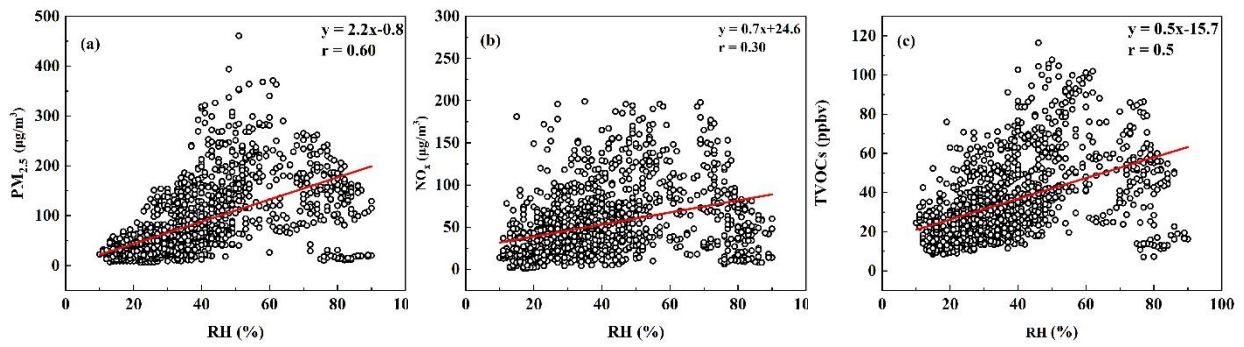
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Fig. S2. (a) the $Q_{true}/Q_{expected}$ ratio for different F_{peak} value solutions; (b) The $Q_{true}/Q_{expected}$ ratios in different solutions.

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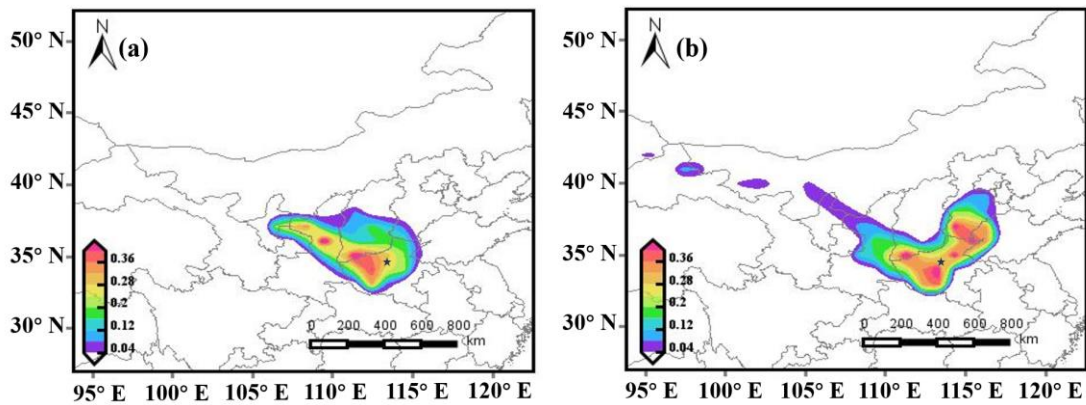


30 **Fig. S3. Relative humidity and (a) PM_{2.5}, (b) NO_x, (c) TVOCs correlation.**

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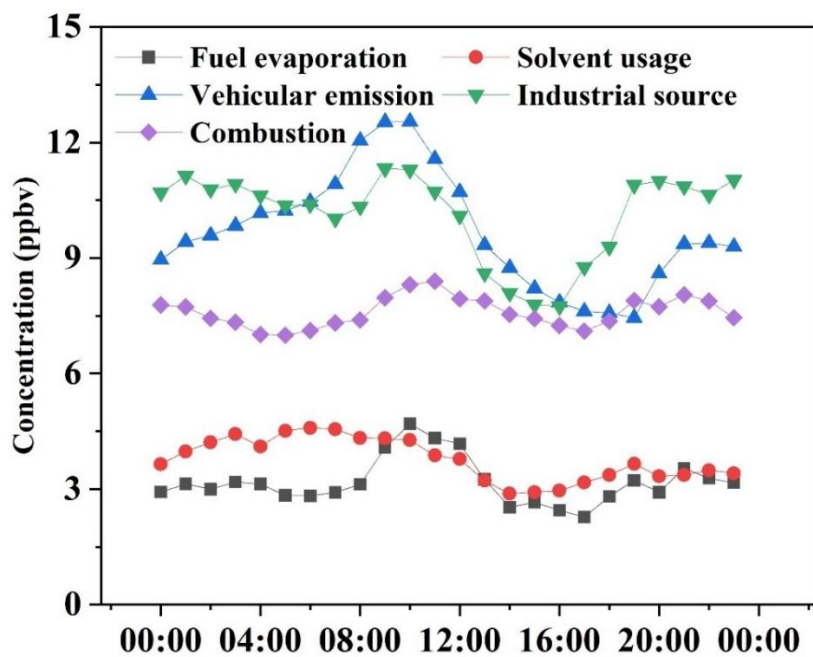
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35 **Fig. S4. Potential source areas for VOCs (a) Infection period (b) Recovery period**
 36 **(Black pentagrams represent sampling locations).**

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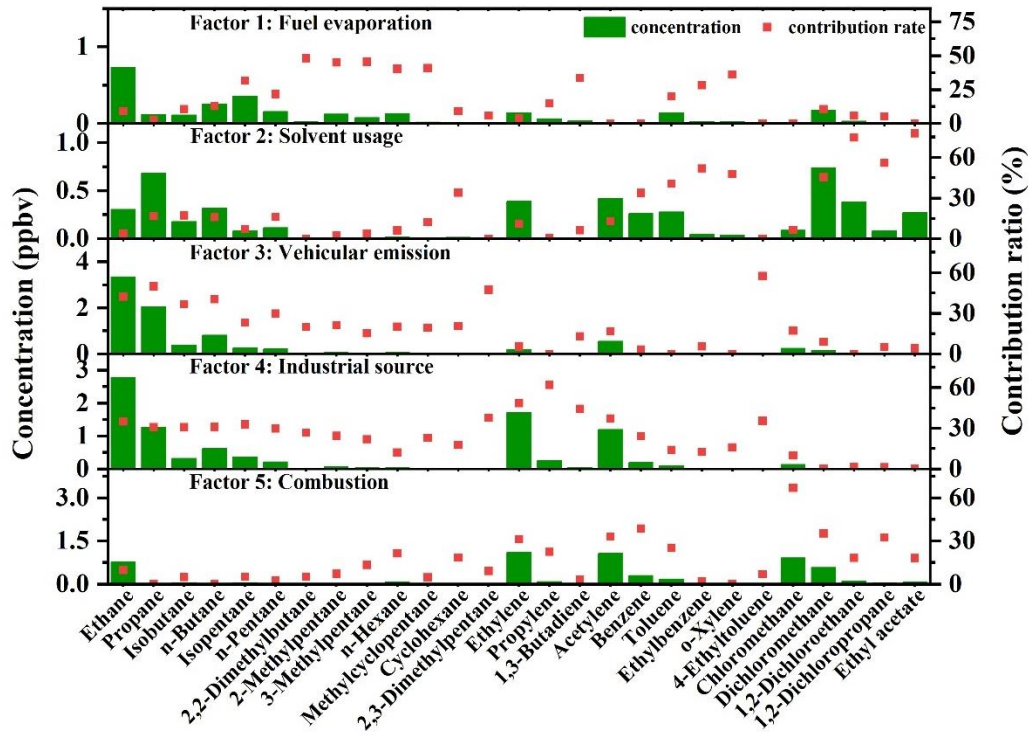


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39Fig. S5. Characteristics of daily changes in different sources obtained using the PMF
40 model.

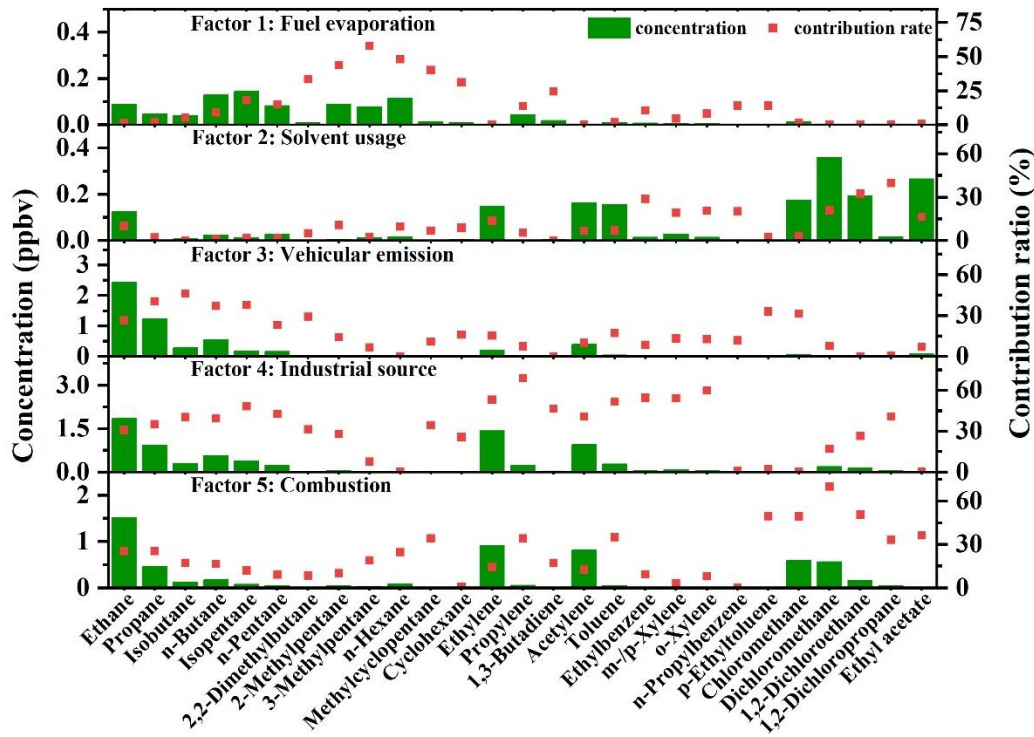
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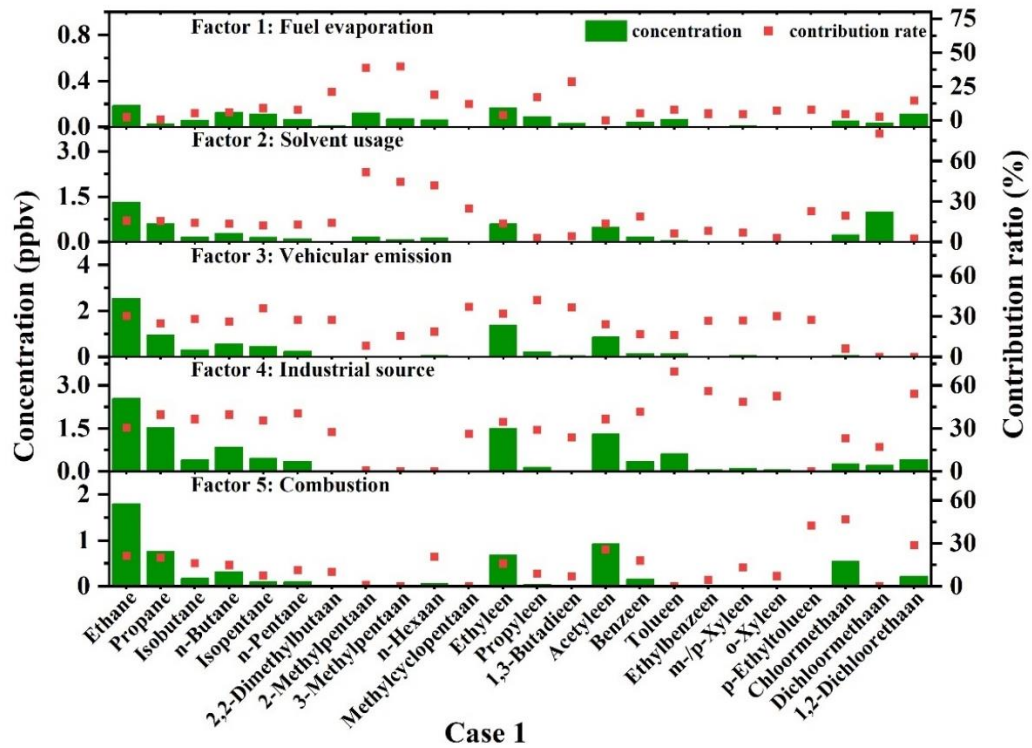
recovery period

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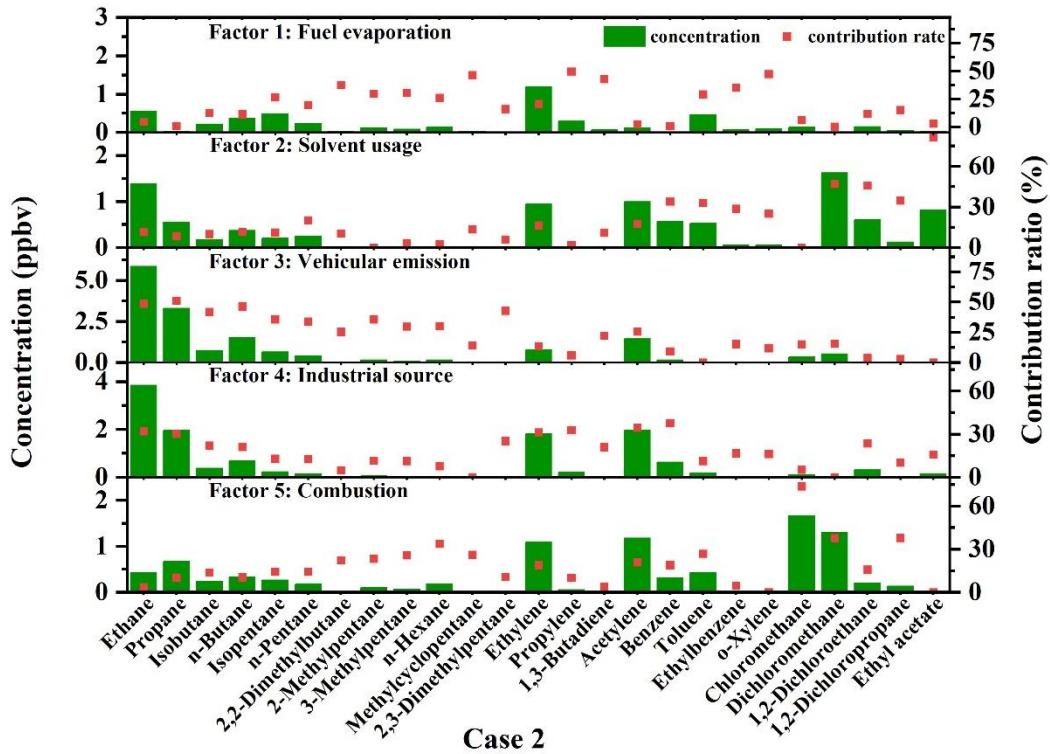


infection period

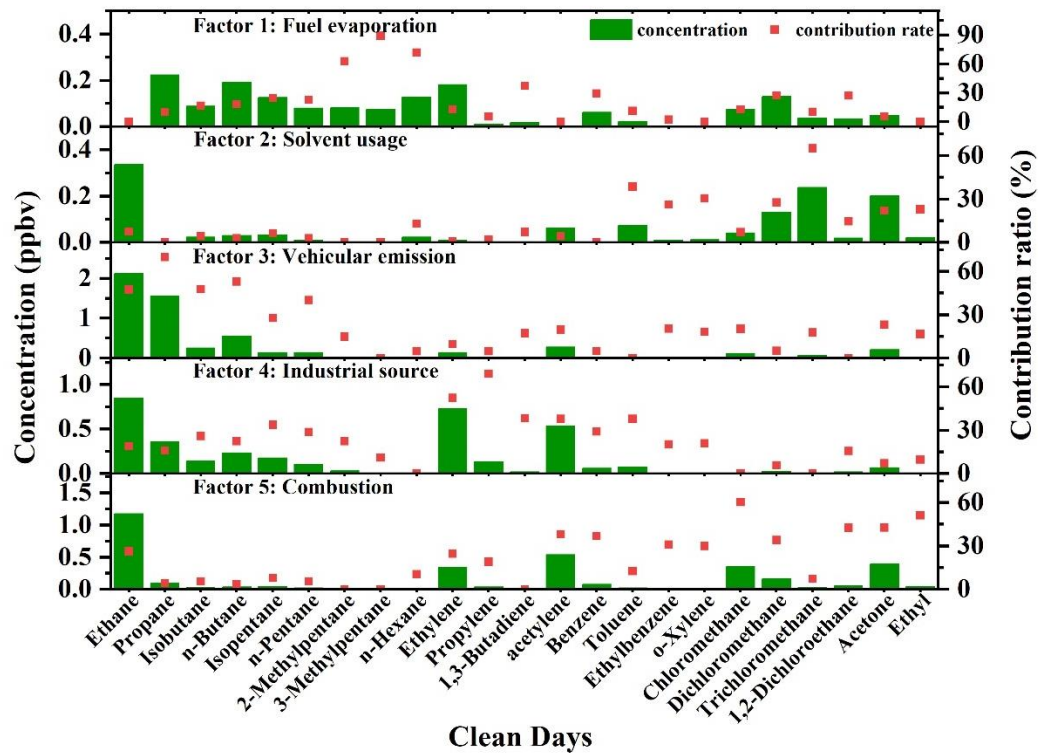
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48 Fig. S6. Infection period, recovery period, high pollution events, and clean days PMF
 49 source analysis.

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Table S1. Specific VOCs concentrations and ratios.

species	Concentration (ppbv)	Ratio
toluene	0.7	toluene/benzene = 1.0
benzene	0.7	
isopentane	1.0	isopentane/n-pentane = 1.4
n-pentane	0.7	
isobutane	0.9	Isobutane/n-butane = 0.5
n-butane	1.8	
m/p-xylene	0.2	m/p-xylene/ethylbenzene = 2.0
ethylbenzene	0.1	

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Table S2. Concentrations of important tracer substances in different processes (ppbv) (observations in parentheses).

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Source	ethane						2-Methylpentane					
	Infection	Recovery	Entire	Case 1	Case 2	Clean days	Infection	Recovery	Entire	Case 1	Case 2	Clean days
Factor 1 Fuel evaporation	0.09	0.73	0.41	0.19	0.55	0	0.09	0.12	0.10	0.12	0.13	0.08
Factor 2 Solvent usage	0.14	0.30	0	1.32	1.38	0.34	0.01	0.01	0.01	0.16	0	0
Factor 3 Vehicle emission	2.39	3.35	2.91	2.55	5.85	2.12	0.02	0.06	0.06	0.03	0.16	0.02
Factor 4 Industrial source	1.83	2.77	2.5	2.54	3.84	0.85	0.06	0.07	0.07	0.01	0.05	0.03
Factor 5 Combustion	1.55	0.76	1.36	1.80	0.43	1.17	0.04	0.02	0	0	0.10	0
sum	6.00 (6.80)	7.91 (7.81)	7.18 (6.80)	8.40 (10.06)	12.05 (12.17)	4.48 (4.30)	0.22 (0.25)	0.28 (0.26)	0.24 (0.24)	0.32 (0.37)	0.44 (0.45)	0.13 (0.14)
	benzene						methyl chloride					
Factor 1 Fuel evaporation	0.02	0	0.06	0.04	0.01	0.06	0.02	0	0.08	0.05	0.14	0.07
Factor 2 Solvent usage	0.13	0.26	0.16	0.17	0.57	0	0.18	0.09	0	0.23	0	0.04
Factor 3 Vehicle emission	0.01	0.03	0.07	0.15	0.15	0.01	0.06	0.23	0.06	0.07	0.34	0.12

Factor 4 Industrial source	0.16	0.19	0.09	0.36	0.63	0.06	0	0.13	0.30	0.27	0.11	0	
Factor 5 Combustion	0.24	0.3	0.33	0.16	0.31	0.08	0.58	0.91	0.72	0.55	1.67	0.35	
sum	0.56 (0.65)	0.78 (0.83)	0.71 (0.69)	0.88 (1.10)	1.67 (1.74)	0.21 (0.20)	0.84 (0.99)	1.36 (1.43)	1.16 (1.14)	1.17 (1.37)	2.26 (2.35)	0.58 (0.54)	
	ethyl acetate												
Factor 1 Fuel evaporation	0	0	0.01	0.02	0.03	0							
Factor 2 Solvent usage	0.27	0.27	0.72	0.63	0.80	0.02							
Factor 3 Vehicle emission	0.08	0.01	0.03	0.01	0	0.01							
Factor 4 Industrial source	0	0	0.02	0.08	0.16	0.01							
Factor 5 Combustion	0	0.06	0.01	0.01	0	0.04							
sum	0.35 (0.45)	0.34 (0.40)	0.79 (0.68)	0.75 (0.81)	0.99 (1.09)	0.08 (0.06)							

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Table S3. Top 10 VOC species of SOAP in Case 1.

Material	SOAP/ $\mu\text{g}/\text{m}^3$	percentage of measured VOCs /%
toluene	34.6	51.7
m/p-Xylene	9.8	14.6
benzene	8.5	12.7
o-xylene	4.3	6.4
ethylbenzene	4.3	6.4
m-Ethyltoluene	1.4	2.1
1,2,4-Trimethylbenzene	1.1	1.6
1,3,5-Trimethylbenzene	0.7	1.0
o-Ethyltoluene	0.5	0.7
1,2,3-Trimethylbenzene	0.5	0.7
The total of top 10 species	65.7	97.9

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Table S4. Top 10 VOC specie of SOAP in Case 2.

Material	SOAP/ $\mu\text{g}/\text{m}^3$	percentage of measured VOCs /%
toluene	49.4	45.2
m/p-Xylene	19.4	17.8
benzene	13.4	12.3
ethylbenzene	7.5	6.9
o-xylene	7.5	6.9
1,3,5-Trimethylbenzene	2.2	2.0
m-Ethyltoluene	1.9	1.7
1,2,4-Trimethylbenzene	1.5	1.4
o-Ethyltoluene	1.2	1.1
1,2,3-Trimethylbenzene	1.1	1.0
The total of top 10 species	105.1	96.3

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Reference

CCDCP, Chinese Center for Disease Control and Prevention
https://www.chinacdc.cn/jkzt/crb/zl/szkb_11803/jszl_13141/202302/t20230201_263576.html (Accessed at 18 Nov. 2023)