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

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

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

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

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

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

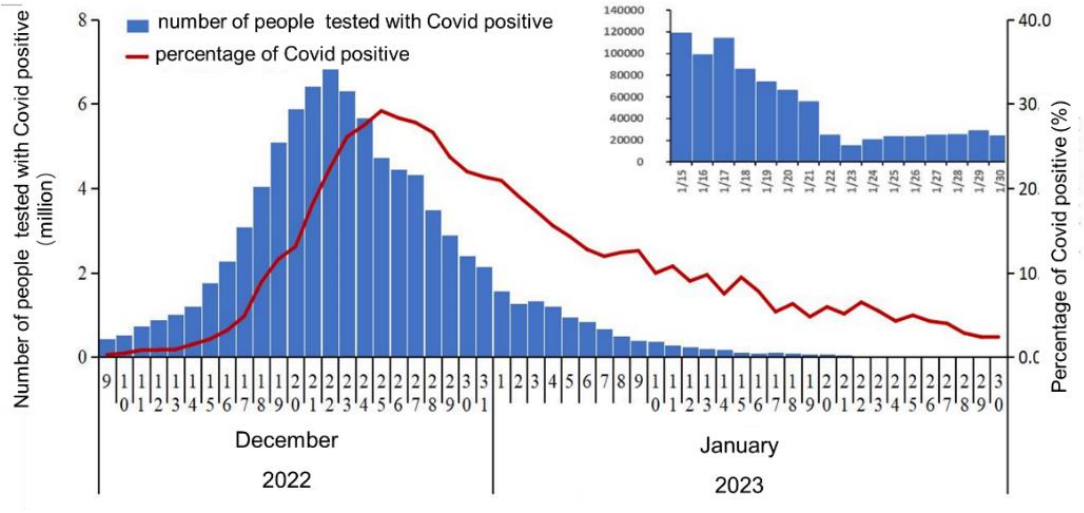
Fig. S6. Infection period, recovery period, high pollution events, and clean days PMF source analysis.

Table S1. Specific VOCs concentrations and ratios.

Table S2. Concentrations of important tracer substances in different processes (ppbv) (observations in parentheses, red text indicates the corresponding source concentration of the substance).

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

Table S4. Top 10 VOC species of SOAFP in Case 2.



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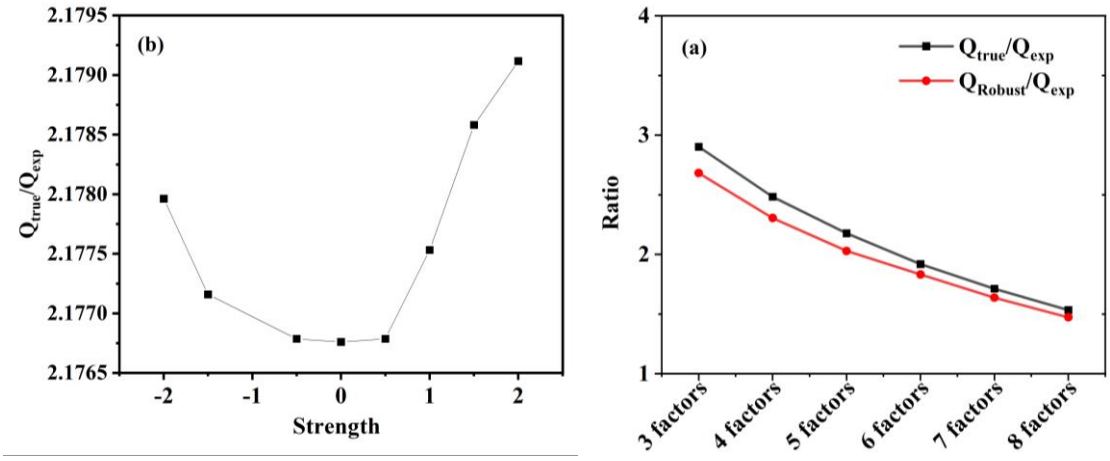

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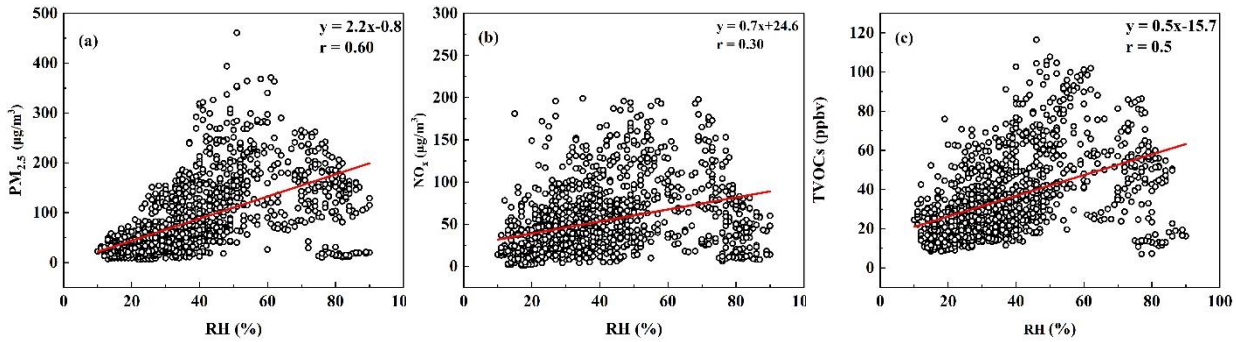

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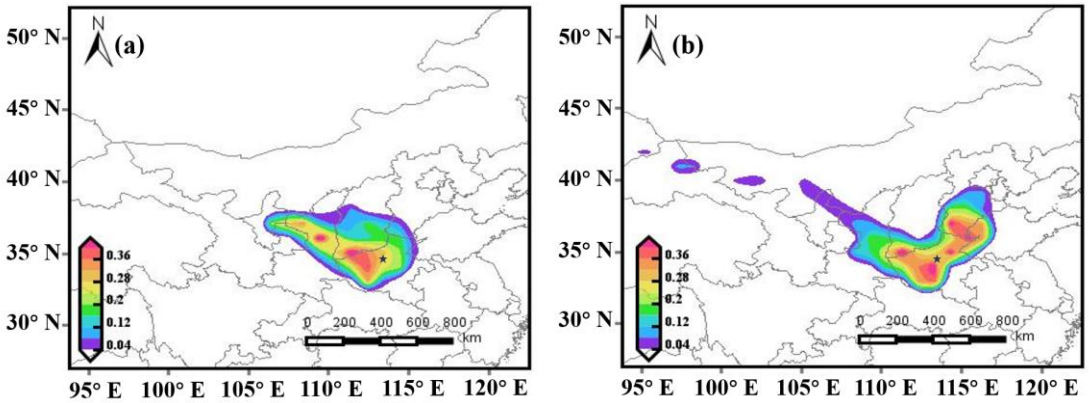

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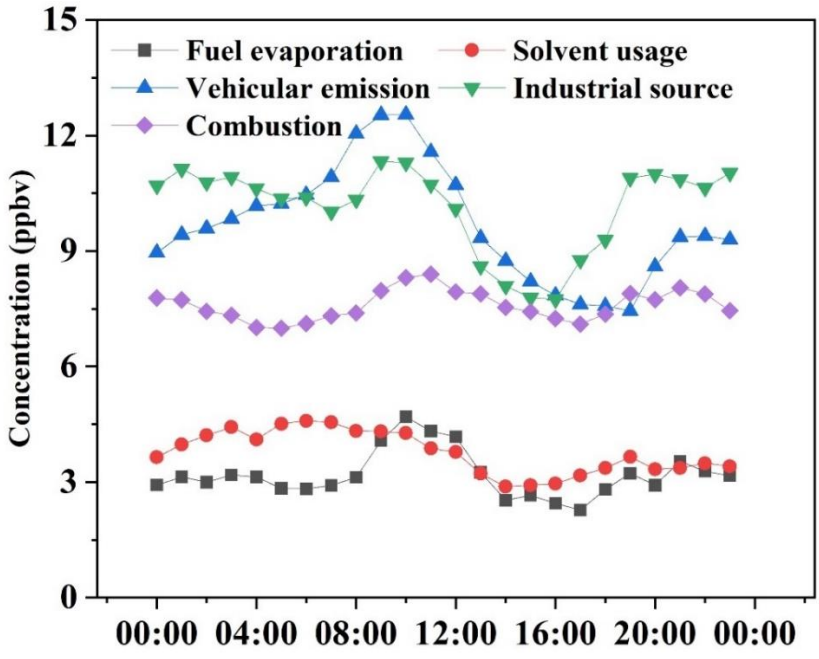

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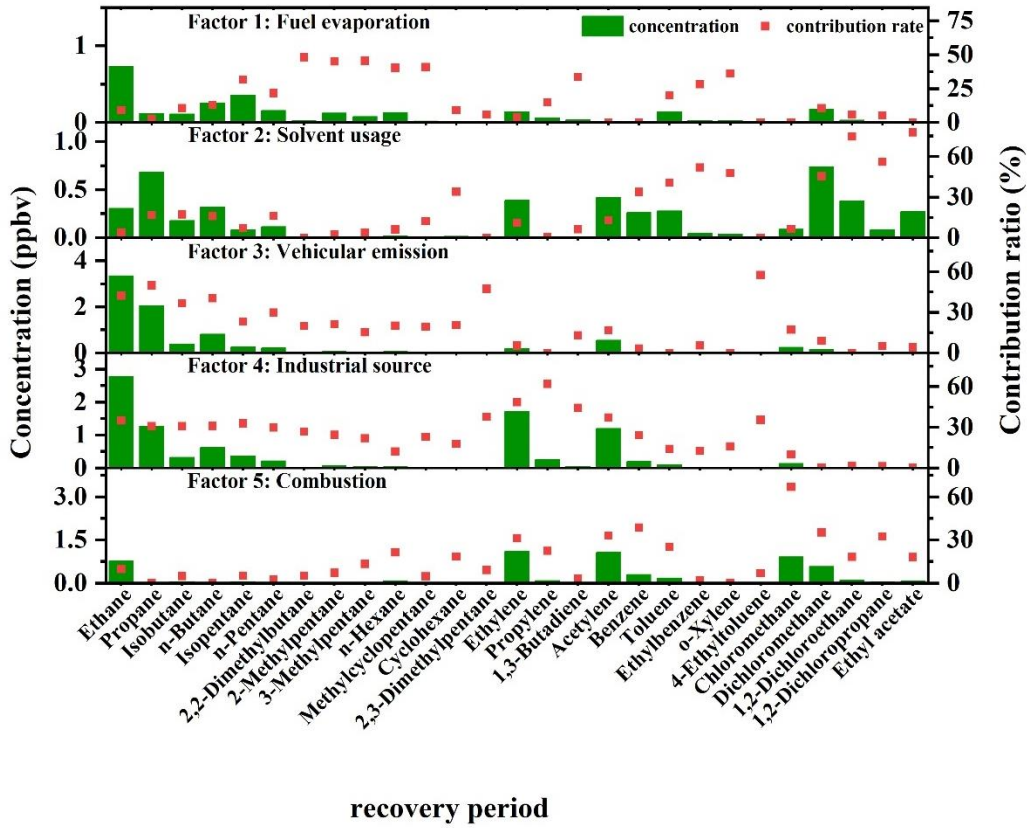
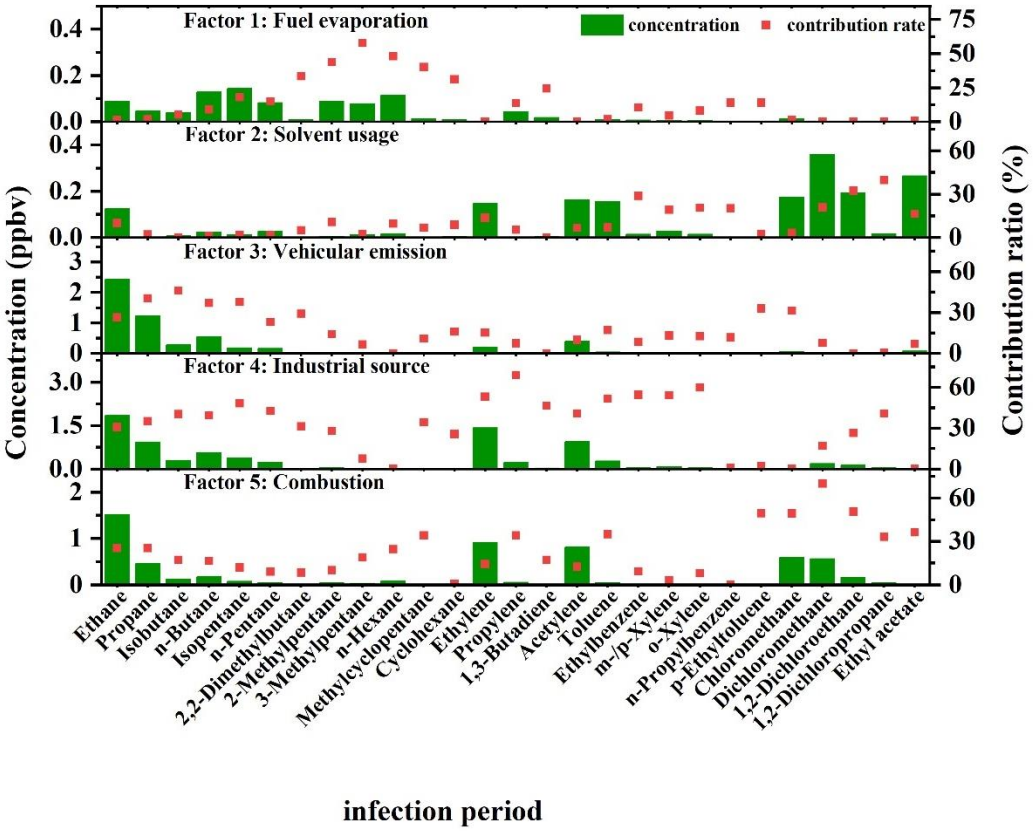

Factor 1: Fuel evaporation
concentration
contribution rate
Factor 2: Solvent usage
Factor 3: Vehicular emission
Factor 4: Industrial source
Factor 5: Combustion
Concentration (ppbv)
Contribution ratio (%)
Ethane
Propane
Isobutane
n-Butane
Isopentane
n-Pentane
2,2-Dimethylbutane
2-Methylpentane
3-Methylpentane
n-Hexane
Methylcyclopentane
Cyclohexane
2,3-Dimethylpentane
Ethylene
Propylene
1,3-Butadiene
Acetylene
Benzene
Toluene
Ethylbenzene
o-Xylene
4-Ethyltoluene
Chloromethane
Dichloromethane
1,2-Dichloroethane
1,2-Dichloropropane
Ethyl acetate
recovery period

43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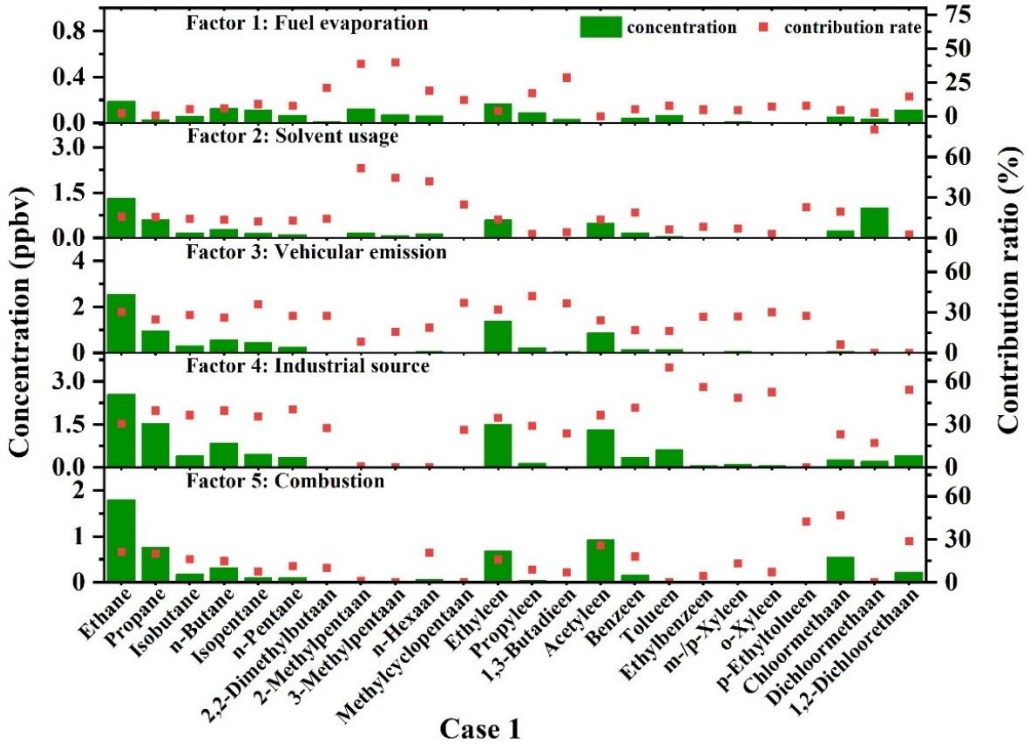
Methylcyclopentane
Cyclohexane
Ethylene
Propylene
1,3-Butadiene
Acetylene
Toluene
Ethylbenzene
m-/p-Xylene
o-Xylene
n-Propylbenzene
p-Ethyltoluene
Chloromethane
Dichloromethane
1,2-Dichloroethane
1,2-Dichloropropane
Ethyl acetate
infection period

44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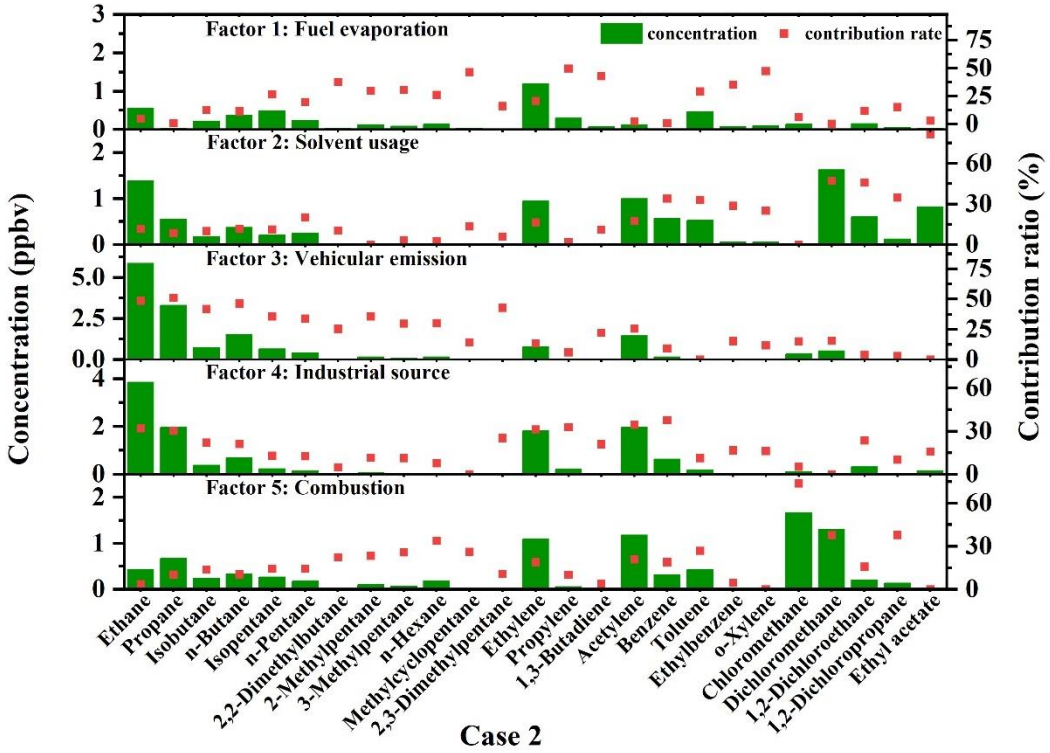
2-Methylpentaan
3-Methylpentaan
n-Hexaan
Methylcyclopentaan
Ethyleen
Propyleen
1,3-Butadieen
Acetyleen
Benzeen
Tolueen
Ethylbenzeen
m-/p-Xyleen
o-Xyleen
p-Ethyltolueen
Chloormethaan
Dichloormethaan
1,2-Dichloorethaan
Case 1

45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Ethane
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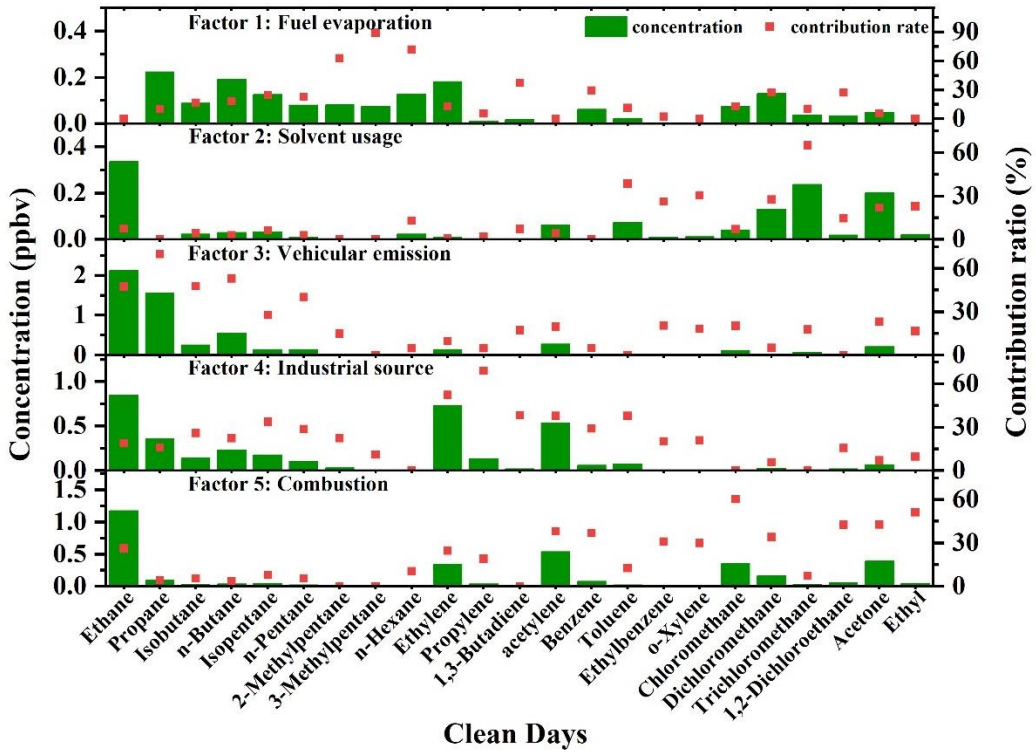
3-Methylpentane
n-Hexane
Methylcyclopentane
2,3-Dimethylpentane
Ethylene
Propylene
1,3-Butadiene
Acetylene
Benzene
Toluene
Ethylbenzene
o-Xylene
Chloromethane
Dichloromethane
1,2-Dichloroethane
1,2-Dichloropropane
Ethyl acetate
Case 2

46



47

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

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51

52 **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	

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

	ethane						2-Methylpentane					
Source	**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)**						

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

Material	SOAP/μg/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

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

Material	SOAP/μg/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

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)