

# Characteristics and Source Apportionment of VOCs in a City with Complex Pollution in China

Table S1 Factor analysis results for VOCs in spring.

VOCs	PCA source loadings				
	PC1	PC2	PC3	PC4	PC5
n-Butane	0.9	0.2	0.0	0.0	0.0
Propane	0.9	0.3	0.0	0.1	-0.1
i-Butane	0.9	0.0	-0.1	0.0	0.0
m,p-Xylene	0.8	0.4	0.2	0.2	0.2
2-Methylpentane	0.8	0.0	-0.2	0.2	0.0
n-Pentane	0.7	0.2	0.4	0.1	0.1
Toluene	0.6	0.4	0.1	0.2	0.1
Ethylbenzene	0.5	0.2	0.3	0.3	0.5
Ethene	0.2	0.9	0.1	-0.1	0.0
Ethane	0.4	0.7	0.1	0.0	-0.1
Benzene	0.4	0.6	0.0	0.1	0.0
n-Dodecane	0.0	0.2	0.8	0.1	0.2
p-Diethylbenzene	0.0	-0.1	0.8	0.1	0.0
Acetylene	-0.1	0.4	0.4	0.2	0.0
n-Octane	0.1	0.0	-0.4	0.5	0.2
n-Hexane	0.1	0.0	-0.1	0.8	0.0
Styrene	0.0	0.1	0.4	0.8	0.2
i-Pentane	0.3	0.0	0.3	0.5	-0.1
m-Diethylbenzene	-0.1	0.0	0.0	-0.2	0.9
2,2-Dimethylbutane	0.2	-0.2	0.1	0.3	0.8
Variance (%)	27.0	12.5	11.8	11.6	9.6
Source	LPG/NG and solvent use	automobile exhaust	diesel vehicle	industrial	solvent use

Table S2 Factor analysis results for VOCs in summer.

VOCs	PCA source loadings					
	PC1	PC2	PC3	PC4	PC5	PC6
i-Butane	0.9	-0.1	0.1	0.2	0.1	0.0
n-Butane	0.9	-0.1	0.1	0.2	-0.1	0.1
Propane	0.8	-0.2	0.3	0.2	0.1	0.1
n-Pentane	0.8	-0.1	0.1	0.3	0.0	0.0
Acetylene	0.5	0.0	0.3	0.0	0.1	-0.2
n-Hexane	0.4	-0.2	0.2	0.0	0.3	0.0
i-Pentane	0.0	0.5	-0.1	0.0	0.0	-0.1

Styrene	-0.1	0.9	-0.1	-0.1	-0.1	0.1
Ethylbenzene	0.1	0.9	-0.1	0.4	0.0	0.1
2-Methylpentane	-0.2	0.9	-0.1	0.0	0.0	0.0
Isoprene	-0.3	0.5	0.0	-0.2	0.3	-0.3
Ethene	0.1	-0.1	0.9	0.1	0.0	0.0
Benzene	0.2	-0.1	0.9	0.1	0.1	0.1
Ethane	0.5	-0.2	0.8	0.1	0.1	0.1
o-Xylene	0.3	0.0	0.0	0.8	0.1	-0.1
m,p-Xylene	0.5	0.1	0.1	0.8	0.0	0.0
Toluene	0.2	0.0	0.3	0.6	-0.1	0.1
p-Diethylbenzene	0.1	0.0	-0.1	-0.1	0.7	0.1
n-Dodecane	0.0	0.1	0.3	0.3	0.7	-0.1
Isoprene	0.0	0.0	0.1	0.0	0.1	0.9
Variance	20.7	18.7	14.5	10.9	6.3	5.5
Source	gasoline evaporation	solvent use	automobile exhaust	industrial	diesel vehicle	biogenic

Table S3 Factor analysis results for VOCs in autumn.

VOCs	PCA source loadings				
	PC1	PC2	PC3	PC4	PC5
Toluene	0.9	0.2	0.2	0	0
o-Xylene	0.9	0.2	0.2	0	0.1
m,p-Xylene	0.9	0.2	0.2	0	0.1
Ethylbenzene	0.8	0.2	0.2	0	0.1
n-Pentane	0.8	0.5	0.1	-0.1	0.1
Styrene	0.7	0.2	0.2	0	0.2
n-Butane	0.7	0.6	0.1	0	0.2
i-Pentane	0.7	0.6	0.1	0	0.1
n-Decane	0.7	0.5	0.3	-0.1	0.1
m-Ethyltoluene	0.6	0.4	0.2	-0.1	0
Ethane	0.4	0.8	0.3	0	-0.1
Propane	0.6	0.7	0.1	-0.1	0.1
n-Undecane	0	0.2	0.1	0	0.1
Ethene	0.4	0.3	0.8	0	0
Benzene	0.6	0.3	0.7	0	0
n-Dodecane	-0.3	-0.1	-0.1	0.9	-0.1
2,2-Dimethylbutane	0	-0.1	0	0.6	-0.1
cis-2-Butene	0.1	0.1	0.1	0.3	0
p-Diethylbenzene	0	-0.1	0	0.1	0.1
Acetylene	0.3	0.3	0.1	0	0.9
Variance	36.7	15.5	8.0	6.6	5.1
Source	solvent use and fuel volatilization	gasoline vehicle emissions	industrial	diesel vehicle	biomass combustion

Table S4 Factor analysis results for VOCs in winter.

VOCs	PCA source loadings			
	PC1	PC2	PC3	PC4
Ethene	0.9	0.0	0.0	0.0
Ethane	0.9	0.4	0.1	0.0
Propene	0.9	0.3	0.1	-0.1
Benzene	0.8	0.4	0.0	0.0
Propane	0.7	0.6	0.2	0.0
Toluene	0.7	0.5	0.1	0.1
i-Butane	0.7	0.6	0.2	-0.1
m,p-Xylene	0.6	0.6	0.1	0.2
p-Diethylbenzene	0.0	0.8	0.1	0.3
n-Pentane	0.5	0.7	0.2	-0.1
i-Pentane	0.5	0.7	0.3	-0.1
o-Xylene	0.6	0.7	0.1	0.1
Ethylbenzene	0.6	0.7	0.1	0.1
n-Decane	0.5	0.7	0.2	0.6
Acetylene	0.6	0.6	0.1	0.0
n-Butane	0.6	0.6	0.2	-0.1
1-Hexene	0.2	0.5	-0.3	-0.1
o-Ethyltoluene	0.1	0.0	0.8	0.2
m-Ethyltoluene	0.2	0.5	0.7	0.0
n-Dodecane	0.0	0.1	0.1	0.9
Variance (%)	36.5	30.5	8.1	5.9
Source	LPG/NG and solvent use	combustion (internal combustion engine emission and fossil fuel)	industrial	diesel vehicle