

1 **Supplementary Information for *Impact of cooking style and oil on***
2 ***semi-volatile and intermediate volatility organic compound emissions***
3 ***from Chinese domestic cooking***

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31 **Table S1.** Details of cooking procedures.

Domestic cooking	Material	Oil temperature
Fried chicken	170 g chicken, 500 mL oil (corn, peanut, soybean, or sunflower oil), a few condiments	145 ~ 150 °C
Kung Pao chicken	150 g chicken, 50 g peanut, 40 mL corn oil, a few condiments	Not stable
Pan-fried tofu	500 g tofu, 200 mL corn oil, a few condiments	100 ~ 110 °C
Stir-fried cabbage	300 g chicken, 40 mL corn oil, a few condiments	95 ~ 105 °C

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41 **Table S2.** Detailed instrumentation parameters of TD-GC \times GC-qMS.

		TDS	CIS	
Carrier gas	He, 50 mL/min	Initial temperature	-90 °C	
Split/splitless	splitless	Split/splitless	Split, ratio = 15	
Temperature program	30°C_60°C/min_280°C (10 min)	Temperature program	-90°C_12°C/s_320°C (5 min)	
				qMS
Carrier gas	He, 1.2 mL/min	Ion source	EI (70 eV, 230 °C)	
Columns	1st Shimadzu SH-Rxi-1ms (30 m \times 0.25 mm \times 0.25 μ m) 2nd BPX50 (2.5 m \times 0.1 mm \times 0.1 μ m)	Mode	TIC	
Temperature program	50 °C(5min)_3 °C/min_250 °C(5min)_10 °C/m in_300 °C(20 min)	Mass range	33-500 amu	

42 **Table S3.** Chemicals qualified and quantified, with CAS numbers, chemical classes, retention times, bins, response surrogates, kOH, yield, and
 43 MIR.

compound	CAS	class_detail	class	retention1	retention2	bins	VOCs	bins_	response_	kOH	yield	MIR
				(min)	(s)		2D	surrogate				
Ethyl Acetate	141-78-6	esters	oxygenated	5.5	0.42	B8_be	VOCs	P1	Hexanoic	1.703	0.05	0.63
			compounds			fore			acid,	8	8	
									methyl			
									ester			
Acetic acid	64-19-7	acids	oxygenated	5.5	0.42	B8_be	VOCs	P1	Heptanoic	0.622	0.05	0.68
			compounds			fore			acid		8	
C6	110-54-3	alkanes	alkanes	5.5	1.41	B8_be	VOCs	P3	C7	5.2	0	1.24
						fore						
1-Butanol	71-36-3	alkanols	oxygenated	6.4	0.57	B8_be	VOCs	P2	1-Hexanol	8.5	0	2.88
			compounds			fore						
1-Penten-3-ol	117-81-7	oxygenated-isopr	oxygenated	6.8	0.54	B8_be	VOCs	P2	1-Hexanol			0.41
		enes	compounds			fore						
Pentanal	110-62-3	aldehydes	oxygenated	6.9	0.66	B8_be	VOCs	P2	Heptanal	28	0.02	4.35
			compounds			fore					1	
1-Heptene	592-76-7	alkenes	alkenes	7.1	1.77	B8_be	VOCs	P4	C7	40	0.01	4.43

							fore				5	
Trichloroethylene	79-01-6	chlorides	chlorides	7.2	0.57	B8_be	VOCs	P2	Ethane,	0.804	0.05	0.64
						fore			hexachlor	8	8	
									o-			
C7	142-82-5	alkanes	alkanes	7.3	2.04	B8_be	VOCs	P5	C7	6.76	0.04	1.07
						fore					8	
C7	110-54-3	n-alkanes	alkanes	7.4	0.33	B8_be	VOCs	P1		5.2	0	1.24
						fore						
1-Pentanol	71-41-0	alkanols	oxygenated	9	0.78	B8_be	VOCs	P2	1-Hexanol	11	0	2.83
			compounds			fore						
Toluene	108-88-3	aromatics	aromatics	9.1	0.51	B8	VOCs	P2		5.63	0.1	4
N-Nitrosodimethylamine	62-75-9	amines	nitrogen-contai	9.3	1.56	B8	VOCs	P4	C8		0.05	
			ning								8	
			compounds									
Heptane, 2-methyl-	592-27-8	b-alkanes	alkanes	9.4	0.39	B8	VOCs	P1	C8	8.276	0.05	1.07
											8	
2-Hexanone	591-78-6	ketones	oxygenated	9.6	0.93	B8	VOCs	P2	2-Decano	9.1	0.05	3.14
			compounds						ne		8	
2-Furanol, tetrahydro-	7326-46-7	aldehydes	oxygenated	9.6	1.2	B8	VOCs	P3	Heptanal		0.02	

			compounds								1	
Hexanal	66-25-1	aldehydes	oxygenated	9.8	0.99	B8	VOCs	P2	Heptanal	30	0.02	4.35
			compounds								1	
1-Octene	111-66-0	alkenes	alkenes	10.2	0.48	B8	VOCs	P1	C8	33.00	0.04	3.25
										41	8	
b-alkanes-C8		b-alkanes	alkanes	10.3	0.45	B8	VOCs	P1	C8		0.05	0.9
											8	
C8	111-65-9	n-alkanes	alkanes	10.7	0.45	B8	VOCs	P1		8.11	0.05	0.9
											8	
Tetrachloroethylene	127-18-4	chlorides	chlorides	10.7	0.78	B8	VOCs	P2	Ethane,	0.213	0.05	0.031
									hexachlor	9	8	
									o-			
Acetic acid, butyl ester	123-86-4	esters	oxygenated	10.7	0.87	B8	VOCs	P2	Hexanoic	4.609	0.05	0.83
			compounds						acid,	4	8	
									methyl			
									ester			
3,3-Dimethylbutane-2-ol	464-07-3	alkanols	oxygenated	11.1	1.14	B8	VOCs	P3	1-Hexanol		0.04	
			compounds								8	
2-Octene, (E)-	13389-42-9	alkenes	alkenes	11.2	0.51	B8	VOCs	P2	C8	61.82	0.04	6

											7	8
Formic acid, pentyl ester	638-49-3	esters	oxygenated compounds	11.2	0.87	B8	VOCs	P2	0.058	C8	0.8	3
Cyclopentanone,	1120-72-5	ketones	oxygenated compounds	11.3	1.41	B8	VOCs	P3	2-Decanone		0.05	
2-methyl-											8	
2-Hexenal, (E)-	6728-26-3	aldehyde-enes	oxygenated compounds	11.6	1.2	B8	VOCs	P3	Heptanal		0.02	1
Furfural	98-01-1	aldehyde-enes	oxygenated compounds	11.6	1.71	B8	VOCs	P4	Heptanal	37.42	0.02	06 1
Cyclopentanol, 2-methyl-, trans-	39947-48-3	alkanols	oxygenated compounds	11.7	0.93	B8	VOCs	P2	1-Hexanol		0.04	8
Butanoic acid, 3-methyl-	503-74-2	acids	oxygenated compounds	12.3	0.84	B8	VOCs	P2	C9	4.102	0.05	4.23 4 8
2-Hexenal	505-57-7	aldehyde-enes	oxygenated compounds	12.3	1.23	B8	VOCs	P3	Heptanal	38.51	0.02	89 1
3-Furanmethanol	4412-91-3	furans	oxygenated compounds	12.6	1.5	B8	VOCs	P4	1-Hexanol		0.05	8
Butanoic acid, 2-methyl-	116-53-0	acids	oxygenated compounds	12.7	0.84	B8	VOCs	P2	C9		0.05	4.23 8

Ethylbenzene	100-41-4	aromatics	aromatics	12.8	1.02	B8	VOCs	P3	7	0.1	3.04
p-Xylene	106-42-3	aromatics	aromatics	13.2	0.99	B9	VOCs	P2	14.3	0.06	5.84
b-alkanes-C9		b-alkanes	alkanes	13.5	0.45	B9	VOCs	P1	C9	0.14	0.78
8-Oxabicyclo[5.1.0]octane	286-45-3	oxygenated-cycl oalkanes	oxygenated compounds	13.7	1.29	B9	VOCs	P3	1-Hexanol	0.41	
2-Heptanone	110-43-0	ketones	oxygenated compounds	13.8	1.08	B9	VOCs	P3	2-Decano ne	11	0.14
Butyrolactone	96-48-0	furanones	oxygenated compounds	13.8	3.69	B9	VOCs	P8	Hexanoic acid, methyl ester	2.308	0.14
4-Heptenal, (Z)-	6728-31-0	aldehyde-enes	oxygenated compounds	14	1.17	B9	VOCs	P3	Heptanal 1	0.02	
Styrene	100-42-5	aromatics	aromatics	14.1	1.26	B9	VOCs	P3	p-Xylene 4	58	0.22
3-Nonene	20063-77-8	alkenes	alkenes	14.2	0.51	B9	VOCs	P2	C9	0.15	6
o-xylene	95-47-6	aromatics	aromatics	14.2	1.11	B9	VOCs	P3	p-Xylene	0.06	5.84
Pentanoic acid	109-52-4	acids	oxygenated compounds	14.4	0.9	B9	VOCs	P2	Heptanoic acid	4.110	0.14

Heptanal	111-71-7	aldehydes	oxygenated compounds	14.4	1.08	B9	VOCs	P3		30	0.02	3.69
											1	
1-Hexanol	111-27-3	alkanols	oxygenated compounds	14.5	0.63	B9	VOCs	P2		15	0	2.69
1-Nonene	124-11-8	alkenes	alkenes	14.6	0.51	B9	VOCs	P2	C9	34.41	0.15	2.6
										71	4	
2-Heptanol	543-49-7	alkanols	oxygenated compounds	14.6	1.2	B9	VOCs	P3	1-Heptanol		0.04	1.84
											8	
Pentane, 1-nitro-	628-05-7	nitro-alkanes	nitrogen-containing compounds	14.9	1.23	B9	VOCs	P3	C9		0.14	
Cyclohexanecarboxaldehyde	2043-61-0	oxygenated-cyclic alkanes	oxygenated compounds	15	1.47	B9	VOCs	P3	1-Hexanol		0.41	
C9	111-84-2	n-alkanes	alkanes	15.2	0.51	B9	VOCs	P2		9.7	0.14	0.78
Nitric acid, pentyl ester	1002-16-0	nitrates	nitrogen-containing compounds	15.3	1.05	B9	VOCs	P3	0.14	C9		
2-Nonene	2216-38-8	alkenes	alkenes	15.7	0.57	B9	VOCs	P2	C9		0.15	6
											4	

Benzene, (1-methylethyl)-	98-82-8	aromatics	aromatics	15.8	0.99	B9	VOCs	P2		6.3	0.03	2.52
											1	
1,3-Nonadiene, (E)-	56700-77-7	alkenes	alkenes	16.1	0.72	B9	VOCs	P2	C9		0.15	2.17
											4	
2-Heptenal, (Z)-	57266-86-1	aldehyde-enes	oxygenated compounds	16.2	1.35	B9	VOCs	P3	Heptanal		0.02	
											1	
4-Oxohex-2-enal	2492-43-5	aldehyde-enes	oxygenated compounds	16.2	2.4	B9	VOCs	P5	Heptanal		0.02	
											1	
2(3H)-Furanone,	1679-47-6	esters	oxygenated compounds	16.2	3.33	B9	VOCs	P7	Hexanoic acid,	2.721	0.14	
dihydro-3-methyl-											4	
											methyl	
											ester	
Bicyclo[3.1.0]hex-2-ene,	2867-05-2	di-isoprenes	alkenes	16.3	0.69	B9	VOCs	P2	C9		0.41	
2-methyl-5-(1-methylethy												
l)-												
Bicyclo[3.1.0]hex-2-ene,	28634-89-1	di-isoprenes	alkenes	16.3	0.69	B9	VOCs	P2	C9		0.41	
4-methyl-1-(1-methylethy												
l)-												
aldehyde-enes-trans-2-Do	20407-84-5	aldehyde-enes	oxygenated	16.4	1.02	B9	VOCs	P3	Heptanal		0.02	

decenal-surrogate			compounds								1	
Cyclohexane, propyl-	1678-92-8	cyclo-alkanes	alkanes	16.5	0.69	B9	VOCs	P2	C9	13.40	0.14	1.29
											45	
3-Ethylcyclopentanone	10264-55-8	ketones	oxygenated compounds	16.5	1.71	B9	VOCs	P4	2-Decanone	0.14	2.36	
alpha-Pinene	80-56-8	di-isoprenes	alkenes	16.6	0.72	B9	VOCs	P2	C9	52.3	0.41	4.51
Cyclopentane, butyl-	2040-95-1	cyclo-alkanes	alkanes	16.7	0.66	B9	VOCs	P2	C9	0.14	1.29	
2-Heptenal, (E)-	18829-55-5	aldehyde-enes	oxygenated compounds	16.7	1.59	B9	VOCs	P4	Heptanal	0.02		1
Benzaldehyde	100-52-7	aldehydes	oxygenated compounds	16.7	2.25	B9	VOCs	P5	Heptanal	12	0.38	
3-Nonen-1-yne, (E)-	70600-49-6	alkynes	alkynes	17	0.93	B9	VOCs	P2	C9	0.15		4
2(3H)-Furanone, dihydro-5-methyl-	108-29-2	esters	oxygenated compounds	17.1	3.33	B9	VOCs	P7	0.14	C9		
Cyclohexene, 4-propyl-	13487-64-4	cyclo-alkanes	alkanes	17.2	0.81	B9	VOCs	P2	C9	0.14	1.29	
Benzene, propyl-	103-65-1	aromatics	aromatics	17.2	1.11	B9	VOCs	P3		5.8	0.1	2.03
cis-2,3-Epoxyoctane	23024-54-6	oxygenated-alkanes	oxygenated compounds	17.3	0.93	B9	VOCs	P2	Octanal	0.14		

Benzene,	622-96-8	aromatics	aromatics	17.7	1.11	B10	VOCs	P3	Benzene,	11.8	0.1	4.44
1-ethyl-4-methyl-									propyl-			
Benzonitrile	100-47-0	nitriles	nitrogen-contai ning	17.8	2.4	B10	VOCs	P5		0.344	0.22	
			compounds						3			
4-Methyl-5H-furan-2-one	6124-79-4	furanones	oxygenated compounds	17.9	3.21	B10	VOCs	P7	0.22	C10		
1-Octen-3-one	4312-99-6	ketone-enes	oxygenated compounds	18	1.26	B10	VOCs	P3	Isophorone		0.04	1.4
									8			
Benzene, 1,2,3-trimethyl-	526-73-8	aromatics	aromatics	18.1	1.08	B10	VOCs	P3	Benzene,	32.7	0.07	11.97
									propyl-			5
beta-Pinene	127-91-3	di-isoprenes	alkenes	18.4	0.87	B10	VOCs	P2	C10		0.22	3.52
1-Octen-3-ol	3391-86-4	alkanols	oxygenated compounds	18.4	1.08	B10	VOCs	P3	1-Heptanol		0.04	
									8			
Furan,	1004-29-1	tetrahydro-furans	oxygenated compounds	18.4	1.5	B10	VOCs	P4	1-Hexanol	23.56	0.22	2.13
2-butyltetrahydro-									32			
Benzene,	611-14-3	aromatics	aromatics	18.5	1.2	B10	VOCs	P3	Benzene, propyl-		0.07	
1-ethyl-2-methyl-									5			
b-alkanes-C10		b-alkanes	alkanes	18.7	0.57	B10	VOCs	P2	C10		0.22	0.68

2-Octanone	111-13-7	ketones	oxygenated compounds	18.7	1.17	B10	VOCs	P3	2-Decano ne	11	0.22	1.4
1-Heptanol	111-70-6	alkanols	oxygenated compounds	18.8	0.99	B10	VOCs	P2		14	0.04	1.84
2,4-Heptadienal	5910-85-0	aldehyde-enes	oxygenated compounds	18.8	1.62	B10	VOCs	P4	Octanal		0.02	1
Cyclohexane, isocyanato-	3173-53-3	CN	nitrogen-containing compounds	18.9	1.38	B10	VOCs	P3	C10		0.22	
Phenol	108-95-2	phenols	oxygenated compounds	18.9	1.59	B10	VOCs	P4	Phenol, 2,4-dimethyl-	33.46	0.38	2.76
Hexanoic acid	142-62-1	acids	oxygenated compounds	19	1.23	B10	VOCs	P3	Heptanoic acid	5.523	0.22	8
Furan, 2-pentyl-	3777-69-3	furans	oxygenated compounds	19.2	0.99	B10	VOCs	P2	1-Heptanol		0.22	
Benzene,	620-14-4	aromatics	aromatics	19.3	1.17	B10	VOCs	P3	Benzene, propyl-	18.6	0.1	7.39
1-ethyl-3-methyl-												
Benzene, 1,2,4-trimethyl-	95-63-6	aromatics	aromatics	19.3	1.2	B10	VOCs	P3	Benzene,	32.5	0.06	8.87

										propyl-		
Octanal	124-13-0	aldehydes	oxygenated	19.3	1.2	B10	VOCs	P3		31.65	0.02	3.16
			compounds							7	1	
2,4-Heptadienal, (E,E)-	4313-03-5	aldehyde-enes	oxygenated	19.3	1.74	B10	VOCs	P4	Octanal		0.02	
			compounds								1	
beta-Myrcene	123-35-3	di-isoprenes	alkenes	19.4	0.84	B10	VOCs	P2	C10	215	0.11	4.51
1,2-Heptanediol	3710-31-4	di-ols	oxygenated	19.4	1.5	B10	VOCs	P4	1-Heptanol		0.04	
			compounds								8	
1-Decene	872-05-9	alkenes	alkenes	19.6	0.6	B10	VOCs	P2	C10	35.83	0.31	2.17
										02	7	
2-Octanol	123-96-6	alkanols	oxygenated	19.6	0.99	B10	VOCs	P2	1-Octanol		0.05	1.43
			compounds								8	
Cyclohexanol,	69542-91-2	alkanols	oxygenated	19.7	1.23	B10	VOCs	P3	1-Octanol		0.05	
2,4-dimethyl-			compounds								8	
trans-3-Decene	19150-21-1	alkenes	alkenes	19.8	0.63	B10	VOCs	P2	C10		0.31	
											7	
C10	124-18-5	n-alkanes	alkanes	20.2	0.57	B10	VOCs	P2		11	0.22	0.68
Acetic acid, hexyl ester	56219-06-8	esters	oxygenated	20.2	1.05	B10	VOCs	P3	0.22	C10	0.8	
			compounds								3	

UCM3		UCMs	UCMs	20.4	2.28	B10	VOCs	P5	C10	0.22	0.68
3-Cyclohexene-1-carboxaldehyde, 1-methyl-	931-96-4	aldehydes	oxygenated compounds	20.5	1.65	B10	VOCs	P4	Octanal	0.02	1
Phenol, 2-chloro-	95-57-8	chlorides	chlorides	20.5	1.77	B10	VOCs	P4	p-Cresol	9.870	0.22
										6	
2H-Pyran-2-one, tetrahydro-	542-28-9	pyranones	oxygenated compounds	20.5	4.26	B10	VOCs	P9	0.22	C10	
Bicyclo[5.3.0]decane aromatics-C3	5661-80-3	cyclo-alkanes	alkanes	20.6	0.81	B10	VOCs	P2	C10	0.22	1.29
	103-65-1	aromatics	aromatics	20.6	1.35	B10	VOCs	P3	Benzene,	5.8	0.1
									propyl-		2.03
2(3H)-Furanone, 5-ethyldihydro-	695-06-7	furanones	oxygenated compounds	20.6	3.18	B10	VOCs	P7	Hexanoic acid,	5.453	0.22
									methyl	8	
									ester		
Benzeneacetaldehyde	122-78-1	aldehydes	oxygenated compounds	20.7	2.43	B10	VOCs	P5	Octanal	26.30	0.38
									55		
o-Cymene	527-84-4	aromatics	aromatics	20.8	1.14	B10	VOCs	P3	Benzene,	8.536	0.06
									propyl-		
Dicyclopentadiene	77-73-6	alkenes	alkenes	20.9	1.2	B10	VOCs	P3	C10	0.34	

											4
di-isoprenens		di-isoprenes	alkenes	20.9	1.26	B10	VOCs	P3	C10		0.41
Cyclohexene,	1124-26-1	cyclo-alkanes	alkanes	21	0.84	B10	VOCs	P2	C10		0.22 1.29
3-methyl-6-(1-methylethy											
I)-, trans-											
3,4-Dimethylcyclohexanol	5715-23-1	alkanols	oxygenated compounds	21	1.35	B10	VOCs	P3	1-Octanol		0.05 8
Eucalyptol	470-82-6	oxygenated-di-isoprenes	oxygenated compounds	21.2	1.14	B10	VOCs	P3	1-Octanol		0.41
Indane	496-11-7	aromatics	aromatics	21.2	1.53	B10	VOCs	P4	Benzene, propyl-	19	0.07 3.32 7
D-Limonene	5989-27-5	di-isoprenes	alkenes	21.3	0.93	B10	VOCs	P2	C10	164	0.41
di-isoprenes		di-isoprenes	alkenes	21.3	0.93	B10	VOCs	P2	C10		0.22 4.51
2-Octenal, (E)-	2548-87-0	aldehyde-enes	oxygenated compounds	21.3	1.35	B10	VOCs	P3	Octanal		0.02 1
b-alkanes-C11		b-alkanes	alkanes	21.4	0.54	B10	VOCs	P2	C11		0.33 0.61
2-Methylphenylacetylene	766-47-2	aromatics	aromatics	21.5	1.77	B10	VOCs	P4	Benzene, propyl-		0.06
trans-beta-Ocimene	3779-61-1	di-isoprenes	alkenes	21.6	0.93	B10	VOCs	P2	C10	252	0.41
Bis(2-chloro-1-methyleth	108-60-1	chlorides	chlorides	21.9	1.29	B10	VOCs	P3	0.22 C10		

yl) ether

n-Caproic acid vinyl ester	3050-69-9	esters	oxygenated compounds	21.9	1.53	B10	VOCs	P4	0.22	C10	0.8
Acetophenone	98-86-2	ketones	oxygenated compounds	22	2.34	B10	VOCs	P5	2-Decano ne	1.879	0.38
1,3,6-Octatriene,	3338-55-4	di-isoprenes	alkenes	22.2	0.93	B10	VOCs	P2	C10	252	0.41
3,7-dimethyl-, (Z)-											
Benzene,	1074-43-7	aromatics	aromatics	22.2	1.14	B10	VOCs	P3	Benzene,	15.24	0.1
1-methyl-3-propyl-									propyl-	94	
4,7-Methano-1H-indene,		di-isoprenes	alkenes	22.9	1.08	B11	VOCs	P3	C11		0.41
octahydro-,											
2-Octen-1-ol, (E)-	18409-17-1	alkanols	oxygenated compounds	22.9	1.17	B11	VOCs	P3	1-Octanol		0.04
Benzene,	1074-17-5	aromatics	aromatics	22.9	1.26	B11	VOCs	P3	Benzene,	8.802	0.06
1-methyl-2-propyl-									propyl-	5	
1-Octanol	111-87-5	alkanols	oxygenated compounds	23.1	1.08	B11	VOCs	P3		14	0.5
1,7-Octadien-3-ol,	22460-59-9	oxygenated-bi-isoprenes	oxygenated compounds	23.2	1.23	B11	VOCs	P3	1-Octanol		0.41
2,6-dimethyl-											

2H-Pyran-2-one,	10603-03-9	esters	oxygenated	23.2	3.51	B11	VOCs	P8	0.33	C11
tetrahydro-3-methyl-			compounds							
3-Hydroxy-3-phenylbuta	3155-01-9	oxygenated-arom	oxygenated	23.4	1.89	B11	VOCs	P4	0.38	Pheno
n-2-one		atics	compounds						1	
oxygenated-aromatics		oxygenated-arom	oxygenated	23.5	1.86	B11	VOCs	P4	0.38	Pheno
		atics	compounds						1	
oxygenated-bi-isoprenes		oxygenated-bi-is	oxygenated	23.6	1.47	B11	VOCs	P3	1-Octanol	0.41
		oprenes	compounds							
oxygenated-di-isoprenes		oxygenated-di-is	oxygenated	23.7	1.44	B11	VOCs	P3	1-Octanol	0.41
		oprenes	compounds							
p-Cresol	106-44-5	phenols	oxygenated	23.7	1.47	B11	VOCs	P3	41.13	0.38
			compounds						2.4	
									05	
n-Amyl ether	693-65-2	ethers	oxygenated	23.8	0.6	B11	VOCs	P2	C11	27.51
			compounds						56	0.33
										2.15
1,10-Undecadiene	13688-67-0	alkenes	alkenes	23.8	0.75	B11	VOCs	P2	C11	0.34
									4	
Heptanoic acid	111-14-8	acids	oxygenated	23.8	1.11	B11	VOCs	P3	6.936	0.33
			compounds						9	
UCMs		UCMs	UCMs	23.8	1.41	B11	VOCs	P3	C11	0.33
										0.61

4-Nonenal, (E)-	2277-16-9	aldehyde-enes	oxygenated compounds	23.9	1.26	B11	VOCs	P3	Octanal	0.02	1
Cyclohexene,	586-62-9	di-isoprenes	alkenes	24.4	1.2	B11	VOCs	P3	C11	225	0.2 6.36
1-methyl-4-(1-methylethylidene)-											
Nonanal	124-19-6	aldehydes	oxygenated compounds	24.4	1.29	B11	VOCs	P3	Octanal	33.07	0.02 3.16
Linalool	78-70-6	oxygenated-di-isoprenes	oxygenated compounds	24.6	1.08	B11	VOCs	P3	1-Octanol	119.6	0.41
4-Undecene, (E)-	693-62-9	alkenes	alkenes	24.7	0.66	B11	VOCs	P2	C11	0.34	4
2(5H)-Furanone, 5-(1-methylethyl)-	56767-19-2	furanones	oxygenated compounds	25	2.82	B11	VOCs	P6	0.33	C11	
C11	1120-21-4	n-alkanes	alkanes	25.3	0.6	B11	VOCs	P2		12.3	0.33 0.61
trans,trans-2,9-Undecadiene	821-96-5	alkenes	alkenes	25.5	0.96	B11	VOCs	P2	C11	0.34	4
aromatics-C4	104-51-8	aromatics	aromatics	25.6	1.32	B11	VOCs	P3	Benzene, propyl-	8.723	0.1
2-Undecene, (E)-	693-61-8	alkenes	alkenes	25.7	0.54	B11	VOCs	P2	C11	0.34	

											4
2-Undecene, (Z)-	821-96-5	alkenes	alkenes	25.8	0.69	B11	VOCs	P2	C11	0.34	
											4
2(3H)-Furanone,	105-21-5	furanones	oxygenated	25.8	2.82	B11	VOCs	P6	0.33	C11	
dihydro-5-propyl-			compounds								
oxiranes-surrogate-Oxira	2855-19-8	oxiranes	oxygenated	25.9	1.14	B11	VOCs	P3	Octanal	0.33	
ne, decyl-			compounds								
trans-3-Nonen-2-one	18402-83-0	ketone-enes	oxygenated	26	1.38	B11	VOCs	P3	Isophorone	0.15	
			compounds								4
Cyclopentene,3-hexyl-	37689-18-2	cyclo-alkanes	alkanes	26.3	0.78	B11	VOCs	P2	C11	0.33	1.29
2-Nonenal, (Z)-	60784-31-8	aldehyde-enes	oxygenated	26.4	1.32	B11	VOCs	P3	Octanal	0.02	
			compounds								1
1H-Indene,	824-22-6	aromatics	aromatics	26.5	1.53	B11	VOCs	P4	Benzene, propyl-	0.07	
2,3-dihydro-4-methyl-											7
UCM6		UCMs	UCMs	26.5	2.07	B11	VOCs	P5	C11	0.33	0.61
Cyclopentanone, 3-butyl-	84131-68-0	ketones	oxygenated	26.8	1.59	B11	VOCs	P4	2-Decanone	0.33	
			compounds								
Indane, 1-methyl-	767-58-8	aromatics	aromatics	26.9	1.59	B11	VOCs	P4	Benzene, propyl-	0.07	3.32
											7

2-Nonenal, (E)-	18829-56-6	aldehyde-enes	oxygenated compounds	27	1.35	B11	VOCs	P3	Octanal	0.02
aromatics-C4-surrogate	104-51-8	aromatics	aromatics	27.1	1.44	B11	VOCs	P3	Benzene, propyl-	1 8.723 0.1
1-Propanone, 1-phenyl-	93-55-0	ketones	oxygenated compounds	27.1	2.16	B11	VOCs	P5	2-Decanone	0.38
Phenol, 2,4-dimethyl-	105-67-9	phenols	oxygenated compounds	27.2	1.77	B11	VOCs	P4	50.49 0.38	2.12
Benzene, pentyl-	538-68-1	aromatics	aromatics	27.4	1.23	B11	VOCs	P3	Benzene, propyl-	10.13 0.1 61
Benzoic acid	65-85-0	acids	oxygenated compounds	28	1.95	B12	IVOCs	P4	Heptanoic acid	1.242 0.02
1-Nonanol	143-08-8	alkanols	oxygenated compounds	28.1	1.08	B12	IVOCs	P3	13.95 0.5 53	0.41
3-Cyclohexen-1-ol,	20126-76-5	oxygenated-di-isoprenes	oxygenated compounds	28.2	1.17	B12	IVOCs	P3	1-Nonanol	0.41
4-methyl-1-(1-methylethyl)-										
I-, (R)-										
Naphthalene	91-20-3	PAHs	PAHs	28.2	2.25	B12	IVOCs	P5	23	0.26 3.34
alkenes-C12	7206-28-2	alkenes	alkenes	28.4	0.6	B12	IVOCs	P2	C12	0.46 1.48

Octanoic acid	124-07-2	acids	oxygenated compounds	28.5	1.08	B12	IVOCs	P3	Heptanoic acid	0.02
b-alkanes-C12		b-alkanes	alkanes	28.7	0.6	B12	IVOCs	P2	C12	0.02 0.55
2,4-Nonadienal	557-48-2	aldehyde-enes	oxygenated compounds	28.7	1.5	B12	IVOCs	P4	Octanal	0.02 1
(E,E)-1,3,5-Undecatriene	16356-11-9	alkenes	alkenes	28.8	1.02	B12	IVOCs	P3	C12	0.34 4
4-Decenal, (E)-	65405-70-1	aldehyde-enes	oxygenated compounds	28.9	1.23	B12	IVOCs	P3	Octanal	0.02 1
3-Cyclohexene-1-methanol, I, alpha,alpha,4-trimethyl-, propanoate	80-27-3	oxygenated-di-is oprenes	oxygenated compounds	28.9	1.38	B12	IVOCs	P3	1-Nonanol	0.41
Pyridine, 2-pentyl-	2294-76-0	pyridines	nitrogen-contai ning compounds	29	1.56	B12	IVOCs	P4	Benzene, dodecyl-	0.02
Estragole	140-67-0	oxygenated-arom atics	oxygenated compounds	29	1.74	B12	IVOCs	P4	Phenol, 2,4-dimeth	54.26 23 0.38

										yl-	
3-Dodecene, (E)-	7206-14-6	alkenes	alkenes	29.4	0.72	B12	IVOCs	P2	C12		0.46
										8	
Decanal	112-31-2	aldehydes	oxygenated compounds	29.4	1.17	B12	IVOCs	P3	Octanal	34.48	0.02
										1	
Benzene,	4706-89-2	aromatics	aromatics	29.4	1.29	B12	IVOCs	P3	Benzene, propyl-		0.1
2,4-dimethyl-1-(1-methyle											
thy)-											
2,4-Nonadienal, (E,E)-	5910-87-2	aldehyde-enes	oxygenated compounds	29.5	1.59	B12	IVOCs	P4	Octanal		0.02
										1	
Benzothiazole	95-16-9	SN	nitrogen-containing compounds	29.8	3.09	B12	IVOCs	P7	Benzene, dodecyl-		0.02
Cyclohexane,	1122-82-3	SN	nitrogen-containing compounds	30	2.22	B12	IVOCs	P5	Benzene, dodecyl-		0.02
isothiocyanato-											
C12	112-40-3	n-alkanes	alkanes	30.1	0.63	B12	IVOCs	P2		13.2	0.02
1,2-Benzothiazole	272-16-2	SN	nitrogen-containing	30.1	2.97	B12	IVOCs	P6	Benzene, dodecyl-		0.02

				compounds							
UCM5		UCMs	UCMs	30.3	1.62	B12	IVOCs	P4	C12	0.02	0.55
2-Sec-Butylcyclohexanon e	14765-30-1	aldehydes	oxygenated compounds	30.3	2.04	B12	IVOCs	P5	Octanal	0.02	1
4-Oxononanal	74327-29-0	aldehydes	oxygenated compounds	30.3	2.25	B12	IVOCs	P5	Octanal	0.02	1
2(3H)-Furanone, 5-butyldihydro-alk-di-enes-C12	104-50-7	esters	oxygenated compounds	30.7	2.61	B12	IVOCs	P6	0.02	C12	0.41
2-Decenal, (Z)-	2497-25-8	aldehyde-enes	oxygenated compounds	31.2	1.32	B12	IVOCs	P3	Octanal	0.02	1
2-Cyclohexen-1-one, 3-methyl-6-(1-methylethy l)-	89-81-6	oxygenated-di-isoprenes	oxygenated compounds	31.3	1.86	B12	IVOCs	P4	1-Nonanol	0.41	
Cyclohexanone, 2-butyl-	1126-18-7	aldehydes	oxygenated compounds	31.6	1.89	B12	IVOCs	P4	Octanal	0.02	1
2-Decenal, (E)-	3913-81-3	aldehyde-enes	oxygenated compounds	31.8	1.44	B12	IVOCs	P3	Octanal	0.02	1
2,4-Pentadien-1-ol,		oxygenated-di-is	oxygenated	31.8	1.56	B12	IVOCs	P4	1-Nonanol	0.41	

3-pentyl-, (2Z)-		oprenes	compounds								
(Z)-3-Phenylacrylaldehyd e	57194-69-1	aldehyde-enes	oxygenated compounds	31.8	2.76	B12	IVOCs	P6	Octanal	0.02	1
b-alkanes-C13		b-alkanes	alkanes	31.9	0.6	B12	IVOCs	P2	C13	0.03	0.53
Linalyl acetate	115-95-7	oxygenated-di-isoprenes	oxygenated compounds	31.9	1.08	B12	IVOCs	P3	1-Nonanol	0.41	
Benzene, hexyl-alkynes-C12	1077-16-3 765-03-7	aromatics n-alkynes	aromatics alkynes	32.2 32.4	1.2 0.93	B12 B13	IVOCs IVOCs	P3 P2	Benzene, propyl- C12	0.1 0.46	8
Decanenitrile	1975-78-6	nitriles	nitrogen-containing compounds	32.7	1.26	B13	IVOCs	P3		8.737	0.03
1-Decanol	112-30-1	alkanols	oxygenated compounds	32.8	1.05	B13	IVOCs	P3		15.36	0.5
Nonanoic acid	112-05-0	acids	oxygenated compounds	32.8	1.17	B13	IVOCs	P3	Heptanoic acid	9.763	0.03
Benzene, 1-methoxy-4-(1-propenyl)-, (Z)-	25679-28-1	esters	oxygenated compounds	32.9	1.92	B13	IVOCs	P4	0.1		

Hexanoic acid, pentyl ester	540-07-8	esters	oxygenated compounds	33.3	1.08	B13	IVOCs	P3	0.03	C13	0.4
2,4-Decadienal, (E,Z)-	25152-83-4	aldehyde-enes	oxygenated compounds	33.3	1.68	B13	IVOCs	P4	Octanal		0.02
											1
Naphthalene, 1-methyl-	90-12-0	PAHs	PAHs	33.4	2.13	B13	IVOCs	P5		40.9	0.33
6-Undecanol	23708-56-7	alkanols	oxygenated compounds	33.5	0.99	B13	IVOCs	P2	1-Undecanol	0.1	1.43
cis-Undec-4-enal	68820-32-6	aldehyde-enes	oxygenated compounds	33.6	1.23	B13	IVOCs	P3	Octanal		0.02
											1
2-N-Octylfuran	4179-38-8	furans	oxygenated compounds	33.8	1.02	B13	IVOCs	P3	1-Undecanol		0.03
alkenes-C13	2437-56-1	alkenes	alkenes	34	0.72	B13	IVOCs	P2	C13	40.06	0.45
										93	9
Undecanal	112-44-7	aldehydes	oxygenated compounds	34.1	1.17	B13	IVOCs	P3	Octanal		0.02
											1
Phenol,	59-50-7	chlorides	chlorides	34.1	1.68	B13	IVOCs	P4	0.38	Pheno	
4-chloro-3-methyl-											1
2H-1b,4-Ethanopentaleno	117221-80-	oxygenated-di-is	oxygenated	34.2	1.92	B13	IVOCs	P4	1-Undecanol		0.41
[1,2-b]oxirene,	4	oprenes	compounds								

hexahydro-,

(1a-alpha-,1b-bta-,4-bta-,

4a-alpha-,5a-alpha-) -

2,4-Decadienal, (E,E)-	25152-84-5	aldehyde-enes	oxygenated compounds	34.3	1.98	B13	IVOCs	P4	Octanal	0.02		
Naphthalene, 2-methyl-	91-57-6	PAHs	PAHs	34.3	2.22	B13	IVOCs	P5	Naphthalene,	48.6	0.38	3.06
1,2-Benzenedicarboxylic acid	88-99-3	oxygenated-aromatics	oxygenated compounds	34.3	3.09	B13	IVOCs	P7	0.38	Pheno	1	
C13	629-50-5	n-alkanes	alkanes	34.6	0.66	B13	IVOCs	P2		15.1	0.03	0.53
UCM1		UCMs	UCMs	34.7	2.43	B13	IVOCs	P5	C13		0.03	0.53
Benzoic acid,	3306-36-3	esters	oxygenated compounds	35	1.68	B13	IVOCs	P4	0.03	C13	0.9	
1-methylpropyl ester										8		
UCM2		UCMs	UCMs	35.2	2.04	B13	IVOCs	P5	C13		0.03	0.53
oxo-aldehyde-enes		oxo-aldehyde-enes	oxygenated compounds	35.3	1.8	B13	IVOCs	P4	Octanal		0.03	
2(3H)-Furanone, dihydro-5-pentyl-	104-61-0	furanones	oxygenated compounds	35.5	2.4	B13	IVOCs	P5	0.03	C13		

alkenols-1-Tridecanol-surface	112-70-9	alkanols	oxygenated compounds	35.6	1.11	B13	IVOCs	P3	1-Undecanol	0.45
rogate										9
UCM4		UCMs	UCMs	35.7	1.47	B13	IVOCs	P3	C13	0.03 0.53
2-Undecenal, E-	53448-07-0	aldehyde-enes	oxygenated compounds	35.8	1.29	B13	IVOCs	P3	Octanal	0.02
alpha-Terpinal acetate	80-26-2	oxygenated-di-isoprenes	oxygenated compounds	36	1.32	B13	IVOCs	P3	1-Undecanol	0.41
2,4-Decadienal	2363-88-4	aldehyde-enes	oxygenated compounds	36.1	1.29	B13	IVOCs	P3	Octanal	0.02
1-Undecanol	112-42-5	alkanols	oxygenated compounds	36.3	0.99	B13	IVOCs	P2		16.78 0.5
2-Undecenal	2463-77-6	aldehyde-enes	oxygenated compounds	36.4	1.41	B13	IVOCs	P3	Octanal	0.02
alkynes-C13	26186-02-7	n-alkynes	alkynes	36.5	0.78	B13	IVOCs	P2	C13	0.45
cis-4,5-Epoxy-(E)-2-decenal	188590-62-7	oxo-aldehyde-enes	oxygenated compounds	36.5	1.92	B13	IVOCs	P4	Octanal	0.03
6-Dodecanone	6064-27-3	ketones	oxygenated compounds	37	1.08	B14	IVOCs	P3	2-Decanone	0.42 1.4

Copaene	3856-25-5	tri-isoprenes	alkenes	37.9	0.99	B14	IVOCs	P2	C14	90	0.41
o-Nitroaniline	88-74-4	nitro	nitrogen-containing compounds	37.9	3.15	B14	IVOCs	P7	Decanenitrile	13.45	0.05
b-alkanes-C14		b-alkanes	alkanes	38	0.63	B14	IVOCs	P2	C14		0.05 0.51
alkynes-C14	765-10-6	n-alkynes	alkynes	38.1	0.84	B14	IVOCs	P2	C14		0.50
alkenes-C14	1120-36-1	alkenes	alkenes	38.3	0.75	B14	IVOCs	P2	C14	41.48	0.50 1.34
Benzene,	606-20-2	nitrophenols	nitrogen-containing compounds	38.3	3.45	B14	IVOCs	P7	Phenol, 2,4-dimethyl-	0.272	0.05
2-methyl-1,3-dinitro-											
Dodecanal	112-54-9	aldehydes	oxygenated compounds	38.5	1.17	B14	IVOCs	P3	Octanal		0.02 3.16
2,4-Dodecadienal	13162-47-5	aldehyde-enes	oxygenated compounds	38.8	1.5	B14	IVOCs	P4	Octanal		0.02
C14	629-59-4	n-alkanes	alkanes	38.9	0.69	B14	IVOCs	P2		17.9	0.05 0.51
Benzeneacetic acid, methyl ester	15206-55-0	oxygenated-aromatics	oxygenated compounds	38.9	2.97	B14	IVOCs	P6	0.38 Pheno		
										1	

Longifolene	475-20-7	tri-isoprenes	alkenes	39	1.2	B14	IVOCs	P3	C14	47	0.41
UCM7		UCMs	UCMs	39.5	2.25	B14	IVOCs	P5	C14	0.05	0.51
UCM8		UCMs	UCMs	39.8	2.31	B14	IVOCs	P5	C14	0.05	0.51
UCM9		UCMs	UCMs	40.1	2.31	B14	IVOCs	P5	C14	0.05	0.51
Acenaphthylene	208-96-8	PAHs	PAHs	40.2	2.55	B14	IVOCs	P6		75.49	0.03
										21	
1-Hexanone, 1-phenyl-	942-92-7	ketones	oxygenated compounds	40.3	1.92	B14	IVOCs	P4	2-Decanone		0.38
Undecanoic acid	112-37-8	acids	oxygenated compounds	40.6	1.02	B14	IVOCs	P3		12.58	0.05
										91	
2-Dodecenal	4826-62-4	aldehyde-enes	oxygenated compounds	40.8	1.29	B14	IVOCs	P3	Octanal		0.02
										1	
2,5-Cyclohexadiene-1,4-di	719-22-2	UCMs	UCMs	40.8	1.41	B14	IVOCs	P3	C14		0.05
one,											
2,6-bis(1,1-dimethylethyl)											
-											
Benzoic acid, pentyl ester	2049-96-9	esters	oxygenated compounds	41	1.8	B15	IVOCs	P4	0.08	C15	0.9
										8	
2,6-Di-tert-butyl-4-hydro	10396-80-2	oxygenated-arom	oxygenated	41.1	1.23	B15	IVOCs	P3	0.38	Pheno	

xy-4-methylcyclohexa-2,5-dien-1-one		atics	compounds								1		
b-alkanes-C15		b-alkanes	alkanes	41.5	0.63	B15	IVOCs	P2	C15		0.08	0.5	
alkenes-C15	13360-61-7	alkenes	alkenes	42.3	0.78	B15	IVOCs	P2	C15	42.89	0.53	1.25	
										54			
Tridecanal	10486-19-8	aldehydes	oxygenated compounds	42.6	1.17	B15	IVOCs	P3	Octanal		0.02	3.16	
										1			
o-Hydroxybiphenyl	90-43-7	oxygenated-arom atics	oxygenated compounds	42.7	2.64	B15	IVOCs	P6	0.38	Pheno			
										1			
C15	629-62-9	n-alkanes	alkanes	42.9	0.69	B15	IVOCs	P2			20.7	0.08	0.5
Phenylmaleic anhydride	36122-35-7	acids	oxygenated compounds	43.1	3.15	B15	IVOCs	P7	Undecanoic acid		0.08		
Benzene,	121-14-2	nitrophenols	nitrogen-containing compounds	43.5	2.85	B15	IVOCs	P6	Phenol,	0.272	0.08		
1-methyl-2,4-dinitro-									2,4-dimeth				
									y1-				
alkynes-C15	765-13-9	n-alkynes	alkynes	43.7	0.96	B15	IVOCs	P2	C15			0.53	
alpha-Patchoulene		tri-isoprenes	alkenes	45.1	1.41	B16	IVOCs	P3	C16			0.41	
6-(p-Tolyl)-2-methyl-2-heptenol, trans-	39599-18-3	oxgenated-tri-iso prenes	oxygenated compounds	45.1	1.71	B16	IVOCs	P4	Octanal		0.12		

b-alkanes-C16		b-alkanes	alkanes	45.2	0.69	B16	IVOCs	P2	C16	0.12	0.45
alkenes-C16	629-73-2	alkenes	alkenes	46.1	0.81	B16	IVOCs	P2	C16	0.63	1.25
										8	
Benzene,	4537-13-7	aromatics	aromatics	46.4	1.2	B16	IVOCs	P3	Benzene, dodecyl-	0.1	
(1-methylnonyl)-											
Benzophenone	119-61-9	oxygenated-arom atic	oxygenated compounds	46.6	3.09	B16	IVOCs	P7	Phenol, 2,4-dimeth	3.554	0.38
									y1-	9	
C16	544-76-3	n-alkanes	alkanes	46.7	0.72	B16	IVOCs	P2		23.2	0.12
alkynes-C16	19781-86-3	n-alkynes	alkynes	47.4	0.99	B16	IVOCs	P2	C16		0.63
										8	
tri-isoprenes		tri-isoprenes	alkenes	47.4	1.74	B16	IVOCs	P4	C16		0.41
tridecanoic acid	638-53-9	acids	oxygenated compounds	47.7	1.17	B16	IVOCs	P3	Undecanoic acid	15.41	0.12
									c acid	52	
b-alkanes-C17		b-alkanes	alkanes	47.8	0.72	B16	IVOCs	P2	C17	0.2	0.42
Xanthoxylin	90-24-4	oxygenated-arom atic	oxygenated compounds	48.7	2.61	B17	IVOCs	P6	0.38	Pheno	
									1		
alkenes-C17	6765-39-5	alkenes	alkenes	49.5	0.84	B17	IVOCs	P2	C17	0.48	1.25
										7	

2-Pentadecanone	2345-28-0	ketones	oxygenated compounds	49.7	1.2	B17	IVOCs	P3	2-Decanone	0.2	1.4
Methyl myristoleate	56219-06-8	esters	oxygenated compounds	49.8	1.14	B17	IVOCs	P3		0.2	0.44
Benzoic acid, 2-ethylhexyl ester	5444-75-7	esters	oxygenated compounds	49.9	1.65	B17	IVOCs	P4	Methyl myristoleate	11.53	0.2
									te	68	0.98
1H-Indene,	3910-35-8	aromatics	aromatics	50.1	2.07	B17	IVOCs	P5	Benzene, dodecyl-	0.1	
2,3-dihydro-1,1,3-methyl-3-phenyl-											
Silane, diethoxydiphenyl-	2553-19-7	siloxanes	siloxanes	50.2	1.95	B17	IVOCs	P4	Benzene, dodecyl-	0.1	
C17	629-78-7	n-alkanes	alkanes	50.3	0.75	B17	IVOCs	P2		28.5	0.2
1,8,11-Heptadecatriene,	56134-03-3	alkenes	alkenes	50.5	1.08	B17	IVOCs	P3	C17	0.48	
(Z,Z)-										7	
Ethanone, 1,2-diphenyl-	451-40-1	oxygenated-aromatics	oxygenated compounds	50.5	3.24	B17	IVOCs	P7	Phenol, 2,4-dimethyl-	7.323	0.38
alkynes-C17	26186-00-5	n-alkynes	alkynes	50.6	1.05	B17	IVOCs	P3	C17	0.48	

b-alkanes-C18		b-alkanes	alkanes	50.7	0.69	B17	IVOCs	P2	C18		0.3	0.4
3,5-di-tert-Butyl-4-hydroxybenzaldehyde	1620-98-0	oxygenated-aromatics	oxygenated compounds	51.4	2.1	B17	IVOCs	P5	0.38	Pheno	1	
alkenes-C17-UCM	6765-39-5	alkenes	alkenes	51.8	1.08	B17	IVOCs	P3	C17		0.48	
											7	
Phenanthrene	85-01-8	PAHs	PAHs	52.4	3.24	B18	IVOCs	P7			13	0.49
2,4-Diphenyl-4-methyl-1-pentene	6362-80-7	aromatics	aromatics	52.5	2.19	B18	IVOCs	P5	Benzene, dodecyl-	0.1		
Benzene,	1889-67-4	aromatics	aromatics	52.5	2.22	B18	IVOCs	P5	Benzene, dodecyl-	0.1		
1,1'-(1,1,2,2-tetramethyl-1,2-ethanediyl)bis-												
Anthracene	120-12-7	PAHs	PAHs	52.6	3.15	B18	IVOCs	P7			40	0.49
alkenes-C18	112-88-9	alkenes	alkenes	53.1	0.84	B18	IVOCs	P2	C18		0.48	
											7	
C18	593-45-3	n-alkanes	alkanes	53.8	0.78	B18	IVOCs	P2			35.1	0.3
Benzene,	104142-11-2	aromatics	aromatics	54	2.19	B18	IVOCs	P5	Benzene, dodecyl-	0.1		
1,1'-(3,3-dimethyl-1-bute-2-nylidene)bis-												
2,4-Diphenyl-4-methyl-2-(2,4-diphenyl-4-methyl-1-butenylidene)	6258-73-7	aromatics	aromatics	54	2.22	B18	IVOCs	P5	Benzene, dodecyl-	0.1		

E)-pentene											
b-alkanes-C19		b-alkanes	alkanes	54.2	0.72	B18	IVOCs	P2	C19	0.42	0.38
Methyl	90176-52-6	esters	oxygenated	54.3	1.14	B18	IVOCs	P3		0.3	1.7
(Z)-10-pentadecenoate			compounds								
alkynes-C18	629-89-0	n-alkynes	alkynes	54.3	1.17	B18	IVOCs	P3	C18	0.48	
										7	
Neophytadiene	504-96-1	aldehyde-enes	oxygenated	55	0.84	B18	IVOCs	P2	C18	0.41	
			compounds								
7,11-Hexadecadienal	6750-03-4	aldehyde-enes	oxygenated	55.3	1.47	B18	IVOCs	P3	Octanal	0.02	
			compounds							1	
C19	629-92-5	n-alkanes	alkanes	57	0.81	B19	IVOCs	P2		43.2	0.42 0.38
9-Hexadecenoic acid,	1120-25-8	esters	oxygenated	57	1.2	B19	IVOCs	P3		71.89	0.42 1.7
methyl ester, (Z)-			compounds							19	
Hexadecanoic acid,	112-39-0	esters	oxygenated	57.3	1.2	B19	IVOCs	P3		18.84	0.42 0.44
methyl ester			compounds							64	
b-alkanes-C20		b-alkanes	alkanes	59.3	0.72	B20	IVOCs	P2	C20	0.56	0.36
C20	112-95-8	n-alkanes	alkanes	60.1	0.87	B20	IVOCs	P2		53.1	0.56 0.36
Methyl gamma linolenate	301-00-8	esters	oxygenated	61.2	1.68	B20	IVOCs	P4		180.9	0.56 2.32
			compounds							571	

9-Octadecenoic acid (Z)-, methyl ester	112-62-9	esters	oxygenated compounds	61.9	1.53	B21	IVOCs	P4		74.71	0.77	1.54
9,12-Octadecadienoic acid (Z,Z)-, methyl ester	112-63-0	esters	oxygenated compounds	62.2	1.35	B21	IVOCs	P3		127.8	0.77	1.84
9-Octadecenoic acid, methyl ester, (E)-	1937-62-8	esters	oxygenated compounds	62.7	0.9	B21	IVOCs	P2	0.77	C21	1.5	
C21	629-94-7	n-alkanes	alkanes	63.1	0.87	B21	IVOCs	P2		26.65	0.77	0.34
1-Propene-1,2,3-tricarboxylic acid, tributyl ester	7568-58-3	esters	oxygenated compounds	63.8	1.92	B21	IVOCs	P4	0.77	C21		
C22	629-97-0	n-alkanes	alkanes	66	0.99	B22	IVOCs	P2		28.06	0.96	0.33
5,8,11,14,17-Eicosapentae noic acid, methyl ester, (all-Z)-	2734-47-6	esters	oxygenated compounds	66.8	1.71	B22	IVOCs	P4	0.96	C22	1.8	
5,8,11,14-Eicosatetraenoic acid, methyl ester, (all-Z)-	2566-89-4	esters	oxygenated compounds	67.5	1.32	B23	SVOC	P3		1.08	1.84	
cis-11,14,17-Eicosatrienoic acid, methyl ester	55682-88-7	esters	oxygenated compounds	68.1	1.62	B23	SVOC	P4		1.08	1.84	

C23	638-67-5	n-alkanes	alkanes	68.9	0.99	B23	SVOC	P2	29.48	1.08
						s			01	
C24	646-31-1	n-alkanes	alkanes	71.3	0.96	B24	SVOC	P2	30.89	1.14
						s			32	
4,7,10,13,16,19-Docosahe xaenoic acid, methyl ester, (all-Z)-	2566-90-7	esters	oxygenated compounds	71.6	1.98	B24	SVOC	P4		1.14 1.84
13-Docosenoic acid, methyl ester	7439-44-3	esters	oxygenated compounds	73.3	1.59	B25	SVOC	P4		1.14
C26	630-01-3	n-alkanes	alkanes	77.1	1.29	B26	SVOC	P3	33.71	1.14
						s			93	
15-Tetracosenoic acid, methyl ester, (Z)-	2733-88-2	esters	oxygenated compounds	79.9	1.29	B27	SVOC	P3		1.14
C27	593-49-7	n-alkanes	alkanes	80.2	0.42	B27	SVOC	P1	35.13	1.14
						s			23	
C30	638-68-6	n-alkanes	alkanes	83.9	0.66	B30	SVOC	P2	39.37	1.14
						s			15	

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50 **Table S4.** The averaged concentrations, retention times and retention time shifts, bins of chemicals (semi-)quantified.

compound	class	class	concentration mean ($\mu\text{g m}^{-3}$)	concentration sd	retention1	retention1
		detail			(min)	sd
Ethyl Acetate	oxygenated	esters	1.54	1.03	5.50	0.08
	compounds					
1-Butanol	oxygenated	alkanols	17.86	10.10	6.40	0.09
	compounds					
Pentanal	oxygenated	aldehydes	7.65	3.65	6.90	0.28
	compounds					
1-Heptene	alkenes	alkenes	24.25		7.10	
Trichloroethylene	chlorides	and chlorides	3.78	3.12	7.20	0.10
	sulfur compounds					
1-Pentanol	oxygenated	alkanols	23.14		9.00	
	compounds					
Toluene	aromatics	aromatics	128.03	175.59	9.10	0.21

Heptane, 2-methyl-	b-alkanes	b-alkanes	10.91	1.48	9.40	0.00
2-Furanol, tetrahydro-	oxygenated compounds	aldehydes	2.49		9.60	
Hexanal	oxygenated compounds	aldehydes	9.40	5.40	9.80	0.12
b-alkanes-C8	b-alkanes	b-alkanes	2.28	2.41	10.30	0.27
C8	n-alkanes	n-alkanes	24.18	25.25	10.70	0.11
Tetrachloroethylene	chlorides sulfur compounds	and chlorides	3.50	2.64	10.70	0.03
Acetic acid, butyl ester	oxygenated compounds	esters	0.10	0.07	10.70	0.07
3,3-Dimethylbutane-2-ol	oxygenated compounds	alkanols	4.99		11.10	
2-Octene, (E)-	alkenes	alkenes	1.20		11.20	
Formic acid, pentyl ester	oxygenated compounds	esters	0.04	0.01	11.20	0.00
Cyclopentanone, 2-methyl-	oxygenated compounds	ketones	1.62	0.82	11.30	0.19
2-Hexenal, (E)-	oxygenated	aldehyde-enes	3.79		11.60	

		compounds				
Furfural		oxygenated	aldehyde-enes	5.10		11.60
		compounds				
Cyclopentanol, 2-methyl-, trans-		oxygenated	alkanols	2.53	0.48	11.70
		compounds				0.45
Butanoic acid, 3-methyl-		oxygenated	acids	2.76		12.30
		compounds				
2-Hexenal		oxygenated	aldehyde-enes	1.75	1.62	12.30
		compounds				0.23
3-Furanmethanol		oxygenated	furans	9.64	3.07	12.60
		compounds				0.14
Butanoic acid, 2-methyl-		oxygenated	acids	0.42		12.70
		compounds				
Ethylbenzene		aromatics	aromatics	3.39	3.42	12.80
p-Xylene		aromatics	aromatics	2.73	2.48	13.20
b-alkanes-C9		b-alkanes	b-alkanes	2.44	2.15	13.50
2-Heptanone		oxygenated	ketones	0.80		13.80
		compounds				
Butyrolactone		oxygenated	furanones	0.09		13.80
						0.07

		compounds					
Styrene		aromatics	aromatics	0.93	0.56	14.10	0.28
o-xylene		aromatics	aromatics	1.70	1.47	14.20	0.08
Pentanoic acid		oxygenated	acids	77.69	61.50	14.40	0.46
		compounds					
Heptanal		oxygenated	aldehydes	4.30	3.95	14.40	0.48
		compounds					
1-Nonene		alkenes	alkenes	0.53	0.38	14.60	0.19
Pentane, 1-nitro-		nitrogen-containing	nitro-alkanes	2.61	1.93	14.90	0.17
		compounds					
C9		n-alkanes	n-alkanes	0.90	0.55	15.20	0.21
Nitric acid, pentyl ester		nitrogen-containing	nitrates	0.04		15.30	
		compounds					
Benzene, (1-methylethyl)-		aromatics	aromatics	1.02	1.20	15.80	0.07
2-Heptenal, (Z)-		oxygenated	aldehyde-enes	5.14	5.08	16.20	0.40
		compounds					
Bicyclo[3.1.0]hex-2-ene, 2-methyl-5-(1-methylethyl)-		alkenes	di-isoprenes	0.48	0.38	16.30	0.15
Bicyclo[3.1.0]hex-2-ene, 4-methyl-1-(1-methylethyl)-		alkenes	di-isoprenes	1.48	0.56	16.30	0.13
aldehyde-enes-trans-2-Dodecenal-surrogate		oxygenated	aldehyde-enes	1.35	0.59	16.40	0.05

		compounds					
3-Ethylcyclopentanone		oxygenated	ketones	1.19	0.86	16.50	0.24
		compounds					
alpha-Pinene		alkenes	di-isoprenes	2.47	1.84	16.60	0.04
2-Heptenal, (E)-		oxygenated	aldehyde-enes	6.60	8.51	16.70	0.17
		compounds					
Benzaldehyde		oxygenated	aldehydes	4.95	1.86	16.70	0.41
		compounds					
2(3H)-Furanone, dihydro-5-methyl-		oxygenated	esters	0.02		17.10	
		compounds					
Benzene, propyl-		aromatics	aromatics	1.67	1.31	17.20	0.09
Benzene, 1-ethyl-4-methyl-		aromatics	aromatics	2.86	2.30	17.70	0.06
Benzonitrile		nitrogen-containing	nitriles	2.09	0.30	17.80	0.29
		compounds					
4-Methyl-5H-furan-2-one		oxygenated	furanones	0.00		17.90	0.07
		compounds					
Benzene, 1,2,3-trimethyl-		aromatics	aromatics	0.73	0.73	18.10	0.82
beta-Pinene		alkenes	di-isoprenes	3.79	4.98	18.40	0.04
1-Octen-3-ol		oxygenated	alkanols	4.44	3.29	18.40	0.30

		compounds					
Benzene, 1-ethyl-2-methyl-	aromatics	aromatics	0.79	0.68	18.50	0.08	
b-alkanes-C10	b-alkanes	b-alkanes	10.29	4.76	18.70	0.78	
1-Heptanol	oxygenated	alkanols	1.72		18.80		
		compounds					
Cyclohexane, isocyanato-	nitrogen-containing	CN	0.74	0.36	18.90	0.14	
		compounds					
Phenol	oxygenated	phenols	2.36	1.11	18.90	0.41	
		compounds					
Hexanoic acid	oxygenated	acids	173.17	138.49	19.00	0.93	
		compounds					
Furan, 2-pentyl-	oxygenated	furans	6.14	3.84	19.20	0.05	
		compounds					
Benzene, 1-ethyl-3-methyl-	aromatics	aromatics	2.04	3.04	19.30	0.31	
Benzene, 1,2,4-trimethyl-	aromatics	aromatics	2.65	2.22	19.30	0.06	
Octanal	oxygenated	aldehydes	2.62		19.30		
		compounds					
beta-Myrcene	alkenes	di-isoprenes	3.21	1.97	19.40	0.00	
Cyclohexanol, 2,4-dimethyl-	oxygenated	alkanols	2.53	1.84	19.70	1.27	

		compounds					
C10		n-alkanes	n-alkanes	0.88	0.57	20.20	0.04
Acetic acid, hexyl ester		oxygenated	esters	0.07	0.03	20.20	0.16
		compounds					
3-Cyclohexene-1-carboxaldehyde, 1-methyl-		oxygenated	aldehydes	1.87	0.52	20.50	0.00
		compounds					
Phenol, 2-chloro-		chlorides and chlorides		2.03		20.50	
		sulfur compounds					
Bicyclo[5.3.0]decane		cyclic compounds	cyclo-alkanes	1.18	1.06	20.60	0.16
aromatics-C3		aromatics	aromatics	3.69	1.96	20.60	1.54
Benzeneacetaldehyde		oxygenated	aldehydes	2.03	1.66	20.70	0.36
		compounds					
o-Cymene		aromatics	aromatics	0.09		20.80	0.00
Dicyclopentadiene		alkenes	alkenes	0.60		20.90	0.00
di-isoprenens		alkenes	di-isoprenes	1.25	0.99	20.90	0.37
3,4-Dimethylcyclohexanol		oxygenated	alkanols	2.45	0.59	21.00	0.00
		compounds					
Eucalyptol		oxygenated	oxygenated-di-isoprenes	1.78	1.68	21.20	0.30
		compounds					

Indane	aromatics	aromatics	0.33	0.37	21.20	0.06
D-Limonene	alkenes	di-isoprenes	5.13	2.76	21.30	0.05
di-isoprenes	alkenes	di-isoprenes	14.75	21.43	21.30	1.20
2-Octenal, (E)-	oxygenated compounds	aldehyde-enes	3.64	1.76	21.30	0.23
b-alkanes-C11	b-alkanes	b-alkanes	6.63	6.19	21.40	1.02
trans-beta-Ocimene	alkenes	di-isoprenes	1.12	0.76	21.60	0.00
Acetophenone	oxygenated compounds	ketones	3.36	2.71	22.00	0.32
1,3,6-Octatriene, 3,7-dimethyl-, (Z)-	alkenes	di-isoprenes	1.36	0.91	22.20	0.00
Benzene, 1-methyl-3-propyl-	aromatics	aromatics	0.61		22.20	0.00
4,7-Methano-1H-indene, octahydro-, (3a ,4 ,7 ,7a)-	alkenes	di-isoprenes	1.82	1.37	22.90	0.07
Benzene, 1-methyl-2-propyl-	aromatics	aromatics	0.35	0.26	22.90	0.36
2H-Pyran-2-one, tetrahydro-3-methyl-	oxygenated compounds	esters	0.01		23.20	
3-Hydroxy-3-phenylbutan-2-one	oxygenated compounds	oxygenated-aromatics	3.19	1.52	23.40	0.10
oxygenated-aromatics	oxygenated compounds	oxygenated-aromatics	2.37	2.35	23.50	0.13

oxygenated-bi-isoprenes	oxygenated compounds	oxygenated-bi-isoprenes	1.86		23.60	
p-Cresol	oxygenated compounds	phenols	1.93		23.70	
Heptanoic acid	oxygenated compounds	acids	17.25		23.80	
Nonanal	oxygenated compounds	aldehydes	9.06	5.57	24.40	0.20
Linalool	oxygenated compounds	oxygenated-di-isoprenes	6.94	4.76	24.60	0.11
C11	n-alkanes	n-alkanes	0.44	0.38	25.30	0.04
aromatics-C4	aromatics	aromatics	3.08	2.53	25.60	1.51
2-Undecene, (E)-	alkenes	alkenes	1.43		25.70	0.45
2-Undecene, (Z)-	alkenes	alkenes	0.00		25.80	
1H-Indene, 2,3-dihydro-4-methyl-	aromatics	aromatics	0.23		26.50	0.05
2-Nonenal, (E)-	oxygenated compounds	aldehyde-enes	3.53		27.00	
aromatics-C4-surrogate	aromatics	aromatics	8.12	5.51	27.10	0.98
1-Propanone, 1-phenyl-	oxygenated	ketones	0.56		27.10	

		compounds					
Phenol, 2,4-dimethyl-		oxygenated	phenols	1.40		27.20	
		compounds					
3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)-, (R)-		oxygenated	oxygenated-di-isoprenes	1.82	1.83	28.20	0.20
		compounds					
alkenes-C12		alkenes	alkenes	0.65	0.82	28.40	0.15
b-alkanes-C12		b-alkanes	b-alkanes	6.03	4.79	28.70	1.15
3-Cyclohexene-1-methanol, alpha,alpha,4-trimethyl-, propanoate	alpha,alpha,4-trimethyl-, propanoate	oxygenated compounds	oxygenated-di-isoprenes	2.10	1.29	28.90	0.21
Estragole		oxygenated	oxygenated-aromatics	1.47	0.62	29.00	0.24
		compounds					
3-Dodecene, (E)-		alkenes	alkenes	2.08		29.40	
Decanal		oxygenated	aldehydes	1.35	0.89	29.40	0.19
		compounds					
Benzothiazole		chlorides and SN		2.25	1.28	29.80	0.33
		sulfur compounds					
Cyclohexane, isothiocyanato-		chlorides and SN		1.11	1.11	30.00	0.12
		sulfur compounds					
C12		n-alkanes	n-alkanes	0.52	0.34	30.10	0.03

1,2-Benzisothiazole	chlorides sulfur compounds	and SN	3.25	2.34	30.10	0.19
alk-di-enes-C12	alkenes	alkenes	0.06		30.90	0.50
2-Decenal, (Z)-	oxygenated compounds	aldehyde-enes	3.53	2.80	31.20	0.41
2-Cyclohexen-1-one, 3-methyl-6-(1-methylethyl)-	oxygenated compounds	oxygenated-di-isoprenes	8.07		31.30	
2-Decenal, (E)-	oxygenated compounds	aldehyde-enes	6.86		31.80	
b-alkanes-C13	b-alkanes	b-alkanes	1.44	1.46	31.90	0.86
Linalyl acetate	oxygenated compounds	oxygenated-di-isoprenes	1.97		31.90	
alkynes-C12	others	n-alkynes	0.48	0.34	32.40	0.34
Decanenitrile	nitrogen-containing compounds	nitriles	0.60		32.70	
1-Decanol	oxygenated compounds	alkanols	0.88		32.80	
Benzene, 1-methoxy-4-(1-propenyl)-, (Z)-	oxygenated compounds	esters	0.07	0.08	32.90	0.30

2,4-Decadienal, (E,Z)-	oxygenated compounds	aldehyde-enes	4.00	2.89	33.30	0.34
Naphthalene, 1-methyl-	PAHs	PAHs	3.16		33.40	0.25
Undecanal	oxygenated compounds	aldehydes	1.36	0.73	34.10	0.35
Phenol, 4-chloro-3-methyl-	chlorides sulfur compounds	and chlorides	2.57		34.10	
2,4-Decadienal, (E,E)-	oxygenated compounds	aldehyde-enes	9.93	4.53	34.30	0.14
C13	n-alkanes	n-alkanes	0.10	0.13	34.60	0.06
Benzoic acid, 1-methylpropyl ester	oxygenated compounds	esters	0.01	0.01	35.00	0.28
alpha-Terpinal acetate	oxygenated compounds	oxygenated-di-isoprenes	1.61	1.33	36.00	0.36
2,4-Decadienal	oxygenated compounds	aldehyde-enes	7.30	8.15	36.10	0.49
1-Undecanol	oxygenated compounds	alkanols	0.81		36.30	
2-Undecenal	oxygenated	aldehyde-enes	3.10	2.66	36.40	0.52

		compounds					
Copaene		alkenes	tri-isoprenes	0.66	0.55	37.90	0.00
b-alkanes-C14		b-alkanes	b-alkanes	2.11	1.94	38.00	1.31
Benzene, 2-methyl-1,3-dinitro-		nitrogen-containing compounds	nitrophenols	0.75		38.30	
Dodecanal		oxygenated compounds	aldehydes	0.83	0.66	38.50	0.31
Longifolene		alkenes	tri-isoprenes	0.08		39.00	0.00
Undecanoic acid		oxygenated compounds	acids	2.69		40.60	
2-Dodecenal		oxygenated compounds	aldehyde-enes	1.09	1.05	40.80	0.66
2,5-Cyclohexadiene-1,4-dione, 2,6-bis(1,1-dimethylethyl)-	UCMs	UCMs		0.28	0.27	40.80	0.58
Benzoic acid, pentyl ester	oxygenated compounds	esters		0.00		41.00	
2,6-Di-tert-butyl-4-hydroxy-4-methylcyclohexa-2,5-dien-1-one	oxygenated compounds	oxygenated-aromatics		0.98	1.07	41.10	0.41
b-alkanes-C15	b-alkanes	b-alkanes		2.47	1.92	41.50	
Tridecanal	oxygenated	aldehydes		1.13	0.01	42.60	0.72

		compounds					
o-Hydroxybiphenyl	oxygenated	oxygenated-aromatics	0.90	0.55	42.70	0.46	
	compounds						
C15	n-alkanes	n-alkanes	0.13	0.10	42.90	0.03	
Benzene, 1-methyl-2,4-dinitro-	nitrogen-containing	nitrophenols	1.02		43.50		
	compounds						
alpha-Patchoulene	alkenes	tri-isoprenes	0.83	0.88	45.10	0.05	
6-(p-Tolyl)-2-methyl-2-heptenol, trans-	oxygenated	oxgenated-tri-isoprenes	1.38	0.79	45.10	0.00	
	compounds						
b-alkanes-C16	b-alkanes	b-alkanes	2.00	1.32	45.20	0.71	
Benzophenone	oxygenated	oxygenated-aromatics	3.50	1.83	46.60	0.07	
	compounds						
C16	n-alkanes	n-alkanes	0.09	0.03	46.70	0.03	
alkynes-C16	others	n-alkynes	0.17		47.40	1.25	
tridecanoic acid	oxygenated	acids	5.50		47.70		
	compounds						
b-alkanes-C17	b-alkanes	b-alkanes	1.51	1.17	47.80	0.73	
Xanthoxylin	oxygenated	oxygenated-aromatics	1.17	0.83	48.70	0.35	
	compounds						

Methyl myristoleate	oxygenated compounds	esters	0.02		49.80	
Benzoic acid, 2-ethylhexyl ester	oxygenated compounds	esters	0.08	0.09	49.90	0.25
1H-Indene, 2,3-dihydro-1,1,3-trimethyl-3-phenyl-	aromatics	aromatics	1.32	0.70	50.10	0.00
Ethanone, 1,2-diphenyl-	oxygenated compounds	oxygenated-aromatics	1.12	0.62	50.50	0.45
b-alkanes-C18	b-alkanes	b-alkanes	1.14	0.86	50.70	0.75
3,5-di-tert-Butyl-4-hydroxybenzaldehyde	oxygenated compounds	oxygenated-aromatics	1.07	0.64	51.40	0.04
Phenanthrene	PAHs	PAHs	0.39	0.39	52.40	0.27
2,4-Diphenyl-4-methyl-1-pentene	aromatics	aromatics	0.74	0.83	52.50	0.00
Benzene, 1,1'-(1,1,2,2-tetramethyl-1,2-ethanediyl)bis-	aromatics	aromatics	0.89	0.69	52.50	0.04
Anthracene	PAHs	PAHs	0.10		52.60	
alkenes-C18	alkenes	alkenes	0.59	0.40	53.10	0.58
Benzene, 1,1'-(3,3-dimethyl-1-butenyldiene)bis-	aromatics	aromatics	1.38	0.99	54.00	0.05
2,4-Diphenyl-4-methyl-2(E)-pentene	aromatics	aromatics	1.72	1.49	54.00	0.08
b-alkanes-C19	b-alkanes	b-alkanes	0.60	0.52	54.20	1.03
Methyl (Z)-10-pentadecenoate	oxygenated	esters	0.01		54.30	

		compounds					
alkynes-C18	others	n-alkynes	0.39	0.29	54.30	0.94	
Neophytadiene	oxygenated	aldehyde-enes	0.18	0.14	55.00	0.24	
	compounds						
9-Hexadecenoic acid, methyl ester, (Z)-	oxygenated	esters	0.02		57.00		
	compounds						
Hexadecanoic acid, methyl ester	oxygenated	esters	0.02	0.03	57.30	0.05	
	compounds						
b-alkanes-C20	b-alkanes	b-alkanes	0.45	0.33	59.30	0.54	
C20	n-alkanes	n-alkanes	0.03	0.02	60.10	0.07	
Methyl gamma linolenate	oxygenated	esters	0.02		61.20		
	compounds						
9-Octadecenoic acid (Z)-, methyl ester	oxygenated	esters	0.03		61.90		
	compounds						
9,12-Octadecadienoic acid (Z,Z)-, methyl ester	oxygenated	esters	0.01		62.20		
	compounds						
C21	n-alkanes	n-alkanes	0.24	0.19	63.10	0.43	
1-Propene-1,2,3-tricarboxylic acid, tributyl ester	oxygenated	esters	0.05	0.04	63.80	0.04	
	compounds						

C22	n-alkanes	n-alkanes	0.26	0.22	66.00	0.10
5,8,11,14,17-Eicosapentaenoic acid, methyl ester, (all-Z)-	oxygenated compounds	esters	0.02		66.80	
5,8,11,14-Eicosatetraenoic acid, methyl ester, (all-Z)-	oxygenated compounds	esters	0.01		67.50	
cis-11,14,17-Eicosatrienoic acid, methyl ester	oxygenated compounds	esters	0.02		68.10	
C23	n-alkanes	n-alkanes	0.30	0.28	68.90	0.24
C24	n-alkanes	n-alkanes	0.43	0.53	71.30	0.16
4,7,10,13,16,19-Docosahexaenoic acid, methyl ester, (all-Z)-	oxygenated compounds	esters	0.01		71.60	
13-Docosenoic acid, methyl ester	oxygenated compounds	esters	0.01		73.30	
C26	n-alkanes	n-alkanes	1.12	1.20	77.10	0.43
15-Tetracosenoic acid, methyl ester, (Z)-	oxygenated compounds	esters	0.12		79.90	
C27	n-alkanes	n-alkanes	0.47	0.32	80.20	0.57
C30	n-alkanes	n-alkanes	3.79	9.88	83.90	0.49

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53 **Table S5.** The calibration curve, R², linear range, and RSD of different concentration levels of authentic standards.

compound	slope	intercept	R ²	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
acids									
Benzoic acid	250343	-6847795	0.971	4-200ng	n.d.	n.d.	28.9%	n.d.	4.3%
Heptanoic acid	2131	-3755	0.805	4-200ng	n.d.	n.d.	n.d.	n.d.	n.d.
Phthalic anhydride	231389	22202135	0.981	4-200ng	n.d.	n.d.	6.3%	n.d.	36.0%
Undecanoic acid	812	5935	0.970	4-200ng	n.d.	n.d.	n.d.	n.d.	n.d.
aldehydes									
Hexanal	428427	9717187	0.972	4-200ng	n.d.	n.d.	2.5%	n.d.	3.3%
Heptanal	465836	8589705	0.961	4-200ng	13.7%	n.d.	1.0%	n.d.	3.3%
Benzaldehyde	440370	13599045	0.968	4-200ng	24.4%	n.d.	1.9%	n.d.	4.4%
Octanal	559030	6559260	0.992	4-200ng	2.6%	n.d.	5.2%	n.d.	3.3%
Nonanal	281558	13319080	0.977	4-200ng	5.1%	n.d.	1.5%	n.d.	2.4%
Decanal	338030	15966783	0.975	4-200ng	0.8%	n.d.	1.8%	n.d.	2.5%
Citral	338504	4634663	0.988	4-200ng	n.d.	n.d.	4.0%	n.d.	1.8%
Dodecanal	829420	7367850	0.980	4-200ng	4.9%	n.d.	1.4%	n.d.	5.8%
alkanols									

compound	slope	intercept	R ²	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
1-Butanol	173641	18107050	0.973	4-200ng	n.d.	n.d.	2.1%	n.d.	6.2%
1-Butanol, 3-methyl-	539780	8579677	0.996	4-200ng	18.1%	n.d.	1.5%	n.d.	5.1%
1-Hexanol	448439	3807097	0.991	4-200ng	n.d.	n.d.	6.7%	n.d.	3.9%
Benzyl alcohol	464912	8209089	0.979	4-200ng	n.d.	n.d.	4.3%	n.d.	1.9%
1-Hexanol, 2-ethyl-	34496	27524926	0.963	4-200ng	7.2%	n.d.	24.9%	n.d.	3.8%
Phenylethyl Alcohol	502037	20235693	0.973	4-200ng	n.d.	n.d.	5.1%	n.d.	1.6%
1-Dodecanol	1030789	2210803	0.996	4-200ng	67.7%	n.d.	1.9%	n.d.	2.5%
alkenols									
Linalool	46187	5109924	0.979	4-200ng	n.d.	n.d.	15.2%	n.d.	6.8%
Citronellol	552899	4042779	0.989	4-200ng	16.5%	n.d.	3.5%	n.d.	3.8%
amides									
Caprolactam	495849	14426984	0.958	4-200ng	n.d.	n.d.	22.7%	n.d.	4.8%
Hexadecanamide	83503	-646915	0.961	4-200ng	n.d.	n.d.	n.d.	n.d.	n.d.
aromatics									
Toluene	443121	4846746	0.998	4-100ng	5.7%	5.2%	n.d.	4.1%	n.d.
Ethylbenzene	415866	9506163	0.996	4-100ng	6.6%	3.2%	n.d.	6.1%	n.d.
Benzene, 1,3-dimethyl-	702273	21421131	0.973	4-100ng	4.7%	2.5%	n.d.	5.7%	n.d.

compound	slope	intercept	R ²	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
Styrene	472665	8554263	0.999	4-100ng	n.d.	5.9%	n.d.	7.5%	n.d.
o-Xylene	395014	12307653	0.975	4-100ng	4.6%	2.5%	n.d.	3.9%	n.d.
Benzene, (1-methylethyl)-	635195	8419191	0.986	4-100ng	4.2%	1.7%	n.d.	2.1%	n.d.
Benzene, propyl-	478544	9944618	0.972	4-100ng	3.2%	1.9%	n.d.	4.0%	n.d.
esters									
n-Propyl acetate	358155	11228820	0.977	4-200ng	3.3%	n.d.	2.7%	n.d.	16.3%
sec-Butyl acetate	556400	5542265	0.991	4-200ng	5.3%	n.d.	4.9%	n.d.	5.1%
Butanoic acid, ethyl ester	462753	7566755	0.980	4-200ng	5.7%	n.d.	2.5%	n.d.	3.7%
1-Butanol, 3-methyl-, acetate	614255	8680932	0.978	4-200ng	3.4%	n.d.	5.3%	n.d.	2.4%
Acetic acid, hexyl ester	477741	3406899	0.989	4-200ng	15.0%	n.d.	5.8%	n.d.	2.6%
Acetic acid, phenylmethyl ester	610322	6465680	0.995	4-200ng	10.5%	n.d.	4.2%	n.d.	2.9%
Benzeneacetic acid, ethyl ester	265875	15735816	0.986	4-200ng	2.3%	n.d.	5.7%	n.d.	3.5%
Acetic acid, 2-phenylethyl ester	647480	8130532	0.980	4-200ng	5.3%	n.d.	2.9%	n.d.	2.0%
Linalyl acetate	198923	6751661	0.980	4-200ng	12.8%	n.d.	7.7%	n.d.	5.9%
Dimethyl phthalate	350836	3614714	0.989	4-100ng	2.9%	2.8%	n.d.	4.2%	n.d.
Diethyl Phthalate	371204	1488632	0.980	4-100ng	7.8%	3.2%	n.d.	2.4%	n.d.
Benzyl Benzoate	830246	6059710	0.990	4-200ng	3.8%	n.d.	1.8%	n.d.	2.5%

compound	slope	intercept	R ²	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
Dibutyl phthalate	328509	15297024	0.975	4-100ng	6.6%	1.3%	n.d.	1.7%	n.d.
Benzyl butyl phthalate	459157	8652860	0.975	4-100ng	7.8%	3.0%	n.d.	5.9%	n.d.
Hexanedioic acid, bis(2-ethylhexyl) ester	649694	4949450	0.986	4-200ng	6.3%	n.d.	3.9%	n.d.	3.7%
Bis(2-ethylhexyl) phthalate	731246	6634275	0.991	4-100ng	16.7%	3.0%	n.d.	5.3%	n.d.
Di-N-octyl phthalate	919796	3612301	0.986	4-100ng	18.1%	3.0%	n.d.	5.0%	n.d.
ketones									
Cyclohexanone	707182	5939017	0.997	4-200ng	1.9%	n.d.	5.6%	n.d.	3.2%
3-Heptanone	286135	9024371	0.978	4-200ng	32.1%	n.d.	1.9%	n.d.	3.1%
2-Heptanone	292003	35369085	0.965	4-200ng	22.3%	n.d.	5.0%	n.d.	6.4%
5-Hepten-2-one, 6-methyl-	458266	11114987	0.972	4-200ng	6.5%	n.d.	2.6%	n.d.	2.2%
Acetophenone	591155	15979443	0.987	4-200ng	12.9%	n.d.	2.1%	n.d.	4.8%
Isophorone	487756	6832225	0.975	4-100ng	2.2%	0.9%	n.d.	8.6%	n.d.
Camphor	195385	22259055	0.955	4-200ng	n.d.	n.d.	4.6%	n.d.	4.8%
Quinoline	637795	8612696	0.988	4-200ng	5.1%	n.d.	5.4%	n.d.	2.4%
alkanes and alkenes									
C7	146035	3133309	0.986	4-100ng	20.3%	30.7%	n.d.	96.3%	n.d.
C8	784938	4737945	0.990	4-100ng	7.7%	2.8%	n.d.	5.5%	n.d.

compound	slope	intercept	R^2	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
C9	292422	18633044	0.978	4-100ng	7.6%	2.5%	n.d.	1.8%	n.d.
C10	598582	9039032	0.976	4-100ng	6.1%	2.9%	n.d.	2.1%	n.d.
C11	257733	17282643	0.967	4-100ng	2.3%	2.1%	n.d.	4.1%	n.d.
C12	511216	9518454	0.975	4-100ng	2.8%	1.4%	n.d.	2.2%	n.d.
C13	609010	10636341	0.980	4-100ng	0.8%	1.2%	n.d.	1.7%	n.d.
C14	483085	11803587	0.986	4-100ng	0.8%	1.2%	n.d.	2.1%	n.d.
C15	577509	24698431	0.987	4-100ng	3.8%	0.4%	n.d.	3.6%	n.d.
C16	539434	27472675	0.991	4-100ng	1.6%	0.9%	n.d.	4.1%	n.d.
C17	863756	17858175	0.978	4-100ng	2.4%	1.7%	n.d.	4.9%	n.d.
C18	409603	25656993	0.974	4-100ng	3.0%	1.7%	n.d.	3.7%	n.d.
C19	424592	19678887	0.974	4-100ng	1.3%	1.5%	n.d.	2.9%	n.d.
C20	587255	8079682	0.989	4-100ng	2.2%	1.6%	n.d.	9.5%	n.d.
C21	738093	10204776	0.979	4-100ng	3.0%	0.9%	n.d.	4.8%	n.d.
C22	703648	11095092	0.976	4-100ng	2.6%	0.8%	n.d.	5.6%	n.d.
C23	530361	19584994	0.971	4-100ng	3.8%	1.1%	n.d.	2.7%	n.d.
C24	852644	15234240	0.992	4-100ng	4.5%	1.5%	n.d.	5.4%	n.d.
C25	907839	15516191	0.983	4-100ng	9.1%	1.2%	n.d.	4.8%	n.d.

compound	slope	intercept	R ²	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
C26	1090682	9247177	0.992	4-100ng	15.1%	2.8%	n.d.	4.1%	n.d.
C27	909060	11372911	0.995	4-100ng	10.3%	1.3%	n.d.	3.4%	n.d.
C28	1030031	5203146	0.990	4-100ng	9.4%	0.9%	n.d.	5.4%	n.d.
C29	1253914	-1134576	0.973	4-100ng	10.3%	1.8%	n.d.	3.5%	n.d.
C30	1420611	-8453663	0.994	4-100ng	11.1%	4.1%	n.d.	4.9%	n.d.
C31	1304834	-2319492	0.994	4-100ng	7.2%	3.4%	n.d.	5.7%	n.d.
C32	1379389	-12026336	0.993	4-100ng	3.9%	5.3%	n.d.	5.8%	n.d.
Cyclohexane, octyl-	357541	16843976	0.991	4-200ng	3.7%	n.d.	0.6%	n.d.	2.5%
3-Carene	218769	10384090	0.987	4-200ng	1.3%	n.d.	3.7%	n.d.	3.0%
N-compounds									
1-Propanamine, N-nitroso-N-propyl-	326597	10974780	0.996	4-100ng	4.9%	1.1%	n.d.	11.4%	n.d.
Benzene, nitro-	362708	6222925	0.984	4-100ng	n.d.	1.0%	n.d.	5.5%	n.d.
Indole	627410	6842884	0.998	4-200ng	10.0%	n.d.	3.7%	n.d.	2.4%
Carbazole	1063918	7272520	0.991	4-100ng	8.0%	1.1%	n.d.	3.5%	n.d.
Benzonitrile	437203	8219380	0.978	4-200ng	8.2%	n.d.	2.1%	n.d.	3.6%
PAHs									
Naphthalene	343479	19347461	0.987	4-100ng	2.2%	3.1%	n.d.	1.3%	n.d.

compound	slope	intercept	R ²	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
Naphthalene, 2-methyl-	862618	16797341	0.975	4-100ng	3.7%	3.0%	n.d.	4.6%	n.d.
Acenaphthylene	452774	7766843	0.991	4-100ng	3.7%	1.6%	n.d.	3.4%	n.d.
Acenaphthene	523720	11138693	0.986	4-100ng	0.5%	1.1%	n.d.	2.5%	n.d.
Fluorene	835221	7374597	0.992	4-100ng	0.9%	0.9%	n.d.	2.4%	n.d.
Azobenzene	376963	6555488	0.988	4-100ng	4.7%	2.3%	n.d.	3.5%	n.d.
Phenanthrene	533657	8641899	0.984	4-100ng	2.3%	2.0%	n.d.	5.6%	n.d.
Anthracene	677343	12322203	0.992	4-100ng	2.8%	2.7%	n.d.	1.8%	n.d.
Fluoranthene	702143	14392382	0.985	4-100ng	3.2%	1.3%	n.d.	3.8%	n.d.
Pyrene	759231	18389814	0.978	4-100ng	4.0%	1.4%	n.d.	3.2%	n.d.
Benz[a]anthracene	545969	13969649	0.987	4-100ng	17.2%	2.5%	n.d.	5.1%	n.d.
Chrysene	779638	20110086	0.979	4-100ng	4.9%	1.0%	n.d.	1.9%	n.d.
Benzo[b]fluoranthene	1508220	19731914	0.975	4-100ng	4.5%	3.2%	n.d.	7.3%	n.d.
Benzo[k]fluoranthene	829561	15533128	0.986	4-100ng	n.d.	0.4%	n.d.	5.6%	n.d.
Indeno[1,2,3-cd]pyrene	1928464	-20525563	0.977	4-100ng	n.d.	9.0%	n.d.	24.4%	n.d.
Benzo[ghi]perylene	1197192	4235210	0.996	4-100ng	n.d.	8.0%	n.d.	16.9%	n.d.
phenols									
Phenol	181376	2256806	0.965	4-100ng	n.d.	6.7%	n.d.	6.8%	n.d.

compound	slope	intercept	R^2	linear_range	RSD(n=5)				
					4ng	20ng	40ng	60ng	200ng
Phenol, 2-methyl-	426215	-8029785	0.987	4-200ng	6.4%	n.d.	2.3%	n.d.	2.1%
Phenol, 3-methyl-	792593	-13245628	0.993	4-200ng	10.5%	n.d.	2.2%	n.d.	1.4%
Phenol, 2,6-dimethyl-	370168	23598090	0.984	4-200ng	5.1%	n.d.	2.4%	n.d.	6.1%
Resorcinol	480783	-4239934	0.972	4-200ng	n.d.	n.d.	1.7%	n.d.	1.9%
1-Naphthalenol	331227	9477848	0.973	4-200ng	12.3%	n.d.	1.2%	n.d.	2.5%
2-Naphthalenol	757947	11450570	0.986	4-200ng	n.d.	n.d.	1.8%	n.d.	0.8%
VCPs									
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	243154	2038616	0.979	4-200ng	3.6%	n.d.	4.6%	n.d.	5.9%

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56 **Table S6.** The amounts of selected standards calculated by standard curves, surrogate standard curves, and the difference of the semi-quantitative
 57 method.

Compound	True calibrated amounts (ng)	Amounts using TIC and surrogates of the same class calibration (ng)	Amounts using TIC and <i>n</i> -alkanes calibration (ng)	% Difference using surrogates of the same class	% Difference using <i>n</i> -alkanes
Alkanols					
1-Heptanol	19.99	15.72	10.86	-21%	-46%

1-Octanol	14	17.31	1.29	24%	-91%
1-Nonanol	19.42	17.44	10.91	10%	-44%
1-Decanol	19.84	22.16	5.96	12%	-70%
1-Undecanol	9.46	9.96		5%	
Square average				16%	66%
Phenols					
p-Cresol	21.08	15.31	3.8	-27%	-82%
Phenol,	19.22	25.22	8.44	31%	-56%
2,4-dimethyl-					
Square average				29%	70%
Aldehydes					
Hexanal	17.06	18.11	15.65	6%	-8%
Heptanal	32.01	30.31	16.65	-5%	-48%
Octanal	22.27	20.21	16.66	-9%	-25%
Square average				7%	32%
Ketones					
Isophorone	19.04	18.08	6.4	-5%	-66%
2-Decanone	21.06	22.53	13.3	7%	-37%
Square average				6%	54%

Esters					
Hexanoic acid, methyl ester	20.84	19.03	21.94	-9%	5%
Octanoic acid, methyl ester	21.56	22.52	18.64	4%	-14%
Decanoic acid, methyl ester	23.36	21.99	10.57	-6%	-55%
Undecanoic acid, methyl ester	20.99	17.65	3	-16%	-86%
Methyl (Z)-10-pentadecenoate	20.9	20.1	4.18	-4%	-80%
9-Hexadecenoic acid, methyl ester, (Z)-	18.92	22.72	1.65	20%	-91%
Square average				12%	65%

Amides

Hexadecanamide	19.77	50.43	7.12	155%	-64%
Octadecanamide	17.66	13.76	2.81	-22%	-84%

Square average				111%	75%
Nitriles					
Benzonitrile	22.09	21.35	25.81	-3%	17%
Decanenitrile	17.5	19.03	7.12	9%	-59%
Square average				7%	43%
Aromatics					
Toluene	20.83	15.22	15.99	-27%	-23%
o-Xylene	18.86	20.87	32.11	11%	70%
Benzene, propyl-	20.19	24.74	34.61	23%	71%
Benzene, dodecyl-	20.48	12.54	4.36	-39%	-79%
Square average				27%	65%
Total uncertainty				27%	69%

58 **Figures caption**

59 **Figure S1.** Typical chromatograms of fried chicken (a), Kung Pao chicken (b), Pan-fried tofu (c),
60 and stir-fried cabbage (d) emissions.

61 **Figure S2.** A typical chromatogram of system blank.

62 **Figure S3.** Total mass concentration, ozone formation potential (OFP), and secondary organic
63 aerosol (SOA) of gaseous contaminants of four dishes.

64 **Figure S4.** Chemical composition of mass concentration, ozone formation potential (OFP), and
65 secondary organic aerosol (SOA) of gaseous chemicals of four dishes.

66 **Figure S5.** Typical chromatograms of fried chicken cooked with corn (a), peanut (b), soybean (c),
67 and sunflower (d) oils.

68 **Figure S6.** Chemicals identified from fried chicken emissions cooked with corn (a), peanut (b),
69 soybean (c), and sunflower (d) oils. Column and Tenax TA bleeding after 75 min in 1st retention time
70 are excluded from qualification, quantification, and 2D binning processes.

71 **Figure S7.** Total mass concentration, ozone formation potential (OFP), and secondary organic
72 aerosol (SOA) of gaseous chemicals of fried chicken using four types of oil (corn, peanut, soybean,
73 and peanut).

74 **Figure S8.** Chemical composition of mass concentration, ozone formation potential (OFP), and
75 secondary organic aerosol (SOA) of gaseous chemicals of fried chicken using four types of oil (corn,
76 peanut, soybean, and peanut).

77 **Figure S9.** Volatility-polarity panels of gaseous chemical emissions from fried chicken fumes
78 cooked with corn, peanut, soybean, and sunflower oils. Ozone formation potential (OFP), and
79 secondary organic aerosol (SOA) were estimated from gas-phase precursors. VOCs (blue color in
80 x-axis), IVOCs (orange color in x-axis), and SVOCs (red color in x-axis) are displayed in volatility
81 bins (a decrease of volatility from B9 to B31) along with their polarity (an increase from P1 to P10 in
82 y-axis). The mass concentration unit is $\mu\text{g m}^{-3}$.

83 **Figure S10.** Chemical reactions of cooking emissions elucidated by MPCA key components.
84 Chemicals in red color are detected by TD-GC \times GC-MS.

85

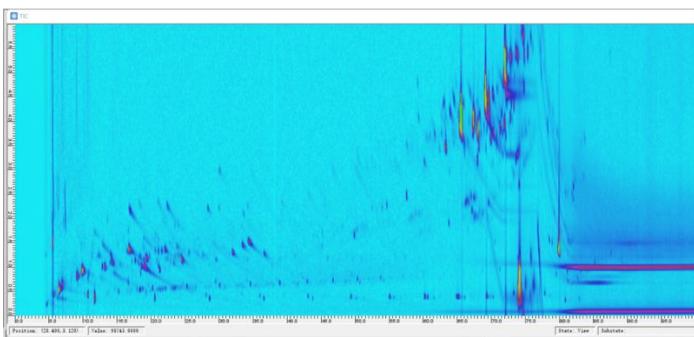
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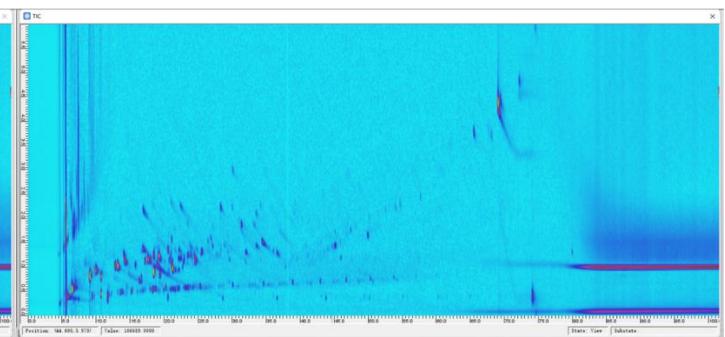
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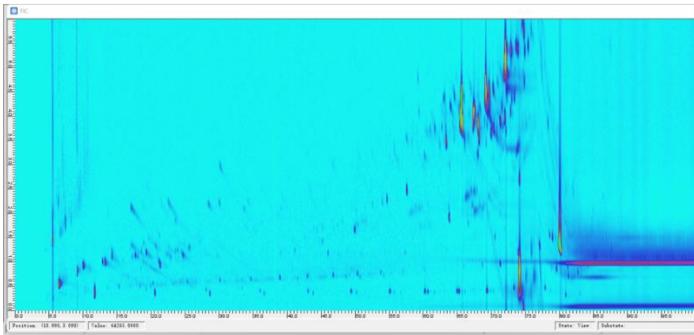
(a) Fried chicken



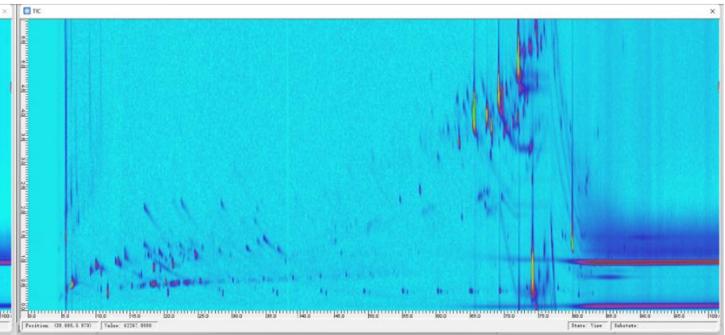
(b) Kung Pao chicken



(c) Pan-fried tofu



(d) Stir-fried cabbage



90

91 **Figure S1.** Typical chromatograms of fried chicken (a), Kung Pao chicken (b), Pan-fried tofu (c),
92 and stir-fried cabbage (d) emissions.

93

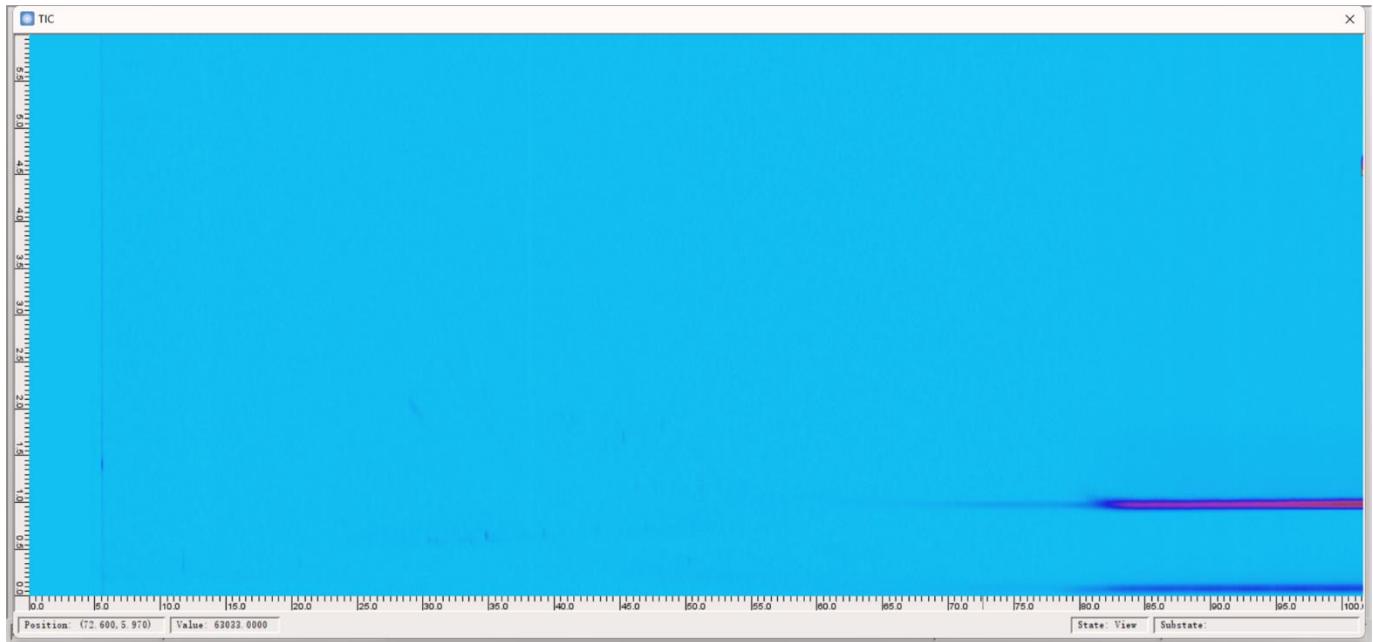
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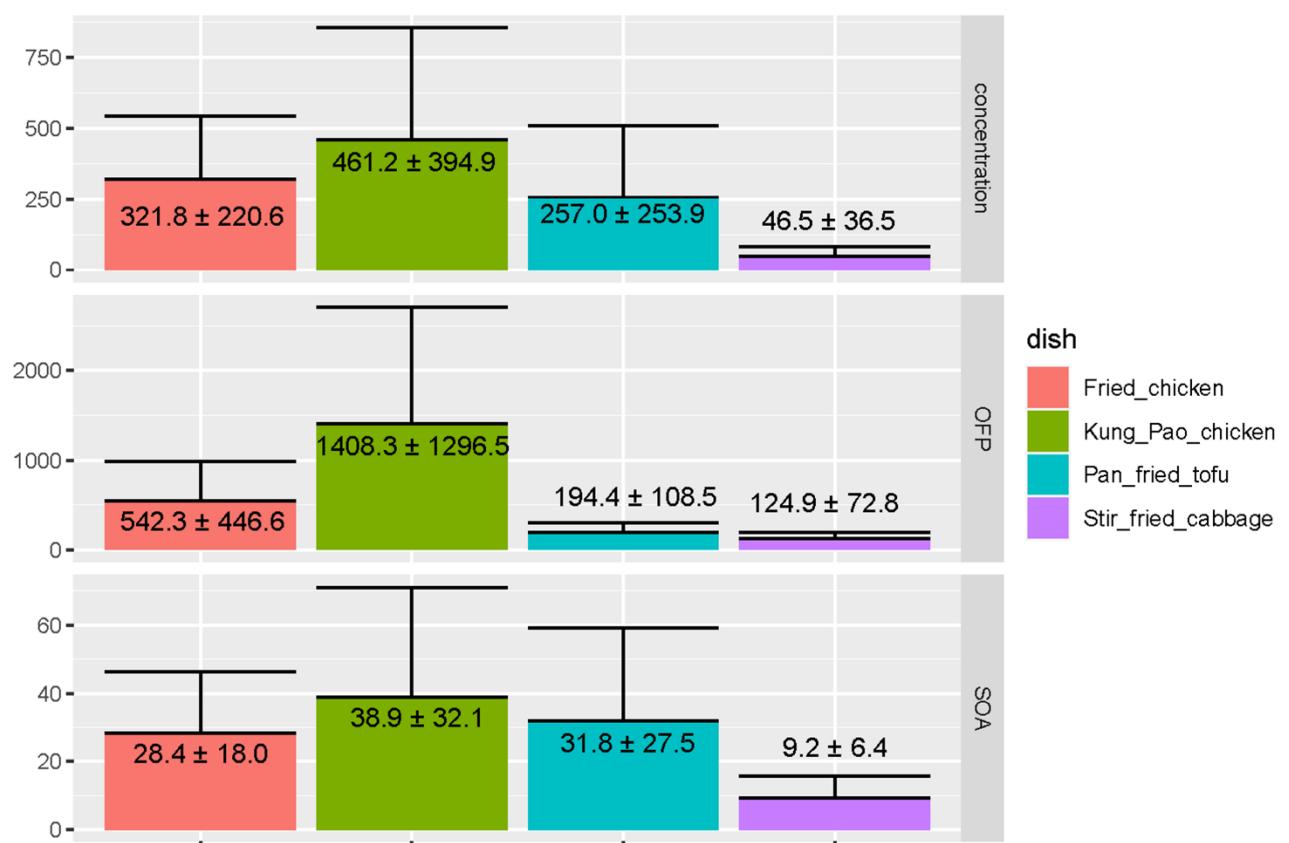
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100 **Figure S2.** A typical chromatogram of system blank.

101

102

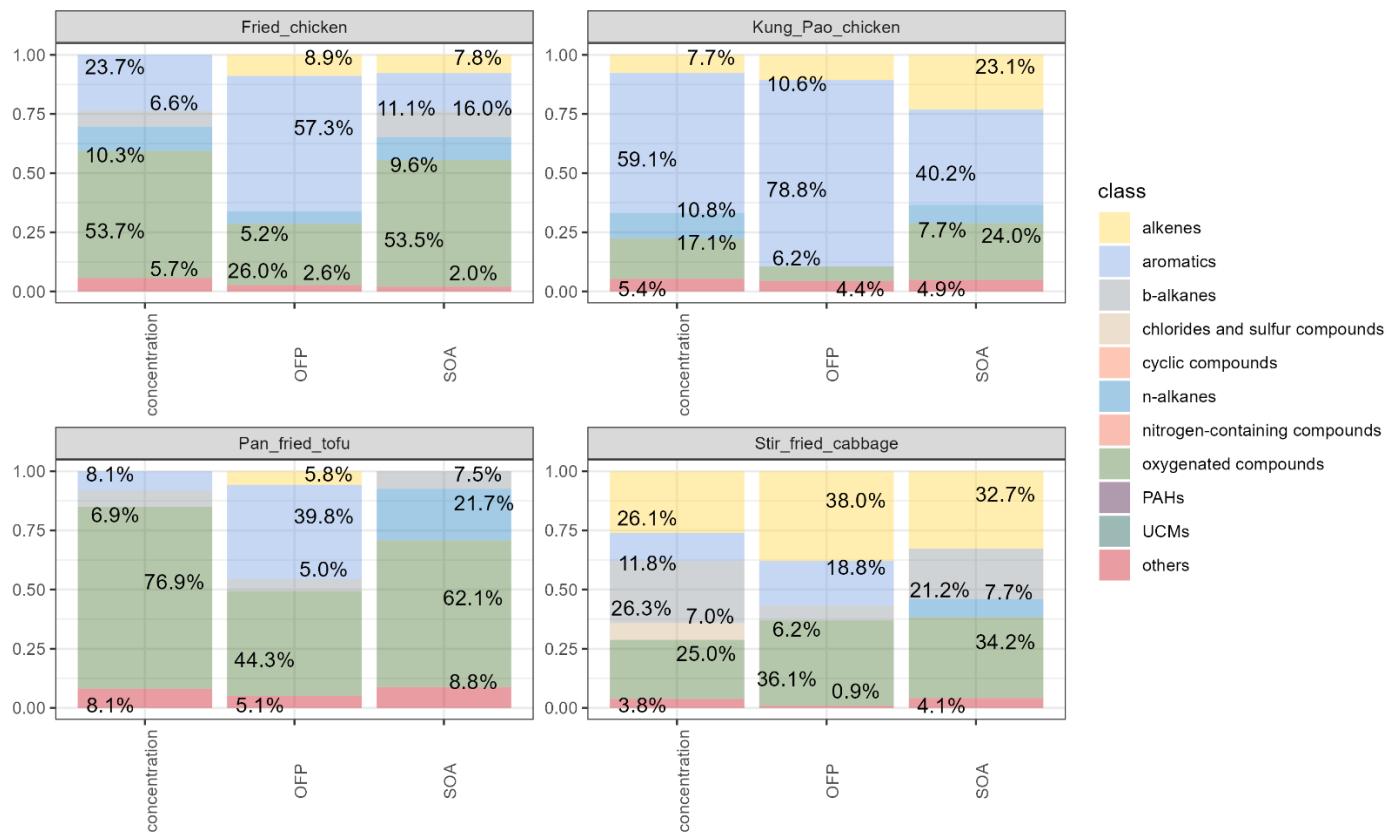
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104

105 **Figure S3.** Total mass concentration, ozone formation potential (OFP), and secondary organic
106 aerosol (SOA) of gaseous contaminants of four dishes.

107



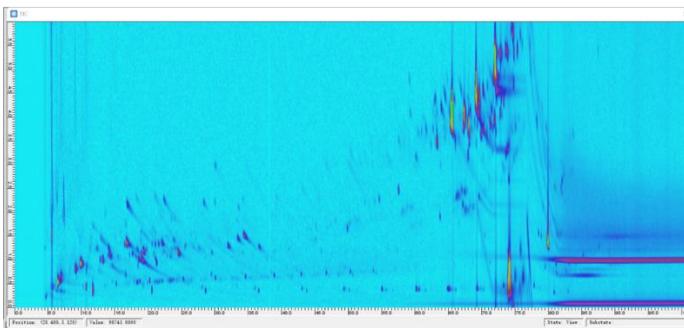
108

109 **Figure S4.** Chemical composition of mass concentration, ozone formation potential (OFP), and
110 secondary organic aerosol (SOA) of gaseous chemicals of four dishes.

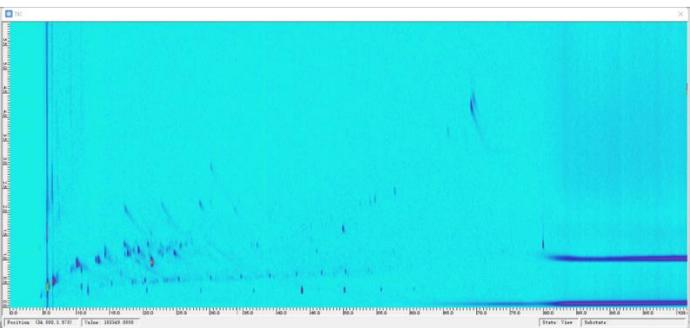
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112

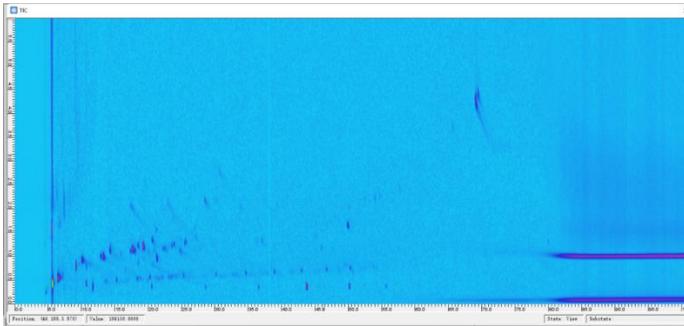
113 (a) Corn



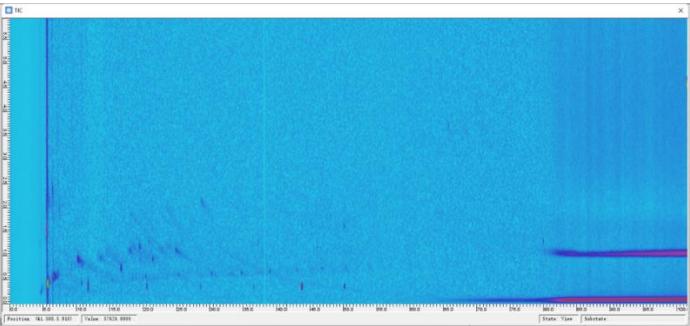
114 (b) Peanut



115 (c) Soybean



116 (d) Sunflower



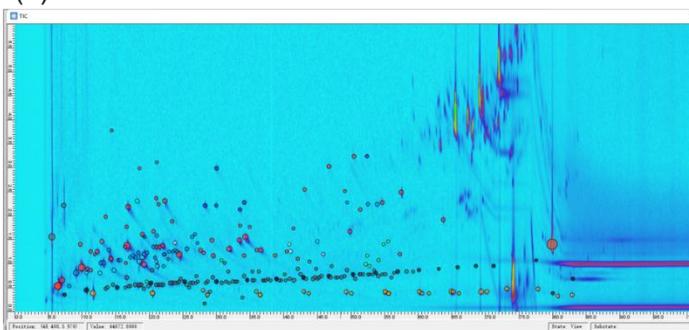
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118 **Figure S5.** Typical chromatograms of fried chicken cooked with corn (a), peanut (b),
119 soybean (c) and sunflower (d) oils.

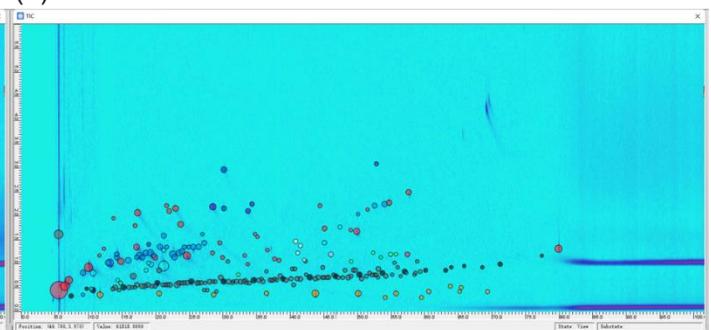
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121

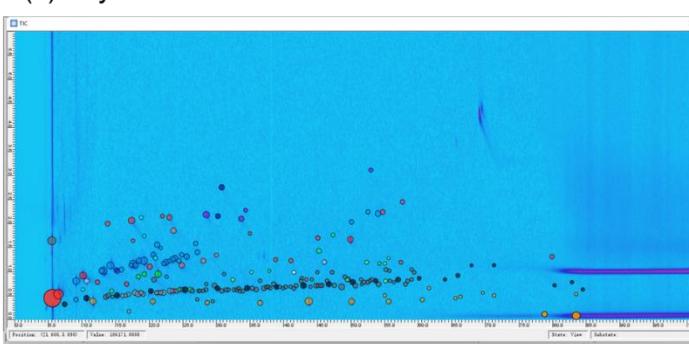
(a) Corn



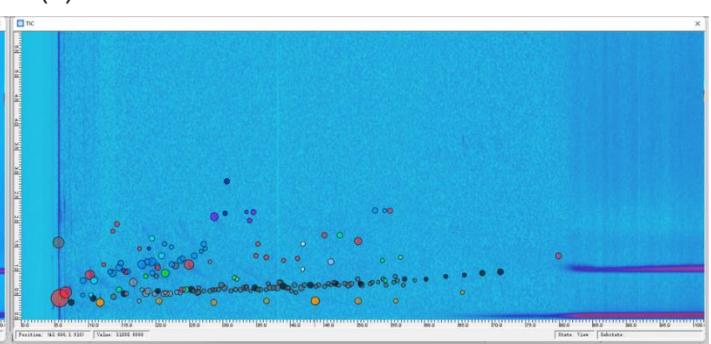
(b) Peanut



(c) Soybean



(d) Sunflower



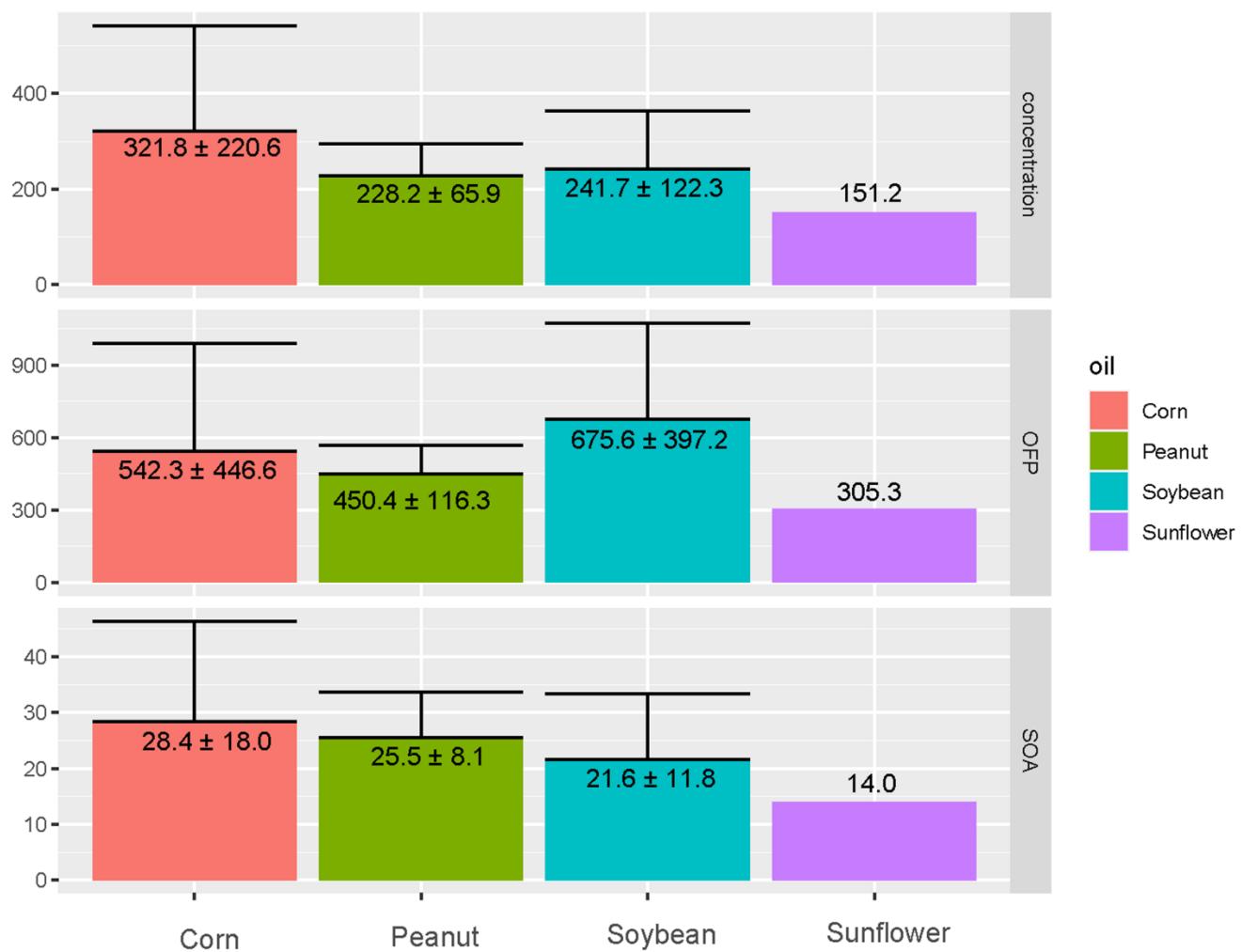
n-alkanes b-alkanes oxygenated compounds aromatics PAHs siloxanes alkenes others

118

119 **Figure S6.** Chemicals identified from fried chicken emissions cooked with corn (a), peanut (b),
 120 soybean (c), and sunflower (d) oils. Column and Tenax TA bleeding after 75 min in 1st retention time
 121 are excluded from qualification, quantification, and 2D binning processes.

122

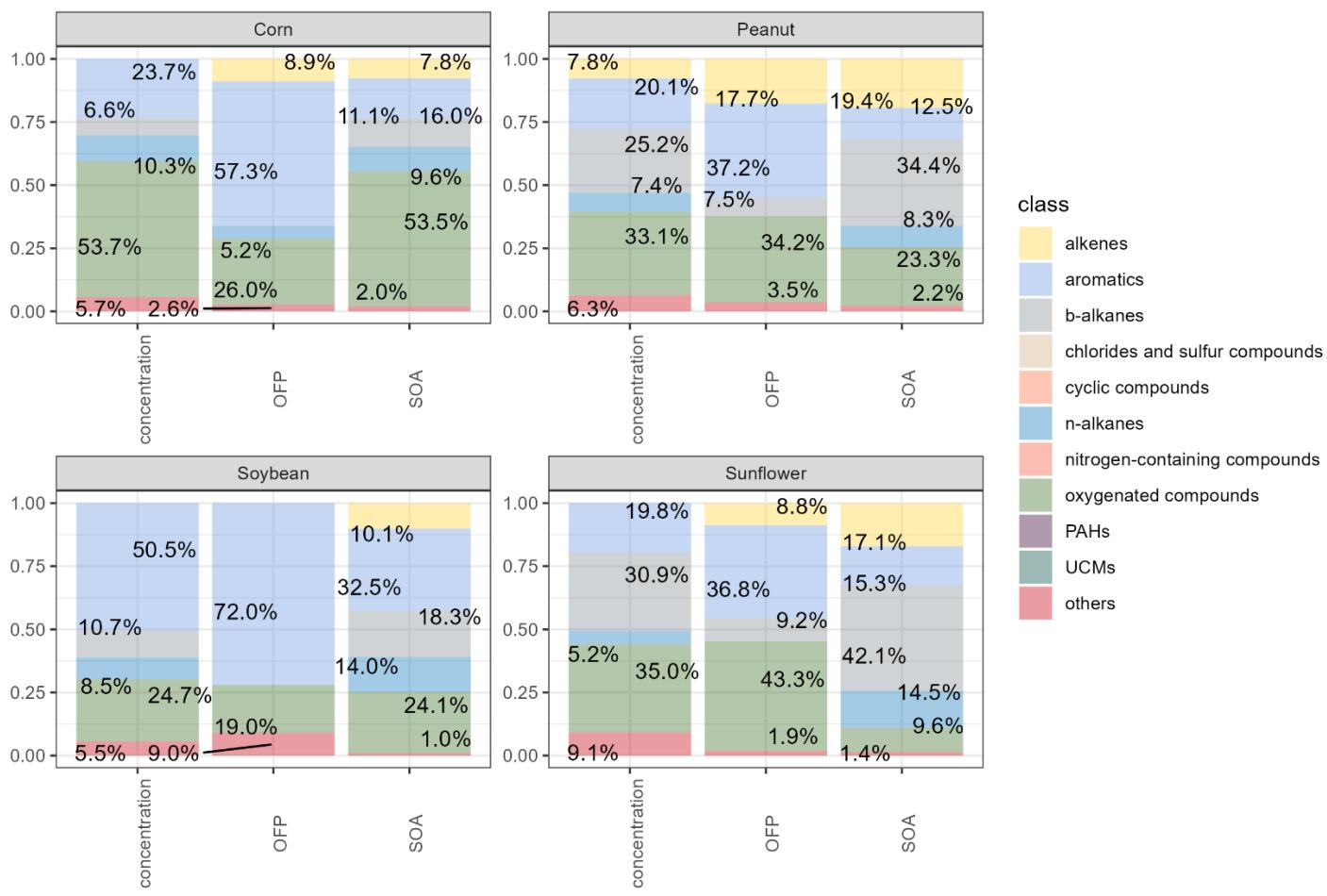
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124

125 **Figure S7.** Total mass concentration, ozone formation potential (OFP), and secondary organic
 126 aerosol (SOA) of gaseous chemicals of fried chicken using four types of oil (corn, peanut, soybean,
 127 and peanut).

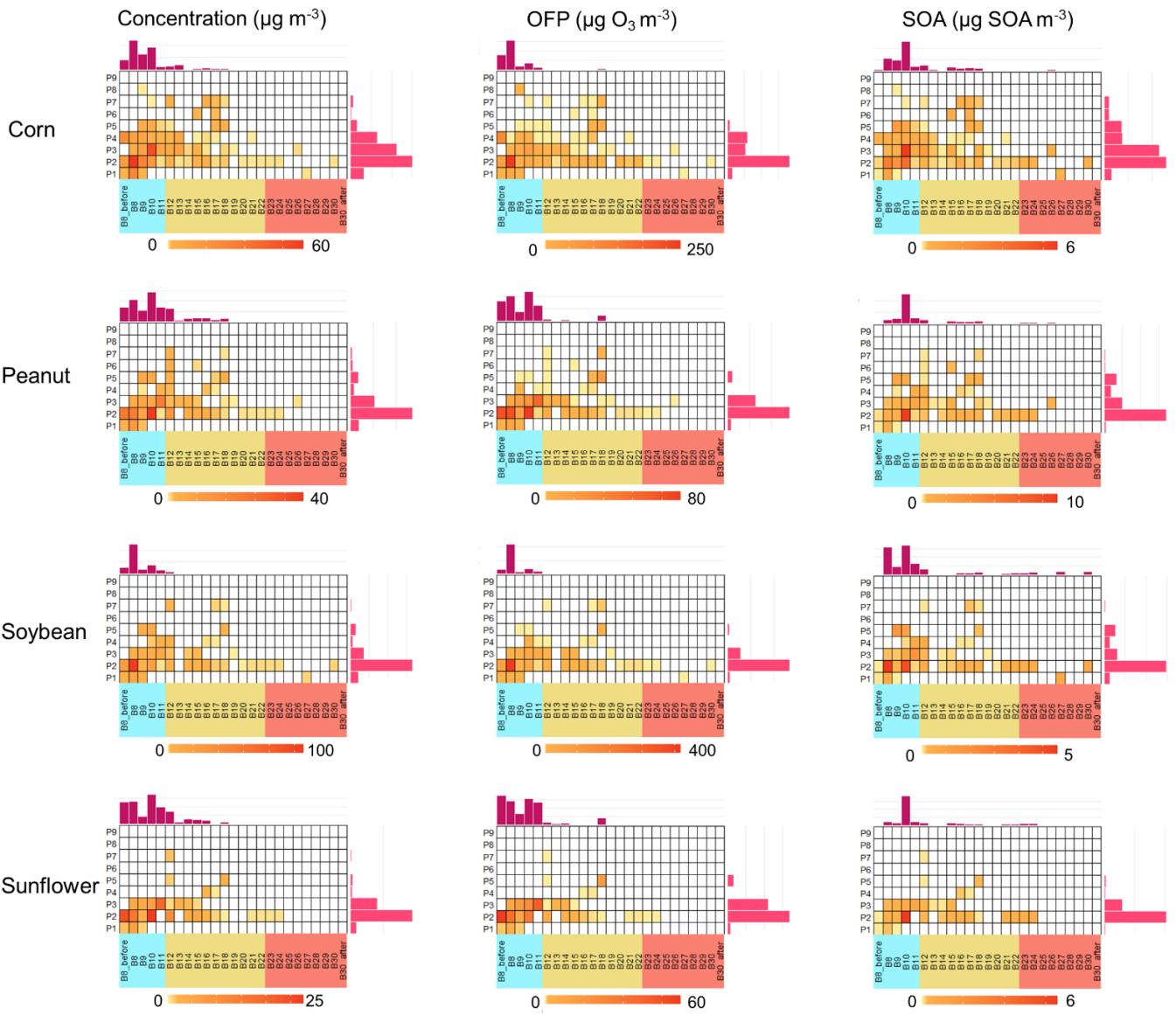
128



129

130 **Figure S8.** Chemical composition of mass concentration, ozone formation potential (OFP), and
 131 secondary organic aerosol (SOA) of gaseous chemicals of fried chicken using four types of oil (corn,
 132 peanut, soybean, and peanut).

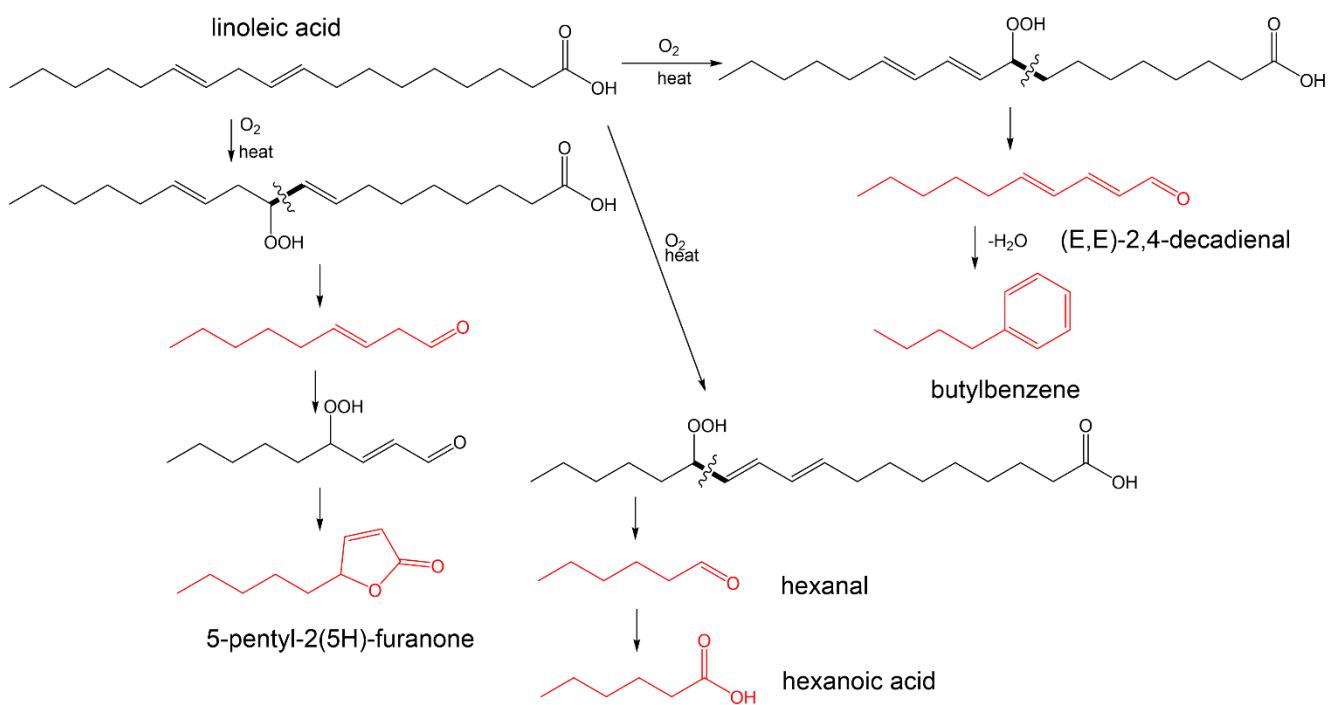
133



134

135 **Figure S9.** Volatility-polarity panels of gaseous chemical emissions from fried chicken fumes
 136 cooked with corn, peanut, soybean, and sunflower oils. Ozone formation potential (OFP), and
 137 secondary organic aerosol (SOA) were estimated from gas-phase precursors. VOCs (blue color in
 138 *x*-axis), IVOCs (orange color in *x*-axis), and SVOCs (red color in *x*-axis) are displayed in volatility
 139 bins (a decrease of volatility from B9 to B31) along with their polarity (an increase from P1 to P10 in
 140 *y*-axis). The mass concentration unit is $\mu\text{g m}^{-3}$.

141



142

143 **Figure S10.** Chemical reactions of cooking emissions elucidated by MPCA key components.

144 Chemicals in red color are detected by TD-GC \times GC-MS.

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