

Effect of Bio-Oil Species on Rheological Behaviors and Gasification Characteristics of Coal Bio-Oil Slurry Fuels

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Bio-oils were analyzed by GC/MS (3800GC/300MS, Varian, Palo Alto, CA, U.S.A.) with FFAP column of 30 m × 0.25 mm × 0.25 µm to identify the compositions. The analytical conditions were as follows: the oven temperature started from 40 °C holding for 3 min, then increased by 4 °C/min to 100 °C holding for 3 min, and finally increased by 6 °C/min to 240 °C holding for 10 min; the injector and ion source temperature was 240 °C and 250 °C, respectively. Components of bio-oils (BSR, BPA and BFT) are shown in Table S1.

Table S1. Components of bio-oils in the experiments.

BSR			BPA			BFT		
Retention time	Area %	Name	Retention time	Area %	Name	Retention time	Area %	Name
3.007	7.62	Ethanol	0.02	0.3	Acetonitrile, hydroxy-	2.895	3.05	Ethanol
5.586	3.97	Water	1.322	0.29	Nickel tetracarbonyl	2.952	2.45	Ethanol
13.405	0.21	2-Propanone, 1-hydroxy-	1.377	0.17	Nickel tetracarbonyl	3.007	0.6	Ethanol
14.962	0.15	2-Cyclopenten-1-one	1.566	0.47	Acetaldehyde	5.474	3.36	Water
15.308	0.21	2-Cyclopenten-1-one, 2-methyl-	1.6	0.33	Acetaldehyde	5.6	0.86	Water
17.797	2.3	Acetic acid	1.867	0.39	Propanal	12.023	0.09	Styrene
18.59	0.27	Indene	1.986	0.55	Acetone	14.9	0.11	Benzene, 2-propenyl-
19.842	0.68	2-Cyclopenten-1-one, 3-methyl-	2.05	0.28	Acetic acid, methyl ester	15.301	0.16	2-Cyclopenten-1-one, 2-methyl-
20.624	0.56	2-Cyclopenten-1-one, 2,3-dimethyl-	2.533	0.65	Methyl Alcohol	17.524	0.09	Cyclotetradecane
20.847	0.3	Propanoic acid	2.98	30.51	Ethanol	17.837	1.23	Acetic acid
22.1	0.13	5-Ethyl-2-furaldehyde	3.745	1.2	2,3-Butanedione	18.586	0.41	Indene
23.33	0.18	Cyclopentane carboxaldehyde, 2-methyl-3-methylene-	5.55	13.47	Water	19.029	0.13	5-Octyn-4-one, 2,2,7,7-tetramethyl-
23.558	0.3	2-Cyclopenten-1-one, 3-ethyl-	13.392	1.29	2-Propanone, 1-hydroxy-	19.449	0.1	Benzofuran
23.722	0.26	Butyrolactone	14.958	0.42	2-Cyclopenten-1-one	19.593	0.09	Ethanone, 1-(2-furanyl)-
23.781	0.29	Butanoic acid	15.303	0.3	2-Cyclopenten-1-one, 2-methyl-	19.847	0.25	2-Cyclopenten-1-one, 3-methyl-
24.145	0.19	2-Propenoic acid	15.523	0.37	1-Hydroxy-2-butanone	20.626	0.34	2-Cyclopenten-1-one, 2,3-dimethyl-
24.348	0.22	Acetophenone	17.841	3.42	Acetic acid	20.854	0.18	Propanoic acid
24.854	0.12	2-Furanmethanol	18.272	1.13	Furfural	22.013	0.12	2-Methylindene
26.717	1.02	Naphthalene	20.854	0.45	Propanoic acid	22.24	0.15	1H-Indene, 1-methyl-
27.857	0.17	Crotonic acid	22.099	0.22	2-Furancarboxaldehyde, 5-methyl-	22.583	0.2	5-Methylbenzimidazole
28.245	0.13	2-Cyclopenten-1-one, 3-ethyl-2-hydroxy-	23.72	0.21	Butyrolactone	22.779	0.11	Cycloprop[a]indene, 1,1a,6,6a-tetrahydro-

29.111	0.91	2-Cyclopenten-1-one, 2-hydroxy-3-methyl-	23.79	0.26	Butanoic acid	22.914	0.19	1H-Indene, 3-methyl-
29.507	0.98	Naphthalene, 1-methyl-	26.715	0.37	Naphthalene	23.333	0.12	Cyclopentanecarboxaldehyde, 2-methyl-3-methylene-
29.587	0.26	9-Nonadecene	27.335	0.21	2(5H)-Furanone	23.562	0.12	2-Cyclopenten-1-one, 3-ethyl-
29.903	0.73	Phenol, 2-methoxy-	29.116	0.79	2-Cyclopenten-1-one, 2-hydroxy-3-methyl-	23.786	0.1	Butanoic acid
30.327	0.59	Naphthalene, 2-methyl-	29.513	0.36	Naphthalene, 1-methyl-	24.34	0.24	Acetophenone
30.612	0.13	2-Cyclopenten-1-one, 3-ethyl-2-hydroxy-	29.904	1.69	Phenol, 2-methoxy-	24.851	0.1	3-Furanmethanol
30.691	0.13	1,6-Dimethylhepta-1,3,5-triene	30.33	0.19	Naphthalene, 2-methyl-	25.73	0.09	1H-Indene, 1,3-dimethyl-
30.788	0.12	2-Bromotetradecane	30.53	0.16	4-Methyl-5H-furan-2-one	25.892	0.14	Heptadecane
31.037	0.42	Phenol, 2,6-dimethyl-	32.042	1.61	Creosol	26.325	0.1	2(5H)-Furanone, 3-methyl-
31.618	0.26	Naphthalene, 2-ethyl-	33.102	2.04	Phenol	26.718	2.17	Naphthalene
31.835	0.14	9-Tricosene, (Z)-	33.577	0.84	Phenol, 4-ethyl-2-methoxy-	28.26	0.09	2-Cyclopenten-1-one, 3-ethyl-2-hydroxy-
31.908	0.31	Heptanoic acid	34.653	1.21	<i>p</i> -Cresol	28.466	0.09	Octadecane
32.043	1.54	Creosol	34.79	0.75	Phenol, 2-methyl-	28.74	0.11	3,4-Dimethoxytoluene
32.209	0.34	Maltol	35.135	0.23	Phenol, 2-methoxy-4-propyl-	29.115	0.45	2-Cyclopenten-1-one, 2-hydroxy-3-methyl-
32.601	0.2	Biphenyl	36.165	0.24	Tridecanoic acid	29.509	0.91	Naphthalene, 1-methyl-
32.667	0.22	Naphthalene, 1,4-dimethyl-	36.256	1	Eugenol	29.605	0.18	3,5-Dimethoxytoluene
32.801	0.48	Naphthalene, 2,6-dimethyl-	36.423	2.04	Phenol, 3-ethyl-	29.904	1.53	Phenol, 2-methoxy-
32.983	0.47	Phenol, 2,3,5-trimethyl-	36.555	0.42	Phenol, 3-ethyl-	30.154	0.15	2-Methoxy-5-methylphenol
33.094	6.2	Phenol	36.68	0.58	Acenaphthylene	30.331	0.55	Naphthalene, 2-methyl-
33.307	0.2	3-Heptenoic acid	36.845	0.17	4-Hydroxy-2-methylacetophenone	30.611	0.15	2-Cyclopenten-1-one, 3-ethyl-2-hydroxy-

33.38	0.21	7-Methylindan-1-one	37.093	0.15	Pentadecanoic acid, 13-methyl-, methyl ester	31.042	0.18	Phenol, 2,6-dimethyl-
33.575	0.95	Phenol, 4-ethyl-2-methoxy-	37.728	0.17	Docosyl pentafluoropropionate	31.458	0.1	Isoquinolinium, 2-methyl-, iodide
33.743	0.32	Phenol, 3-methyl-5-(1-methylethyl)-, methylcarbamate	37.918	0.4	trans-Isoeugenol	31.615	0.17	Naphthalene, 2-ethyl-
33.924	0.34	Octacosyl heptafluorobutyrate	38.035	0.23	Phenol, 4-propyl-	31.907	0.27	Heptanoic acid
34.119	0.67	Octanoic acid	38.154	2.88	Phenol, 2,6-dimethoxy-	32.045	2.35	2-Methoxy-5-methylphenol
34.449	0.43	Phenol, 2-ethyl-	39.121	0.31	Ethyl 2-acetamido-3,3,3-trifluoro-2-isopropoxypropionate	32.21	0.13	Maltol
34.562	1.1	Phenol, 2,6-dimethyl-	39.234	0.7	Fluorene	32.266	0.2	3,4-Dimethoxytoluene
34.65	4.74	Phenol, 2-ethyl-	39.349	0.41	Cyclopropane, 1-methoxy-2,2-dimethyl-3-(3,3-dimethyl-1-propynyl)-	32.33	0.09	2-Hydroxy-3-propyl-2-cyclopenten-1-one
34.794	3.19	Phenol, 3-methyl-	39.554	1.34	trans-Isoeugenol	32.604	0.22	Biphenyl
34.922	0.37	2-Methylhexacosane	39.653	2.35	3,5-Dimethoxy-4-hydroxytoluene	32.671	0.12	Pentobarbital
35.052	0.33	Benzene, 1-methoxy-4-methyl-2-(1-methylethyl)-	40.22	0.16	Propylene Carbonate	32.795	0.27	Naphthalene, 2,6-dimethyl-
35.132	0.38	Phenol, 2-methoxy-4-propyl-	40.345	0.4	Benzofuran, 2,3-dihydro-	32.982	0.15	Phenol, 2,3,5-trimethyl-
35.351	0.5	7-Octenoic acid	40.4	0.46	1,4:3,6-Dianhydro-.alpha.-d-glucopyranose	33.098	3.74	Phenol
35.571	0.41	Acenaphthene	40.613	1.51	Benzene, 1,2,3-trimethoxy-5-methyl-	33.304	0.13	3-Heptenoic acid
35.765	0.61	Phenol, 2-ethyl-4-methyl-	40.74	0.34	3-Pyridinol	33.38	0.13	7-Methylindan-1-one
35.871	0.3	5-Chlorovaleric acid, hexadecyl ester	41.185	0.4	1-Heptacosanol	33.576	1.49	Phenol, 4-ethyl-2-methoxy-
35.944	0.53	Phenol, 2,3-dimethyl-	41.64	0.41	Aziridine, 2-(1,1-dimethylethyl)-1-ethyl-3-methyl-, trans-	33.652	0.13	Ethanone, 1-(2-hydroxy-4-methoxyphenyl)-

36.018	0.25	7-Methylindan-1-one	41.763	0.47	2,4-Hexadienedioic acid, 3-methyl-4-propyl-, dimethyl ester, (Z,E)-	33.749	0.18	Decanoic acid, phenylmethyl ester
36.175	0.44	Tridecanoic acid	41.838	0.32	5-Hydroxymethyldihydrofuran-2-one	33.923	0.23	Fumaric acid, cyclobutyl pentadecyl ester
36.26	1.83	Phenol, 2-(1-methylethyl)-	42.206	0.69	5-Hydroxymethylfurfural	34.044	0.15	Benzene, 1,2,3-trimethoxy-5-methyl-
36.325	0.26	Phenol, 2-ethyl-4-methyl-	42.777	0.76	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl)phenol	34.116	0.58	Octanoic acid
36.426	3.14	Phenol, 3-ethyl-	43.158	0.73	Vanillin	34.452	0.24	Phenol, 2-ethyl-
36.552	0.79	Phenol, 3-ethyl-	43.43	0.17	1,3-Dioxolane-4-carbothioic acid, 2-(1,1-dimethylethyl)-4-(1-hydroxy-1-methylethyl)-, S-(1,1-dimethylethyl) ester, (2R-trans)-	34.564	0.5	Phenol, 2,6-dimethyl-
36.683	0.79	Acenaphthylene	44.063	0.27	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl)phenol	34.652	2.14	Phenol, 2-ethyl-
36.8	0.17	Hexadecane	44.333	0.37	Apocynin	34.797	1.86	Phenol, 3-methyl-
36.848	0.21	1-Naphthalenol, decahydro-4a-methyl-	44.601	0.39	2-Propanone, 1-(4-hydroxy-3-methoxyphenyl)-	34.917	0.23	Pentadecane
36.925	0.18	Phenol, 2-methyl-5-(1-methylethyl)-	45.281	0.19	2',4'-Dihydroxy-3'-methylpropiophenone	35.05	0.14	1-Isopropenylnaphthalene
37.093	0.91	2,5-Diethylphenol	45.553	0.42	Phenanthrene	35.133	0.35	Phenol, 2-methoxy-4-propyl-
37.297	0.87	Phenol, 3,4-dimethyl-	45.776	2.06	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl) phenol	35.355	0.17	7-Octenoic acid
37.335	0.51	Phenol, 2,4,6-trimethyl-	47.91	0.18	Ethanone, 1-(3-hydroxyphenyl)-	35.574	0.21	Acenaphthene
37.735	0.55	9-Ethylbicyclo(3.3.1)nonan-9-ol	48.108	4.54	n-Hexadecanoic acid	35.764	0.23	Phenol, 3-(1-methylethyl)-, methylcarbamate

37.924	0.62	Dibenzofuran	49.139	0.46	Benzaldehyde, 4-hydroxy-	35.871	0.13	Pentadecafluorooctanoic acid, octadecyl ester
37.986	0.28	Phenol, 2-ethyl-4-methyl-	49.811	0.26	Ethanone, 1-(4-hydroxy-3,5- dimethoxyphenyl)-	35.945	0.23	Phenol, 2,3-dimethyl-
38.047	0.33	Benzeneacetic acid, 4-hydroxy-	49.984	0.26	1,4-Benzenediol, 2-methyl-	36.174	0.27	Nonanoic acid
38.156	3.15	Phenol, 2,6-dimethoxy-	50.16	0.27	Desaspidinol	36.259	0.87	3-Allyl-6-methoxyphenol
38.588	0.13	Heneicosane	50.516	0.82	Hydroquinone	36.321	0.13	Phenol, 2-ethyl-4-methyl-
38.696	0.15	Phenol, 3-ethyl-5-methyl-	50.63	0.2	Nonahexacontanoic acid	36.426	1.71	Phenol, 3-ethyl-
38.895	0.16	Fluorene-9-methanol	51.764	1.52	Octadecanoic acid	36.555	0.46	Phenol, 3-ethyl-
39.165	0.21	Pentanoic acid, 4-oxo-	52.895	0.48	Coniferyl aldehyde	36.679	0.68	Acenaphthylene
39.228	0.79	Fluorene				36.848	0.37	2-Methoxy-4-vinylphenol
39.352	0.41	Benzaldehyde, 2,4-dihydroxy-3,6- dimethyl-				37.091	0.35	Phenol, 2,3,6-trimethyl-
39.43	0.25	1(2H)-Acenaphthylenone				37.304	0.62	Phenol, 2,4-dimethyl-
39.559	1.62	trans-Isoeugenol				37.731	0.26	Hexatriacontyl pentafluoropropionate
39.654	2.71	3,5-Dimethoxy-4-hydroxytoluene				37.92	0.73	trans-Isoeugenol
39.77	0.24	Diglycolic acid, di(3-methylpent-2-yl) ester				37.985	0.26	Phenol, 2-ethyl-4-methyl-
39.872	0.73	Benzofuran, 2,3-dihydro-				38.042	0.17	Benzeneacetic acid, 4-hydroxy-
39.955	0.2	Undecanoic acid				38.155	3.64	Phenol, 2,6-dimethoxy-
40.045	0.18	7-(4-Isopropoxyphenyl)-2- (methylamino)-4H,6H,7H- [1,3]thiazolo[4,5-b]pyridin-5-one				38.495	0.11	Ethanol, 2-[4-(1- methylethyl)phenoxy]-
40.143	0.31	1-Acenaphthenol, 3-methylamino-				38.586	0.16	Dotriacontane
40.34	0.39	Benzofuran, 2,3-dihydro-				38.694	0.13	Phenol, 3-ethyl-5-methyl-

40.405	0.69	1,4:3,6-Dianhydro-.alpha.-d-glucopyranose	39.165	0.1	Pentanoic acid, 4-oxo-
40.618	1.62	Benzene, 1,2,3-trimethoxy-5-methyl-	39.233	0.44	Fluorene
40.742	0.55	3-Pyridinol	39.349	0.21	Isoxaben
40.925	0.13	Phenol, 2-methyl-6-(2-propenyl)-	39.414	0.19	1-Acenaphthenol, 3-methylamino-
40.993	0.39	Cyclohexanamine, <i>n</i> -(benzoyloxy)-	39.556	2.3	trans-Isoeugenol
41.059	0.24	1-Acenaphthenol, 3-methylamino-	39.654	3.76	3,5-Dimethoxy-4-hydroxytoluene
41.192	0.9	1-Heptacosanol	39.745	0.42	4-Methoxythiobenzamide
41.319	0.32	9H-Fluorene, 2-methyl-	39.874	0.53	Benzofuran, 2,3-dihydro-
41.515	0.18	Naphtho[2,1-b]furan, 1,2-dimethyl-	39.955	0.33	Decyl isopropyl ether
41.695	0.66	2-Coumaranone	40.129	0.15	Norharmane, <i>n</i> -methyl-
41.759	0.39	Mandelic acid, 3,4-dimethoxy-, methyl ester	40.345	0.29	Benzofuran, 2,3-dihydro-
41.84	0.15	5-Hydroxymethyldihydrofuran-2-one	40.391	0.36	1,4:3,6-Dianhydro-.alpha.-d-glucopyranose
42.249	0.38	Phenol, 2-methyl-6-(2-propenyl)-	40.613	2.12	Benzene, 1,2,3-trimethoxy-5-methyl-
42.48	0.24	Phenol, 4-(2-propenyl)-	40.736	0.42	3-Pyridinol
42.62	0.25	Cinnamaldehyde, (E)-	40.86	0.12	2H-1-Benzopyran-2-one, 3-methyl-
42.72	0.17	cis-13-Octadecenoic acid	40.994	0.21	Benzoic acid
42.778	0.82	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl)phenol	41.048	0.16	2-(6-Amino-9H-purin-8-ylsulfanyl)- <i>n</i> -furan-2-ylmethyl-acetamide
43.353	0.32	Phenylacetic acid, 2-hydroxycarbonyl-.alpha.,.alpha.-dimethyl-	41.192	0.44	Octacosanol
43.539	0.58	1H-Indenol	41.675	0.11	1-Hexene, 2-(O-anisyl)-4-methyl-
43.795	0.15	1-Acenaphthenol	41.76	0.56	Mandelic acid, 3,4-dimethoxy-, methyl ester

44.064	0.41	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl)phenol	41.851	0.11	2,6-Octadienal, 2,6-dimethyl-8-(tetrahydro-2H-2-pyranyloxy)
44.194	0.26	4H-1-Benzopyran-4-one, 2,3-dihydro-6-methyl-	41.947	0.2	Tridecanoic acid, 2-ethyl-2-methyl-, ethyl ester
44.374	0.61	22-Tricosenoic acid	42.513	0.2	3-Methoxy-5-methylphenol
44.596	0.28	2-Propanone, 1-(4-hydroxy-3-methoxyphenyl)-	42.616	0.17	2-Propenal, 3-phenyl-
45.03	0.25	Tetradecanoic acid	42.777	1.24	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl) phenol
45.16	0.63	1(2H)-Naphthalenone, 3-(1,1-dimethylethyl)-3,4-dihydro-	42.954	0.16	1,2-Dihydro-6,7-diphenyl-3H-4,2,1-triazolo[3,4-b][1,2,4,5]tetrazepine-3-thione
45.299	0.29	1-(4-Hydroxybenzylidene)acetone	43.025	0.12	Benzenepropanoic acid, .alpha.-hydroxy-, methyl ester
45.554	1.17	Phenanthrene	43.105	0.25	Truxillic acid
45.632	0.32	Phenanthrene	43.16	0.28	Vanillin
45.777	2.12	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl)phenol	43.351	0.2	2C-E
45.966	0.24	Octanoic acid, undec-10-enyl ester	43.395	0.11	6-Thioguanosine
46.232	0.27	Benzofuro[3.2-d]pyrimidin-4(3H)-one	43.54	0.21	Ethyl 3-(3-pyridyl)propenoate
46.445	0.35	4-Chlorobutyric acid, pentadecyl ester	43.786	0.24	Benzoic acid, 4-hydroxy-3-methoxy-, methyl ester
46.596	0.34	Pentadecanoic acid	44.065	0.73	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl) phenol
47.007	0.17	2(3H)-Naphthalenone, 4,4a,5,6,7,8-hexahydro-4a,5-dimethyl-3-(1-methylethylidene)-, (4a-cis)-	44.196	0.27	4H-1-Benzopyran-4-one, 2,3-dihydro-6-methyl-

47.117	0.15	Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, 2-methyl-4-oxo-3-(1,3-pentadienyl)-2-cyclopenten-1-yl ester	44.332	0.73	Apocynin
47.219	0.19	Anthracene, 2-methyl-	44.53	0.16	1-(3-(2-Hydroxy-5-methylphenyl)-3-oxopropyl)pyrazole
47.403	0.4	Anthracene, 9-methyl-	44.603	0.53	2-Propanone, 1-(4-hydroxy-3-methoxyphenyl)-
47.771	0.21	Phenanthrene, 9-methyl-	44.828	0.33	Octadecanoic acid
47.922	0.58	Ethanone, 1-(3-hydroxyphenyl)-	44.91	0.13	Butan-2-one, 4-(3-hydroxy-2-methoxyphenyl)-
48.109	2.55	<i>n</i> -Hexadecanoic acid	45.036	0.17	Tetradecanoic acid
48.225	0.22	2-Methyloctadecan-7,8-diol	45.169	0.16	ethanol, 2-[[2H-1-benzopyran-3-ylmethylene]amino]-
48.861	0.22	Naphthalene, 2-phenyl-	45.291	0.36	benzoic acid, 4-hydroxy-3-propyl-
48.959	0.13	Benzaldehyde, 4-hydroxy-3,5-dimethoxy-	45.554	0.84	Phenanthrene
49.059	0.26	14-Pentadecenoic acid	45.637	0.26	9H-Fluorene, 9-methylene-
49.325	0.18	3-(1-Methylhept-1-enyl)-5-methyl-2,5-dihydrofuran-2-one	45.773	3.56	(E)-2,6-Dimethoxy-4-(prop-1-en-1-yl) phenol
49.406	0.47	1H-Indole-3-acetamide, <i>n</i> -(1,3-benzodioxol-5-ylmethyl)-.alpha.-oxo-	45.941	1.02	cis-10-Heptadecenoic acid
49.499	0.34	1-Hentetracontanol	46.06	0.14	1-Aminofluorene
49.668	0.22	1-Naphthalenol, 2-methyl-	46.234	0.35	Benzofuro[3,2-d]pyrimidin-4(3H)-one
49.808	0.39	Ethanone, 1-(4-hydroxy-3,5-dimethoxyphenyl)-	46.436	0.46	Fluoranthene

49.983	0.45	1,4-Benzenediol, 2-methyl-	46.599	0.13	Pentadecanoic acid
50.166	0.6	Mandelic acid, 3,4-dimethoxy-, methyl ester	47.016	0.24	2(3H)-Naphthalenone, 4,4a,5,6,7,8-hexahydro-4a,5-dimethyl-3-(1-methylethylidene)-, (4a-cis)-
50.513	0.58	Hydroquinone	47.121	0.13	4-Butylbenzoic acid, 2-bromo-4-fluorophenyl ester
50.765	0.14	4'-Phenylpropiophenone	47.234	0.3	Phenanthrene, 4-methyl-
51.255	0.24	1,3-Di-O-acetyl-.alpha.-.beta.-d-ribofuranose	47.35	0.21	Benzoic acid, 3-(1-methylpropyl)oxy-, methyl ester
51.64	0.16	Benzene, (2-methylene-1-phenylcyclopropyl)-	47.4	0.31	Phenanthrene, 2-methyl-
51.76	0.47	Octadecanoic acid	47.46	0.21	6,10,14-Trimethyl-pentadecan-2-ol
52.103	0.23	7-Hydroxycoumarin	47.646	2.2	Oxirane, hexadecyl-
52.435	0.76	cis-10-Heptadecenoic acid	47.92	1.89	Cyclohexanol, 1-methyl-4-(1-methylethylidene)-
			48.109	3.08	n-Hexadecanoic acid
			48.348	0.58	Schkuhrianol
			48.521	0.62	1-Naphthalenol
			48.67	0.79	Citronellyl palmitoleate
			48.82	0.2	Benzoic acid, 2,4,5-trimethyl-
			48.865	0.4	Naphthalene, 2-phenyl-
			48.961	0.6	Benzaldehyde, 4-hydroxy-3,5-dimethoxy-
			49.055	0.41	Palmitoleic acid
			49.294	1.15	Fluoranthene
			49.34	0.21	Methyl biphenyl-4-carboxylate
			49.405	0.66	1-Naphthalenol

49.499	0.96	5-Chlorovaleric acid, tridecyl ester
49.668	0.27	1-Naphthalenol, 2-methyl-
49.807	1.03	Ethanone, 1-(4-hydroxy-3,5-dimethoxyphenyl)-
49.993	0.64	1,4-Benzenediol, 2-methyl-
50.166	1.08	Desaspidinol
50.308	0.3	Heneicosanoic acid, 18-propyl-, methyl ester
50.4	0.17	Pyrimidine, 2-chloro-4-methyl-6-phenyl-
50.515	0.59	Hydroquinone
50.645	0.43	Benz[a]anthracene
50.764	0.79	4'-Phenylpropiophenone
50.982	0.24	1H-Pyrazole, 3-methyl-5-phenyl-
51.084	0.27	.delta.-Selinene
51.259	0.31	1,3-Di-O-acetyl-.alpha.-.beta.-d-ribose
51.5	0.1	Carbonic acid, monoamide, <i>n</i> -octyl-, menthyl ester
51.625	0.1	1-(4-Methoxymethyl-2,3,5,6-tetramethylphenyl)ethanol
51.763	0.3	Octadecanoic acid
52.125	0.22	7-Hydroxycoumarin
52.225	0.18	<i>n</i> -(2-Methylbutyl)undeca-(2E,4E)-diene-8,10-diynamide
52.439	0.72	9-Octadecenoic acid, (E)-

