

Table S1 Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by CG-MS in bio-oil by pyrolysis of residual fat at 400 °C, 1.0 atm, 50 min, using a pyrolysis reactor of 2.0 L, in semi-pilot scale.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	ω (area.%)
<b>Alkanes</b>			
Heptane	4.504	142-82-5	0.650
Octane	6.803	111-65-9	0.874
Nonane	9.723	111-84-2	0.899
Decane	12.913	124-18-5	0.506
Undecane	16.107	112-40-3	0.730
Dodecane	19.180	112-40-3	1.036
Tridecane	22.100	629-50-5	2.506
Tetradecane	24.860	629-59-4	2.255
Pentadecane	27.454	629-62-9	6.816
Hexadecane	29.961	544-76-3	1.947
Heptadecane	32.416	629-78-7	5.106
Σ (Area.%) =			<b>23.325</b>
<b>Alkenes</b>			
1-Heptene	4.350	592-76-7	0.806
1-Octene	6.572	111-66-0	0.573
1-Nonene	9.457	124-11-8	0.550
1-Decene	12.633	872-05-9	0.614
1-Undecene	15.841	821-95-4	1.181
5-Undecene	16.243	4941-53-1	1.405
2-Undecene, (E)-	16.553	693-61-8	0.654
1-Dodecene	18.937	112-41-4	1.036
4-Undecene, 3-methyl-, (Z)-	19.314	74645-87-7	0.149
1-Tridecene	21.871	2437-56-1	1.803
1-Tetradecene	24.654	1120-36-1	2.696
1-Pentadecene	27.274	13360-61-7	2.629
7-Hexadecene, (Z)-	29.596	35507-09-6	1.228
Cetene	29.775	629-73-2	2.335
8-Heptadecene	32.036	54290-12-9	5.181
1-Heptadecene	32.290	6765-39-5	1.815
1-Octadecene	33.832	112-88-9	2.572
9-Hexacosene	53.020	71502-22-2	5.454
Σ (Area.%) =			<b>32.681</b>
<b>Alkynes</b>			
13-Hexacosyne	52.535	34291-68-4	4.524
Σ (Area.%) =			<b>4.524</b>
<b>Ring-containing Alkanes</b>			
Cyclopentane, nonyl-	26.403	2882-98-6	0.357
n-Nonylcyclohexane	29.112	2883-02-5	0.744
Cyclotetracosane	48.767	297-03-0	10.319
Σ (Area.%) =			<b>11.420</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.975	79-09-4	0.162
Butanoic acid	5.903	107-92-6	0.212
Pentanoic acid	8.654	109-52-4	0.416
Hexanoic acid	11.760	142-62-1	0.615
Heptanoic acid	14.895	111-14-8	0.776
Octanoic acid	17.979	124-07-2	1.265
Nonanoic acid	20.903	112-05-0	0.650
n-Decanoic acid	23.737	334-48-5	5.432
Tetradecanoic acid	33.451	544-63-8	2.250
n-Hexadecanoic acid	38.011	57-10-3	9.238
Oleic Acid	44.012	112-80-1	1.051

$\Sigma$ (Area.%) =			<b>23.657</b>
<b>Ketones</b>			
2-Heptadecanone	36.536	2922-51-2	1.596
$\Sigma$ (Area.%) =			<b>1.596</b>
<b>Alcohols</b>			
Behenic alcohol	45.115	661-19-8	1.835
$\Sigma$ (Area.%) =			<b>1.835</b>
<b>Aldehydes</b>			
2H-Pyran-2-carboxaldehyde, 3,4-dihydro-	13.967	100-73-2	0.381
$\Sigma$ (Area.%) =			<b>0.381</b>
<b>Non-identified compounds</b>			0.581
$\Sigma$ (Area.%) =			<b>0.581</b>
<b>Total</b>			<b>100.000</b>

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Table S2: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by CG-MS in bio-oil by pyrolysis of residual fat at 400 °C, 1.0 atm, 60 min, using a pyrolysis reactor of 2.0 L, in semi-pilot scale.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	α (area.%)
<b>Alkanes</b>			
Heptane	4.498	142-82-5	1.283
Octane	6.788	111-65-9	1.933
Nonane	9.704	111-84-2	1.824
Decane	12.885	124-18-5	1.431
Undecane	16.080	112-40-3	1.826
Dodecane	19.157	112-40-3	2.631
Tridecane	22.076	629-50-5	4.698
Tetradecane	24.830	629-59-4	5.921
Pentadecane	27.431	629-62-9	10.059
Heptadecane	32.395	629-78-7	7.653
Σ (Area.%) =			<b>39.259</b>
<b>Alkenes</b>			
1-Heptene	4.339	592-76-7	1.168
1-Octene	6.555	111-66-0	1.188
1-Nonene	9.444	124-11-8	1.312
1-Decene	12.611	872-05-9	1.246
1-Undecene	15.821	821-95-4	1.774
5-Undecene	16.222	4941-53-1	0.625
2-Undecene, (E)-	16.538	693-61-8	0.240
1-Dodecene	18.908	112-41-4	2.146
1-Tridecene	21.851	2437-56-1	4.074
1-Tetradecene	24.625	1120-36-1	5.538
1-Pentadecene	27.246	13360-61-7	6.459
1-Heptadecene	32.269	6765-39-5	4.146
9-Hexacosene	52.987	71502-22-2	7.648
Σ (Area.%) =			<b>37.564</b>
<b>Ring-containing Alkanes</b>			
Cyclopentane, nonyl-	26.383	2882-98-6	0.465
n-Nonylcyclohexane	29.076	2883-02-5	0.966
Cyclotetracosane	48.830	297-03-0	10.261
Σ (Area.%) =			<b>11.692</b>
<b>Carboxylic Acids</b>			
n-Decanoic acid	23.651	334-48-5	1.45
n-Hexadecanoic acid	37.942	57-10-3	2.896
Σ (Area.%) =			<b>4.346</b>
<b>Ketones</b>			
2-Heptadecanone	36.518	2922-51-2	3.316
2-Nonadecanone	42.888	629-66-3	1.827
Σ (Area.%) =			<b>5.143</b>
<b>Non-identified compounds</b>			
			1.994
Σ (Area.%) =			<b>1.994</b>
<b>Total</b>			<b>100.000</b>

Table S3: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by CG-MS in bio-oil by pyrolysis of residual fat at 400 °C, 1.0 atm, 70 min, using a pyrolysis reactor of 2.0 L, in semi-pilot scale.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	α (area.%)
<b>Alkanes</b>			
Heptane	4.476	142-82-5	0.820
Octane	6.786	111-65-9	1.537
Nonane	9.703	111-84-2	1.988
Decane	12.891	124-18-5	2.228
Undecane	16.083	112-40-3	2.833
Dodecane	19.159	112-40-3	3.581
Tridecane	22.083	629-50-5	4.955
Tetradecane	24.839	629-59-4	5.587
Pentadecane	27.444	629-62-9	7.414
Hexadecane	29.940	544-76-3	5.420
Heptadecane	32.403	629-78-7	6.542
Octadecane	34.227	593-45-3	2.012
Σ (Area.%) =			<b>44.917</b>
<b>Alkenes</b>			
1-Heptene	4.328	592-76-7	0.988
1-Hexene, 3-methyl-	4.615	3404-61-3	0.116
1-Octene	6.559	111-66-0	1.477
2-Octene	6.938	111-67-1	0.111
1-Nonene	9.438	124-11-8	1.971
1-Decene	12.614	872-05-9	2.438
1-Undecene	15.822	821-95-4	3.310
5-Undecene	16.221	4941-53-1	0.431
1-Dodecene	18.918	112-41-4	3.802
1-Tridecene	21.857	2437-56-1	5.165
1-Tetradecene	24.635	1120-36-1	6.067
1-Pentadecene	27.257	13360-61-7	7.935
Cetene	29.758	629-73-2	5.675
1-Heptadecene	32.278	6765-39-5	6.000
Σ (Area.%) =			<b>45.486</b>
<b>Ring-containing Alkenes</b>			
Cyclopentene, 1-methyl-	3.755	693-89-0	0.157
Cyclopentane, ethyl-	5.371	1640-89-7	0.057
1-Ethylcyclopentene	5.803	2146-38-5	0.077
Σ (Area.%) =			<b>0.291</b>
<b>Ketones</b>			
4-hydroxy-2-butanone	3.155	590-90-9	0.080
2-Heptadecanone	36.520	2922-51-2	4.292
3-Octadecanone	39.129	18261-92-2	1.592
2-Nonadecanone	42.894	629-66-3	3.070
Σ (Area.%) =			<b>9.034</b>
<b>Total</b>			<b>100.000</b>

Table S4: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by CG-MS in bio-oil by pyrolysis of residual fat at 400 °C, 1.0 atm, 80 min, using a pyrolysis reactor of 2.0 L, in semi-pilot scale.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	α (area.%)
<b>Alkanes</b>			
Heptane	4.498	142-82-5	0.912
Octane	6.788	111-65-9	1.578
Nonane	9.706	111-84-2	1.930
Decane	12.889	124-18-5	2.057
Undecane	16.081	112-40-3	2.837
Dodecane	19.153	112-40-3	3.865
Tridecane	22.076	629-50-5	6.103
Tetradecane	24.832	629-59-4	7.563
Pentadecane	27.432	629-62-9	10.296
Hexadecane	29.933	544-76-3	6.481
Heptadecane	32.396	629-78-7	7.150
Octadecane	34.228	593-45-3	1.255
Σ (Area.%) =			<b>52.027</b>
<b>Alkenes</b>			
1-Heptene	4.339	592-76-7	0.850
1-Octene	6.559	111-66-0	1.158
1-Nonene	9.441	124-11-8	1.469
1-Decene	12.613	872-05-9	1.862
1-Undecene	15.818	821-95-4	2.699
5-Undecene	16.220	4941-53-1	0.323
1-Dodecene	18.912	112-41-4	3.173
1-Tridecene	21.850	2437-56-1	5.087
1-Tetradecene	24.625	1120-36-1	6.239
1-Pentadecene	27.249	13360-61-7	7.534
Cetene	29.752	629-73-2	5.246
1-Heptadecene	32.272	6765-39-5	4.657
8-Heptadecene	32.721	54290-12-9	0.295
Σ (Area.%) =			<b>40.592</b>
<b>Ring-containing Alkanes</b>			
n-Nonylcyclohexane	29.083	2883-02-5	1.334
Σ (Area.%) =			<b>1.334</b>
<b>Ring-containing Alkenes</b>			
1-Cyclohexylnonene	29.548	114614-84-5	1.184
Σ (Area.%) =			<b>1.184</b>
<b>Ketones</b>			
2-Heptadecanone	36.515	2922-51-2	2.858
3-Octadecanone	39.134	18261-92-2	0.690
2-Nonadecanone	42.885	629-66-3	1.317
Σ (Area.%) =			<b>4.865</b>
<b>Total</b>			<b>100.000</b>

Table S5: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by CG-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 5.0% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 50 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	α (area.%)
<b>Alkanes</b>			
Octane	6.802	111-65-9	0.074
Nonane	9.731	111-84-2	0.785
Decane	12.909	124-18-5	0.187
Undecane	16.092	1120-21-4	0.221
Dodecane	19.171	112-40-3	0.245
Tridecane	22.091	629-50-5	0.614
Tetradecane	24.846	629-59-4	0.359
Pentadecane	27.448	629-62-9	2.005
Hexadecane	29.944	544-76-3	0.400
Heptadecane	32.405	629-78-7	1.821
Σ (Area.%) =			<b>6.711</b>
<b>Alkenes</b>			
1-Octene	6.573	111-66-0	0.107
1-Nonene	9.457	124-11-8	0.310
1-Decene	12.632	872-05-9	0.604
1-Undecene	15.835	821-95-4	0.602
5-Undecene	16.236	4941-53-1	0.404
1-Dodecene	18.931	112-41-4	0.510
1-Tridecene	21.871	2437-56-1	0.760
1-Tetradecene	24.641	1120-36-1	0.960
1-Pentadecene	27.260	13360-61-7	1.146
Cetene	29.763	629-73-2	0.674
1-Heptadecene	32.026	6765-39-5	1.351
8-Heptadecene	32.117	54290-12-9	0.625
9-Hexacosene	52.893	71502-22-2	2.443
Σ (Area.%) =			<b>10.496</b>
<b>Alkynes</b>			
11-Hexacosyne	52.368	34291-69-5	3.234
Σ (Area.%) =			<b>3.234</b>
<b>Ring-containing Alkanes</b>			
Cyclotetracosane	48.751	297-03-0	3.993
Σ (Area.%) =			<b>3.993</b>
<b>Ring-containing Alkenes</b>			
1H-Indene, 1-ethylidene-	22.773	2471-83-2	1.254
Σ (Area.%) =			<b>1.254</b>
<b>Aromatic Hydrocarbons</b>			
Naphthalene	19.490	91-20-3	1.231
Anthracene	35.142	120-12-7	0.937
Σ (Area.%) =			<b>2.168</b>
<b>Carboxylic Acids</b>			
Butanoic acid	5.912	107-92-6	0.088
Pentanoic acid	8.676	109-52-4	0.170
Hexanoic acid	11.765	142-62-1	0.514
6-Heptenoic Acid	14.660	1119-60-4	0.417
Heptanoic Acid	14.867	111-14-8	0.807
Octanoic acid	17.983	124-07-2	1.076
Nonanoic acid	20.882	112-05-0	0.680
n-Decanoic acid	23.758	334-48-5	5.232
Dodecanoic acid	28.834	143-07-7	0.333

Tetradecanoic acid	33.452	544-63-8	5.521
Pentadecanoic acid	34.662	1002-84-2	2.419
Palmitoleic acid	37.490	373-49-9	1.793
n-Hexadecanoic acid	38.030	57-10-3	24.867
Oleic Acid	44.018	112-80-1	13.899
Octadecanoic acid	44.616	57-11-4	13.232
$\Sigma$ (Area.%) =			<b>71.048</b>
<b>Ketones</b>			
2-Heptadecanone	36.526	2922-51-2	1.098
$\Sigma$ (Area.%) =			<b>1.098</b>
<b>Total</b>			<b>100.000</b>

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Table S6: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by CG-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 5.0% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 60 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	$\alpha$ (area.%)
<b>Alkanes</b>			
Heptane	4.498	142-82-5	0.073
Octane	6.785	111-65-9	0.172
Nonane	9.711	111-84-2	0.798
Decane	12.884	124-18-5	0.415
Undecane	16.077	1120-21-4	0.269
Dodecane	19.155	112-40-3	0.322
Tridecane	22.070	629-50-5	0.866
Tetradecane	24.827	629-59-4	0.665
Pentadecane	27.429	629-62-9	3.153
Hexadecane	29.924	544-76-3	0.614
Heptadecane	32.395	629-78-7	2.823
$\Sigma$ (Area.%) =			<b>10.170</b>
<b>Alkenes</b>			
1-Heptene	4.340	592-76-7	0.125
1-Octene	6.650	111-66-0	0.212
1-Nonene	9.439	124-11-8	0.414
1-Decene	12.611	872-05-9	0.698
1-Undecene	15.816	821-95-4	0.705
5-Undecene	16.220	4941-53-1	0.380
2-Undecene, (Z)-	16.535	821-96-5	0.209
1-Dodecene	18.910	112-41-4	0.732
1-Tridecene	21.853	2437-56-1	0.953
1-Tetradecene	24.624	1120-36-1	1.384
1-Pentadecene	27.245	13360-61-7	1.715
Cetene	29.742	629-73-2	0.988
1-Heptadecene	32.009	6765-39-5	1.236
8-Heptadecene	32.099	54290-12-9	0.974
1-Octadecene	33.811	112-88-9	1.761
1-Docosene	45.074	1599-67-3	4.906
9-Tricosene, (Z)-	47.143	27519-02-4	2.099
9-Hexacosene	52.875	71502-22-2	6.891
$\Sigma$ (Area.%) =			<b>26.382</b>
<b>Alkynes</b>			
2,4-Hexadiyne	3.973	2809-69-0	0.125
$\Sigma$ (Area.%) =			<b>0.125</b>
<b>Ring-containing Alkanes</b>			
n-Nonylcyclohexane	29.082	2883-02-5	0.512
Cyclotetracosane	48.739	297-03-0	5.102
$\Sigma$ (Area.%) =			<b>5.614</b>
<b>Ring-containing Alkenes</b>			
Cyclooctene	10.185	931-88-4	0.114
1H-Indene, 1-ethylidene-	22.752	2471-83-2	0.189
$\Sigma$ (Area.%) =			<b>0.303</b>
<b>Aromatic Hydrocarbons</b>			
Naphthalene	19.473	91-20-3	0.438
Naphthalene, 2-methyl-	23.237	90-12-0	0.166
Phenanthrene	35.127	85-01-8	0.421
$\Sigma$ (Area.%) =			<b>1.025</b>
<b>Carboxylic Acids</b>			



Butanoic acid	5.879	107-92-6	0.101
Pentanoic acid	8.636	109-52-4	0.148
Hexanoic acid	11.741	142-62-1	0.449
Heptanoic acid	14.883	111-14-8	1.105
Octanoic acid	17.973	124-07-2	1.605
8-Nonenoic acid	20.650	31642-67-8	0.212
Nonanoic acid	20.884	112-05-0	1.316
n-Decanoic acid	23.778	334-48-5	7.995
Undecanoic acid	26.307	112-37-8	1.245
Dodecanoic acid	28.816	143-07-7	0.359
Tetradecanoic acid	33.437	544-63-8	5.183
Pentadecanoic acid	34.836	1002-84-2	1.657
n-Hexadecanoic acid	39.010	57-10-3	20.020
Oleic Acid	43.980	112-80-1	5.717
Octadecanoic acid	44.594	57-11-4	6.901
$\Sigma$ (Area.%) =			<b>54.013</b>
<b>Ketones</b>			
2-Heptadecanone	36.509	2922-51-2	1.202
2-Nonadecanone	42.875	629-66-3	0.616
$\Sigma$ (Area.%) =			<b>1.818</b>
<b>Aldehydes</b>			
E-14-Hexadecenal	32.271	330207-53-9	0.550
$\Sigma$ (Area.%) =			<b>0.550</b>
<b>Total</b>			<b>100.000</b>

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Table S7: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by CG-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 5.0% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 80 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	α (area.%)
<b>Alkanes</b>			
Octane	6.792	111-65-9	0.137
Nonane	9.709	111-84-2	1.099
Decane	12.887	124-18-5	0.277
Undecane	16.080	1120-21-4	0.373
Dodecane	19.157	112-40-3	0.585
Tridecane	22.077	629-50-5	1.275
Tetradecane	24.828	629-59-4	1.212
Pentadecane	27.431	629-62-9	4.405
Hexadecane	29.924	544-76-3	1.272
Heptadecane	32.395	629-78-7	4.417
Σ (Area.%) =			<b>15.052</b>
<b>Alkenes</b>			
1-Octene	6.564	111-66-0	0.199
1-Nonene	9.439	124-11-8	0.561
1-Decene	12.610	872-05-9	1.163
1-Undecene	15.816	821-95-4	1.315
5-Undecene	16.221	4941-53-1	0.587
1-Dodecene	18.911	112-41-4	1.621
1-Tridecene	21.849	2437-56-1	2.326
1-Tetradecene	24.625	1120-36-1	2.638
1-Pentadecene	27.246	13360-61-7	1.953
Cetene	29.747	629-73-2	1.742
1-Heptadecene	32.271	6765-39-5	3.917
1-Octadecene	34.098	112-88-9	0.735
9-Tricosene, (Z)-	47.146	27519-02-4	3.155
Z-12-Pentacosene	50.707		2.587
9-Hexacosene	52.979	71502-22-2	7.523
Σ (Area.%) =			<b>32.022</b>
<b>Ring-containing Alkanes</b>			
n-Octylidencyclohexane	26.908	137595-12-1	0.438
Σ (Area.%) =			0.438
<b>Ring-containing Alkenes</b>			
1H-Indene, 1-ethylidene-	22.758	2471-83-2	0.222
Σ (Area.%) =			<b>0.222</b>
<b>Aromatic Hydrocarbons</b>			
Naphthalene	19.481	91-20-3	0.509
Naphthalene, 2-methyl-	23.243	90-12-0	0.236
Σ (Area.%) =			<b>0.745</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.960	79-09-4	0.103
Butanoic acid	5.872	107-92-6	0.102
Pentanoic acid	8.614	109-52-4	0.156
Hexanoic acid	11.691	142-62-1	0.419
Heptanoic acid	14.840	111-14-8	0.971
7-Octenoic acid	17.704	18719-24-9	0.349
Octanoic acid	17.939	124-07-2	1.290
8-Nonenoic acid	20.657	31642-67-8	0.461
Nonanoic acid	20.885	112-05-0	1.907
n-Decanoic acid	23.710	334-48-5	5.151

Undecanoic acid	26.298	112-37-8	1.845
Dodecanoic acid	28.814	143-07-7	0.470
Tetradecanoic acid	33.421	544-63-8	3.782
n-Hexadecanoic acid	37.957	57-10-3	17.689
Octadecanoic acid	44.575	57-11-4	4.153
$\Sigma$ ( <i>Area</i> ,%) =			<b>38.848</b>
<b>Ketones</b>			
2-Heptadecanone	36.504	2922-51-2	2.013
2-Nonadecanone	42.873	629-66-3	1.404
10-Nonadecanone	55.767	504-57-4	1.727
$\Sigma$ ( <i>Area</i> ,%) =			<b>5.144</b>
<b>Alcohols</b>			
n-Tetracosanol-1	48.883	506-51-4	7.532
$\Sigma$ ( <i>Area</i> ,%) =			<b>7.532</b>
<b>Total</b>			<b>100.000</b>

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Table S8: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by GC-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 5.0% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 100 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT [min]	CAS	α (area.%)
<b>Alkanes</b>			
Octane	6.789	111-65-9	0.130
Nonane	9.714	111-84-2	1.931
Decane	12.887	124-18-5	0.515
Undecane	16.081	1120-21-4	0.774
Dodecane	19.154	112-40-3	1.111
Tridecane	22.069	629-50-5	2.238
Tetradecane	24.831	629-59-4	2.295
Pentadecane	27.428	629-62-9	6.971
Hexadecane	29.928	544-76-3	2.511
Heptadecane	32.395	629-78-7	7.647
Σ (Area.%) =			<b>26.123</b>
<b>Alkenes</b>			
1-Octene	6.563	111-66-0	0.157
1-Nonene	9.439	124-11-8	0.696
1-Decene	12.615	872-05-9	1.999
1-Undecene	15.817	821-95-4	2.691
3-Undecene, (E)-	16.214	1002-68-2	0.690
4-Undecene, (E)-	16.528	693-62-9	0.597
1-Dodecene	18.910	112-41-4	3.526
1-Tridecene	21.849	2437-56-1	4.330
1-Tetradecene	24.624	1120-36-1	5.239
1-Pentadecene	27.243	13360-61-7	5.517
Cetene	29.743	629-73-2	3.564
1-Heptadecene	32.268	6765-39-5	2.792
Σ (Area.%) =			<b>31.798</b>
<b>Ring-containing Alkenes</b>			
1,4-Cyclohexadiene	3.625	628-41-1	0.296
2-Methylindene	18.199	2177-47-1	1.412
Σ (Area.%) =			<b>1.708</b>
<b>Aromatic Hydrocarbons</b>			
Naphthalene	19.478	91-20-3	3.057
Naphthalene, 1-methyl-	22.757	90-12-0	2.237
Naphthalene, 2-methyl-	23.245	91-57-6	2.032
Anthracene	35.116	120-12-7	1.373
Σ (Area.%) =			<b>8.699</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.955	79-09-4	0.161
Butanoic acid	5.864	107-92-6	0.186
Pentanoic acid	8.615	109-52-4	0.241
Hexanoic acid	11.685	142-62-1	0.582
6-Heptenoic Acid	14.619	1119-60-4	0.853
Heptanoic acid	14.836	111-14-8	1.606
Octanoic acid	17.908	124-07-2	1.042
8-Nonenoic acid	20.652	31642-67-8	0.732
Nonanoic acid	20.855	112-05-0	1.957
n-Decanoic acid	23.659	334-48-5	3.904
Tetradecanoic acid	33.415	544-63-8	3.167
n-Hexadecanoic acid	37.931	57-10-3	11.548

$\Sigma$ (Area.%) =			<b>25.976</b>
<b>Ketones</b>			
2-Heptadecanone	36.509	2922-51-2	3.053
2-Nonadecanone	42.873	629-66-3	2.638
$\Sigma$ (Area.%) =			<b>5.691</b>
<b>Total</b>			<b>100.000</b>

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Table S9: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by GC-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 7.5% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 70 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT[min]	CAS	$\omega_i$ (area.%)
<b>Alkanes</b>			
Octane	6.784	111-65-9	0.09
Nonane	9.713	111-84-2	1.672
Decane	12.888	124-18-5	0.459
Undecane	16.079	1120-21-4	0.685
Dodecane	19.151	112-40-3	0.998
Tridecane	22.073	629-50-5	2.353
Tetradecane	24.828	629-59-4	1.706
Pentadecane	27.431	629-62-9	7.979
Hexadecane	29.923	544-76-3	1.42
Heptadecane	32.393	629-78-7	5.441
$\Sigma$ (Area.%) =			<b>22.803</b>
<b>Alkenes</b>			
1-Octene	6.564	111-66-0	0.105
1-Nonene	9.440	124-11-8	0.574
1-Decene	12.611	872-05-9	1.696
1-Undecene	15.817	821-95-4	1.975
5-Undecene	16.218	4941-53-1	0.863
2-Undecene, (Z)-	16.528	821-96-5	0.458
1-Dodecene	18.915	112-41-4	2.346
1-Tridecene	21.852	2437-56-1	2.867
1-Tetradecene	24.627	1120-36-1	2.779
1-Pentadecene	27.243	13360-61-7	1.983
Cetene	29.746	629-73-2	1.48
8-Heptadecene	32.009	06/04/2579	3.284
1-Heptadecene	32.271	6765-39-5	0.907
$\Sigma$ (Area.%) =			<b>21.317</b>
<b>Ring containing Alkenes</b>			
2-Methylindene	18.190	2177-47-1	0.998
$\Sigma$ (Area.%) =			<b>0.998</b>
<b>Aromatic Hydrocarbons</b>			
Benzene, (1-methylethyl)-	10.700	98-82-8	0.225
Naphthalene	19.477	91-20-3	2.472
Naphthalene, 2-methyl-	22.755	91-57-6	1.119
Naphthalene, 1-methyl-	23.241	90-12-0	1.067
Phenanthrene	35.131	85-01-8	0.835
$\Sigma$ (Area.%) =			<b>5.718</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.965	79-09-4	0.192
Butanoic acid	5.878	107-92-6	0.25
4-Pentenoic acid	8.409	591-80-0	0.133
Pentanoic acid	8.635	109-52-4	0.377
Hexanoic acid	11.736	142-62-1	1.033
6-Heptenoic acid	14.637	1119-60-4	0.988
Heptanoic Acid	14.843	111-14-8	2.018
Octanoic acid	17.960	124-07-2	3.041
8-Nonenoic acid	20.649	31642-67-8	0.667
Nonanoic acid	20.876	112-05-0	2.17
n-Decanoic acid	23.735	334-48-5	11.758
Undecanoic acid	26.308	112-37-8	0.667
Tetradecanoic acid	33.424	544-63-8	5.64

n-Hexadecanoic acid	37.944	57-10-3	17.581
$\Sigma$ (Area.%) =			<b>46.515</b>
<b>Ketones</b>			
2-Heptadecanone	36.504	2922-51-2	1.825
$\Sigma$ (Area.%) =			<b>1.825</b>
<b>Non-identified Fraction</b>			<b>0.824</b>
<b>Total</b>			<b>100.000</b>

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Table S10: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by GC-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 7.5% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 90 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT[min]	CAS	$\omega_i$ (area.%)
<b>Alkanes</b>			
Octane	6.789	111-65-9	0.080
Nonane	9.717	111-84-2	1.776
Decane	12.890	124-18-5	0.434
Undecane	16.082	1120-21-4	0.643
Dodecane	19.155	112-40-3	0.902
Tridecane	22.074	629-50-5	2.210
Tetradecane	24.826	629-59-4	1.908
Pentadecane	27.428	629-62-9	7.919
Hexadecane	29.923	544-76-3	1.904
Heptadecane	32.390	629-78-7	6.940
$\Sigma$ (Area.%) =			<b>24.716</b>
<b>Alkenes</b>			
2-Octene	6.560	111-67-1	0.104
1-Nonene	9.436	124-11-8	0.513
1-Decene	12.609	872-05-9	1.649
1-Undecene	15.820	821-95-4	1.975
2-Undecene, (E)-	16.220	693-61-8	0.716
1-Dodecene	18.910	112-41-4	2.607
1-Tridecene	21.850	2437-56-1	3.135
1-Tetradecene	24.625	1120-36-1	3.485
1-Pentadecene	27.244	13360-61-7	3.465
Cetene	29.747	629-73-2	1.834
8-Heptadecene	32.098	06/04/2579	0.834
1-Heptadecene	32.268	6765-39-5	1.283
$\Sigma$ (Area.%) =			<b>21.600</b>
<b>Ring containing Alkenes</b>			
1,4-Cyclohexadiene	3.626	628-41-1	0.159
2-Methylindene	18.179	2177-47-1	1.218
$\Sigma$ (Area.%) =			<b>1.377</b>
<b>Aromatic Hydrocarbons</b>			
Benzene, (1-methylethyl)-	10.701	98-82-8	0.239
Naphthalene	19.481	91-20-3	3.116
Naphthalene, 2-methyl-	22.753	91-57-6	1.588
Naphthalene, 1-methyl-	23.243	90-12-0	1.435
Naphthalene, 2-ethenyl-	25.007	827-54-3	0.397
Phenanthrene	35.128	85-01-8	1.039
$\Sigma$ (Area.%) =			<b>7.814</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.973	79-09-4	0.307
Butanoic acid	5.871	107-92-6	0.277
4-Pentenoic acid	8.414	591-80-0	0.285
Pentanoic acid	8.634	109-52-4	0.377
5-Hexenoic acid	11.407	1577-22-6	0.484
Hexanoic acid	11.709	142-62-1	0.799
6-Heptenoic acid	14.628	1119-60-4	1.373
Heptanoic Acid	14.849	111-14-8	2.184
7-Octenoic acid	17.771	18719-24-9	0.997
Octanoic acid	17.949	124-07-2	2.361
8-Nonenoic acid	20.648	31642-67-8	1.044
Nonanoic acid	20.881	112-05-0	3.189



n-Decanoic acid	23.693	334-48-5	7.92
Undecanoic acid	26.298	112-37-8	1.903
Tetradecanoic acid	33.418	544-63-8	3.706
n-Hexadecanoic acid	37.940	57-10-3	12.438
$\Sigma$ (Area.%) =			<b>39.644</b>
<b>Alcohols</b>			
Phenol	12.139	108-95-2	0.261
$\Sigma$ (Area.%) =			<b>0.261</b>
<b>Ketones</b>			
2-Pentanone, 4-hydroxy-	7.250	4161-60-8	0.069
2-Heptadecanone	36.509	2922-51-2	1.658
2-Nonadecanone	42.882	629-66-3	0.863
$\Sigma$ (Area.%) =			<b>2.590</b>
<b>Non-identified Fraction</b>			<b>1.998</b>
<b>Total</b>			<b>100.000</b>

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Table S11: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by GC-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 7.5% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 120 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT[min]	CAS	wt% (Area)
<b>Alkanes</b>			
Octane	6.789	111-65-9	0.171
Nonane	9.709	111-84-2	1.376
Decane	12.890	124-18-5	0.651
Undecane	16.078	1120-21-4	0.908
Dodecane	19.154	112-40-3	1.167
Tridecane	22.071	629-50-5	2.860
Tetradecane	24.826	629-59-4	2.926
Pentadecane	27.430	629-62-9	12.811
Hexadecane	29.927	544-76-3	2.865
Heptadecane	32.396	629-78-7	10.433
Octadecane	34.221	593-45-3	0.457
Nonadecane	36.381	629-92-5	0.403
Cyclotetracosane	48.740	297-03-0	1.097
<b>Σ (Area.%) =</b>			<b>38.125</b>
<b>Alkenes</b>			
2-Octene	6.557	111-67-1	0.207
1-Nonene	9.439	124-11-8	0.802
1-Decene	12.612	872-05-9	1.478
1-Undecene	15.815	821-95-4	1.431
2-Undecene, E-	16.222	693-61-8	0.567
2-Undecene, (Z)-	16.539	821-96-5	0.303
1-Dodecene	18.912	112-41-4	1.460
1-Tridecene	21.848	2437-56-1	2.268
1-Tetradecene	24.624	1120-36-1	3.493
1-Pentadecene	27.241	13360-61-7	3.481
Cetene	29.747	629-73-2	2.885
8-Heptadecene	32.009	06/04/2579	7.919
1-Heptadecene	32.715	6765-39-5	0.279
1-octadecene	33.819	112-88-9	1.512
1-Docosene	45.065	1599-67-3	0.901
<b>Σ (Area.%) =</b>			<b>28.986</b>
<b>Aromatic Hydrocarbons</b>			
Benzene, (1-methylethyl)-	10.702	98-82-8	0.181
Naphthalene	19.477	91-20-3	0.625
Phenanthrene	35.121	85-01-8	0.446
<b>Σ (Area.%) =</b>			<b>1.252</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.949	79-09-4	0.093
Butanoic acid	5.861	107-92-6	0.068
Hexanoic acid	11.682	142-62-1	0.316
Heptanoic Acid	14.830	111-14-8	0.808
Octanoic acid	17.939	124-07-2	1.540
Nonanoic acid	20.882	112-05-0	2.005
n-Decanoic acid	23.765	334-48-5	13.044
Undecanoic acid	26.307	112-37-8	1.047
Tetradecanoic acid	33.426	544-63-8	3.645
n-Hexadecanoic acid	37.935	57-10-3	5.177
<b>Σ (Area.%) =</b>			<b>27.743</b>
<b>Ketones</b>			
2-Heptadecanone	36.506	2922-51-2	2.163

3-Octadecanone	39.108	18261-92-2	0.424
2-Nonadecanone	42.863	629-66-3	0.707
$\Sigma$ (Area.%) =			3.294
Non-identified Fraction			0.599
Total			100

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Table S12: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by GC-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 10.0% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 60 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT[min]	CAS	$\omega_i$ (area.%)
<b>Alkanes</b>			
Octane	6.788	111-65-9	0.082
Nonane	9.718	111-84-2	1.625
Decane	12.887	124-18-5	0.473
Undecane	16.075	1120-21-4	0.728
Dodecane	19.153	112-40-3	0.884
Tridecane	22.072	629-50-5	2.093
Tetradecane	24.828	629-59-4	1.523
Pentadecane	27.428	629-62-9	6.961
Hexadecane	29.927	544-76-3	1.216
Heptadecane	32.392	629-78-7	4.572
$\Sigma$ (Area.%) =			<b>20.157</b>
<b>Ring containing Alkanes</b>			
Indane	14.080	496-11-7	0.167
Cyclotetracosane	48.742	297-03-0	3.955
$\Sigma$ (Area.%) =			<b>4.122</b>
<b>Alkenes</b>			
1-Octene	6.554	111-66-0	0.104
1-Nonene	9.439	124-11-8	0.569
1-Decene	12.612	872-05-9	1.669
1-Undecene	15.815	821-95-4	1.704
5-Undecene	16.213	4941-53-1	1.816
1-Dodecene	18.911	112-41-4	1.643
1-Tridecene	21.847	2437-56-1	2.013
1-Tetradecene	24.625	1120-36-1	2.481
1-Pentadecene	27.245	13360-61-7	2.617
Cetene	29.744	629-73-2	1.530
8-Heptadecene	32.010	06/04/2579	3.773
1-Heptadecene	32.268	6765-39-5	0.857
1-Octadecene	33.816	112-88-9	1.475
$\Sigma$ (Area.%) =			<b>22.251</b>
<b>Ring containing Alkenes</b>			
2-Methylindene	18.185	2177-47-1	0.797
$\Sigma$ (Area.%) =			<b>0.797</b>
<b>Alkynes</b>			
4-Nonen-2-yne, (Z)-	13.724	53497-78-2	0.147
$\Sigma$ (Area.%) =			<b>0.147</b>
<b>Aromatic Hydrocarbons</b>			
Benzene, (1-methylethyl)-	10.700	98-82-8	0.225
Naphthalene	19.479	91-20-3	3.063
Naphthalene, 2-methyl-	22.757	91-57-6	1.071
Naphthalene, 1-methyl-	23.240	90-12-0	0.897
Phenanthrene	35.118	85-01-8	1.195
$\Sigma$ (Area.%) =			<b>6.451</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.962	79-09-4	0.148
Butanoic acid	5.878	107-92-6	0.198
Pentanoic acid	8.631	109-52-4	0.339
Hexanoic acid	11.736	142-62-1	1.038
6-Heptenoic acid	14.633	1119-60-4	0.763
Heptanoic Acid	14.843	111-14-8	2.078

Octanoic acid	17.961	124-07-2	2.774
8-Nonenoic acid	20.652	31642-67-8	0.489
Nonanoic acid	20.867	112-05-0	1.903
n-Decanoic acid	23.733	334-48-5	11.670
Undecanoic acid	26.303	112-37-8	0.521
Tetradecanoic acid	33.423	544-63-8	5.599
n-Hexadecanoic acid	37.946	57-10-3	15.288
<b><math>\Sigma</math> (Area.%) =</b>			<b>42.808</b>
<b>Ketones</b>			
2-Pentanone, 4-hydroxy-	7.245	4161-60-8	0.062
2-Heptadecanone	36.504	2922-51-2	1.372
<b><math>\Sigma</math> (Area.%) =</b>			<b>1.434</b>
<b>Non-identified Fraction</b>			<b>1.832</b>
<b>Total</b>			<b>100.000</b>

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Table S13: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by GC-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 10.0% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 70 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT[min]	CAS	$\omega_i$ (area.%)
<b>Alkanes</b>			
Octane	6.788	111-65-9	0.093
Nonane	9.710	111-84-2	1.564
Decane	12.889	124-18-5	0.433
Undecane	16.076	1120-21-4	0.642
Dodecane	19.152	112-40-3	0.789
Tridecane	22.070	629-50-5	2.002
Tetradecane	24.830	629-59-4	1.665
Pentadecane	27.429	629-62-9	7.788
Hexadecane	29.927	544-76-3	1.620
Heptadecane	32.394	629-78-7	7.123
$\Sigma$ (Area.%) =			<b>23.719</b>
<b>Ring containing Alkanes</b>			
Cyclotetracosane	48.833	297-03-0	4.448
$\Sigma$ (Area.%) =			<b>4.448</b>
<b>Alkenes</b>			
1-Octene	6.561	111-66-0	0.106
1-Nonene	9.433	124-11-8	0.574
1-Decene	12.611	872-05-9	1.588
1-Undecene	15.813	821-95-4	1.713
5-Undecene	16.218	4941-53-1	1.121
1-Dodecene	18.908	112-41-4	1.968
1-Tridecene	21.849	2437-56-1	2.455
1-Tetradecene	24.624	1120-36-1	2.969
1-Pentadecene	27.241	13360-61-7	2.205
Cetene	29.747	629-73-2	1.880
8-Heptadecene	32.101	06/04/2579	3.239
1-Heptadecene	32.269	6765-39-5	1.390
1-Octadecene	33.805	112-88-9	1.386
$\Sigma$ (Area.%) =			<b>22.594</b>
<b>Ring containing Alkenes</b>			
2-Methylindene	18.195	2177-47-1	0.608
$\Sigma$ (Area.%) =			<b>0.608</b>
<b>Alkynes</b>			
4-Nonen-2-yne, (Z)-	13.726	53497-78-2	0.127
$\Sigma$ (Area.%) =			<b>0.127</b>
<b>Aromatic Hydrocarbons</b>			
Benzene, (1-methylethyl)-	10.703	98-82-8	0.214
Naphthalene	19.475	91-20-3	1.348
Naphthalene, 2-methyl-	22.749	91-57-6	0.394
Naphthalene, 1-methyl-	23.242	90-12-0	0.378
$\Sigma$ (Area.%) =			<b>2.334</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.956	79-09-4	0.144
Butanoic acid	5.872	107-92-6	0.165
2-Pentenoic acid	8.396	626-98-2	0.087
Pentanoic acid	8.606	109-52-4	0.244
Hexanoic acid	11.698	142-62-1	0.704
6-Heptenoic acid	14.626	1119-60-4	0.675
Heptanoic Acid	14.842	111-14-8	1.629
7-Octenoic acid	17.693	18719-24-9	0.610

Octanoic acid	17.938	124-07-2	2.054
8-Nonenoic acid	20.650	31642-67-8	0.583
Nonanoic acid	20.876	112-05-0	2.731
9-Decenoic acid	23.485	14436-32-9	0.401
n-Decanoic acid	23.714	334-48-5	10.772
Undecanoic acid	26.298	112-37-8	0.785
Tetradecanoic acid	33.420	544-63-8	4.901
n-Hexadecanoic acid	37.941	57-10-3	15.494
<b><math>\Sigma</math> (Area.%) =</b>			<b>41.979</b>
<b>Ketones</b>			
2-Pentanone, 4-hydroxy-	7.247	4161-60-8	0.074
2-Heptadecanone	36.508	2922-51-2	1.796
2-Nonadecanone	42.873	629-66-3	0.860
<b><math>\Sigma</math> (Area.%) =</b>			<b>2.730</b>
<b>Non-identified Fraction</b>			<b>1.460</b>
<b>Total</b>			<b>100.000</b>

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Table S14: Classes of compounds, summation of peak areas, CAS number, and retention times of chemical compounds identified by GC-MS in bio-oil by catalytic upgrading of residual fat pyrolysis vapors at 400 °C, 1.0 atm, 10.0% (wt.) activated carbon pellets impregnated with 10.0 M NaOH, 90 min, using a catalyst fixed-bed reactor, in semi-pilot scale two-stage reactor of 2.0 L.

400°C			
Class of Compounds: Chemical Compounds	RT[min]	CAS	$\omega_i$ (area.%)
<b>Alkanes</b>			
Octane	6.793	111-65-9	0.117
Nonane	9.709	111-84-2	2.204
Decane	12.886	124-18-5	0.801
Undecane	16.078	1120-21-4	1.229
Dodecane	19.155	112-40-3	1.607
Tridecane	22.071	629-50-5	2.987
Tetradecane	24.826	629-59-4	3.028
Pentadecane	27.427	629-62-9	9.212
Hexadecane	29.925	544-76-3	3.138
Heptadecane	32.393	629-78-7	9.224
$\Sigma$ (Area.%) =			<b>33.547</b>
<b>Alkenes</b>			
1-Octene	6.562	111-66-0	0.161
1-Nonene	9.440	124-11-8	0.841
1-Decene	12.611	872-05-9	2.682
1-Undecene	15.813	821-95-4	3.154
5-Undecene	16.212	4941-53-1	0.953
1-Dodecene	18.907	112-41-4	3.880
1-Tridecene	21.850	2437-56-1	4.404
1-Tetradecene	24.624	1120-36-1	4.767
1-Pentadecene	27.243	13360-61-7	3.733
Cetene	29.742	629-73-2	3.025
8-Heptadecene	32.105	06/04/2579	3.745
1-Heptadecene	32.271	6765-39-5	2.623
$\Sigma$ (Area.%) =			<b>33.968</b>
<b>Ring containing Alkenes</b>			
1,3-Cyclopentadiene, 1-methyl-	3.630	96-39-9	0.297
2-Methylindene	18.194	2177-47-1	1.513
$\Sigma$ (Area.%) =			<b>1.810</b>
<b>Aromatic Hydrocarbons</b>			
Benzene, (1-methylethyl)-	10.704	98-82-8	0.314
Naphthalene	19.477	91-20-3	2.139
Naphthalene, 2-methyl-	22.749	91-57-6	1.455
Naphthalene, 1-methyl-	23.248	90-12-0	1.348
Phenanthrene	35.127	85-01-8	1.183
$\Sigma$ (Area.%) =			<b>6.439</b>
<b>Carboxylic Acids</b>			
Propanoic acid	3.949	79-09-4	0.139
Butanoic acid	5.867	107-92-6	0.196
Pentanoic acid	8.608	109-52-4	0.260
Hexanoic acid	11.681	142-62-1	0.636
6-Heptenoic acid	14.621	1119-60-4	0.954
Heptanoic Acid	14.836	111-14-8	1.719
Octanoic acid	17.913	124-07-2	0.859
8-Nonenoic acid	20.654	31642-67-8	0.659
Nonanoic acid	20.860	112-05-0	1.904
n-Decanoic acid	23.653	334-48-5	2.555
Undecanoic acid	26.296	112-37-8	0.852
n-Hexadecanoic acid	37.929	57-10-3	6.308
$\Sigma$ (Area.%) =			<b>17.041</b>



<b>Ketones</b>			
2-Pentanone, 4-hydroxy-	7.245	4161-60-8	0.085
2-Heptadecanone	36.508	2922-51-2	2.877
2-Nonadecanone	42.877	629-66-3	1.740
$\Sigma$ (Area.%) =			<b>4.702</b>
<b>Non-identified Fraction</b>			<b>2.494</b>
<b>Total</b>			<b>100.000</b>

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