

Client: Musket Corporation
Job Location: San Francisco, CA, USA
Our Reference Number: US410-0012129
Lab Reference Number: 2014-SANF-000316

Client Reference Number:
None

Sample ID: 2014-SANF-000316-018
Sample Designated As: Bakken Crude
Vessel/Location: Fairview, MT
Representing: Composite

Date Taken: 1-Mar-2014
Date Submitted: 5-Mar-2014
Date Tested: 7-Mar-2014

Method	Test	Result	Unit
* ASTM D323	Test Temperature	122	°F
* ASTM D323	Reid Vapor Pressure (Proc A)	16.30	psi
ASTM D4294	Sulfur Content	0.0868	Wt %
ISM TM0172	NACE Corrosion Rating	E	
ASTM D86	IBP Recovery	44.1	°C
ASTM D5705	Test Temperature	77	°F
ASTM D5705	Average H2S Result	< 5	ppm v/v
ASTM D56	Corrected Flash Point	<21	°C
ASTM D6730	Light Ends	See Attached Report	
ASTM D5002	Density 15.56 °C/ 60 °F	0.8079	g/mL
ASTM D5002	API Gravity @ 60 °F	43.5	°API
ASTM D4928	Water Content	0.05	Mass %
ASTM D4928	Water Content	0.04	Vol %
ASTM D97	Pour Point	<-54	°C
ASTM D664	Procedure Used	A	
ASTM D664	Acid Number	< 0.10	mg KOH/g
IP 501	Sodium	37	mg/kg
IP 501	Vanadium	< 1	mg/kg
IP 501	Nickel	< 1	mg/kg
IP 501	Iron	7	mg/kg
ASTM D445	Kinematic Viscosity @ 60 °F	3.337	cSt
ASTM D445	Dynamic Viscosity @ 60 °F	2.696	kg/m*s

* Results obtained from the average of the individual samples from Fairview, Mt

Signed: _____

Intertek
Nathaniel Preston, Chemist

Date: 3/7/2014

Detailed Hydrocarbon Analysis Summary Report -

Report Date: 3/7/2014 12:38:33 PM

RawFile: C:\Chem32\1\DATA\140306a\140306A 2014-03-06 15-55-00\204B0401.D\204B0401.CDF

Acquired: 03/07/14 01:05:15

Sample: 316-018

Analyzed: 3/7/2014 12:38:33 PM

Processed 335 Peaks

Reference File: C:\Chem32\DHARef\ID6730_V1.DHA

Comments:

Yield: 52.65

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

SUMMARY REPORT

<u>Group Type</u>	<u>Total(Mass%)</u>	<u>Total(Vol%)</u>	<u>Total(Mol%)</u>
Paraffins:	12.50	18.72	14.29
I-Paraffins:	11.63	16.77	11.37
Olefins:	1.36	1.85	1.27
Napthenes:	11.27	14.69	11.41
Aromatics:	6.43	7.27	5.44
Total C14+:	7.30	9.57	3.89
Total Unknowns:	2.15	3.07	1.46

Oxygenates:

Total: 0.00(Mass%) 0.00(Vol%)

Total Oxygen Content: 0.00(Mass%)

Multisubstituted Aromatics: 4.69(Mass%) 5.32(Vol%)

Average Molecular Weight: 101.68

Relative Density: 0.67

Reid Vapor Pressure @ 100F: 3.74

Calculated Octane Number: 56.05

	IBP	T10	T50	T90	FBP
BP by Mass (Deg F)	10.90	161.24	488.66	T90	488.66
BP by Vol (Deg F)	-43.67	140.47	345.47	T90	488.66

Percent Carbon: 85.54

Percent Hydrogen: 14.46

Bromine Number (Calc): 2.36

Detailed Hydrocarbon Analysis Detail Report -

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Reference File: C:\Chem32\DHARE\AD6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

Oxygenates

<u>Compound</u>	<u>Mass%</u>	<u>Mass% Oxygen</u>	<u>Vol%</u>
methyl-t-butylether : X5	4.49	0.81	8.11

Molecular Weight and Relative Density Data

<u>Group</u>	<u>Avg Mw.</u>	<u>Avg Rel. Density</u>
C1	0.00	0.00
C2	0.00	0.00
C3	44.10	0.50
C4	58.12	0.58
C5	71.85	0.63
C6	85.25	0.69
C7	98.76	0.73
C8	112.16	0.75
C9	125.85	0.76
C10	139.01	0.79
C11	153.14	0.80
C12	166.45	0.81
C13	184.09	0.76
Total Sample:	102.00	0.67

Octane Number**Research Octane Number:** 56.00*(Calculated from Individual Component Values)***Contribution to Total by:**

Paraffins:	11.50
Iso-Paraffins:	15.50
Aromatics:	11.00
Napthenes:	15.80
Olefins:	2.22
Oxygenates:	0.00

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Reference File: C:\Chem32\DHARef\D6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.2085

Sample Wt: 4.4360

Sample Den: 1.00

Totals by Group Type & Carbon Number (in Mass Percent)

	<u>Paraffins</u>	<u>I-Paraffins</u>	<u>Olefins</u>	<u>Napthenes</u>	<u>Aromatics</u>	<u>Unknowns</u>	<u>Total</u>
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.27084	0.00000	0.00000	0.00000	0.00000	0.00000	0.27084
C4	1.45338	0.26260	0.00000	0.00000	0.00000	0.00000	1.71598
C5	1.99532	1.07435	0.14677	0.18689	0.00000	0.00000	3.40332
C6	1.81535	1.87450	0.00000	1.70067	0.19221	0.00000	5.58273
C7	1.67867	1.65612	0.00000	3.74187	0.37151	0.00000	7.44816
C8	1.48525	1.12907	0.71582	3.10203	0.87419	0.00000	7.30637
C9	1.01228	1.96874	0.23876	1.67382	1.31958	0.00000	6.21318
C10	0.87577	2.15341	0.04287	0.67727	1.85819	0.13839	5.74589
C11	0.73116	1.04834	0.04376	0.16218	0.88879	0.47818	3.35242
C12	0.64851	0.35514	0.07141	0.02293	0.93005	0.40143	2.42946
C13	0.53490	0.10967	0.10278	0.00000	0.00000	1.13222	1.87957
Total:	12.50141	11.63192	1.36217	11.26766	6.43453	2.15022	43.19770

Oxygenates 0.00000

Total C14+: 7.29783

Total Unknowns: 2.15022

Grand Total: 52.64575

Totals by Group Type & Carbon Number (in Volume Percent)

	<u>Paraffins</u>	<u>I-Paraffins</u>	<u>Olefins</u>	<u>Napthenes</u>	<u>Aromatics</u>	<u>Unknowns</u>	<u>Total</u>
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.54114	0.00000	0.00000	0.00000	0.00000	0.00000	0.54114
C4	2.51102	0.47128	0.00000	0.00000	0.00000	0.00000	2.98230
C5	3.18639	1.73394	0.21711	0.25072	0.00000	0.00000	5.38816
C6	2.75303	2.85147	0.00000	2.24230	0.21870	0.00000	8.06550
C7	2.45527	2.41622	0.00000	4.93702	0.42850	0.00000	10.23700
C8	2.11423	1.59807	0.93778	4.03790	1.00735	0.00000	9.69534
C9	1.41064	2.73708	0.34671	2.14143	1.51171	0.00000	8.14758
C10	1.19968	2.93631	0.05793	0.84549	2.10366	0.19770	7.34076
C11	0.98274	1.40711	0.05833	0.20273	0.95238	0.68312	4.28640
C12	0.86123	0.47163	0.09416	0.02866	1.04516	0.57347	3.07432
C13	0.70717	0.14506	0.13421	0.00000	0.00000	1.61745	2.60390
Total:	18.72254	16.76818	1.84623	14.68625	7.26745	3.07174	59.29066

Oxygenates 0.00000

Total C14+: 9.56717

Total Unknowns: 3.07174

Grand Total: 71.92956

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Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.2085

Sample Wt: 4.4360

Sample Den: 1.00

Totals by Group Type & Carbon Number (in Mol Percent)

	<u>Paraffins</u>	<u>I-Paraffins</u>	<u>Olefins</u>	<u>Napthenes</u>	<u>Aromatics</u>	<u>Unknowns</u>	<u>Total</u>
C1	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C2	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
C3	0.64972	0.00000	0.00000	0.00000	0.00000	0.00000	0.64972
C4	2.64515	0.47793	0.00000	0.00000	0.00000	0.00000	3.12308
C5	2.92547	1.57518	0.22792	0.28188	0.00000	0.00000	5.01046
C6	2.22838	2.30100	0.00000	2.13762	0.26030	0.00000	6.92730
C7	1.77215	1.74835	0.00000	4.03137	0.42652	0.00000	7.97839
C8	1.37543	1.04559	0.67478	2.92428	0.87104	0.00000	6.89111
C9	0.83491	1.62378	0.20007	1.40258	1.16139	0.00000	5.22273
C10	0.65111	1.60100	0.03233	0.51077	1.47193	0.10289	4.37002
C11	0.49482	0.71031	0.03000	0.11120	0.63913	0.34049	2.32595
C12	0.40274	0.22058	0.04488	0.01441	0.60630	0.27868	1.56760
C13	0.30691	0.06292	0.05962	0.00000	0.00000	0.74233	1.17178
Total:	14.28679	11.36662	1.26961	11.41411	5.43661	1.46439	43.77374

Oxygenates 0.00000

Total C14+: 3.89135

Total Unknowns: 1.46439

Grand Total: 49.12949

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Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

Hold

Components Listed in Chromatographic Order

Page: 5

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
6.694	300.000	P3	propane	0.27	0.54	0.65
7.633	374.390	I4	i-butane	0.26	0.47	0.48
8.523	400.000	P4	n-butane	1.45	2.51	2.65
11.809	478.400	I5	i-pentane	1.07	1.73	1.58
13.418	500.000	P5	n-pentane	2.00	3.19	2.93
14.961	528.110	O5	1t,3-pentadiene	0.15	0.22	0.23
15.767	540.820	I6	2,2-dimethylbutane	0.02	0.03	0.02
17.705	567.350	N5	cyclopentane	0.19	0.25	0.28
17.884	569.570	I6	2,3-dimethylbutane	0.08	0.13	0.10
18.235	573.820	I6	2-methylpentane	1.11	1.69	1.36
19.269	585.620	I6	3-methylpentane	0.67	1.00	0.82
20.652	600.000	P6	n-hexane	1.82	2.75	2.23
22.629	624.290	I7	2,2-dimethylpentane	0.02	0.03	0.02
22.792	626.160	N6	methylcyclopentane	1.13	1.50	1.41
23.193	630.680	I7	2,4-dimethylpentane	0.07	0.10	0.07
25.074	650.520	A6	benzene	0.19	0.22	0.26
25.498	654.710	I7	3,3-dimethylpentane	0.01	0.02	0.02
25.870	658.310	N6	cyclohexane	0.57	0.74	0.72
26.868	667.650	I7	2-methylhexane	0.50	0.74	0.53
27.016	668.990	I7	2,3-dimethylpentane	0.23	0.33	0.24
27.302	671.560	N7	1,1-dimethylcyclopentane	0.23	0.30	0.25
27.804	676.000	I7	3-methylhexane	0.74	1.08	0.79
28.500	681.980	N7	1c,3-dimethylcyclopentane	0.51	0.68	0.55
28.823	684.680	N7	1t,3-dimethylcyclopentane	0.48	0.64	0.51
28.974	685.940	I7	3-ethylpentane	0.08	0.12	0.09
29.145	687.340	N7	1t,2-dimethylcyclopentane	0.91	1.21	0.98
30.740	700.000	P7	n-heptane	1.68	2.46	1.77
33.441	718.260	N7	methylcyclohexane	1.50	1.95	1.62
33.872	721.010	N8	1,1,3-trimethylcyclopentane	0.36	0.48	0.34
35.221	729.320	N7	ethylcyclopentane	0.11	0.15	0.12
35.367	730.200	I8	2,5-dimethylhexane	0.06	0.09	0.06
35.673	732.020	I8	2,4-dimethylhexane	0.10	0.14	0.09
36.602	737.440	N8	1c,2t,4-trimethylcyclopentane	0.37	0.49	0.35
36.809	738.630	I8	3,3-dimethylhexane	0.03	0.05	0.03
37.863	744.540	N8	1t,2c,3-trimethylcyclopentane	0.40	0.52	0.38
39.295	752.260	A7	toluene	0.37	0.43	0.43
40.430	758.150	I8	2,3-dimethylhexane	0.09	0.13	0.09
40.551	758.770	I8	2-methyl-3-ethylpentane	0.13	0.19	0.12

Detailed Hydrocarbon Analysis Detail Report -

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Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

Hold

Components Listed in Chromatographic Order

Page: 6

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
41.658	764.300	O8	*2-ethylhexene-1	0.69	0.90	0.65
41.963	765.790	I8	4-methylheptane	0.23	0.32	0.21
42.178	766.840	I8	3-methyl-3-ethylpentane	0.04	0.05	0.03
42.291	767.380	I8	3,4-dimethylhexane	0.05	0.07	0.04
42.806	769.850	N8	1c,3-dimethylcyclohexane	0.05	0.07	0.05
43.247	771.940	I8	3-methylheptane	0.39	0.56	0.37
43.543	773.330	N8	1c,2t,3-trimethylcyclopentane	0.77	1.00	0.73
43.960	775.260	N8	1t,4-dimethylcyclohexane	0.21	0.28	0.20
45.196	780.880	N8	1,1-dimethylcyclohexane	0.07	0.09	0.06
46.043	784.620	N8	3c-ethylmethylcyclopentane	0.07	0.09	0.07
46.552	786.840	N8	3t-ethylmethylcyclopentane	0.07	0.09	0.06
46.862	788.170	N8	2t-ethylmethylcyclopentane	0.17	0.22	0.16
47.355	790.270	N8	1,1-methylethylcyclopentane	0.03	0.04	0.03
48.033	793.120	N8	1t,2-dimethylcyclohexane	0.28	0.36	0.27
49.717	800.000	P8	n-octane	1.49	2.11	1.38
51.838	808.580	N8	i-propylcyclopentane	0.05	0.07	0.05
53.513	815.080	O8	O51	0.03	0.03	0.02
54.786	819.860	N8	N2	0.02	0.03	0.02
56.630	826.580	N8	1c,2-dimethylcyclohexane	0.15	0.18	0.14
58.256	832.300	N9	1,1,4-trimethylcyclohexane	0.43	0.56	0.36
58.868	834.400	I9	2,2,3-trimethylhexane	0.24	0.33	0.20
59.322	835.950	I9	2,4-dimethylheptane	0.03	0.05	0.03
60.002	838.240	I9	4,4-dimethylheptane	0.30	0.42	0.25
60.796	840.880	N8	n-propylcyclopentane	0.04	0.05	0.03
61.116	841.930	I9	2,5-dimethylheptane	0.10	0.14	0.08
61.867	844.380	I9	3,5-dimethylheptane	0.04	0.06	0.03
62.311	845.810	I9	2,6-dimethylheptane	0.08	0.11	0.07
62.892	847.660	N9	1,1,3-trimethylcyclohexane	0.03	0.04	0.03
64.363	852.280	N9	1c,2t,4t-trimethylcyclohexane	0.03	0.04	0.02
64.940	854.060	A8	ethylbenzene	0.17	0.20	0.17
65.473	855.680	N9	1c,3c,5c-trimethylcyclohexane	0.21	0.27	0.18
68.200	863.780	A8	1,3-dimethylbenzene	0.38	0.44	0.38
68.586	864.900	A8	1,4-dimethylbenzene	0.12	0.14	0.12
68.792	865.490	I9	2,3-dimethylheptane	0.14	0.20	0.12
69.681	868.030	I9	3,4-dimethylheptane	0.12	0.16	0.10
70.578	870.560	I9	I5	0.05	0.07	0.04
71.649	873.530	I9	4-methyloctane	0.19	0.27	0.16
72.013	874.520	I9	2-methyloctane	0.23	0.32	0.19

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Hold

Components Listed in Chromatographic Order

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Minutes	Index	Group	Component	Mass %	Volume %	Mol %
72.490	875.820	N9	N15	0.03	0.04	0.02
73.247	877.870	N9	1c,2t,3c-trimethylcyclohexane	0.07	0.09	0.05
73.638	878.910	I9	3-ethylheptane	0.06	0.08	0.05
74.087	880.110	I9	3-methyloctane	0.31	0.44	0.26
75.117	882.820	N9	1,1,2-trimethylcyclohexane	0.04	0.05	0.03
75.392	883.530	A8	1,2-dimethylbenzene	0.19	0.22	0.19
77.269	888.350	N9	N19	0.34	0.44	0.29
77.884	889.900	N9	N20	0.13	0.16	0.11
81.087	897.770	O9	t-nonene-2	0.03	0.04	0.02
81.693	899.220	I9	I10	0.07	0.09	0.06
82.021	900.000	P9	n-nonane	1.01	1.41	0.83
82.233	901.170	N9	1,1-methylethylcyclohexane	0.16	0.20	0.14
82.769	904.100	O9	t-nonene-3	0.03	0.04	0.03
83.020	905.470	N9	N25	0.03	0.03	0.02
84.355	912.680	A9	i-propylbenzene	0.02	0.03	0.02
84.737	914.720	O9	c-nonene-2	0.18	0.26	0.15
85.309	917.760	N9	i-propylcyclohexane	0.08	0.09	0.06
86.012	921.460	I10	2,4-dimethyloctane	0.04	0.05	0.03
86.276	922.850	--	unknown	0.03	0.04	0.02
86.595	924.510	I10	2,2-dimethyloctane	0.06	0.09	0.05
87.323	928.280	N9	N29	0.03	0.04	0.03
87.876	931.120	I10	2,6-dimethyloctane	0.22	0.30	0.16
88.216	932.860	I10	2,5-dimethyloctane	0.07	0.10	0.05
88.914	936.410	N9	n-butylcyclopentane	0.06	0.08	0.05
89.260	938.150	I10	I13	0.09	0.13	0.07
89.706	940.390	I10	I14	0.05	0.06	0.03
90.134	942.530	I10	3,3-dimethyloctane	0.29	0.40	0.22
90.700	945.340	--	unknown	0.09	0.13	0.07
90.988	946.760	A9	n-propylbenzene	0.04	0.04	0.03
91.189	947.760	I10	3,6-dimethyloctane	0.09	0.13	0.07
91.568	949.620	I10	3-methyl-5-ethylheptane	0.19	0.27	0.14
91.956	951.510	N10	N32	0.05	0.07	0.04
92.620	954.740	A9	1,3-methylethylbenzene	0.17	0.20	0.15
92.996	956.560	A9	1,4-methylethylbenzene	0.07	0.08	0.06
93.370	958.360	N10	N33	0.13	0.16	0.09
94.202	962.330	A9	1,3,5-trimethylbenzene	0.28	0.32	0.25
94.508	963.780	I10	I15	0.09	0.12	0.06
94.756	964.950	N10	N34	0.06	0.08	0.05

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 3/7/2014 12:38:33 PM

RawFile: C:\Chem32\1\DATA\140306a\140306A 2014-03-06 15-55-00\204B0401.D\204B0401.CDF

Acquired: 03/07/14 01:05:15

Sample: 316-018

Analyzed: 3/7/2014 12:38:33 PM

Processed 335 Peaks

Reference File: C:\Chem32\DHARef\AD6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

Hold

Components Listed in Chromatographic Order

Page: 8

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
95.406	968.010	I10	5-methylnonane	0.06	0.08	0.04
95.733	969.540	I10	4-methylnonane	0.25	0.33	0.18
95.970	970.650	A9	1,2-methylethylbenzene	0.05	0.06	0.04
96.239	971.900	I10	2-methylnonane	0.20	0.28	0.15
96.584	973.500	--	unknown	0.03	0.04	0.02
96.885	974.890	I10	3-ethyloctane	0.09	0.12	0.07
97.113	975.940	N10	N35	0.04	0.05	0.03
97.432	977.400	I10	3-methylnonane	0.22	0.30	0.16
98.309	981.410	I10	I19	0.03	0.04	0.02
98.780	983.540	A9	1,2,4-trimethylbenzene	0.53	0.60	0.46
99.407	986.360	N10	i-butylcyclohexane	0.17	0.21	0.13
99.669	987.530	I10	I21	0.05	0.06	0.03
99.936	988.730	I10	I22	0.07	0.09	0.05
100.348	990.560	N10	N37	0.03	0.04	0.02
101.031	993.580	O10	2,3-dimethyloctene-2	0.04	0.06	0.03
101.259	994.590	N10	1t-methyl-2-n-propylcyclohexane	0.06	0.07	0.04
101.608	996.120	A10	i-butylbenzene	0.02	0.03	0.02
101.999	997.830	A10	sec-butylbenzene	0.09	0.11	0.07
102.496	1000.000	P10	n-decane	0.88	1.20	0.65
103.051	1003.990	N10	N38	0.03	0.04	0.03
103.490	1007.140	A9	1,2,3-trimethylbenzene	0.16	0.17	0.14
103.735	1008.890	--	unknown	0.03	0.04	0.03
103.909	1010.120	A10	1,3-methyl-i-propylbenzene	0.04	0.05	0.03
104.398	1013.600	I11	I27	0.05	0.07	0.03
104.952	1017.510	I11	I29	0.02	0.03	0.02
105.119	1018.690	--	unknown	0.02	0.03	0.02
105.265	1019.710	A10	2-3-dihydroindene	0.03	0.03	0.03
105.495	1021.320	--	unknown	0.04	0.05	0.03
105.831	1023.670	N10	sec-butylcyclohexane	0.10	0.12	0.08
106.134	1025.780	I11	I30	0.02	0.02	0.01
106.423	1027.790	A10	1,2-methyl-i-propylbenzene	0.28	0.32	0.22
107.082	1032.350	N11	N40	0.16	0.20	0.11
107.339	1034.120	I11	I31	0.06	0.07	0.04
107.758	1036.990	I11	I32	0.09	0.12	0.06
107.982	1038.530	--	unknown	0.03	0.04	0.02
108.236	1040.260	A10	1,3-diethylbenzene	0.06	0.07	0.05
108.637	1042.990	A10	1,3-methyl-n-propylbenzene	0.09	0.11	0.07
108.846	1044.410	I11	I33	0.11	0.15	0.07

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 3/7/2014 12:38:33 PM

RawFile: C:\Chem32\1\DATA\140306a\140306A 2014-03-06 15-55-00\204B0401.D\204B0401.CDF

Acquired: 03/07/14 01:05:15

Sample: 316-018

Analyzed: 3/7/2014 12:38:33 PM

Processed 335 Peaks

Reference File: C:\Chem32\DHARE\AD6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

Hold

Components Listed in Chromatographic Order

Page: 9

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
109.032	1045.670	A10	1,4-diethylbenzene	0.03	0.03	0.02
109.185	1046.700	A10	1,4-methyl-n-propylbenzene	0.03	0.03	0.02
109.338	1047.730	A10	n-butylbenzene	0.04	0.05	0.03
109.682	1050.050	A10	1,3-dimethyl-5-ethylbenzene	0.09	0.10	0.07
110.159	1053.250	I11	I34	0.11	0.15	0.08
110.359	1054.580	--	unknown	0.03	0.04	0.02
110.790	1057.450	A10	1,2-methyl-n-propylbenzene	0.13	0.15	0.10
111.196	1060.150	I11	I36	0.02	0.03	0.01
111.576	1062.660	I11	I37	0.09	0.12	0.06
112.019	1065.570	I11	I38	0.11	0.15	0.07
112.235	1066.990	--	unknown	0.04	0.06	0.03
112.539	1068.990	A10	1,4-dimethyl-2-ethylbenzene	0.18	0.21	0.14
112.859	1071.070	I11	I39	0.03	0.04	0.02
113.431	1074.790	I11	I40	0.21	0.29	0.14
113.869	1077.630	I11	I41	0.05	0.07	0.04
114.126	1079.290	--	unknown	0.05	0.07	0.03
114.572	1082.150	I11	I42	0.02	0.03	0.01
114.882	1084.140	A11	1,4-methyl-t-butylbenzene	0.02	0.02	0.01
115.051	1085.220	I11	I43	0.05	0.07	0.03
115.252	1086.500	--	unknown	0.06	0.09	0.04
115.617	1088.830	--	unknown	0.06	0.09	0.04
115.838	1090.220	O11	undecene-1	0.04	0.06	0.03
116.136	1092.110	--	unknown	0.06	0.09	0.04
116.389	1093.710	A10	1,2-dimethyl-3-ethylbenzene	0.07	0.08	0.06
116.681	1095.550	A11	1,2-ethyl-i-propylbenzene	0.06	0.07	0.04
116.961	1097.310	--	unknown	0.03	0.04	0.02
117.147	1098.480	--	unknown	0.03	0.04	0.02
117.389	1100.000	P11	n-undecane	0.73	0.98	0.49
117.958	1104.860	A10	1,2,4,5-tetramethylbenzene	0.11	0.13	0.09
118.443	1108.980	A10	1,2,3,5-tetramethylbenzene	0.18	0.21	0.14
118.651	1110.750	--	unknown	0.02	0.03	0.02
118.973	1113.470	--	unknown	0.02	0.03	0.02
119.257	1115.860	--	unknown	0.02	0.03	0.02
119.423	1117.260	--	unknown	0.04	0.06	0.03
119.764	1120.130	--	unknown	0.03	0.04	0.02
119.898	1121.250	A11	1,2-methyl-t-butylbenzene	0.08	0.09	0.06
120.621	1127.290	A10	5-methylindan	0.14	0.16	0.11
121.110	1131.350	I12	I44	0.13	0.17	0.08

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 3/7/2014 12:38:33 PM

RawFile: C:\Chem32\1\DATA\140306a\140306A 2014-03-06 15-55-00\204B0401.D\204B0401.CDF

Acquired: 03/07/14 01:05:15

Sample: 316-018

Analyzed: 3/7/2014 12:38:33 PM

Processed 335 Peaks

Reference File: C:\Chem32\DHARef\ID6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

Hold

Components Listed in Chromatographic Order

Page: 10

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
121.407	1133.810	A10	4-methylindan	0.08	0.09	0.06
121.730	1136.470	A11	1,2-ethyl-n-propylbenzene	0.17	0.19	0.12
121.943	1138.230	A10	2-methylindan	0.06	0.07	0.05
122.224	1140.540	A11	1,3-methyl-n-butylbenzene	0.07	0.08	0.05
122.516	1142.930	A12	1,3-di-i-propylbenzene	0.10	0.11	0.06
122.712	1144.540	A11	s-pentylbenzene	0.07	0.08	0.05
122.938	1146.380	--	unknown	0.02	0.03	0.02
123.230	1148.770	A11	n-pentylbenzene	0.07	0.08	0.05
123.649	1152.170	N12	1t-M-2-(4-MP)cyclopentane	0.02	0.03	0.01
123.849	1153.790	A12	1,2-di-i-propylbenzene	0.05	0.06	0.03
124.407	1158.300	--	unknown	0.12	0.17	0.08
124.564	1159.560	A12	1,4-di-i-propylbenzene	0.07	0.08	0.05
124.746	1161.030	--	unknown	0.02	0.03	0.01
125.025	1163.260	A10	tetrahydronaphthalene	0.09	0.09	0.07
125.544	1167.410	I12	I45	0.14	0.19	0.09
125.776	1169.270	A12	1-t-butyl-3,5-dimethylbenzene	0.05	0.05	0.03
126.340	1173.750	A12	1,4-ethyl-t-butylbenzene	0.09	0.10	0.06
126.675	1176.400	--	unknown	0.01	0.02	0.01
126.857	1177.830	I12	I46	0.03	0.03	0.02
127.105	1179.790	I12	I47	0.02	0.03	0.01
127.368	1181.860	--	unknown	0.02	0.03	0.01
127.520	1183.050	I12	I48	0.04	0.05	0.02
127.715	1184.580	--	unknown	0.07	0.11	0.05
128.240	1188.690	A12	1,3-di-n-propylbenzene	0.10	0.12	0.07
128.447	1190.310	A12	A5	0.03	0.04	0.02
128.706	1192.320	O12	dodecene-1	0.07	0.09	0.04
129.697	1200.000	P12	n-dodecane	0.65	0.86	0.40
130.588	1208.550	--	unknown	0.04	0.05	0.02
131.134	1213.770	--	unknown	0.02	0.02	0.01
131.475	1217.010	A12	1,3,5-triethylbenzene	0.27	0.31	0.18
132.342	1225.220	A12	1,2,4-triethylbenzene	0.05	0.05	0.03
132.465	1226.380	--	unknown	0.03	0.04	0.02
132.803	1229.570	--	unknown	0.08	0.11	0.05
133.152	1232.850	--	unknown	0.06	0.08	0.04
133.431	1235.460	--	unknown	0.03	0.04	0.02
133.670	1237.690	--	unknown	0.05	0.07	0.03
133.903	1239.860	--	unknown	0.02	0.02	0.01
134.112	1241.810	A12	1,4-methyl-n-pentylbenzene	0.08	0.09	0.05

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 3/7/2014 12:38:33 PM

RawFile: C:\Chem32\1\DATA\140306a\140306A 2014-03-06 15-55-00\204B0401.D\204B0401.CDF

Acquired: 03/07/14 01:05:15

Sample: 316-018

Analyzed: 3/7/2014 12:38:33 PM

Processed 335 Peaks

Reference File: C:\Chem32\DHARef\1D6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Hold

Sample Wt: 4.44

Sample Den: 1.00

Components Listed in Chromatographic Order

Page: 11

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
134.396	1244.450	--	unknown	0.06	0.09	0.04
134.615	1246.480	--	unknown	0.05	0.08	0.03
135.168	1251.600	A12	n-hexylbenzene	0.03	0.03	0.02
135.596	1255.550	--	unknown	0.11	0.16	0.07
135.796	1257.380	--	unknown	0.09	0.13	0.06
136.130	1260.440	--	unknown	0.02	0.03	0.01
136.308	1262.080	--	unknown	0.06	0.09	0.04
136.516	1263.980	--	unknown	0.02	0.02	0.01
136.805	1266.620	--	unknown	0.14	0.20	0.09
136.990	1268.300	--	unknown	0.07	0.10	0.05
137.524	1273.150	I13	I50	0.11	0.15	0.06
137.965	1277.140	A11	1,2,3,4,5-pentamethylbenzene	0.16	0.16	0.11
138.297	1280.140	--	unknown	0.03	0.04	0.02
138.592	1282.800	A11	2-methylnaphthalene	0.12	0.12	0.09
139.068	1287.070	--	unknown	0.10	0.15	0.08
139.578	1291.620	O13	tridecene-1	0.10	0.13	0.06
140.000	1295.390	--	unknown	0.07	0.10	0.04
140.308	1298.120	A11	1-methylnaphthalene	0.07	0.07	0.05
140.519	1300.000	P13	n-tridecane	0.53	0.71	0.31
140.792	1302.870	+	C14+	0.06	0.08	0.03
141.103	1306.120	+	C14+	0.04	0.05	0.02
141.313	1308.320	+	C14+	0.03	0.04	0.01
141.575	1311.050	+	C14+	0.04	0.05	0.02
141.871	1314.130	+	C14+	0.10	0.13	0.05
142.110	1316.620	+	C14+	0.04	0.05	0.02
142.544	1321.110	+	C14+	0.13	0.17	0.07
142.998	1325.810	+	C14+	0.04	0.05	0.02
143.407	1330.030	+	C14+	0.39	0.51	0.21
143.837	1334.440	+	C14+	0.05	0.06	0.03
144.110	1337.240	+	C14+	0.04	0.06	0.02
144.256	1338.740	+	C14+	0.05	0.07	0.03
144.607	1342.320	+	C14+	0.02	0.02	0.01
144.790	1344.190	+	C14+	0.02	0.03	0.01
145.056	1346.890	+	C14+	0.06	0.08	0.03
145.209	1348.450	+	C14+	0.06	0.08	0.03
145.397	1350.350	+	C14+	0.05	0.06	0.02
145.700	1353.420	+	C14+	0.08	0.10	0.04
146.106	1357.520	+	C14+	0.21	0.28	0.11

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 3/7/2014 12:38:33 PM

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Acquired: 03/07/14 01:05:15

Sample: 316-018

Analyzed: 3/7/2014 12:38:33 PM

Processed 335 Peaks

Reference File: C:\Chem32\DHARef\ID6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

Sample Den: 1.00

Hold

Components Listed in Chromatographic Order

Page: 12

Minutes	Index	Group	Component	Mass %	Volume %	Mol %
146.465	1361.140	+	C14+	0.22	0.29	0.12
146.961	1366.130	+	C14+	0.09	0.12	0.05
147.198	1368.500	+	C14+	0.05	0.06	0.03
147.433	1370.860	+	C14+	0.04	0.05	0.02
147.646	1372.980	+	C14+	0.10	0.13	0.05
148.015	1376.650	+	C14+	0.05	0.06	0.03
148.423	1380.710	+	C14+	0.17	0.23	0.09
148.854	1384.980	+	C14+	0.06	0.08	0.03
149.105	1387.470	+	C14+	0.03	0.04	0.01
149.280	1389.190	+	C14+	0.06	0.08	0.03
149.906	1395.350	+	C14+	0.13	0.17	0.07
150.069	1396.960	+	C14+	0.07	0.09	0.04
150.379	1400.000	+	C14+	0.47	0.62	0.25
150.628	1400.000	+	C14+	0.06	0.08	0.03
150.936	1400.000	+	C14+	0.08	0.11	0.04
151.091	1400.000	+	C14+	0.03	0.04	0.02
151.335	1400.000	+	C14+	0.14	0.19	0.08
151.679	1400.000	+	C14+	0.13	0.17	0.07
152.021	1400.000	+	C14+	0.05	0.07	0.03
152.313	1400.000	+	C14+	0.04	0.05	0.02
152.565	1400.000	+	C14+	0.04	0.05	0.02
153.225	1400.000	+	C14+	0.10	0.13	0.05
153.462	1400.000	+	C14+	0.04	0.06	0.02
153.598	1400.000	+	C14+	0.02	0.03	0.01
153.903	1400.000	+	C14+	0.09	0.12	0.05
154.172	1400.000	+	C14+	0.06	0.08	0.03
154.628	1400.000	+	C14+	0.04	0.05	0.02
154.812	1400.000	+	C14+	0.03	0.04	0.02
155.075	1400.000	+	C14+	0.17	0.23	0.09
155.360	1400.000	+	C14+	0.06	0.08	0.03
155.563	1400.000	+	C14+	0.03	0.04	0.02
155.862	1400.000	+	C14+	0.09	0.12	0.05
156.388	1400.000	+	C14+	0.27	0.35	0.14
156.812	1400.000	+	C14+	0.03	0.04	0.02
156.996	1400.000	+	C14+	0.09	0.11	0.05
157.216	1400.000	+	C14+	0.07	0.10	0.04
157.821	1400.000	+	C14+	0.08	0.11	0.04
158.102	1400.000	+	C14+	0.03	0.04	0.02

Detailed Hydrocarbon Analysis Detail Report -

Report Date: 3/7/2014 12:38:33 PM

RawFile: C:\Chem32\1\DATA\140306a\140306A 2014-03-06 15-55-00\204B0401.D\204B0401.CDF

Acquired: 03/07/14 01:05:15

Sample: 316-018

Analyzed: 3/7/2014 12:38:33 PM

Processed 335 Peaks

Reference File: C:\Chem32\DHARE\ND6730_V1.DHA

Comments:

Yield: 52.65%

Int Std: methyl-t-butylether

Int Std Amt: 0.21

Sample Wt: 4.44

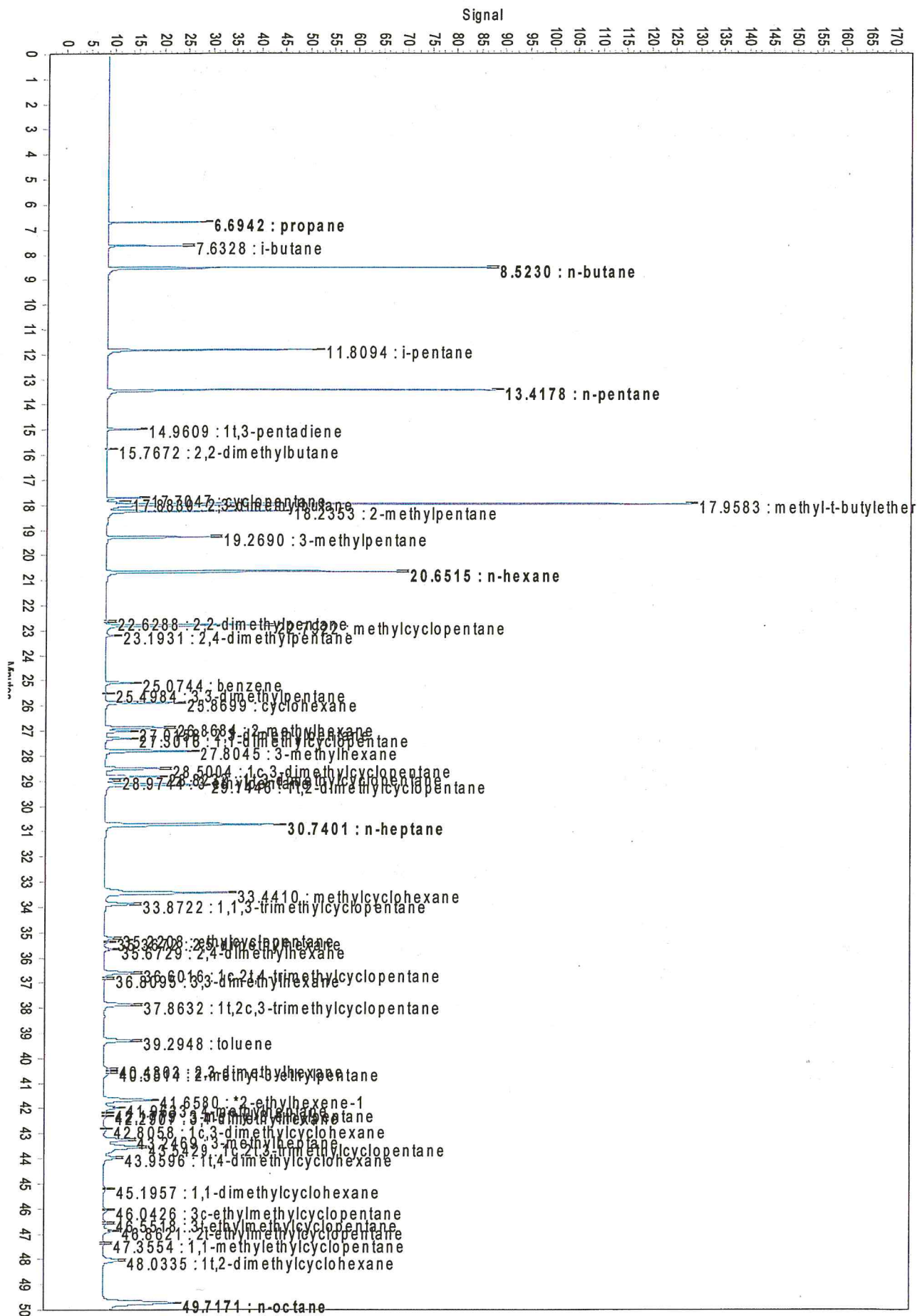
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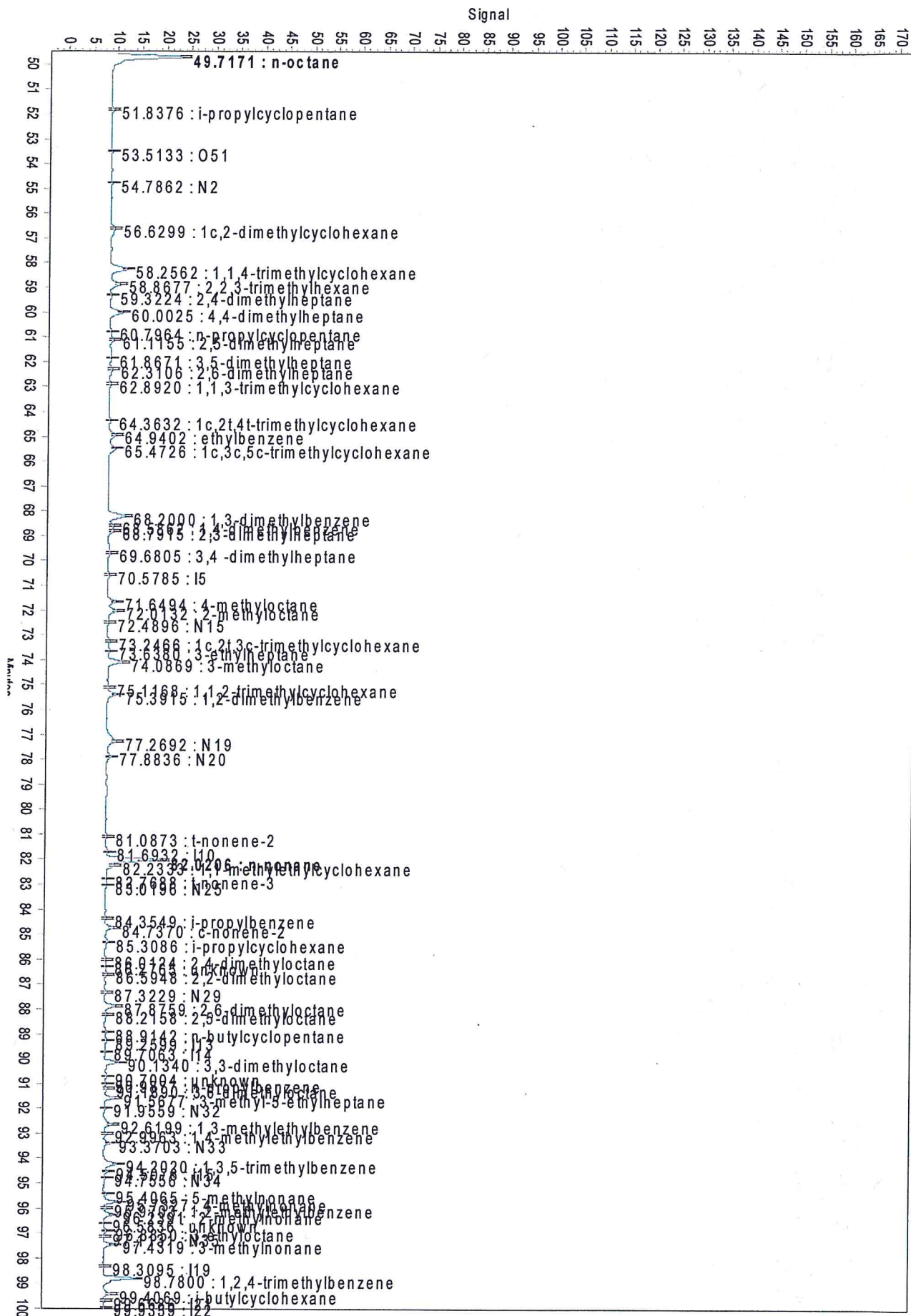
Hold

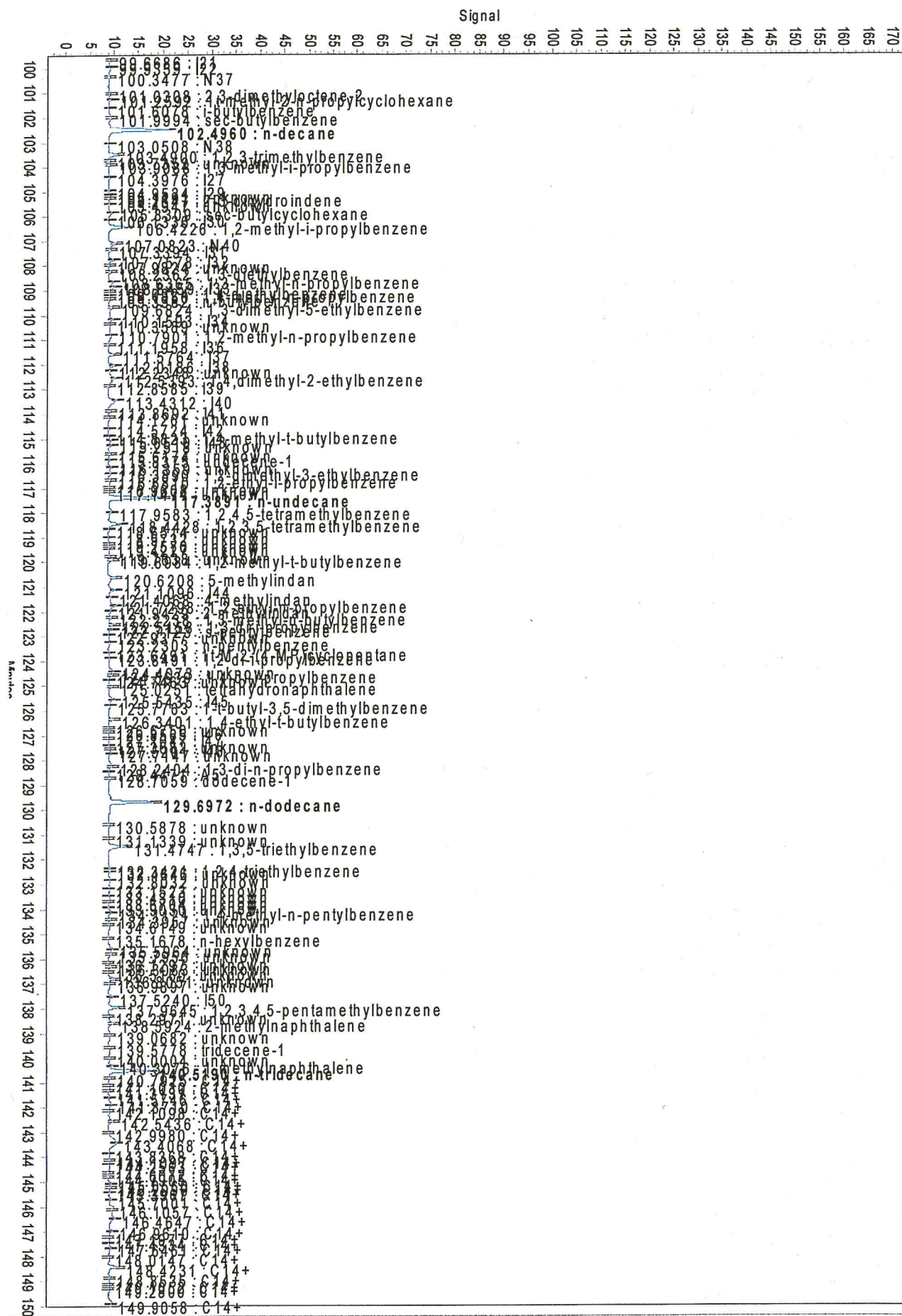
Components Listed in Chromatographic Order

Page: 13

<u>Minutes</u>	<u>Index</u>	<u>Group</u>	<u>Component</u>	<u>Mass %</u>	<u>Volume %</u>	<u>Mol %</u>
158.251	1400.000	+	C14+	0.03	0.04	0.01
158.759	1400.000	+	C14+	0.09	0.11	0.05
159.283	1400.000	+	C14+	0.07	0.09	0.04
159.529	1400.000	+	C14+	0.44	0.57	0.23
159.781	1400.000	+	C14+	0.08	0.10	0.04
160.211	1400.000	+	C14+	0.13	0.17	0.07
160.853	1400.000	+	C14+	0.05	0.07	0.03
161.251	1400.000	+	C14+	0.08	0.11	0.04
161.745	1400.000	+	C14+	0.09	0.11	0.05
162.157	1400.000	+	C14+	0.04	0.05	0.02
162.347	1400.000	+	C14+	0.03	0.04	0.01
162.859	1400.000	+	C14+	0.02	0.03	0.01
163.112	1400.000	+	C14+	0.08	0.11	0.04
163.469	1400.000	+	C14+	0.05	0.06	0.03
163.663	1400.000	+	C14+	0.04	0.06	0.02
163.846	1400.000	+	C14+	0.05	0.06	0.02
164.252	1400.000	+	C14+	0.07	0.09	0.04
164.354	1400.000	+	C14+	0.04	0.05	0.02
164.647	1400.000	+	C14+	0.12	0.16	0.07
165.106	1400.000	+	C14+	0.09	0.11	0.05
165.320	1400.000	+	C14+	0.02	0.03	0.01
165.521	1400.000	+	C14+	0.05	0.07	0.03
165.747	1400.000	+	C14+	0.04	0.06	0.02
165.991	1400.000	+	C14+	0.03	0.04	0.01
167.639	1400.000	+	C14+	0.08	0.10	0.04
168.177	1400.000	+	C14+	0.34	0.44	0.18
168.512	1400.000	+	C14+	0.05	0.07	0.03
168.992	1400.000	+	C14+	0.03	0.04	0.02
169.324	1400.000	+	C14+	0.03	0.04	0.02
169.683	1400.000	+	C14+	0.02	0.03	0.01







316-018 (C:\Chem321\DATA\40306a\40306a.2014-03-06 15-55-00\204B0401.D\204B0401.CDF)
Start Time: 99.500 - End Time: 150.000

316-018 (C:\Chem321\DATA\140306a140306a.2014-03-06 15-55-00\204B0401.D\204B0401.CDF)
Start Time: 149.500 - End Time: 170.997

